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“The Icarus Protocol”

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James Patrick Welch

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Dedication

“For he to-day that sheds his blood with me shall be my brother”
--Shakespeare, Henry the V, 1598.

This research is dedicated to the brave men and women of the armed forces of the United States of America. Their unbounded sacrifice, loyalty, dedication, and their love of freedom and democracy in the face of adversity is their finest tribute to the nation. They stand as the guardians of truth and eternal freedom. For those who came home, and for those who did not, I thank you.
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“The test of the machine is the satisfaction it gives you. There isn't any other test. If the machine produces tranquility it's right. If it disturbs you it's wrong until either the machine or your mind is changed.”


Chapter I

INTRODUCTION

Research Question and Purpose Statement

From computers to satellites, sophisticated technological development has touched, modified and enhanced the daily existence of mankind in all walks of life. The worlds of intelligence and defense have not been exempted from such influence. These two “cousins,” in fact, encompass some of the foremost pioneers, researchers, developers and first hand users of said technology. Today, a vast array of technological systems has become available to both the US Intelligence Community and the military in order to perform their missions safely and efficiently. One such platform is that of the unmanned aircraft system (UAS). It consists of two variants; the UAV (unarmed) intelligence surveillance and reconnaissance (ISR) version and the weaponized, unmanned combat air vehicle (UCAV). The focus of the research is primarily centered upon the armed, UCAV versions; the Predator and Reaper platforms. The Air Force produces a number of *Fact Sheets,* which are exceedingly informative for a basic understanding of the various platforms.

There have been numerous articles, treatises and scholarly works devoted to examining the various facets of legal, moral, ethical and technological issues and their individual dynamics.
regarding the use of UAVs and UCAVS. None of these studies to date, however, has appeared to have addressed the issue in a synergistic manner. With most new discoveries, there is always a conflict; an unfortunate and inevitable “trade-off”. This might, conceivably, be seen as a man vs. machine or a technology vs. humanity paradigm. In the case of unmanned vehicles (UMVs) and robotics, however, there is promise of melding the two aspects. It is in a spirit of comprehensive and critical examination that this research examines and asks: “What are the existing moral, ethical, legal and technological boundaries involved in the use of UAVs and UCAVs and how do these boundaries relate to autonomy and discretion? Furthermore, how do these disparate phenomena interact and what specific criteria can actually be formally established and articulated between them?”

The purpose and intent of this research is to examine the current literature on the subject and shed light upon the various legal, ethical, moral and technological ramifications and limitations. The study also seeks to clarify the advantages and disadvantages, surrounding the use of such deadly and sophisticated unmanned technology. Or as ethicist Patrick Lin et al., refer to these aspects as “risks and benefits.” Social repercussions and psychological impact upon both end users and victims are also briefly considered. Given the extremely complex nature and depth of the current research—as well as the opportunity for expanded exploration and controversy of the topic; the focus of the current work is generally descriptive, in nature.

This research also explores certain aspects and applications in the artificial intelligence space, such as, KEEL® Technology engines and the KEEL Dynamic Graphical Language (DGL), the observe, orient, decide and act (OODA) loop⁴ and how they apply to judgment, reasoning, discretion and autonomy in unmanned systems (UxS). The technological research is complex due to intricate aspects surrounding components of intent, judgment, logic discretion and
reasoning and how these characteristics apply to machine technology. Complex, as well, since there are also philosophical, social, political, diplomatic, legal, strategic and humanitarian dynamics and repercussions involved. The research question is be open to further examination and exploration since no single paper can possibly hope to successfully address all the components of such extremely complex issues. Further research must, by nature, also be conducted due to the ever-evolving character of society—its norms, values and mores—and the changes encountered due to the effects of globalization. It should be noted that a significant conflict exists in attempting to correlate empirically measurable criteria (c.f. technology and limitations) with more nebulous, philosophical and humanitarian constraints. The review of the current literature, contained within this research, exposes the wide range of views and opinions, as well as the advantages, disadvantages and limitations of this technology, and considerations for future development, applications and doctrine.

There is a need to develop a far reaching and well balanced set of established and enforceable rules, concerning the use of this new technology. This research asserts indisputably that vague and imprecise guidelines, provided in the past, need to be replaced by more flexible yet coherent legal precepts. These new laws must take into account the new face of modern, asymmetric, transnational warfare, which neither respects nor recognizes geographical boundaries nor international law. Furthermore, it is likely that the legal, moral and ethical perspectives, as they pertain to increased UAV autonomy, will be required to keep pace with new and evolving technology. This thesis has been approached as an analytical study. A central theme is to propose and recommend the need for the development of an international body dedicated to the arbitration, development and enforcement of international law. This would concern robotics in general and those intended for use in armed conflict in particular.
Chapter II

“Bad laws are the worst sort of tyranny.”
—Edmund Burke, *Speech at Bristol Previous to Election* (06 September 1780).

Literature Review and Theoretical Framework

The Good the Bad and the Ugly

There are numerous positive and negative aspects involved in examining the role and use of UAVs and UCAVs. Each of these aspects are worthy of in-depth treatment and consideration. It is important to separate the relevant materials, such as peer reviewed journals and investigative reporting from some of the less reliable sources. Certain references such as, *The Predator War*, a report by Jane Mayer, in the *New Yorker* cited several times in this research are infallible, while other more dubious articles must be subject to circumspect and rigorous examination for possible bias.

The majority of the literature review is drawn from scholarly sources in the fields of social science, economics, intelligence reports, law reviews, computer engineering, information technology, robotics, and various academic treatises with support from secondary sources such as reports from newspapers and specialized press. This review objectively examines both sides of the issue, when they are presented. Tomes of recent academic work have been produced specifically concerning the legality, morality and ethics of the use of unmanned aerial vehicles. An interesting study by Loes van Wifferen, of the University of Utrecht, in Holland, examines in a well-documented piece of research the question of “moral disengagement of the cubicle warrior,”5 for instance. Authors of the recently published, *Terminator Planet*, Turse and
Engelhardt note, “It’s true that, at the moment, articles are pouring out focused on how to define the limits of future drone warfare.”

There are tactical, strategic, historical, cultural, political, economic, social and humanitarian issues which must be considered and taken into account. Additionally, these elements depend on whether they are held according to a national, transnational, regional or international scale of measurement. They can also change according to the frame of view, for instance, that of a realist, liberal or constructivist perspective. Listed below, is a cross-sectional examination of some of the literature available on the subject. These range from presenting a global perspective to being subject matter specific.

A strategic and political perspective, surrounding the advantages provided by UAVs, may be adopted for instance. Aircrew hostages were often considered “coin of the realm” for certain terrorist groups. They served as high target profiles for media exploitation. Carlo Kopp points out that, “The political impetus for UCAVs resides largely in the CNN Effect, as shot down aircrew are regarded to be a very high value negotiating asset by a great number of regimes which find themselves frequently at odds with the US or indeed other developed countries.”

Hillel Ofek makes a highly skillful, noteworthy and in-depth analysis of the contradictions inherent in the Obama administration’s policy. There is moral indignation of illegal detention and torture, as practiced under the aegis of the Bush administration. By the same token, however, the Obama Administration has condoned reckless and indiscriminate targeting and collateral damage in a drone campaign, shrouded by a lack of transparency. In all fairness, there is a constant conflict between the need for democratic transparency and that of the secrecy protecting national security imperatives. Gabriel Schoenfeld of the Wall Street Journal writes,
“Our country depends on openness for its vitality. But it also depends upon secrecy for its security. The two imperatives are always in tension.”

Despite growing criticism and reservations concerning the targeted killings carried out by drones, it appears that the operational implications outweigh any moral or ethical indignation. Peter Cullen affirms as much when he states, “The conclusion is that, in spite of the genuine controversy surrounding this subject, a carefully circumscribed policy of targeted killing can be a legal, moral, and effective tool in a counterterror campaign.” Note that the term “operational” is the key here, since there has really been no formal strategic or doctrinal philosophy developed and applied to date. The development of an approach including a more cohesive doctrine shall be, hopefully, broached in a following research effort. Future improvements, concerning the legal perspective of the use of targeted killing, should also necessarily include enhanced, improved and regular training for commanders, operators and legal staff concerning international humanitarian law. This aspect has been increasingly neglected and ignored.

From an economic perspective, the cost of losing an unmanned Predator drone or even a Reaper, for that matter, is relatively cheap both in human and economic cost when compared to the value of an F15 and its crew. As Peter Singer writes, “Each Predator costs just under $4.5 million, which sounds like a lot until you compare it to the cost of other military planes.” This enthusiasm must be tempered, however, by the fact that these savings have hidden cost factors, Mabrey notes, “UAVs are commonly referred to as ‘systems,’ which usually consist of three components: a ground station, communications architecture and an air vehicle(s).” Thus when speaking of UAVs as system, the cost are necessarily higher. An alternative perspective is that of the funds generated through the sales of technology. Richard Sisk reported that Turkey was in the market for US hunter/killer drones to the tune of a four million dollar contract. In May of the
same year “Iraq also agreed to purchase at least six unarmed US surveillance drones despite the protests from Iran.” Kit sales to Italy for the arming of its Reaper fleet were also expected to be approved, counting for a hefty seventeen million dollar sale.

Nonetheless, considering high altitude collection platforms, such as the Global Hawk, UAVs are certainly more cost effective than satellite arrays such as the KH-11. Richard Best indicated such a relative comparison in his report to Congress when he stated, “High altitude UAVs such as Global Hawk may also provide surveillance capabilities that overlap those of satellites.” Professor Carlo Kopp, rather skeptically, tends to rather downplay that view, “Again, this is one issue which UCAV proponents often gloss over - the practical reality is that the cost advantages of removing combat pilots and WSOs may not stack up against the overheads required to operate a UCAV remotely. It is worth noting that an RQ-4A Global Hawk complete with sensor package and ground station rivals the cost of an F-15E fighter.”

There are also significant manpower requirements involved with the operation of unmanned systems. The programming, maintenance and control and command functions (C2) in-theatre operation, launch and recovery requirements all call for an expansive support team. As Taylor notes, “This corresponds to a considerable manpower intensive effort, in stark contrast with the current aspiration of UAVs to reduce the manpower burden.” The crew requirements for the more autonomous Global Hawk High Altitude Endurance system are less substantial than for that of the MQ-9 Reaper or the MQ-1 Predator systems.

The economic view has become important in the light of recently proposed sequestration. Carlo Kopp reflects that the enthusiasm for unmanned systems may be based upon the current economic climate and is constraint based decision making. While he is speaking about the
Australian defense budget, such considerations might equally be considered in relation with US economic difficulties. According to majority opinion, presented in the specialized literature, the focus for the immediate future shall be upon enhancing existing platforms and suites and not in the acquisition and research and development (R&D) of new models. This may be even truer given the recent budgetary restrictions and the forthcoming sequestration. This could eventually slow down and prove to be a debilitating factor in the military’s UAV acquisition plans, while negatively impacting R&D programs.

When considering the tactical and strategic value of asymmetric warfare and associated intelligence collection, overly sophisticated technical intelligence may not be ideally suited to low-tech, non-state actor insurrections. “Costly, high-tech intelligence systems designed for conventional warfare or monitoring the electronic environment may be ineffective against organizations employing simpler methods of clandestine communications as Osama bin Laden demonstrated in his well-coordinated, devastatingly effective attack against the US that some have labeled this century’s “Pearl Harbor,”” As Dupont indicates.

Finally, there are the moral, ethical, social and psychological costs to both victim and operator which must be considered. By affording itself the right to of not paying heed to the rules and ethics, which bind civilized society, the US risks in the long run, alienating itself socially and morally from the world community. Military might does not automatically equate with global respect.

On the political portion of the equation, are the scars left by any type of warfare. This fourth generation, insurgent and technologically dominated warfare, however, shall exact its own unique costs; morally, ethically and psychologically. Although US operators may be protected
and cushioned, distant from the harsh realities of actual combat, killing by distance may have
darker, deeper and more insidious consequences than are readily apparent. Lev Grossman of
Time Magazine cites a Pentagon study which related that, “Even though they [drone operators]
work from the safety of air-conditioned bunkers and go home to their families every night,
almost 30% of Air Force drone pilots suffered from burnout, and 17% were clinically distressed.
They may not have been in danger, but some part of them was nevertheless in combat.”17 One of
the best sources on the consequence of warfare is the seminal work of Lt. Colonel Dave
Grossman “On Killing.” This insightful and well written text covers the various psychological
repercussions and the results of armed conflict. Grossman distinguishes between several types of
distance in warfare; cultural, moral, social and mechanical. Many of the concepts apply directly
to the phenomenon of drone warfare and UAV operators. The element of such a vast distance
aids in rendering the situation surreal and dehumanizing the enemy. Grossman wrote presciently,
“Social distance is generally fading as a form of killing enabling in Western war. But even as it
disappears in this more egalitarian age, it is being replaced by a new, technologically based form
of psychological distance. During the Gulf War this was referred to as ‘Nintendo Warfare’,
which evolved into ‘video game combat’ in Iraq and Afghanistan.”18 While speaking of thermal
imaging here, the reference is, nonetheless apt.

Legal, Ethical, Moral Considerations

The research on UCAVs is replete with a vast array and mounting jumble and conflicting
dctrine and documentation. Much ink has flowed and the debate has become intensely heated,
yet few responses or proposals worthy of consideration, are forthcoming. This should not be
surprising, since the phenomenon of the use of armed drones has only recently entered center
stage, yet touches on many assorted issues across the board. The most recent opinions and
relevant legal treatises, covering the legality of drone warfare have been drawn from major law schools such as: the S. J. Quinney College of Law, University of Utah; New York University School of Law, Stanford, Columbia, Harvard, and Yale Law schools, and the Washington College of Law, to cite but a few.

The positions of many of the most erudite legal scholars, on both sides of the issue, present an excellent basis for research in international customary and humanitarian law, and the peremptory (inviolate) norms also referred to as *ius cogens*.19 Official documentation consulted includes: the Hague conventions I- IV (1899/1907); the Geneva Conventions (1949) and additional protocols I and II; the UN Charter (notably Article, 51); International Committee of the Red Cross, *Interpretive Guidance on the Notion of Direct Participation in Hostilities Under International Humanitarian Law* (2009); the Congressional, Authorization for Use of Military Force (2001); the International Covenant on Civil and Political Rights (ICCPR, 1976); Executive Order 12333; Title 18 USC §1119; Supreme Court rulings such as, *Hamdi v. Rumsfeld* 542 U.S. 507 (2004), and *Hamdan v. Rumsfeld*, 548 U.S. 557, 558, (2006). These sources serve as the underlying foundation for various legal positions. Congressional testimony and other official references complete the sources consulted for establishing a sound working legal framework. As mentioned previously, the topic arouses much discord and dialogue, but very little consensus, most notably in the realm of law. Opinions tend to be polarized on either end of the realist – liberal spectrum. “The morality of the U.S. drone campaign, and its legality under domestic or international law, is the subject of bitter debate,”20 indicates Grossman. The answer, if there is one, most likely lies somewhere at a fluctuating midpoint. Andrew C. Orr underscores the importance or finding a resolution which seeks consensus when he writes, “Thus the question becomes whether the program is legal under international law, and if not, why not.”21
Mary Ellen O’Connell, respected professor of law, and arch-critic of, drone doctrine outside the battlespace explains, “The United States began using weaponized drones to attack the border area between Afghanistan and Pakistan. “Drone attacks by the U.S. in Pakistan began in 2004.” These attacks resulted in the deaths of hundreds of unintended victims including children.” Extreme caution must be exercised, with the use of such, unofficially unsubstantiated, statements, when putting forth specific numbers of civilian casualties. If these numbers are correct, then O’Connell is certainly justified in her assertion that the, “Most serious of all, perhaps, is the disproportionate impact of drone attacks fifty civilians killed for one suspected combatant killed is a textbook example of a violation of the proportionality principle.” Alas, if the problem was only so simple and clear-cut!

The actual number of civilians killed depends largely upon whose interpretation one relies upon, and whether the victims were actually civilians at all. In such circumstances it is indeed difficult to distinguish between lieutenants or armed insurgents, aiding the intended target, and true victims of collateral damage. Rarely, do high value targets (HVTs) travel alone unescorted and unprotected. Just such an example of this was the strike on American born radical Islamic cleric, Anwar al-Awlaki. Al-Awlaki was accompanied by several lieutenants including another US citizen, Samir Khan, editor of the radical internet magazine Inspire. Interestingly, those espousing a more passive view would have it both ways it seems. Critics of drone policies often, show two faces of the same argument, which tend to invalidate one another; claiming that drones are incapable of accurately discriminating between targets and civilians, and, at the same time, capable of precise identification. O’Connell, for instance, poses the question, “But can drones ever be precise enough to comply with the rule of distinction in the situation of Western Pakistan?” Turse counters,”…the [drone] cameras are so powerful the ‘pilots’ can reputedly
watch the facial expressions of those being liquidated (emphasis added) on their computer monitors ‘as the bomb hits.’” Examining such a statement shows the inherent contradiction in such reasoning. Furthermore, emphasis was added to Turse’s scathing rebuke, to underscore the use of emotional and value-laden semantics to strengthen his own position.

While passionate in support of her cause, many of Mary Ellen O’Connell’s arguments are often couched in theoretical possibilities and quasi certainties. Defense of her position is replete with “it would seem,” “apparently,” “even if,” statements which, while well-intended, do little or nothing, to elucidate the empirical evidence which is being sought. The author fails to raise a convincing argument and relies upon anecdotal evidence and obscure and ill-defined jurisprudence. O’Connell, further, makes certain assumptions about military strategy and the successful use of drone attacks, which lie well beyond her level of knowledge and experience.

In her article, Unlawful Killing with Combat Drones, O’Connell fails to recognize and assign proper value to such principles as: intent, scale of risk and probability, and threat levels. This is precisely why this research argues that the current set of rules is no longer applicable given the changing face of modern warfare. O’Connell argues that relentless cross-border incursions are not a significant enough factor for a state to resort to self-defense under the principles of Article 51. This totally discounts the obligation of the state to provide security to its citizens from aggression; either directly or indirectly. Harold Koh adopts the inverse position supporting the right of self-defense under Article 51 while Professor Guiora asserts, “The primary obligation of the nation state is to protect its innocent civilian population, valuable natural resources, and assets.” Some critics have equated the use of drones and targeted killing with assassination, treachery, and perfidy, which is prohibited according to the rules of jus in bello, as well as under the Hague Convention IV, Annex, art 23(b), Oct. 18, 1907, 36 Stat. 2277, 2301-02. Cullen,
however, counters such criticism by pointing out that, “Provided the manner of a targeted killing does not involve treachery or perfidy, it is not an illegal assassination under international law.”

Recently, more measured views and approaches have been proffered by such erudite scholars as professor Amos Guiora and Kenneth Anderson and Peter Cullen. Guiora, while defending the rights to preserve national security and preemptive self-defense, also establishes precedents for well-defined targets and strategically measured response. Guiora elucidates, “I argue that killing in the context of narrowly defined self-defense is both legal and moral—provided that the decision to ‘pull the trigger’ is made in the context of a highly circumscribed and criteria-based framework.” The doctrine offered by Guiora is extremely logical and clearly defined. While the principles outlined by professor Guiora extend, generally, to all aspects of armed conflict, they are particularly applicable to the use of UCAVs. When considering the morality of the use of deadly force, for instance, Guiora declares that, “Protecting a civilian population does not justify non-target specific counterterrorism; the measure must be based on legal, moral and operational criteria and guidelines.” Such specific guidelines, when considered in such a manner, therefore, interact and create a fusional entity worthy of serious policy evaluation (author’s emphasis).

Amos Guiora emphasizes that the boundaries and limitations involved with a states counter terrorism policies should be limited by three constraints:

- Domestic law
- International law and
- Morality

Completely to the right of the analytical spectrum stand legal scholars such as: John Yoo, author of the infamous torture memorandum, and Harold Koh, both conservative oriented, legal counsels of Korean extraction. While they were at polar extremities in the contentious issue over torture/enhanced interrogation techniques, their views converged on the question of drone
doctrine. Their support was based upon two crucial documents: The, now time-weary, Armed Use of Military Force resolution passed by Congress on September 14, 2001, and the right to national self-defense as enshrined in Article 51 of the UN Charter. Nawaz cites Koh’s defense of drone attacks, “In March 2010, Harold Koh, the State Department’s legal adviser, defended the use of drones for targeted attacks against the countries enemies under the argument that it “may use force” under its “inherent right to self-defense under international law.”34 Ari Shapiro also reporting on Koh’s public defense of Obama Administration’s drone doctrine, “He said the government uses advanced technologies to ensure ‘that civilian casualties are minimized in carrying out such operations.’”35 Such a view sees little moral or ethical conflict with one side of a conflict having significantly greater power or advantage, particularly in the case of an obviously justified position. This view is relatively chiaroscuro, in nature. It poses a good versus evil paradigm, without little regard for subtle nuances. Such a view is, of course nullified through naturalistic fallacy and its philosophical fact-value nature. Finally, Leo Van Den Hole offers a very thorough treatment of the question of anticipatory self-defense and its relationship to article 51 of the UN Charter, in his probing study, Anticipatory Self-Defence under International Law. Van Den Hole further argues that article 51 was never intended to be restrictive in regards to the right of state self-defense, wither individually, collectively or preemptively, but was geared more toward a collective defense initiative. He bases his argument upon several convincing premises:

- Historical language during the San Francisco Convention of 1945
- The specific wording within Article 51, itself
- The ambiguous (and hence flexible) nature of the language adopted
- The fact that Article 51 was placed within Chapter VII and not Chapter VIII
- Lack of defining criteria for what is ostensibly more important than reactive defense.36
There have been numerous assertions that there are no formal, current guidelines and legal directives to deal with this new type of warfare. Mary Ellen O’Connell, however, insists that, “The view that the world does not have up-to-date rules for responding to terrorism and other contemporary challenges is simply incorrect.” While this statement may, in fact, be true, it is also quite misleading. The world may indeed have rules concerning the use of force and the conduct of armed conflict; however, they are obsolete and ill – adapted to the current criteria of asymmetric warfare and transnational terrorism. As Peter Cullen asserts, “The campaign of transnational terrorism represents a new paradigm with which international law has yet to come to terms.” One might rightfully question the powers of application, enforcement and adherence, for instance, of the United Nations, the ICJ or the ICRC.

The current state of legal doctrine and the rapidly changing face of the globalized world, however, in reality, offer very little in the way of a clear and succinct definition, concerning the right to self-defense and the use of preemption or fist strike doctrine. “Nations perceive the threat of armed aggression differently, and international law has not attempted to codify precisely the circumstances that justify the use of force in self-defense.” This is reinforced by professor Guiora, who emphatically states, “The codified laws of armed conflict, as they exist today, are insufficient to deal with the threats posed by modern terrorist organizations.” Colonel Peter M. Cullen echoes Guiora’s viewpoint, “The ongoing U.S. campaign against terrorism does not fit neatly into the existing system on the use of force in international law.” Fortunately, however, there exist many laws, guidelines, rules and regulations which could serve as a spring board to serious proposals. These precepts are examined more closely in the course of this research. Less fortunate, is the fact that most, if not all, rules and laws are unclear and issued by organizations
with little or no mandate for enforcement, e.g., The United Nations (UN), The International Committee of the Red Cross (ICRC), the International Court of Justice (ICJ), etc.

The study of international humanitarian law conducted by the ICRC, in two volumes, is representative of the quest to seek a consensus on this tumultuous issue. Kreps and Kaag note that, “In 2009 the International Committee of the Red Cross issued guidelines on how to interpret international humanitarian law (IHL), also known as ‘the law of war or the law of armed conflict.’” However, even after 10 years of study the finished product represents little more than a guideline and starting point for legal consideration and further development. Indeed, Jean-Marie Henckaerts stresses that, “Although the Study has now become the starting point of any discussion on customary humanitarian law, it should not be seen as the final word on custom because, per definition, it cannot be exhaustive and the formation of customary law is an ongoing process.” Thus, it would appear that even those responsible for framing international humanitarian law are aware of its shortcomings and the colossal venture which such an undertaking represents. Furthermore, Radsan and Murphy remind that, “One should call that international law binds American officials only if it is also U.S. law.”

International humanitarian law strides the gap between legality and the questions of moral and ethical appropriateness. One of the major ethical dilemmas posed by many critical thinkers is the idea that enhanced technology lowers the associated risk factors and thus, opens the way to a greater propensity to resort to armed conflict. His theme reverberates consistently throughout the numerous sources consulted during the current research. As Radsan and Murphy iterate, “The lower the ‘costs’ of drone strikes, however, encourage governments to resort to deadly force more quickly…”

**On Targeting Americans**
Recently, a White Paper outlining the Obama Administration and the Department of Justice’s policy concerning the use of lethal force against US citizens was leaked and published by Michael Isikoff of the NBC news network. It appeared on the Internet on Monday, February 4, 2013. Jennifer Rowland reporting for Foreign Policy Magazine highlights the significant points, “The Obama administration has crafted a legal argument for the targeted killing of a U.S. citizen if an ‘informed, high-level official’ decides he is a ranking member of al-Qaeda who poses ‘an imminent threat of violent attack against the United States’…”46 In a public address, only one day after the leak, the White House spokesman Jay Carney, in an effort at damage control stated, “ Strikes against Americans overseas are sometimes ‘necessary to mitigate ongoing attacks.’ The operations are ‘fully consistent with our Constitution.’ …they are legal, they are ethical and they are wise.”47 Andrew Cohen, commenting on this recent paper elucidates, “I’m not remotely ready to conclude that this policy is either constitutional or likely to survive a political challenge from Congress.”48 There does, however, appear to be a distinct lack of willpower in either of the other two branches of federal government to intercede in the executive power grab.

Cohen points out that, “Indeed, the nature of presidential power being what it is, almost as disturbing as the conclusions in this memo is the timidity shown (so far) by the federal judges and law makers in refusing to challenge it.”49 Cullen while strongly in favor of well-coordinated and preventive strikes is against the idea of targeting American citizens. “Targeted killings should not be conducted against U.S. citizens or persons located within U.S. territory.”50 Congress has been held in the dark due to executive restrictions imposed in the area of national security. Critics allege that the Obama administration is upsetting the balance of power in failing to inform Congress adequately. A power trade-off between Congress and Obama seems to have taken place. In order to get his candidate for Director of the CIA, John Brennan appointed,
Obama has agreed to brief Congress on the details of drone strike policy outlined in the recent memo. Amie Parnes reports that, “President Obama has decided to reverse course and allow members of Congress to be briefed on a classified memo that details the justification for drone strikes against U.S. citizens, an administration official said Wednesday night.”\textsuperscript{51} This state of affairs, at last examination, remains a stalemate between Congress and the executive.

**Collateral “Damage”**

By itself, the term collateral damage is highly misleading. The concept of damage transmits the idea of something which can be repaired. The drone strikes used by the Obama Administration leave little, if anything to be repaired. Back at home the public remains largely uninformed and unaware of the consequences of the current campaign. Mokenhaupt asserts, ”People care less about what their government does when they are not asked to contribute.”\textsuperscript{52} There are a number of excellent sources available which provide information concerning the complex issues surrounding targeted killing and collateral damage.\textsuperscript{53}

One of the most outspoken critics of the early drone campaign was Phillip Aston, the special rapporteur for the United Nations Commission on Human rights (UNCHR). According to O’Connell, “In January 2003, the United Nations Commission on Human Rights received a report on the Yemen strike [November 3, 2002] from its special rapporteur on extrajudicial, summary or arbitrary killing. The rapporteur concluded that the strike constituted a clear case of extrajudicial killing.”\textsuperscript{54} The drone campaign has nonetheless continued unabated, and has even accelerated despite these numerous criticisms and warnings. As RT journal emphasizes, “As the US continues its War on Terror, however, the deaths continue to add up.”\textsuperscript{55} The damage is not only affecting the enemy either it has taken its toll both home and abroad, “Despite the distance
from their targets, drone operators are not fully immunized from the psychological effects of killing people by dint of their not-so-subtle deployment of Reaper and Predator technologies,”^56 Randall Amster observes. “Virtual warfare still produces tangible effects on civilians and combatants half a world away as well as on those who are asked to control the misnamed ‘joysticks’ here at home,”^57 he expands.

In a recent article for *Foreign Affairs* magazine, Sarah Holewinski, executive director for the Center for Civilians in Conflict, brilliantly ties the issues of collateral damage, and grand strategy development within an international relations framework. She insists, “…the United States needs to turn its recent ad hoc progress into a permanent and formal policy followed not only by its own military but also by those of its partners.”^58 This is a logical approach given that if United States leads in the sphere of strategic planning, then they should also lead in the realm of diplomacy and soft power as well.

Most recently, Bi Mingxin of Xinhua News of China, reporting on the most recent drone attack writes, “The strike destroyed the compound completely and also damaged many other houses located nearby. Local people rushed to the site for rescue work as there was no official or private rescue service available in the restive region.”^59 Putting the debate into ethical perspective, Bill Moyers speaking on, Professor Juan Coles’ site, *Informed Comment*, asserts, “It brought us to grief in Vietnam and Iraq and may do so again with President Obama’s cold-blooded use of drones, and his seeming indifference to so-called collateral damage, otherwise known as innocent bystanders.”^60

One of the major drawbacks politically and diplomatically has been the indiscriminant nature of attacks exercised during drone warfare. Lev Grossman writing for *Time Magazine* notes
“Since President Obama took office, the U.S. has executed more than 300 covert drone attacks in Pakistan, a country with which we’re not at war.”\textsuperscript{61} This has created a lack of legitimacy, due to issues of transparency and waning support internationally. It has also created a loss of credibility in the eyes of an aggrieved and victimized public, both at home and abroad. Peter Cullen speaking about the tightening of transparency in regards to the use of drones for targeted killing states, “All this requires a more transparent policy on targeted killing in which there is public confidence in its checks and balances to ensure proper targeting decisions are made.”\textsuperscript{62} Michael Schmitt also underlines a most significant concern relating to civilian casualties and asymmetric conflict, “…asymmetry creates a paradoxical situation. The more a military is capable of conducting ‘clean’ warfare, the greater its legal obligations, and the more critical the international community will be of any instance of collateral damage and incidental injury (even when unavoidable).”\textsuperscript{63} Interestingly this statement highlights yet another paradox, that of the military and politicians touting and vaunting the successes of their precision munitions and the efficacy of their weapons platforms.

The issue of targeted killing raises many ethical issues which lie at the center of the current debate. Guiora (2012) lays out four important principles that should define the US counterterrorism policy and help to dissipate the misty veil of dubious legality and the sense of improper state conduct, under which it currently struggles. He emphasizes a clearly defined targeting policy which clearly defines the concept of imminent threat; a greater emphasis on all source intelligence, as opposed to technological reliance; an ethically, morally and strategically balanced decision making process, rather than a simple, ‘ends justifies the means’ approach; and finally, the target determination process should have a moral and legal foundation, when bridging the gap between a threat and a target. The interest of strategic victory must not preclude
the rule of law and principles upon which the democracy was founded. Should the US continue to ignore international law and ethics, and bend them to its needs, the state will ultimately lose its legitimacy and finish little more than a powerful failed state.

**Technology and Warfare**

Despite all the controversy, the subject of robotic warfare is presenting a watershed moment in military history and international humanitarian law. Ugo Pagallo writes, “For the first time, legal systems will hold political authorities and military commissioners responsible for what an artificial soldier autonomously decides to do.” The use of armed and lethal hunter/killer technology, such as that exercised by Reaper and Predator UCAVs, is intimately linked to questions of legality, morality and ethics, particularly when discussing the question of autonomy and target discrimination.

Enhanced technology is rapidly changing the face of modern warfare. Newman notes in his thoughtful case study that, “…technologies mediate how humans perceive reality and also co-shape people’s decision making.” It would not be unimaginable, given the current leaps and bounds, that a totally autonomous system, capable of reasoning, might see the light of day in a not too distant future. Tom Keeley writes, “When we suggest KEEL® provides "human-like reasoning", what we mean is that we want to build a "machine" that can address the same problems addressed by humans, where humans use judgment and reasoning to address those problems. Humans have other (and different) drivers than machines: survival, evolution, procreation…. Machines are built (by humans) to perform a function or do a job. They do not
have (and we don't necessarily want them to have) all the baggage (and randomness) that humans have.”

Human drivers or needs were aptly addressed by the renowned anthropologist Bronislaw Malinowski and his famous hierarchy of needs. Turse and Engelhardt, citing the Washington Post, write, “Fort Benning has also seen the testing of true robotic drones—which fly without human guidance or a hand on any joystick. This, wrote the Washington Post, is considered the next step toward a future in which drones will ‘hunt, identify and kill the enemy based on calculations made by software, not decisions made by humans.” These considerations may, of course be seen in both lights, that is as a negative or positive characteristic.

Dr. Carlo Kopp is quite measured concerning the possibilities, “Full autonomy in complex roles will remain unattainable until a true AI technology becomes available - and this may well be many decades away, despite the unquestioning optimism of UCAV proponents.” Other critics see the distinct possibility and express concern. According to Taylor’s perception, “One example to avoid would be authorizing target prosecution for autonomous UAVs based only on pre-set automatic target recognition (ATR) criteria without independent operator verification of the target context RoE.”

There are others, such as Peter Singer and Thomas Keeley, however, who share a more optimistic view. “The overall promise of a technology is frequently judged by, and therefore conceptually limited to, the original context in which it was first used, rather than new situations. Secondly, new technology is typically judged by the capabilities and flaws of its first models, rather than where it is clearly headed.” Thomas Keeley also sheds light on the issue when he notes, “If a human expert “just” followed a set of rules, then computers would have already
exhibited the capabilities of humans for many years. It is this reasoning and interpretation of information that has been the differentiator.”

Despite the differences of views and opinions, one thing becomes readily apparent and that is that the Air Force is set on developing the technology behind UAS for the foreseeable future. Turse and Engelhardt assert, “In the years ahead, the Air Force intends to make drone-related policy decisions on everything from treaty obligations to automatic target engagement—robotic killing without a human in the loop.” Thus, it would appear that the advantages outweigh any possible reservations. Patrick Lin adds in his informative but rather pompously titles article, Drone-Ethics Briefing: What a Leading Robot Expert Told the CIA, “They’re unaffected by emotion and adrenaline and hunger. They’re immune to sleep deprivation, low morale, fatigue, etc., that would cloud our judgement.”

Technologically there are further difficulties as well, not necessarily concerning AI, but rather the significant and oft ignored issue of bandwidth. Professor Carlo Kopp in an email discussed the problem. In his opinion, “The bandwidth vs. autonomy dichotomy I identified in the 2001 paper is central, and remains an unsolved problem with multiple hard boundaries in the sciences side of networking and AI/AGI. Curiously much of the literature out there assumes these boundaries are either non-existent, or can be easily overcome, both assumptions being bunk produced by non-scientists who refuse to listen to scientists.” Mockenhaupt reiterated the same issue, “…in increasingly wired war zones, everyone will be fighting for bandwidth.”

Peter Singer elucidates the problem quite clearly, “Essentially, there is only so much space in the spectrum to convey all the instructions, commands, information, and requests going back and forth. But the changed in war are creating far greater demands on this limited space.” Singer
compares the bandwidth requirement for Gulf War I, of 100 megabytes in 1991, with those required in 2003 of 4.2 megabytes, a forty fold increase. The more complex he system becomes, the more “net-centric,” the more it requires greater bandwidth.

Autonomous systems are one possible way to side skirt this issue. Air Chief Marshall Sir Brian Burridge also contends, “On the other hand, I pointed out challenges represented by the need for interoperability of systems, their vulnerability, their limited capacity to address a wide surveillance area, their insatiable demand for bandwidth, and their inability to deal with ambiguity in quite the same way as a manned aircraft.”77 Much of this demand for bandwidth is related to the live broadcasting of real-time video transmission during the surveillance and loitering phase. This is, as Dr. Kopp posits a solid argument for the development of true AI, such as that also suggested by Tom Keeley, despite having different views on the subject. As long as there is a human in the loop, bandwidth it seems will pose significant problems. KEEL® Technology offers one viable and serious alternative to this conundrum.

Research Significance

The information and insights developed in the course of this research examine the extremely polarized positions within international customary humanitarian law and international jurisprudence. The current rules, laws and regulations are outmoded and inadequate, and must be addressed. “Bottom line: the U.S. seems to be struggling to adapt its 20th century moral code of warfare to the 21st century practice of sending flying robots into other countries to kill people,”78 clarifies Grossman. They are no longer suitable, nor are they adaptable to the current state of asymmetric warfare which can include non-state actors, sub nationalist groups and organized criminality. While this research focuses primarily upon US systems the precepts and is equally
applicable to all states using this technology. This research provides a possibility for enhanced understanding of these fundamentally contentious issues, while laying the foundations for further research.

Another positive objective is to establish a functional framework concerning the legal ethical, moral and technological use of armed drones. This current polemic is murky and shrouded in obfuscation. Suggestions for possible improvement and administration are provided. In order to place limitations and boundaries on the use and application of any combat proven technology it, is imperative to first examine, as in the case of the current research, the historical and moral and ethical precedents. This study also highlights the far-reaching consequences of advances in technology, while the legal, moral and ethical impact of increased autonomy in unmanned aerial vehicles is evaluated. The various political, strategic and tactical advantages, disadvantages and ramifications are explored. The social and psychological dynamics including: collateral damage, trauma and morality of distance are also presented.

Methodological Analysis

The method of research revolves primarily around standard, qualitative, cross-referential content document analysis. Peer reviewed scholarly journals, official documents, Congressional testimony and carefully filtered and selected secondary sources have been used in support of data collection. Cutting-edge technology is examined through the analysis of various white papers and conference proceedings, electronic correspondence and interviews. The research is further bolstered through the use of graphic displays from earth based, analytics, such as Google Earth. General, comparative, statistical inferences may be drawn from sites such as the Long War Journal, bearing in mind possible biases and margins of error.
Theoretically, national security lacks the sort of cohesive and explicative framework which denotes other related social science disciplines, making it difficult, if not impossible to actually attribute a specific theoretical framework to the current research. The closest possible and most applicable theories are those pertaining to the laws of war, such as the just war theory and the global conflict paradigm. There is, however, the element of the constantly changing and nebulous character of asymmetric, non-state actor oriented conflict, which tends to render the just war theory less applicable, while many researchers see the global conflict paradigm as no longer applicable. There are indeed, portions of the Collective Security approach, first developed in 1914, which can be applied under the aegis of the cooperative efforts of the International Security Assistance Force (ISAF), for instance. However, such a theory is also wanting in regards to a conclusive application concerning drone warfare and the other aspects involved in this particular research. Other structurally applicable frameworks might be derived from: Utilitarianism Theory, The Ethics of Duty theory, Complexity theory, Game theory (Neumann and Morgenstern), Postcolonialism theory, Revolution in Military Affairs theory (RMA), and identity politics. Interestingly, Taylor notes that, “Although some progress has been made – there are UMVs operating in various areas of the world today – no integrated theory of human-automation integration has surfaced as of this writing.”  Perhaps the most directly applicable theory, however, is that which encapsulates the central focus of this research and that is Advancement theory. Singer neatly summarizes this paradigm as, “…a school of thought that explains how old paradigms are broken by people who look at the world in a fresh way.”

In the course of the current research, Tom and Helena Keeley, the developers of KEEL® Technology were interviewed, in order to obtain greater insight into the technological aspects of artificial intelligence (henceforth referred to as AI). Professor Amos Guiora, also kindly accepted
to be interviewed concerning certain legal and ethical aspects surrounding drone warfare and targeted killing. Finally, cautious examination of mainstream reporting was referenced, while bearing in mind once again possible falsehoods, misleading or unsubstantiated information, personal agendas and biases. Three hypotheses are posited and tested throughout the research:

**Hypothesis 1:** The use of drones will become ever more prevalent in the modern battlespace.

**Hypothesis 2:** A new, revised, and enforceable set of laws and rules of engagement should be developed and clearly defined. They shall succeed if they are shaped through unified political will and coherent, but flexible policies.

**Hypothesis 3:** Unmanned aerial vehicles will become more independent and autonomous in the decision making process.

The dependent variables outlined within the body of this research include: Legal, ethical, moral and technological aspects, boundaries and limitations in the use of unmanned aerial vehicles. The independent variables having an impact upon these dependent variables include: The effects of globalization and the question of nation-state sovereignty versus international mandates; Political grand strategies and the balance of military versus diplomatic initiatives; The evolution international humanitarian law (IHL) and the development of enforceable legal precepts; International humanitarian law and the polarization of national self-defense as defined by Article 51 on the UN Charter; The moral justification of targeted killing in the face of transnational aggression; The issues of collateral damage and its relationship to urban insurgent infiltration; The articulation of international customary and treaty law in regards to the violation of national sovereignty and restricted air land and sea space; Accessing intelligence from neutral or non-belligerent 3rd party states; Technological advances in hardware and software
engineering; The integration and consequences of discretionary reasoning in the decision making process in human - computer interfaces (HCI), particularly in the case of enhanced autonomy and automatic target recognition (ATR) and acquisition, as regards to normative and ethical standards; Operational and strategic effectiveness of the use of UxS technology; Socio-psychological characteristics and the impact of targeted killing on victims and operators; The psycho-ethical issues of the target and distance relationship, incorporating the concept of *morality of altitude*.

The body of the research is broken into three distinct segments: **Reaching**, which consists of examining the topic, posing questions and developing a path of investigation; **Bridging**, through examining the current literature and drawing cognitive connections related to this research and **Seizing**, during which findings and conclusions are drawn based upon all the potential resources available. Much like the *intelligence cycle,* this study utilizes a “research cycle.” This consists of: investigating the problem, analyzing the problem and the associated literature, drawing specific conclusions and eventually presenting recommendations to provide various outlets for further research and policy development.
Chapter III

“The question is not its success—it is its lawfulness.”
—Kenneth Anderson, Congressional testimony, 2010

LEGAL PERSPECTIVES

Rules, Regulations and Guidelines

The following sections offer a more in depth analysis and build upon previous insights. As discussed, there are a number of fundamental rules, regulations and guidelines. These customary laws define the different reasons and justifications for commencing an armed conflict as well as the method in which that conflict is conducted, once it has been initiated. For instance, according to the BBC ethical guide there are 9 principle justifications for entering into armed conflict. They list:

- Invasion
- Assassination of a leader
- Attack on national honor (e.g., attack on an embassy)
- Attack on a state religion
- Economic attack (boycotts or embargoes)
- Attack on a neighbor or ally (alliances of security)
- Preemptive strike (largely nullified by UN article 2.3 of the UN Charter
- Assisting a friendly nation
- Punish an act of aggression (not universally accepted and seen by some as an unjust qualification)\(^2\)

These laws and rules are encompassed under what is commonly referred to as international customary laws. International law traces its philosophical origins back to the days of early Christian theologians such as St. Augustine and St. Thomas, Aquinas. It was created through the customary practices and the creation of international treaties, such as the Treaty of Westphalia (1648), The Hague and Geneva Conventions. International customary law is composed of two
facets: the first as previously mentioned is state practice while the second, opinion juris is the consideration of the state that is bound or obligated to such a law. These “laws” then become legitimized through the establishment of international treaties and protocols. The problem with these rules is that they were designed for traditional international warfare between states and have no provision to address contemporary conflicts. The difference between the traditional state-to-state conflicts of the past and current asymmetric confrontation has been the introduction of two unforeseen elements; advanced technology in the battlespace and the advent of the non-state actor. Professor Guíora aptly points out “The era of state/non-state conflict, in contrast, has been marked by both random and deliberate attacks against innocent civilians by non-state actors.”83 Transnational criminality, subnational insurgency and transnational terrorism do not conveniently fit into the existing framework, which has become obsolete and inadequate. Peter Cullen significantly adopts a parallel line of argument:

This type of conflict is normally regulated by Additional Protocol II, but its provisions are limited to internal conflict between a government and non-state actors within its territory. Clearly, this is not the case with the current U.S. conflict with AQAM which is taking place primarily on the territory of third countries such as Pakistan, Yemen, and Somalia. Since such a restrictive interpretation would place the parties to the armed conflict between the U.S. and AQAM outside jus in bello and create an unacceptable gap in the law’s coverage, it is necessary to expand the definition of a non-international conflict to include one between a state and non-state actors outside the state’s own territory.84

There exists a vast body of legislative and humanitarian guidelines concerning the conduct of armed conflict: Besides the Charter of the United Nations, there are also customary international law and treaties such as the ICCPR and the general principles contained within the concept of bellum iustum [just war principles]. The rules covering the actual conduct of armed conflict are covered by the Lieber Code (1863); Geneva Conventions of 1949, and their associated protocols I-III, of 1977 and 2005; the Hague Conventions I-IV, of 1899 and 1907. They are also covered
by the varied sets of rules of engagement (ROE), the law of armed conflict (LOAC or law of war LOW) and associated directives, such as the Department of Defense directive DoDD 5100.77. Finally there are the general principles enshrined within *jus in bello* [conduct of war principles]. The charter of the United Nations lays forth several key principles namely, Article 2(4), which concerns the principle of proportionality, and the often abused Article 51 which covers the right of national self-defense. The ICJ has also interpreted the issue of the right of state self-defense.

An absolutely vital aspect in determining an approach for effectively combating terrorism is the distinction drawn between criminal activity and acts of armed conflict. Travalio and Altenberg point out that, “A state may use two possible legal theories in responding to terrorist acts: (1) A law enforcement approach or (2) use of armed force (conflict management) approach.” Law enforcement approaches have far greater limitations placed upon the participants due to the constraints of due process and the obligation of arrest and subsequent prosecution, which are not the same constraints placed upon the adoption of armed force. Travalio and Altenberg further clarify, “the law enforcement approach to terrorism applies to domestic law while the conflict management (use of force) approach applies to international law.” Anderson adds, “The view of much of the international law community is that all uses of force must be with law enforcement seeking to arrest a person, or else uniformed military of a state, engaged in armed conflict under its legal definitions in the laws of war.” A possible alternative approach to such a stalemate would be the recognition of a completely novel institution which bridges the gap between law enforcement and armed warfare. Colonel Charles Dunlap reincarnated the concept of “lawfare,” at a presentation during the 2001, Humanitarian Challenges in Military Intervention Conference. Colonel Dunlap described this model as
“lawfare,” that is, the use of law as a weapon of war, is the newest feature of 21st century combat."

An alternative approach, which few writers seem to have deemed worthy of consideration, either due to a lack of interest or a lack of knowledge, would encompass a balance of military and diplomatic pressure to obtain more measured results. One of the few with the foresight to attempt such a model was the soldier-statesman Stanley McChrystal. It is logical to adopt an approach which combines both military prowess and diplomatic debate as preferable to either approach isolated. Thus, an “iron hand in a velvet glove” policy might actually be far more effective.\(^8^8\) Unfortunately since the removal of General McChrystal little positive progress has been made, in fact an already difficult situation has continued to deteriorate. Some of this political and strategic failure may be due, in part, to the tradition of mutual antagonism held between the Departments of Defense and State as well as simply inadequate leadership and policymaking.

There are two imperatives, according to IHL, which prevail in aspects of targeted killing and armed conflict. The first concerns \textit{necessity} and the protection of civilians during a time of war and secondly, the associated rules of \textit{proportionality}. The concept of proportionality, a reflection of skilled and ethical warfare, is an integral element in \textit{both jus ad bellum} and \textit{jus in bello}. According to the view of Kenneth Anderson, testifying before a congressional committee, the laws of war are, however, not the appropriate guidelines, Anderson stated, “…the proper legal rationale for the use of force in drone operations in special, sometimes covert, operations, outside of traditional zones of armed conflict is the customary international law doctrine of self-defense, rather than the narrower law of armed conflict.”\(^8^9\)
The nature of modern warfare often precludes a clear delineation or an appropriate definition of whom or what is the intended target. Mary Ellen O’Connell, however, asserts, “The United States has an obligation to take feasible precautions to protect civilians, such as providing advance warning of an attack; never attacking homes, or only attacking at night in open spaces. The author has found no evidence that the U.S. is taking precautions in Pakistan.” While this may certainly apply to the antiquated notions of state-to-state warfare, this would be unfeasible and counterproductive in the current asymmetric environment. Furthermore, this would negate one of the principles of the law of armed conflict—the action must have every opportunity of achieving its intended goals.

According to the just war theory, morality must guide both strategic and operational considerations. From a strictly strategic point of view, it is counterproductive to emit such warnings given the fact that the intended target is most likely within the intended strike zone and would flee at the first opportunity. In such a situation, the strategic importance of the target must be weighed against the humanitarian issues. Guirao, for instance emphasizes that, “Operational decision-making is thus predicted on a complicated triangle that must incorporate the rule of law, morality and effectiveness.” Effectiveness is effectively often overlooked as criteria. This is important because war is not only an issue concerning humanitarian concerns and reducing civilian casualties, but it is also one of strategic and operational imperatives. One of the primary difficulties involving asymmetric conflicts is the fact that, in the state versus non-state actor paradigm, states are expected and obliged to respect the laws of war, whereas non-state actors, although also accountable under jus in bello, do not. This feature of the law of armed conflict is referred to as the doctrine of moral equality. Quite ironically, in fact Schmitt states, “Yet, as a practical matter, the fact that they [terrorists] are already punishable for participating in the
conflict diminishes the incentives for complying with IHL.”92 The rules of war hold that, both sides are held to the principles of *jus in bello*, even if one of the parties fails to honor this obligation.

Military personnel are guided, in the conduct of armed conflict, by two important documents: The *rules of engagement*, and the Law of War Handbook, FM 27-10. “Rules of engagement, or ROE, are rules that are set out when, where, and how force can be used. They are meant to codify and operationalize international and domestic legal obligations for military forces, including the principle of distinction between combatants and non-combatants.”93 These rules of engagement are formulated into doctrine by the Joint Chiefs of Staff and are entitled the US Standing ROE (SROE). One may justifiably wonder what the rules of war might have to do with armed conflicts of the present as Peter Singer points out when, “We do not declare war anymore; the last time Congress actually did so was in 1942 – against Bulgaria, Hungary, and Romania.”94

This, of course leads one to wonder whether the constitutional declaration of war is still even a valid concept. Singer appears to share this public apprehension, “I do not condemn these strikes; I support most of them. What troubles me, though is how a new technology is short—circuited the decision—making process for what used to be the most important choice a democracy could make. Something that would have previously been viewed as a war is simply not being treated like a war.”95 Singer’s statement is important because it not only reflects the unusual character of war as it is currently defined but also emphasizes the current conundrum reflecting a simultaneous support of the campaigns themselves and dissatisfaction with the lack of transparency surrounding them. This theme is echoed not only by Singer himself, but by a large number of legal scholars, academicians, researchers and writers who normally harbor conflicting viewpoints in other circumstances. Perhaps the single most cohesive argument
against robotics and there use in modern warfare is that they tend to lower the barrier for resorting
to armed conflict and replace the traditional diplomatic instruments. Singer recalls, “Lowering the
bar to more and more unmanned strikes from afar would most resemble the so-called cruise
missile diplomacy of the 1990s.”\textsuperscript{96} This reasoning is heard across a wide swath of opinion. The
reason for this ethical transition and the associated dilemma is quite simple: The more the factor
of risk and danger are reduced the great the propensity to call upon lethal force as a solution. The
traditional “brake” on going to war, the actual risk and cost of conflict are removed in the case of
UCAVs. There is an irony however related to the expanded use of drones and that is that while
the public largely approves of the drone strikes since they keep the horror
of war at bay, by the same token, they are paradoxically calling for greater scrutiny and
transparency in the use of these weapons.

\textbf{Preemption and Intent}

There has been much heated discussion over the use of anticipatory self-defense, otherwise
known as the doctrine of \textit{preemption}. Prior to the establishment of the Charter of the United
Nations, customary international law, and particularly the question of preemption, was set
according to the precedents of the Caroline incident of 1867. The principles of necessity and
proportionality were firmly established as the criteria underlying state self-defense. The then
Secretary of State Daniel Webster, pronounced the famous guidelines, “necessity of that self-
defense is instant, overwhelming, and leaving no choice of means, and no moment of
deliberation.”\textsuperscript{97} The concept of preemption was, therefore, the established benchmark for
preemptive defense prior to the establishment of the UN Charter and particularly Article 51.
Ambiguous language of the UN Charter is largely responsible for the polarized positions which have been adopted in regards to the self-defense issue. Arend stipulates three possible solutions to this current deadlock:

- Acceptance of the constrained reactive conditions under the Caroline paradigm
- Relaxation of imminence requirement due to nature of evolving threats
- Could abrogate and declare the UN charter frame work to be a failure

In its current format the Charter of the United Nations can be seen through two opposing perspectives simultaneously, leaving the concept of imminence to be loosely determined. If this is indeed the case and the foundation upon which the US has based its rights to self-defense then one must question the concept of imminence itself. The guidelines for the conceptualization concerning the question of imminence were brushed aside under the Bush doctrine and carried forward by the current administration. Arend recalls, “…in its 2002 National Security Strategy (NSS) that the United States ‘must adapt the concept of imminent threat to the capabilities and objectives of today’s adversaries.’” If such semantic juggling, however, is acceptable (as appears to be the case) then, this completely invalidates the guidelines and international humanitarian law. Indeed, if they are that outmoded and out of touch with the reality of modern conflict then they should be scrapped altogether and replaced with a more reasonable and adequate framework.

This is the position of many current thinkers and the thrust of the current research as well. It is, however, important to emphasize that such modifications must be strictly controlled and created in a spirit of global needs rather than geared towards those of individual states. The rules otherwise become automatically invalidated by expanding the boundaries largely to suit one’s own needs. For instance, writing on the Bush policies, Mayer highlights such practices, “By
classifying terrorism as an act of war, rather than as a crime, the Bush Administration reasoned that it was no longer bound by legal constraints requiring the government to give suspected terrorists due process.”\textsuperscript{100} Mary Ellen O’Connell, sees preemption as a direct challenge to international humanitarian law and asserts, “…the right of self-defense in international law is based on response to an armed attack, not pre-empting future attacks.”\textsuperscript{101}

Many critics make assertions concerning the legality and authorization of the use of force and proportionality. They do so by referring to often vague ill-defined or generalized legislation contained within international humanitarian law. There are so many circumstances and variables involved, in modern warfare that an inflexible, “one rule fits all” framework, in the current environment, is an inadequate response. It is nearly impossible to establish a set of rules, concerning anticipatory self-defense, which is equally applicable to all states in all situations of armed conflict. This is particularly true with the advent of threats such as weapons of mass destruction (WMD) and transnational terrorism. Anthony Arend cleverly reiterates, “Both WMD and Terrorism pose threats unanticipated by traditional international law.”\textsuperscript{102} The current situation remains unclear with proponents and critics on both sides of the legal debate.

\textit{Intent} is yet another central concept when considering the justification for the use of force. The interpretation of hostile intent, in situations where combatants should be considered hors de combat, for instance, is also an area of paramount concern and considerable ambiguity under international law; as well as in state policy and practice. This issue is addressed in a recent edition of the Harvard Law Journal which postulates, “Further research should also be guided by the existing tensions and debates among governments, NGOs, academics, and international organizations on the interpretation of hostile intent in both law and practice.”\textsuperscript{103}
On an individual level, there is the question of target distinction. The distinction between what represents a non-combatant from an active participant and the differentiation between fighters that are *hors combat* or just momentarily incapacitated is extremely difficult to determine, particularly in the heat of armed asymmetric conflict. This situation often falls more likely upon elimination rather than capture. This distinction is essential when differentiating between a state of armed conflict and a law enforcement action. The inherent risk must be measured against the possible consequences in each case. For instance, how does one differentiate between a combatant (especially from drone captured imagery) and an individual who is actually hors de combat from one merely momentarily stunned? In the same vein how does the drone operator distinguish whether a person is rushing to the aid of a fallen fighter or running to retrieve the weapon and resume the combat? It thus becomes clear that rules or no rules; each case is specific and reaction based and that the interpretation depends upon the discretion of the operator and the proportion of risk involved. “However, in Afghanistan, U.S. and ISAF troops appear to interpret hostile intent broadly, leading to the killing of civilians not directly participating in hostilities or otherwise demonstrating and hostile intent and, therefore, protected from attack under international law.”\textsuperscript{104} In part, this reactionary development, of broad interpretation, is part of a spiraling cycle of actions-reaction based on asymmetric inequality. This of course is problematic when considering IHL and the aspects of necessity, proportionality, distinction and humanity. No clear and concise definition of what intent entails, outside of a direct threat has been, so far, forthcoming. Intent is closely related to preemptive self-defense and can be seen on a sliding scale of importance. This scale is indicated in Appendix F.
Opponents, Proponents and Those Caught in-Between

The initial portion of this research briefly discussed the various positions which have been adopted in the current legal ethical and moral debate. This section pertains exclusively to the legal aspects of the discussion; the ethical and moral issues shall be examined later in a separate section. Needless to say there is, inevitably a porous border and many of the issues and concerns are not mutually exclusive.

Among the critics, O’Connell, initially rather isolated in her fight, now has more allies to count on for support. Michael Walzer, Sarah Kreps and John Kaag, for instance, all call into question the moral ethical and legal justifications of the drone policies. In support of her position O’Connell has attempted to use all possible tools available. She attempts, cleverly yet rather unsuccessfully, to utilize Cullen’s argument in support of her own rather weak assertions. Thus, she states, “Indeed as Cullen accepts, the United States is resorting only to peacetime criminal law on the territory of the U.S. He does not believe there is any right to kill without warning persons in the U.S. How can there be any such right on the territory of other states that are, like the U.S., not experiencing hostilities on their territory?” This flawed argument is, however, unfortunately sidelines, and fails to recognize, in addition to the ambiguous and flexible language of Article 51, the question of secret protocols and agreements, which may be in place by the respective governments. It also dismisses the question of the inherent right to self-defense under Article 51 of the Charter of the United Nations.

This type of argument might possibly be viewed by the more cynical as a futile exercise in artful, courtroom semantics. This is not to infer, however, that O’Connell should not be taken seriously, or her position discounted. On the contrary, many of her insights are probing and have
significant merit. There can be no question of steady hostility in the case of Pakistan where armed groups of marauding terrorist create perpetual havoc and insecurity within that failed state. Once again, unfortunately the author fails to appreciate the distinction between residual threat and national security and her own narrow interpretation armed conflict. This type of justification concerning the rights of preemptive self-defense, for instance have been grouped under what is labeled the “restrictive” school of thought, in direct opposition to those adopting a broader more expansive interpretation. These points are significant because resorting to such a polarized view on either side of the debate, does little to face the practical realities involved, nor contribute to the development of a successful and coherent strategy.

Travalio and Altenberg see justification for intervention in the case where a state will not or cannot exercise the appropriate rule of law, “Furthermore the rules of international law must permit states, as a last resort, to force the cooperation of recalcitrant states or to act in their stead.” This practice of intervention, particularly in the case of failed states, such as the former Yugoslavia, or more recently that of Somalia, have been generally accepted by the international community. The UN more recently has begun to forcefully question the drone campaign equating it at times with extra-judicial killing according to certain of its special rapporteurs. Some of their assertions, however, border on the ludicrous, for instance demanding that the US hand over video feeds of each drone attack. There are three principle, recognized instances where intervention can be theoretically legitimate according to international law:

- By invitation from a host nation
- Through a violation of neutrality
- The failure of a state to exercise its inherent authority and take responsibly to implement to the rule of law.
Somewhere in the middle dived between the harsh critics and the staunch proponents are a few balanced positions. If, as many contend O’Connell and those who support her stance, are alienated, and fighting the lonely battle, then this is even more so in the case of those “caught in the middle” of the maelstrom. There is an irony, in the fact that recent developments in government policy, reflect the same carefully constructed previously posed by those in the center, which had previously fallen on deaf ears. whereas they initially, In a recent video conference, for instance, Professor Guiora related, “At times I feel like the individual waving the yellow flag and standing in the middle,” the yellow flag obviously serving as a metaphor for a more balanced approach to drone warfare. Guiora however, is not completely alone and does have some important advocates; Kenneth Anderson, for instance, also represents a more measure view and echoes several of Guiora’s positions. For instance, Anderson called for greater transparency and oversight by Congress in testimony, during hearings in 2010. While several authors have written justifiably of the struggle of Mary Ellen O’Connell, as the advocate for peaceful restraint, few have devoted significant attention to the more measured, and seemingly more logical, approach to those caught in the middle of the debate. One of the major concerns voiced elsewhere in this research, is that of executive power. Citing Justice Jackson, Professor Guiora states, “I am deeply concerned with the unfettered executive power.” There have been few, unfortunately few who have presented a focused and empirically reasonable position which combines both the positive and negative aspects, of drone warfare.

On the opposite side of the legal spectrum, stand figures such as John Yoo and Harold Koh, former legal adviser to the State Department under the first Obama Administration. Koh addressed and further iterated the logic and legality of the administration’s use of drone warfare in the following summary:
• First, some have suggested that the *very act of targeting* a particular leader of an enemy force in an armed conflict must violate the laws of war. But individuals who are part of such an armed group are belligerents and, therefore, lawful targets under international law.

• Second, some have challenged *the very use of advanced weapons systems*, such as unmanned aerial vehicles, for lethal operations. But the rules that govern targeting do not turn on the type of weapons system used, and there is no prohibition under the laws of war on the use of technologically advanced weapons systems in armed conflict—such as pilotless aircraft or so-called smart bombs—so long as they are employed in conformity with applicable laws of war.

• Third, some have argued the use of lethal force against specific individuals fails to provide adequate process and thus constitutes *unlawful extrajudicial killing*. But a state that is engaged in an armed conflict or in legitimate self-defense is not required to provide targets with legal process before the state may use legal force.

• Fourth, and finally, some have argued that our targeting practices violate *domestic law*, in particular, the long-standing *domestic ban on assassinations* [Executive order 12333]. But under domestic law, the use of lawful weapons systems—consistent with applicable laws of war—for precision targeting of specific high-level belligerent leaders when acting in self-defense or during an armed conflict is not unlawful, and hence does not constitute “assassination.”

The administration’s position has been to adopt the article 51 right to self-defense combined with the authorization provided by congress under the now aging AUMF. Additionally, a part of the support for the drone campaign is drawn from the ICJs *Tadic*, and later the *Boskoski* tests. The tests basically adopt a two pronged approach in order to define what constitutes armed conflict:

• The intensity of the conflict, and
• The organization of the parties thereto

There have also been some positive efforts to establish a more cohesive set of formal guidelines. Unfortunately many of these efforts are often driven by personal agendas or blinkered vision. A ten year study undertaken by the ICRC was but one example. The International Law Association, chaired by Mary Ellen O’Connell, adopted another, which resulted in a report conducted by a panel of eighteen experts originating from fifteen different states and presenting five years of investigative research and documentation. Unfortunately despite their intensive
efforts the resulting report was just as vague as the currently existing rules and criteria. Their findings resulted in two minimum criteria for defining the existence of a situation of armed conflict:

- The existence of organized armed groups
- Engaged in fighting of some intensity\(^\text{112}\)

This is certainly a limited, arbitrary and extremely disappointing finding, particularly in light of the time factor involved at reaching such conclusions. Existence of armed groups could easily apply to two groups of two individuals at a minimum and they might be terrorists, bank robbers or members of a drug cartel. The second point is also further invalidated by the qualifier ‘some.’ What possible empirical definition can be related to some is a matter for speculation.

**Discussion of the DOJ White Paper: “License to Kill”**

A white paper recently leaked, to Michael Isikoff of the NBC news network, concerning the possibilities of targeting US citizens has further deepened the debate about the justifications of targeted killing and the question of due process. While the Obama administration has run the gauntlet between international legality and unethical behavior this latest development added fuel to the already raging debate. The document uses highly imprecise and ambiguous language. Such ambiguity, further lends itself to a broad interpretation which can, in turn result in manipulations and abusive exploitation of executive privilege; a practice which has already been called into question. On Monday March 4, 2013, a bipartisan group of senators petitioned the Obama administration requesting greater transparency and the release of secret memos. In their request the senators stated, “It is vitally important…for Congress and the American public to have a full
understanding of how the executive branch interprets the limits and boundaries of this authority.\textsuperscript{113}

In an interview Professor Amos Guiora qualified the document as “outrageous.”\textsuperscript{114} It is difficult to see how the language of the document coincides with currently held notions of international law and justice and further amplifies concerns surrounding what is seen by many as a ruthless and unethical administration crafting law to suit their needs. Legal Scholar, John Yoo writing in the \textit{Wall Street Journal} also fretted about the possibilities for contentious absolutism and abuse, “American may have constitutional rights, but the realities of war and the right to national self-defense trump individual rights when the executive branch is picking targets.”\textsuperscript{115}

The basic tenets are mere reiterations of past assertions and shed no new light upon the legal foundations for many of the problematic aspects underlying the current drone campaign. The four principle arguments for justifying the campaign itself are:

- Constitutional authority of the president
- Article 51 and the right to self-defense under the UN Charter
- The existence of an armed conflict\textsuperscript{116}

These various elements of support have been “cherry-picked” from assorted sections of customary international law and combined with aspects of US domestic to provide the foundations of the documents supposed logic. The Authorization for the Use of Military Force (AUMF), also referred to as the “Bush Doctrine,” should certainly be showing signs of wear and be fraying at the edges. Initially it was destined to target any and all individuals who were involved in the 9/11 bombings. Many of those who were directly or indirectly involved, have been either captured, killed or died of natural causes. Jonathan Masters cites John B. Bellinger as stating, “The farther we get from [targeting] al-Qaeda [e.g., al-Shabaab in Somalia], the harder it
is to squeeze [those operations] into the AUMF.”\textsuperscript{117} Professor Guiora emphasized the relative nature of the AUMF agreement when, during a recent interview, he stated, “The intention of the AUMF was not to authorize drone attacks in seven or eight different countries.”\textsuperscript{118}

Much of the language used within the white paper is couched in metaphors, vague unrelated allusions to non-related case law and conditional language. Much is made of the concept of public authority, yet little is mentioned concerning its limitations and abuse. As for targeting Americans and the evaporation of Fourth Amendment rights the paper states, “Were the target of a lethal operation a U.S. citizen who may have rights under the Due Process Clause and the Fourth Amendment, that individual’s citizenship would not immunize him from a lethal operation.”\textsuperscript{119} Thus, the Executive office has accordingly decided to lift the constitutional right of due process and to become judge jury and executioner. This creates a dangerous precedent, more commonly seen in dictatorships.

If this issue were not enough, to inflame public sentiment, Eric Holder, the US Attorney General, added to the controversy by stating that Americans might be targeted even within the United States itself, under “extraordinary circumstances”. This led to a 14 hour filibuster conducted by Senator Paul Rand, in an effort to stave off the nomination of John Brennan, proposed candidate to head the CIA, who is seen to hold analogous views, this despite his pledge before lawmakers “this administration has not carried out drone strikes inside the United States and has no intention of doing so.”\textsuperscript{120} However, Michael Isikoff, investigative reporter for NBC news network also points out that ‘Brennan was the first administration official to publicly acknowledge drone strikes in a speech last year, calling them “consistent with the inherent right of self-defense.’\textsuperscript{121} There are three fundamental prerequisites laid out within the document
which would justify the lethal targeting of a US citizen, located outside the territory of the United States:

- Where an informed, high-level official of the U.S. government has determined that the targeted individual poses an imminent threat of violent attack against the United States.
- Where a capture operation would be infeasible—and where those conducting the operation continue to monitor whether capture becomes feasible and
- Where such an operation would be conducted consistent with applicable law of war principles

Another of the other principles outlined within the paper, is the lack of precedence in international law concerning the question of geographic scope or limitations concerning non-international armed conflict (NIAC) and the related yet unmentioned violation of national sovereignty. Heller asserts however, “And if there is no single NIAC between the United States and ‘al-Qaeda and its associated forces,’ the US cannot—by its own standards—justify targeting anyone who is a ‘senior operational commander’ in one of those groups simply by citing the existence of hostilities between the US and al-Qaeda in Afghanistan.”122 This assertion is not well founded since there have indeed been precedents notably, the UN condemnation of Israel’s attack on the Osirak nuclear facility, for instance. This assertion is, of course, related to the concerns of self-defense and imminence. These questions were also treated by the ICJ in the cases of *US v. Iran, Congo v. Uganda* and the *US v. Nicaragua*.123 The fact that the US has decided to disregard the question of absolute sovereignty in its war with terrorism, may well spell the death knell for the principles enshrined in 1648, under the treaty of Westphalia.

The utilitarian approach of this document weighs the good of many against the good of few, while this may seem a commendable attitude, at first glance; it is the entire system of democratic justice and due process which is, in fact, placed in jeopardy. Another area where the paper fails the ultimate test of legitimacy can be seen in its failure to clearly define the concept and use of
imminence. The paper states, “…the condition that an operational leader present an ‘imminent’ threat of violent attack against the United States does not require the United States to have clear evidence that a specific attack on U.S. persons and interests will take place in the immediate future.”124 Of course the problem with such an assertion should be glaringly obvious. The fact that this precludes the requirement of concrete evidence, the lethal attacks can be carried out on a whim and this leaves the entire policy open to abuse based upon nothing more than circumstantial evidence, unqualified intent, association and the presumption of guilt. As Grossman so eloquently remarks, “Drones don’t just give us power, they tempt us to use it.”125 This neglects the entire legal concept of due process and is a clear travesty of the principles of democratic justice. The only possible solution to this conundrum is a three part equation: greater transparency, based upon clearly defined definitions and legal precepts, verifiable discrimination in the target selection process.

Thus this white paper provides what is meant to serve as a more transparent presentation of US policy but which, in fact, is little more than an open-ended and limitless death warrant. Such broad and general criteria do nothing to transmit the ideas of democracy and justice, for which the United States is meant to be the primary role model. Finally, the provisions as presented in the current format ignore the basic principles enshrined within the laws of armed conflict notably: necessity, right cause, proportionality, distinction, and humanity. The New York Times, in an op-ed piece perhaps underscores the most obvious world view however, that, “More broadly, the administration’s legal reasoning has not persuaded many other countries that the strikes are acceptable under international law.”126 The public declarations by administration officials such as Harold Koh, John Brennan, Eric Holder and even Obama himself, show an
epistemological disconnect between their statements and the ambiguous contents of the much broader white paper.
CHAPTER IV

“Using the Predator is a tactic, not a strategy.”
—General Stanley McChrystal, Interview with Jane Mayer

ETHICAL AND MORAL CONSIDERATIONS

Ethical and Moral Considerations

Until recently, ethical concerns have played a small role in the military robotic developmental process. This may be due to the fact that, “…given a common perception that robots will do only what we have programmed them to do,”\(^{127}\) as Lin, Bekey and Abney indicate. Prior to delving into the complex issues of moral and ethical characteristics, it would do well to examine the definitions of each in order to understand the subtle differences between the two principles. It is important to bear in mind that morals are the “well spring” from whence normative ethics are derived. One of the best sources for an examination of the field of ethics in warfare is provided in the seminal work of Ward Thomas’ “The Ethics of Destruction.” Thomas, brilliantly bridges the gap between international relations and armed conflict. These two areas though often seen through a prism of polar opposites are, in reality, twins born of the same mother.

Thomas writes:

This analysis suggests two hypotheses regarding ethical norms restricting the use of force. The first is that such norms are grounded upon a priori moral principles and to some degree reflect those principles, even if imperfectly. The second hypothesis endorses Bull’s observation: because norms are geopolitically constructed, their specific content and application will tend to reflect the broad interests of powerful states in international society over time.\(^{128}\)

There are many fine works covering the varying aspects of ethics and how they apply to armed conflict. The purpose of this section is to briefly address the way in which normative ethics play a role in their relation to the use of UCAVs. As previously noted ethics grow out of
moral convictions and are then often, in turn, transformed into conventions and codified legal strictures. State actors are often bound by codes of professional ethic, which have long standing precedence. One such example if that of the Lieber Code of 1863, which still exerts a direct influence on the code of conduct of the US military. Non-state actors conversely do not respect any specific set of normative rules or guidelines concerning the conduct of armed conflict.

**Ethically speaking**

Much like the legal debate the position of academics, politicians, legal scholars and the general public are divided into two rival schools of thought. Gaillott also confirms as much, “Much of the literature arising from the growing debate surrounding the ethics of uninhabited aerial vehicles (UAVs) can be broadly grouped into two categories: that which opposed their use at this point in time…and that which argues for their mandated use, citing the potential capacity of these systems to reduce battle field deaths and other harms.”

Part of the polemic revolves around the law of armed conflict and customary international law. These laws, despite the seemingly inherent contradiction, see war as being waged in such a way that the two sides must at the minimum have a chance of success. Writing on the equality principle, “This notion of a fair fight comes from the just-war theory, which is the basis for IHL.” Patrick Lin points out, while Mary Ellen O’Connell insists that despite any polemic, “The U.S. must respect the principles of necessity, proportionality and humanity in carrying out drone attacks.” Concerning the ethical foundation surrounding the actual use of drones, “Weapon platforms themselves do not bring ethical dilemmas, their use does. How one elects to employ a weapon platform is what matters,” Kolff stresses.
Once a viable threat has diminished, one significant problem is that, there is the very real risk of bypassing the thresholds of asymmetry. The problem to date has been exactly how to quantify the calculus for such a threshold. The language of the various statutes, such as that ensconced within Additional Protocol I (1977), is highly ambiguous at best and directly conflict one another at worst. As Kreps and Kaag reason, “And like the language of distinction, the language of proportionality introduces problems of interpretation because of two flawed assumptions. One is that we can make a sharp distinction between legitimate targets and protect civilians. The second is that we can identify a clear, uncontroversial threshold at which anticipated military advantage exceeds anticipated civilian damage.”

Another crucial ethical consideration, besides that of the enemy being able to offer an adequate resistance, is the related avoidance of civilian casualties. An asymmetric confrontation could conceivably result in the same measures pushing the weaker side toward excessive brutality in an effort to merely survive or in search of vengeance. Gaillot makes an insightful observation speaking of his concept of ‘evoked potential,’ “…a reasonably prudent state ought to be able to foresee that an asymmetric attack will, in many case, restrict an opponents retaliatory options to an extent that drives them to utilize deplorable means they would not otherwise seek to use, thus rendering an asymmetric attack unjust from the outset.” There are, obviously alternate views concerning the question of asymmetry. Bradley Strawser, for instance, according to Gaillot adopts a totally inverse view.

Unfortunately Gaillot’s propos are misleading and paint Strawser with a hawkish profile, while Strawser, himself points out that that he encourages Western nation states to adopt UAV platforms but to ban IAW development. The Strawser versus Gaillott debate is indicative of the extreme polarization with regards to all aspects of asymmetry, targeted killing, collateral damage
and the use of drones in general. A more reasonable solution, no doubt combines the best of both worlds, in much the same way that qualitative and quantitative research complement one another, or as do military prowess and diplomatic savoir-faire.

Gaillot raises six points for consideration as possible reasons that UCAVs may be ultimately unethical:

- May lead toward completely autonomous decision making – no human in the loop
- May violate *jus in bello* principles
- Cognitive dissonance may result for operators
- May result in increased TK by Civilian authorities e.g., CIA
- May result in unfair asymmetry in warfare
- May reduce the threshold for resorting to war

**Morally Speaking**

When defining morality, Ward Thomas writes, “I take ‘moral principle’ to mean a proposition or tenet that expresses an abstract judgment about right or wrong.” Morality is a fuzzy grey area, especially since it can change from one time to another and from one set of circumstance or place to another. What was immoral yesterday may not be so tomorrow and vice-versa. Generally speaking, morality has had a tough time of keeping pace with technology. This conundrum is particularly reinforced by the promise a seemingly risk free enterprise that robotic warfare tend to hold forth. Indeed, as Lev chastises, “But the seductive theoretical simplicity of drone warfare – omniscient surveillance, surgical precision, zero risk – has led the nation into a labyrinth of confusion and moral compromise.”

In the realm of military technology, this wavering of moral conviction has been a staple condition throughout history. It spans from the banning of the lethal crossbow in 1149, through
the scoured machine gun, the condemnation of poisonous gases on the battlefields of WWI, the replacement of horses by armored vehicles, the nemesis of aerial bombardment, the menace of nuclear holocaust and on through to the current debate concerning robotic warriors. The tragic irony is that the utility of these weapons systems seem to have, in the long run, abrogated all moral indignation, eroding the sense of immoral and replacing it with a sense of the useful. “The call is complicated: the U.S. is a nation based on democratic values that deeply believes in ethics and values; yet when push comes to shove, does not always act in accordance with those articulated principles,”\textsuperscript{137} notes professor Guora.

Michael Keifman states for the record that, “The U.S., as well as the world community, must face this issue and determine some clear ethical guidelines for the use of these new weapons, which will serve in the future and beyond the War on Terror.”\textsuperscript{138} The United States has claimed the moral high ground. This is a common practice in a conflict, where the most powerful belligerent adopts the superior moral position. Targeted killing, as carried out under the drone campaign, is just one area where the legal ethical and moral issues collide and policy makers attempt to marry logic, humanity and necessity.

Cullen notes that, “Targeted killing operations are a moral option provided that earnest efforts are taken to verify the accuracy of the intelligence on which they are based and that the operations are conducted in a manner to minimize civilian casualties.”\textsuperscript{139} Guora continues, “Targeted killing sits at the intersection of law, morality, strategy and policy.”\textsuperscript{140} Author Peter Cullen highlights this discrepancy and the inherent conundrum that it presents, “Some commentators view it as an indispensable tool and argue for its expanded use, while others question its legality and claim that it is immoral and ultimately ineffective.”\textsuperscript{141} When
considering one specific aspect of the moral dilemma that of separation and distance from the battlefield Chief Air Marshal Sir Brian Burridge writes:

“The term 'morality of altitude' was coined to understand the disconnection of the pilot from the destruction he caused on the ground. Right now a similar situation is potentially in existence through reach-back operations. I am also on record as placing a question mark over the way in which international law will interpret robotic warfare in the future. The 'morality of altitude' is at the heart of the debate. Feeling the granularity of the battlespace is the key issue in interpreting the Rules of Engagement.”

Perhaps, in this given case, a new term, that of *morality of distance*, might be more appropriate.

“Such patterns [of dehumanization] erode accountability, promote ethical detachment, and turn people into mere data points. While humans have always found ways to inflict harm on one another, physical or otherwise, the scale of our current capacities to do so has outstripped our moral development,” Randall Amster further clarifies. Peter Singer echoes Amster’s concerns and takes them even a step further, “Wars without costs can undermine the morality of even ‘good’ wars.” Thus, there can be a factor of dehumanization, an increased propensity to choose instruments of violence in conflict resolution due to the seemingly riskless nature of armed conflict in a highly asymmetrical paradigm.

In a totally different register, and according to Strawser, who adopts the non-equality thesis, “…the just combatant is morally justified in the taking of the life of the unjust combatant, but the unjust combatant is not justified in taking the life of the just combatant—even if the unjust combatant appears to fight in accordance with jus in bello. This rather singular and empirically trenchant perspective of right and wrong—the white hat, black hat thinking, was also at the core of neocon philosophy. The question, which inevitably then arises, and which such a polarized position fails to respond to, is: “whose truth is truest?” and parallel to this “which cause is the just cause?” Unfortunately war is never so clear cut, not so simplistic. “The deeper problem
that underlies the asymmetry objection is that using UAVs in place of the manned equivalent removes an important element of justice in the *resort to war*, an element that seems important regardless of whether the [moral] non-equality thesis succeeds,” states Gaillot. Despite certain misgivings, targeted killing may represent the lesser of two evils.

Peter Cullen commenting on the moral considerations underlying targeted killing writes, “If targeted killing is removed as an option and arrest is precluded, the remaining alternative—letting the terrorist continue to kill innocent civilians—is surely the least attractive moral option.” It is both a moral and an ethical imperative for a state and its leader to provide security to its citizens; how it does that, needs to be tempered by both a moral and ethical compass. Complex situations have no easy answers. As Patrick Lin asserts, “Integrating ethics may be more cautious and less agile than a ‘do first, think later’ (or worse ‘do first, apologize later’) approach, but it helps us to win the moral high ground—perhaps the most strategic of battlefields.” Until now this has not, unfortunately, been the case.

**Wild Horses: Political Repercussions**

The current administration has continued carrying out certain already questionable policies of their predecessor. While remaining justifiably critical and eliminating some of the more unsavory, they have unfortunately reinforced the adopted ones well beyond the limits anyone might have previously imagined. There have been six times as many drone attacks under Obama than that under the precedent Bush administration. The Nobel Peace Prize stands in stark and ironic contrast to the mounting toll of civilian casualties accumulated during the drone campaign. “During his first nine and a half months in office, he [Obama] has authorized as many C.I.A. aerial attacks in Pakistan as George W. Bush did in his final three years in office,” states journalist
Jane Mayer points out. Thus, a simplistic view might state that while Bush failed to respect and
denied prisoner rights, Obama skirted the entire complication of due process and trail simply by
elimination.

John Yoo, speaking on the Obama administration’s questionable approach stated, “I don’t
want to speak specifically about Koh’s record…There’s no doubt that on issues ranging from
drones to military commissions to Guantanamo Bay, Obama and his legal advisors performed a
180-degree turnaround once in office. But the nation’s security was better off that they were
hypocritical, rather than maintaining a foolish consistency with the immature 2008 campaign
views.”¹⁵⁰ Hillel Ofek also points out some of the political “double speak” presented in the
Obama administration’s policy, “President Obama and his allies claim that Bush-era policies like
waterboarding and Gitmo undermined our security, were illegal, and were immoral -- but the
same criticisms can and have been leveled against Obama’s expanded drone program. In
implementing his vision to "restor[e] the adherence to rule of law," President Obama has, judged
by his own standards, compensated abroad -- strategically, legally, and morally.”¹⁵¹ Perhaps one
of the most duplicitous positions concerning the drone campaign came from Harold Koh, dire
critic of the Bush administration’s policies and, obsequious legal advisor to the Obama
administration. “The next administration must ‘restore the rule of law in the national security
arena’ end ‘excessive government secrecy’ and set aside the ‘claims of unfettered executive
power.’ Koh told a House panel in 2008.”¹⁵² The irony of such a statement is almost too painful
to contemplate. The Obama administration has proven itself historically the least transparent
administration to ever take power. “Some former Bush advisors say they are surprised at how
little criticism the Obama administration has faced over the drone strikes.”¹⁵³
While the legitimate concerns for self-defense, must be addressed, and given proper consideration and latitude, the US and particularly the current executive, cannot be given ‘carte blanche’ and free rein to indiscriminately recreate their own version of international law. As Anderson also points out, “This invocation of self-defense law should not be construed as meaning that it is without limits or constraining standards,”154 The US represents but one state, albeit more powerful than many, in a community of nations. The laws must be equally applicable and respected regardless of influence. Failure to respect the international code and customary devices will render any state, even the most powerful, illegitimate in the eyes of the international community. Professor Guiora, (citing Justice Jackson in Youngstown Sheet and Tube Co. v. Sawyer), and speaking on the power of the Executive and the lack of judicial oversight it has benefited from states, “nothing is more dangerous to a democracy than an ‘unfettered executive.’”155 The main stream media has quite rightly been accused, by the public, of “towing the line” in reference to the current administration. A few “renegade” journalists have, however, braved the hostility of the White House. Conor Friedersdorf makes a “tongue-in-cheek” statement which nonetheless reflects the valid concerns of many Americans today. “President Obama might rightly lay claim to the rather unpropitious title of “King of the Drone Wars.”156

The two most prevalent (and justified) criticisms of the way the current administration is directing the current campaign, against terrorism, are a lack of transparency and a blatant abuse of executive authority. Referring to the related collateral damage involved Sarah Holewinski writes, “As the use of drones becomes the norm, the White House needs to rethink its opaque policy, figuring out how to limit the harm inflicted on civilians in the first place and how to address it when it does occur.”157 Yet it is not merely the foreign victims that are causing concern.
In a recent legal dispute between the US government and the ACLU, and the New York Times who had requested a release of information concerning the execution of al-Awlaki and two other US nationals. The issue was brought to court in a lawsuit, when the Obama administration refused to release documents requested under the Freedom of Information Act (FOIA). During the decision Judge Colleen McMahon indicated, “There are indeed legitimate reasons, historical and legal, to question the legality of killings unilaterally authorized by the Executive that take place otherwise than on a ‘hot’ field of battle.” McMahon affirmed. However, due to the fact that her verdict, in favor of the plaintiffs, concerned only the aspect surrounding the FOIA requests, “…her ruling cannot take into consideration what sort of questions—be it historical, legal, ethical or moral—are raised by the ongoing practice of using remote-controlled drones to kill insurgents and, in these instances, US citizens.” Thus, the victory of the administration to keep its policies secret was somewhat mitigated by judicial reprehension targeting those very same policies. Kevin Govern addressed the issue, of signature strikes and the related lack of transparency, in the face of rising criticism, “These yet-to-be identified or disclosed policy standards and procedures will pertain to ‘personality strikes’ against named terrorists and ‘signature strikes’ against groups of suspected, unknown militants.”

Concerning the far reaching powers, which the executive has taken for granted Guiora emphatically states, “The constitution did not leave war, no matter how it is waged, to the executive branch alone.” The other two branches of government—the legislature and the judiciary—have failed miserably in their responsibilities to ensure the democratic process of checks and balances; a cornerstone of democracy. The putative view is that Congress is inefficient and compliant while the Supreme Court is powerless and manipulated. As the ever prolific Dr. Guiora further asserts, “The free pass that the Supreme Court has historically granted
the executive in national security cases (Korematsu v United States being the poster child) has, in
the long-run, harmed the individual and the state alike.” In recent developments, the US House
Judiciary Committee finally exerted its influence in the wake of public indignation. In a meeting,
“lawmakers asked legal experts how the drone strikes might be better regulated by US Congress
or the courts, to provide a check on what they called potentially excessive presidential power.”
It appears that, despite past claims of transparency, the executive office is now being called upon
to provide greater clarity and justification in regards to its drone strategy. Whether or not the
Executive Office will recognize these calls for greater transparency and accountability remains to
be determined.

This sense of unrestrained executive omnipotence, combined with congressional lassitude is
quite worrying. The framers of the Constitution separated the war powers for good reasons.
Increasingly, the Obama administration has run the show pretty much as they see fit; with or
without the congressional seal of approval. While John Yoo may have seriously questionable
values in other areas, his reflection on the executive drone campaign is enlightening, “Recent
stories in major newspapers portray a White House war room where Mr. Obama studies the files
of potential targets, compiles a ‘kill list,’ and makes the final decision on strikes—at last count
[June 7, 2012], 269 in Pakistan, 38 in Yemen.” The recent 146 drone strikes in Libya, which
inadvertently resulted in the death of Libyan leader, Muammar Gaddafi, is but one extreme
example of the combined ethical misuse of executive power and technology. This troubling sense
of bypassing officially sanctioned norms and well-established checks and balances between the
three branches of government is forcefully articulated by Guiora, “The essence of judicial review
is to protect the unprotected and to ensure that the executive acts within reasonable boundaries as
broadly defined.”
The fundamental concept of the separation of powers appears, to many, to have lost its relevance with respect to the current administration. Ofek emphasizes the rather hypocritical nature of the Obama administration’s rhetorical stone throwing, “President Obama and his allies criticized the Bush administration for policies that hurt America in "the battle for hearts and minds," but the Obama drone war is itself such a policy.”¹⁶⁶ There has been a reluctance to call out the administration for its numerous shortcomings. There are direct sharp contrasts between what was initially touted as official policy and what was actually put into place. Professor Guiora pointed out in his interview: “There is more leniency toward the Obama administration than there was against that of Bush.”¹⁶⁷ This is not to say that the Bush administration’s position was justified, merely that both paths appear flawed strategically. Professor Guiora attributes such leniency as a failure of the academics and the international community to challenge the administration. He further attributes this reluctance to the fact that, “The Supreme Court has not had an opportunity to question the position of the administration.”¹⁶⁸ Thus a combination of factors has led to the current impasse, including: a failure of the academic community to pose a challenge, and Congressional Judicial and international pressure.

Politically and diplomatically the strategy of the drone campaign is certainly a questionable one. The humanitarian proclamations by the US government contrast sharply with the reality on the ground. The political capital gained at the outset of the administration has begun to rapidly dwindle and dry up. Bergen writes, “The drones are immensely unpopular in Pakistan, and Pakistani politicians routinely claim they violate national sovereignty. But many Pakistani officials are privately supportive, and much of the intelligence used to target the strikes comes from Pakistani informants.”¹⁶⁹ Nawaz writes, “A legal stalemate appears to have emerged shrouded in a fog of conflicting statements from the authorities of the United States and
Pakistan.” However even if Pakistan were to allow intervention by invitation, there are numerous legal difficulties within the body of customary international law concerning such principles as using an outside force for internal security matters. O’Connell notes that, “intervention by invitation is controversial because, while based on the principle of consent it may clash with other norms, such as self-determination and nonintervention.”

O’Connell, one of the most outspoken critics, for instance, asserts, “The United States has put itself in a vulnerable position. Without express, public consent of the kind the U.S. received from Afghanistan and Iraq, Pakistan is in a position to claim the U.S. is acting unlawfully, even bringing a future legal claim for compensation.” The issue of national sovereignty seems to have taken on a new significance more recently, Jenifer Rowland reports that, “Pakistan’s ambassador to the United States, Sherry Rehman, told journalists on Tuesday [February 5, 2013] that CIA drone strikes are a ‘direct violation of our sovereignty’ and are doing more harm than good by encouraging anti-American extremism in Pakistan’s tribal regions.” Whether this is meant to assuage an angry citizenry or is a sincere declaration of national intent remains to be determined.

The CIA: Where It All Began; Where It Is Now…

The first documented use of offensive drones by the CIA is considered to have occurred on February 4, 2002. According to John Sifton, “The strike was in Paktia province in Afghanistan, near the city of Khost. The intended target was Osama bin Laden, or at least someone in the CIA had thought so.” A more well-known attack was that carried out in Yemen, in 2002. The targets of the strike were Qaed Sinan Harithi a Yemeni national and Kamal Derwish (Ahmed Hijazi), a US citizen. Three other al-Qaeda operatives were also slain in the attack. Since two of the targets were linked to the USS Cole bombing, and the vehicle attacked was part of a convoy, it is
reasonable to assume they were well placed within the al-Qaeda hierarchy. was the first known instance of a US targeted killing of an American citizen, during the campaign against terrorism. Mary Ellen O’Connell indicates, “On November 3, 2002 Central Intelligence (“CIA”) Agents in Djibouti fired laser-guided Hellfire missiles from a drone at a passenger vehicle in Yemen killing all passengers on board, including an American citizen.”\textsuperscript{175} The campaign has continued unabated with relentless precision, in a program controlled by the CIA. “President Obama’s first known authorization of a missile strike on Yemen, on December 17, 2009, killed more than forty Bedouins, many of them women and children, in the remote village of al Majala in Abyan.”\textsuperscript{176}

This discussion will not delve into the complex legal morass surrounding the definition of what constitutes a “lawful combatant” since this aspect has been broadly treated in the course of this research. Additionally, much ink has already flowed concerning this oft-discussed elusive legal and academic topic. Mary Ellen O’Connell has pointed out that, “Under the law of armed conflict, only lawful combatants have the right to use force during an armed conflict.”\textsuperscript{177} The use of civilian personnel and contractors does raise ethical issues as to their legitimacy and the rights to which they are entitled during their participation in an armed conflict. Some such as Gary Solis contends there is little distinction between the armed combatants of al-Qaeda and those engaged by the CIA. The question becomes even more slippery when considering the status of civilian contractors working for a civilian organization during a military conflict. Solis, further makes the distinction previously ignored that, “While the guidance [ICRC handbook] speaks in terms of non-state actors, there is no reason why the same view is not true of civilian agents of state actors such as the United States.”\textsuperscript{178} Hodge cites Loyola Law School professor David Glazer who states, “But employing CIA personnel to carry out those armed attacks…clearly fall outside the scope of permissible conduct and ought to be reconsidered, particularly as the United States seek to prosecute members of its adversaries for generally similar conduct.”\textsuperscript{179} The drone
strikes conducted by the CIA have been shrouded in the veil of secrecy which characterizes anything to do remotely with the question of national security.

Recent arguments related to possible criminal liability and the public authority paradigm, indicate that the CIA is not actually behind the kill process, but rather performs the target acquisition and provides the strike authorizations. In this measure they still remain, nonetheless, accountable according to certain scholars.\textsuperscript{180} They have, nonetheless, continued unabated and have increased both in number and intensity. “In September 2011, a drone missile killed Anwar al-Awlaki, the radical American-born cleric, using live video on Yemeni tribal turf where it is too dangerous for American troops to go.”\textsuperscript{181} The expansion of the lethal targeting to include American citizens, as mentioned elsewhere in this research has been the topic of heated debate.

The use of civilian operators is not the only sticking point concerning the legal, moral and ethical aspects of operating drones in warfare. Precision in warfare is a military necessity. The CIA is rather new to this game As O’Connell points out, “The heavy involvement of the CIA and CIA contractors in the decisions to strike may alone account for the high-unintended death rate. CIA operatives are not trained in the law of armed conflict [LOAC].”\textsuperscript{182} This contention, valid on the surface, nonetheless requires qualification, since many of the CIA operators are qualified ex-military personnel as well. But further issues require clarification nonetheless. As well-known author and scholar Peter Singer writes, “Similarly, C.I.A. drone strikes outside of declared war zones are setting a troubling precedent that we might not want to see followed by the close to 50 other nations that now possess the same unmanned technology — including China, Russia, Pakistan and Iran.”\textsuperscript{183} This obviously raises a question fundamentally related to this research: \textit{what are the limitations and boundaries on the use of drones?} At the same
time, this foreshadows a vision of expanded use of armed drones, as predicted in the first hypothesis; *the use of drones will become ever more prevalent in the modern battlespace.*

There is the question of strategic approach to targeted killings. The CIA “hit list,” is an “in-house” project with apparently little control or oversight from anyone outside the Agency. Radsan and Murphy claim that compared with military initiatives, “…the specific procedures for CIA targeted killing cry out for scrutiny and improvement.”\(^{184}\) Although the Joint Special Operations Command (JSOC) and the CIA do have joint targets an unknown number of targeted hits are exclusive to the CIA itself. The target list for the CIA remains hidden from disclosure, while that of JSOC carries the rather cumbersome title of, the joint integrated prioritized target list. Another significant problem discussed frequently throughout this research is the lack of transparency and accountability. Nowhere is this more evident than within the hallowed wall of the US intelligence community (USIC). Jane Mayer emphasizes this lack of oversight, “…because of the C.I.A. program’s secrecy, there is no visible system or accountability in place, despite the fact that the agency has killed many civilians inside a politically fragile, nuclear-armed country with which the U.S. is not at war.”\(^{185}\) Michael Walzer in his important work *Just and Unjust Wars* poses the important questions concerning the CIA’s right to exercise lethal authority. Unfortunately the silence is deafening.

When considering the question of legitimate targets, Amos Guiora recalls, “Two central questions with respect to operational counterterrorism are *who* can be targeted and *when* can the identified legitimate target be legitimately targeted.”\(^{186}\) Recently the CIA has adopted two different strategies related to targeted killing. The first is the use of personality strikes of individuals designated on kill lists of targets who pose an immediate threat to national security, while the second known as a *signature strike* is much more controversial. The latter, refers to
targeting unknown individuals based upon a pattern of suspicious behavior and is much less precise than the first (which is already a questionable approach). Alan Fisher reporting for Al-Jazeera commented, that administration officials (according to a report by the Washington Post), admitted approving the controversial signature strikes in Yemen on Thursday April 27, 2012. The strikes can be based upon nothing more credible than suspicious behavior, intercepted telephone communications, known as their intelligence signature. Not content with these enhanced powers the CIA and US military petitioned the Yemeni government for permission to expand their reach. The request was subsequently refused.

According to an article published in the Wall Street Journal in April 2012, “The CIA and JSOC asked last year for broader targeting powers, however, which would include leeway to conduct what are known as "signature strikes," in which targets are identified based on patterns of behavior, such as surveillance showing they are transporting weapons.” April of 2012 Al Jazeera reported that, “The Washington Post, quoting administration officials, said on Thursday that the US president approved the use of "signature" strikes this month.”

In recent reports by the Bureau of Investigative journal, a combined study conducted by legal teams at New York and Stanford universities and statements by Christof Heyns, UN rapporteur on extra-judicial killings it appears that the CIA has upped the ante by quite possibly using follow-up strikes on mourners at funeral services. This information has been kept close to the breast and although not unimaginable is, difficult to corroborate. Such accusations have led the UN to organize further investigations under the aegis of the UN Human Rights Council (HRC). Clearly the use of a civilian organization, which is not held to the same standards and responsibilities as the military poses an ethical dilemma. Criticism has been leveled at the agency some, no doubt, justified, much however, is most likely unwarranted. “A thorough review of the
arguments against the CIA drone campaign, however, shows that most critics invoke laws that do not bind American officials or laws that are vague,” note Radsan and Murphy. There have been considerations within the administration concerning the eventual transferring of drone operations from the CIA to the Pentagon. It is important however, to recognize the efficiency and precision of this organization and avoid rashly distributing caustic, unfounded demonization of the unknown; thus biting the proverbial hand which protects.

Finally, there is the thorny question of Americans being legitimate targets. From one perspective, there is the view at a democratic society, such as the United States, is not in the business of dispatching its own citizen’s, at least not before having provided them with due process. Given the complexity of the current asymmetric conflict however, should, a belligerent enemy of the state (and by association democratic institutions), by virtue of mere US citizenship, by itself, be enough to keep them from being targeted? John Yoo quite logically, seems to think not, “U.S. citizenship doesn’t create a legal force field around Americans who treasonously join the enemy,” he continues with now famous, Hamdi v. Rumsfeld decision, “Citizens who associate themselves with the military arm of the enemy government…are enemy belligerents.” It is the opinion of the current research that an individual, who betrays the fundamental principles of the democratic process, should no longer be protected. Through treason they forfeit their inherent rights and are no longer subject to the fruits of such democratic processes nor shielded by those same rights. Equal rights entail equal responsibilities. Yet it is essential that the evidence corroborating such treason be clearly defined, traceable and well-established beyond a reasonable doubt. To profit from the protections afforded by the democratic process of due rights, then an individual must also fully adhere to the laws and conventions of democratic society.
Operation Troy, (the codename), according to the *NY Times* was apparently “...the first time since the Civil War, the United States government had carried out the deliberate killing of an American citizen as a wartime enemy and without a trial.” Additional conflict rises under domestic law if one considers the constraints of Title 18 part I, Chapter 51, USC § 1119, where it is expressly stated that: “A person who, being a national of the United States [e.g., a member of the CIA] kills or attempts to kill a national of the United States while such a national is outside the United States but within the jurisdiction of another country shall be punished as provided under sections 1111, 1112, and 1113.” The limitations on prosecution, however, offer the possibility for the Attorney General, his Deputy or Assistant to approve or not the decision to prosecute. Thus, ceteris paribus, it is unlikely that such prosecution would be forthcoming in any event, despite the constraints imposed by domestic law. This contentious issue shall, no doubt, plague the philosophers and social scientists for the unforeseeable future.
Chapter V

“Everything is very simple in war, but the simplest thing is difficult.”
—Carl Von Clausewitz. *On War*, c. 1832.194

**The Good, the Bad and the Ugly**

The title of this section of the analysis, amply indicates the current state of drone warfare, there are positive aspects, such as saving the lives of service members, there are negative aspects such as a failure to adhere to the principles of IHL and there is the ugly side common to all warfare, that of human casualties. This is certainly the principle element supporting the increased use of drones, the idea that it isolates us from, the direct risk of warfare. Chaplain, Major Michael Keifman offers an interesting historical parallel based upon altruistic assumptions, “The argument for the use of Predator drones is somewhat similar to the argument for the dropping of the atomic bombs on Japan in WWII. It was thought that doing so would spare many Japanese and American lives.”195

Yet, ironically the use of drones, by the same token, inoculates the public, desensitizing their awareness to events which take place far from home. As Jane Mayer qualifies, “Cut off from the realities of the bombings in Pakistan, Americans have been insulated from the human toll, as well as from the political and the moral consequences.”196 From a political standpoint there are several advantages. There is, of course, the possibility of plausible deniability. There is also the factor that, “When combined with good intelligence, they [drones] provided plausible deniability against U.S. laws that forbade assassinations in foreign countries”197 according to Nawaz, Shuja. There is also a bad flip side which takes into account aspects such as, the abuse of executive authority and the neglect and failure to pay heed to international law. Finally, there is the ugly side which accompanies any armed conflict, the loss of human life on both sides, particularly in
the case of civilian, non-combatant casualties. In an effort to form balanced conclusions, it is vital to first gain insight and then weigh the various advantages and disadvantages involved in the use of UCAVs.

**Positive Characteristics**

Many different authors have pointed out both the obvious strong and weak points of UCAVS and UAVs. In some cases, various strengths may also be perceived as inherent flaws or shortcomings. For instance, although laser guided munitions reduce civilian casualties, they do not eliminate them. Additionally, it is well worth calling to mind that increased complexity, such as that offered by Net-centric warfare (NCW) and robotics, also consequently, automatically engenders increased vulnerability. In other words, the more complex a platform is the more vulnerable it becomes. The positive factors involved are quite numerous. Operationally, there is the fact that the platforms can perform multiple roles, such as surveillance, interdiction and support. Kreps and Kaag, like many other writers point to: lack of risk or danger to pilot; UAVs do not suffer the same human limitations, e.g., hunger, exhaustion and so on; UAVs are designed to be expendable, having a much lower price tag than their manned counterparts.\textsuperscript{198} Many authors have pointed out similar findings concerning the advantages of the use of robotic aircraft. They do not suffer the weaknesses or the limitations as imposed upon human endurance.

On the positive side there are numerous arguments in support of the platforms. Jackie Northam speaking for National Public Radio, for instance, (NPR) cites Stephen Cohen of the Brookings Institute as saying ‘with good intelligence, the drones are accurate.’\textsuperscript{199} Keith Somerville of BBC news stresses, “In the past, drones have been used as a cheap form of aerial reconnaissance which avoided endangering pilots' lives”\textsuperscript{200} There are also numerous strategic
and tactical advantages associated with the use of drones, particularly multifunctional platforms. As BBC correspondent Keith Somerville indicates, “The chairman of the US Joint Chiefs of Staff, General Richard Myers, said the advantage of using Predator drones in combat was that they could remain in the air for long periods and then respond immediately if they spot hostile targets.” Speaking of the more obvious advantages related to the use of unmanned aircraft Mary Ellen O’Connell writes, “Thus, even if a drone is shot down there is no loss of human life. They are also relatively cheap and easy to manufacture…Further, drones can be used for any battlefield operation: surveillance, reconnaissance, precision attacks, targeted killings etc. As any other robot, a drone can be used to carry out dull, dirty or dangerous battlefield operations, referred to as the ‘Three Ds.’” The ability of the platforms to linger has also decreased the unnecessary number of civilian deaths through enhanced identification of legitimate targets.

Obviously, drones do not succumb to the pressures of the battlefield in the way that humans do. They are not affected directly by the elements and bodily needs which plague soldiers and pilots. Nawaz adds, “They do not need to be fed clothed, or tended to beyond their technical maintenance.” While Patrick Lin points out, “…robots may likely have better situational awareness, if they’re outfitted with sensors that can let them see in the dark, through walls, networked with other computers, and so on.” Indirectly, they may, however, be the victim of their human operators. Unmanned aircraft suffer neither from lack of sleep, nor the fear or effects of combat. Air Chief Marshall Burridge underscores the fact that, “The plain fact is that UAVs allow us to overcome some fairly fundamental human limitations.” Robots or drones are also not subject to the emotional and temperamental vagaries of humans, they are dispassionate. Finally the unmanned systems can navigate and access particularly challenging terrain without perceivable ill effects. Dr. Kopp underlines the fact that, “UCAVs do offer some
compelling advantages other than avoiding aircrew exposure. A UCAV does not fatigue, and thus endurance is bounded by consumables like lubricants, weapon payloads, and availability of aerial refuelling [sic] assets. Another consideration is G tolerance - UCAV CPUs do not experience GLOC.”

Operationally advantages are numerous and cannot be questioned. The fact that the head of the multi-cephalic beast of terror has been strategically decapitated has enhanced morale while reducing casualties, both civilian and military, in the zones of conflict. The elimination of operational leadership has reduced the effectiveness of al-Qaeda as an organization, and sent much of the remaining control structure scrambling for safety in the far reaches of isolated wastelands, such as Yemen and Africa. Of course the obvious negative blowback is that this tends to spread the scourge rather than eradicate it. Additionally, those who are dead can obviously no longer serve as possible sources of intelligence. Thus, the second and third level effects touted by proponents of NCW (Net Centric Warfare) and EBO (Effects Based Operations) warfare are often exaggerated in light of such negative repercussions. As Kreps and Kaag insightfully point out, “Predicting first-order effects is difficult enough; going several steps farther to try and predict second-, third-, or fourth-order effects, as EBO proponents do, is a practical impossibility. There are simply too many variables.”

Strategically, UCAVS create a debilitating effect upon the morale of the enemy. The fact that the Taliban and al-Qaeda leadership are constantly concerned about their own safety and survival, means they have less time to ponder strategy and mount counteroffensive operations. A leader who knows that he has become a target, or has been hit-listed, must not only be concerned with the complexities of logistics, planning his next operation and preparing an offensive, but must also be concerned for his own safety and personal welfare. This seriously impacts
operations and lowers the efficacy of the organization as a whole. Additionally, there is suspicion sown within the rank and file causing many of the members to turn on one another like rabid dogs. This can and often does lead to an internal pogrom with the secondary effects of creating insecurity, wavering loyalty and over-cautiousness among the group. This practice, in turn, reduces the effectiveness and solidarity of the organization and limits recruitment efforts as well. An increased campaign of covert misinformation, by the intelligence services if not in place, would be a positive and erastwhile tactical maneuver in this sense.

**Negative Blowback: Alienate Hearts and Minds without Really Trying**

One of the most stirring and often voiced arguments concerning warfare in general and the widespread use of UCAVs in particular, is the idea that enhanced technology, combined with reduced risk, makes governments more prone to entering conflict rather than avoiding it. This increased propensity to resort to armed conflict is echoed by Johansson who writes, “But I will argue that the possession of UAVs might increase the inclination to start a war.” 209 In essence reducing the danger reduces the incentives to avoid war at all costs. As Patrick Lin asks, “But might this effect prove counterproductive to the larger goal of peace, to the extent that these machines also lower the political costs associated with declaring war, and so make engaging in war as a preferred or convenient method of conflict resolution easier rather than more difficult?” 210 Peter Singer weighs in with a most pertinent observation, “A leader needn’t carry out the kind of consensus building that is normally needed before a war, and doesn’t even need to unite the country behind the effort.” 211 This tendency to succumb to the siren lure of painless warfare, regardless the other consequences was seen in the recent attacks on Libya. Robotic unmanned Predator drones had direct involvement in firing on the convoy which resulted in the death of Colonel Gaddafi.
The US is already seen in the eyes of much of the Arab and Islamic world as anti-Islamic and overtly aggressive. Such perceptions should give cause serious reflection within the administration prior to engaging in certain conflicts, where their own national security is not a tantamount factor. Failure to engage in Libya would have had little or no impact on the United States, perhaps other than strained relations with their allies. The use of unmanned systems is considered “cowardly” and “unmanly” by the enemy and this perception is enhanced to provide moral justification as well as serving as a powerful recruiting tool. Finally, on the level of international propaganda the asymmetric struggle of poorly armed fighters against the advanced technological prowess of a superpower makes for compelling fodder in anti-American media.

Other Technical, Tactical and Strategic Shortcomings

Another area which has significant importance is the concern with the enemy affecting the operational aspects of the autonomous systems, or worse turning them back against their operators. For instance, Noah Shachtman of the Danger Room reported in October of 2011, that a persistent virus had infected the U.S. drone fleet, “A computer virus has infected the cockpits of America’s Predator and Reaper drones, logging pilots’ every keystroke as they remotely fly missions over Afghanistan and other warzones.”212 Additionally, the overall security of the system has been called into question. Recently captured Talibran and al-Qaeda insurgents have been revealed to have copied drone footage pirated using inexpensive, off the shelf (OTS) technology costing less than $26. Shachtman notes, “Many Reapers and Predators don’t encrypt the video they transmit to American troops on the ground. In the summer of 2009, U.S. forced discovered ‘days and hours’ of the drone footage on the laptops of Iraqi insurgents.”213 Peter Singer also points to several of these potential risks:
• Jamming of the electromagnetic transmission frequencies, either intentionally or unintentionally.
• Unreliability of COTS components in harsh battle field conditions
• Electro-magnetic pulse (EMP), gamma ray generated attacks and intrusion
• Hacking and reverse engineering

Still another downside to drone technology is the unreliability of America’s so-called allies, notably Pakistan. Pakistan has its own thriving drone production business, evidenced by its supplying the DHS with its Border Eagle platform, produced by Integrated Dynamics, as a more affordable option. Pakistan also has cooperative UAV developmental relations with Italy and Turkey. Yet Pakistan is seeking more advanced technology and relentlessly badgers the various administrations to cede to its requests. There has been talk of supplying Pakistan with 12 RQ-7 Shadow units for its anti-terrorism campaign, yet this could open a Pandora’s Box and set a dangerous precedent. There are well-founded fears that Pakistan might reverse engineer certain components and sell them off to China. Sanjay Kumar reports that, “Richard Fisher, a senior researcher at the international Assessment and Strategy Center in Washington, says that Pakistan may choose to produce China’s new CH-3 attack [unmanned] aircraft.” While Kumar has a definite pro-Indian bias to his writing the facts concerning Pakistan are indisputable. He also adds that India has purchased Israeli Harop ‘killer’ UAVs as well. It would appear that, internationally speaking, the secret is out of the box, and with anywhere between 40 and 77, or more different states now at various stages of development, there is little chance of ever turning back the clock. The future portends more intensive technological sharing, research and development. It also infers a possible, new-age, arms race with various nations scrambling to obtain technological parity. Furthermore a more pressing issue is raised by Grossman of Time Magazine who writes, “The moral ambiguity of covert drone strikes will clarify itself very quickly if another country claims the right under international law to strike its enemies in the
U.S.”216 He continues with a stern warning that, “There may come a day when the U.S. bitterly regrets the precedents it has set.”217 This accords with and confirms the first hypothesis of this research. The consequences of such an arms race, remain to be seen, yet if history is any indicator, even a jaundiced view depicting a deadly game of musical drones might not be an over exaggeration.

Other criticism and negative aspects, some justified, others not include: …”the weapons’ lack of precision, and the uncertain intelligence on which the attacks are based.”218 This latter concern is particularly worrying since many of the informants have proven untrustworthy. While Air Force doctrine calls for HUMINT confirmation prior to initiating any strikes, it must be noted that HUMINT sources are notoriously inadequate and unreliable, much like witnesses in the case of a homicide. Still, it is not only the informants who may err as Mayer underlines, “But the strikes are only as accurate as the intelligence that goes into them. Tips from informants on the ground are subject to error, as is the interpretation of video images.”219 Some report in order to appear to be fulfilling a function, others for pecuniary gain and yet others still, to be rid of a rival, settle a boundary dispute or to covet a neighbor’s goods and lands. Holewinski, adopting a purely humanist perspective, goes as far to assert, “The United Stated should never launch a strike that could hit civilians if the intelligence behind it comes from paid or unvetted sources.”220

The enemy is not the only one to suffer from inadequate of imprecise targeting. Although the Pentagon does its utmost to suppress revelations of incidents of friendly fire,”(yet, like collateral damage, another oxymoron) the reports do eventually make their way to the public, “Marine Staff Sgt. Jeremy Smith, 26 and Navy hospital staffer Benjamin D. Rast, 23, were both killed by an unmanned US aircraft back in April [2011],….it has been revealed that the two men lost their
lives because those commanding the craft assumed the men to be Taliban fighters, even though air force analysts weren’t certain.”

The increased tempo of the drone strikes and the resultant number of associated civilian deaths, both inside the area of responsibility, (AOR) as well as without, have helped swell the ranks of the Taliban and Al-Qaeda and assisted them in their recruiting efforts. And this phenomenon is not exclusive to Pakistan and the FATA autonomous region. The Obama administration has increasingly targeted individuals in Yemen, Somalia and Libya. “Advocates of expanding the scope of U.S. drone strikes in Yemen say the latest U.S. intelligence shows that al-Qaeda in the Arabian Peninsula (AQAP) has grown stronger since one of its prominent leaders, American-born Muslim cleric Anwar al-Awlaki, was killed in a U.S. strike in September.” Danya Greenfield, spoke to Yemeni youth leaders who expressed their anger at the US strikes there. The leaders insisted that, “more harm than good is being done by the unmanned strikes that often hit civilians by mistake.” The net result, according to the leaders, is a significant increase in the number of recruits for Ansar Al Sharia, the Yemeni section of al-Qaeda. Greenfield adds, “What is equally worrisome is that AQAP is exploiting the impact of US drone attacks both internally to garner sympathy and attract new recruits and externally to inspire lone wolves abroad to launch attacks against Western targets.”

Another major stumbling block, in Yemen, has been the approach adopted by the US in its combat there. The US has shown little concern for public welfare and safety and has allowed a negative perception bias to develop. According to the popular view the United States seems intent on merely carrying its battle to root out the insurgents, with little regard for the inhabitants. Jonathan Masters appears to confirm such a view, “However, strikes in Yemen, home to AQAP, are on the rise and likely to accelerate.” In order to gain the confidence and cooperation of the
Yemeni population an enhanced campaign of meaningful discussion and the expression of US commitment, should be a fundamentally strategic imperative.

**Nasty, Brutish and Short: A Return to Hobbes**

Modern warfare, over the past few decades, has become increasingly sinister and lawless. While this excess is not always justifiable, by any means, it is a direct response to the asymmetric types of conflict being waged, which fosters a vicious cycle of overindulgence in unethical and immoral bloodshed, reprisals and suffering. This brief segment is meant to illustrate some of the spillover effects and the difficulties they place when state actors, abiding by the law of armed conflict run up against non-state actors who abrogate all laws of decency to turn the situation to their own advantage.

Asymmetry is the most standardized form of warfare today. Schmitt describes two types of asymmetry, Positive, which reinforces the advantage of one belligerent over another and negative symmetry, where an enemy’s weakness can be exploited. Sometimes these models work simultaneously or are totally intertwined. This type of warfare can contain two forms. There is, of course *logistical asymmetry* where the weaker side lacks the logistics and weaponry of their adversaries but there is also *doctrinal* or *operational asymmetry* as well. Doctrinal and operational asymmetry exists when a well-formed and trained force faces a disorganized, under armed and poorly trained enemy. Finally there is the concept of technological asymmetry. Technology is but one form of asymmetry closely related with new cognitive approaches and doctrinal asymmetry, mentioned previously. This leads to enhanced efficiency, not only in the weapons of war but in the way war, itself, is waged. This is a particularly complex paradigm;
However, Michael Schmitt does an outstanding job of succinctly describing positive technological asymmetry:

Using networked C4ISR unavailable to the other side, friendly forces seek to get inside the enemy’s observe-orient-decide-act (OODA) loop. In other words, acting more quickly than the enemy forces him to become purely reactive, thereby allowing you to control the flow, pace, and direction of battle. Eventually he becomes so disoriented that paralysis ensues.²²⁷

There also exists a notion of an *asymmetric threshold*. According to such a view there comes a point which when passed renders the asymmetric conflict as no longer justifiable, due to such an enormous disparity of means. Gaillott explicates, “The asymmetry objection essentially holds that the use of remote weapons by one force against another force, without such technology, crosses some symmetry threshold making the fight intrinsically unfair and thus unjust.”²²⁸

Related to these concerns, previously mentioned, are questions surrounding strategic, operational and tactical assessments by the terrorists themselves, and their possible choices of retaliation. Terrorists, insurgents and illegal combatants all have one thing in common. They have little or no defense against unmanned armed aircraft. Furthermore they have little or no option of surrender. This dilemma forces them into a corner and it is important to consider the future possible consequences and analyze such a threat appropriately. Patrick Lin, strikes home, “The Predator [and Reaper] UAV pilots in Las Vegas, half a world away from the robots they operate, would seem to be classified as combatants and therefore lawful targets of attack even when they are at home with family.”²²⁹ The obvious danger with this is that there is a distinct risk of opening the door to an expansion of the conflict and bringing it back full circle.
Chapter VI

“Ethics change with technology.”
– Larry Niven, N-Space

The Wedding of Man and Machine: The Future Is Now

Very few individuals, outside of science fiction novelists and technological dreamers might have foreshadowed the incredible leaps of technology which are currently taken for granted. Some of the more farsighted, those involved initially in information technology, then later in robotics dared, whether for better or for worse, to “think outside the box.” As mentioned in the very first few lines of this research, “all new discoveries, there is always an unfortunate and inevitable trade-off.” Nuclear power can heat and create propulsion, yet it can also presage the destruction of the planet. In the same sense drones may limit the risk to personnel while increasing it for innocent civilians. In the domain of espionage UAVs can infiltrate and obtain secrets precious for national security, while their misuse has and can be turned to more nefarious ends, such as infringing upon constitutional rights to privacy, smuggling contraband into correctional facilities or enabling drug cartels enhanced operational capacity. Today’s robotics are completing tasks unimaginable just a decade previous and they are doing them faster, better and more autonomously then might ever have been inconceivable. This is not to say that technology is infallible, and such a fallacy is totally flawed. For instance, drones and robotic weapons may still be outplayed through the use of cleverly prepared denial and deception tactics, in much the same way as they can be by various jamming devices. These tactics do not change because of the introduction of technology and are based upon the same principles utilized during WWII and the Cold War.
While technology can improve and save lives it can also destroy them indiscriminately as well. Jean McKenzie criticizes, “Time and again, drones have targeted the wrong house, the wrong group, or have caused excessive collateral damage.”\(^\text{\textsuperscript{230}}\) In the case of UCAVs this has been a major criticism. The typical response has been to claim that while civilian deaths are a tragic necessity of armed conflict, they have, nonetheless, been drastically reduced by the better intelligence and enhanced and sophisticated precision munitions sported by drones. Sarah Kreps and John Kaag, however, make a remarkable observation when they state, “Some observers wrongly conflate increasingly sophisticated technology with increasingly sophisticated individual judgment.”\(^\text{\textsuperscript{231}}\) Thus, while outstanding judgment and high performance technology can and do occur simultaneously, they may also be mutually exclusive variables. Helena Keeley made a most pertinent observation, parallel to the current discussion, by citing the shortcomings of humans when compared with that of robotics. Additionally, there is a significant imbalance related to margin of error, responsibility and attribution, c.f. machines are expected to be perfect, humans are, of course, not.\(^\text{\textsuperscript{232}}\) As the mutual bond of trust develops between man and machine, the boundaries and limitations of each fully recognized and appreciated at their just value, it is quite likely there will be more integrated, joint Man to machine (M2M) teams (authors concept) in the future. Thus, applying the principle of parsimony of reason as outlined in the Occam razor paradigm, the simplest solutions may very well be the best. It is not because a problem concerns technology that the solution must also be technological or even “overthought.”

**Technology: The Changing Face of Warfare**

Many of the issues involved concerning the limitations and boundaries of legal, ethical and moral perspectives also apply to the world of technology. The question of bandwidth has been the poster child for technological bantering with both sides vindicating their various standpoints.
Thus Dr. Kopp strongly explicated, “This is basic research which is under-explored, yet assumed to be complete by people who should know better. When I did the 2001 conference paper I had two people in the public audience argue with me very loudly that these boundaries did not exist! One was an aeronautical engineer, the other was a programmer, neither were scholars of networking or AI!”

Helena Keeley counters with a very convincing argument, “A lot of the bandwidth issues they worry about come from a basic assumption that a lot of data will be passed FROM/TO the drone to/from ground control (humans). We (Compsim) think that the drones’ policies should be followed without the data being passed back and forth for decision-making. The drones will know “more” than the people back at the ranch because it’s “there” at the time when decisions are needed.” This appears to be a straight forward approach and quite possibly, a simple solution to the problem of increased demands for ever expanding bandwidth. For a schematic matrix refer to appendix C.

There are several limitations and boundaries which require examination when considering the use of robotic technology in warfare. As previously mentioned there are the legal, ethical and moral constraints. Additionally, there are the limits of technology. Three such limitations posed by critics are:

- Bandwidth limitations
- Midflight refueling
- Augmented endurance and longer dwell time (closely related to the former)

The most problematic issues in these areas, for the present are the viability of the unmanned systems and the question of the ever increasing need for bandwidth. The UAVs have been plagued with crashes and failings. Mockenhaupt, in 2009, wrote, “A third of the Air Force’s
Predator fleet has crashed along with a couple of Reapers."235 While Major Vanessa Meyer, also speaking of the shortcomings states, “Great planes…They just don’t work in bad weather.”236 These failures, however, may represent little more than the normal growing pains, of adjustment, associated with the introduction of any new technology. Still, Grossman significantly emphasizes, “Taken together the Global Hawk, the predator and the Reaper are the most accident-prone aircraft in the Air Force fleet, according to a Bloomberg report.”237 Certainly any technology is also vulnerable to various attacks such as computer viruses, anti-aircraft fire and reverse engineering. The advantages, however, at least technologically, appear to outweigh the inconveniences. Indeed all that glitters is not “steel and transistors.” For instance, “…recently, in 2011, a computer virus infected the cockpits of America’s Predator and Reaper drones. Logging pilots’ every keystroke as they remotely flew missions over Afghanistan and other war zones.”238 To be fair every system has its shortcomings, these are the ones related specifically to this technology.

**Artificial Intelligence**

While it is possible to write an entire book on the vast topic of artificial intelligence, and indeed such is the case, the discussion here shall be limited to the legal, ethical and moral impact and associated limitations in regard to the use of AI in armed conflict and specifically in relation to its application to drone warfare. There is an ever growing corpus of literature and academic research involved in the ethical study of robotics and warfare. This is promising since it is optimally during the research and development stages that such study must be carried out. In several instances ethicists are working in close collaboration with industry during the developmental phase.
In this context, it may be best to begin with a definition of what actually constitutes artificial intelligence and how artificial intelligence differs from Artificial General Intelligence (AGI) or “Strong AI.” Singer sees AI as, “The idea of robots, one day being able to problem-solve, create and even develop personalities past what their human designers intended…” He further clarifies the difference between two types of intelligence that of reactive and predictive. These are, for the most part, self-explanatory. The documentation examined during the current research, and the opinions contained therein, indicate a general lack of a clear definition or consensus concerning what actually constitutes artificial intelligence. This is due to the fact that different individuals perceive artificial intelligence at different levels and in different ways. Some link it to, and compare it with, human intelligence. Singer and the majority of roboticists see artificial intelligence as the ability of a machine to find solutions when faced with intricate and complex paradigms.

The step beyond artificial intelligence is referred to in scientific circles as “Strong AI.” While strong AI approached the boundaries of humans, people still maintain a few major advantages over machines. One such advantage is social cognition, the ability to recognize, analyze and react to emotional behavior and social situations, which remain, as yet, largely outside machine capability. Although researchers are currently working on this development, the sheer complexity may still leave man in control, at least for now. Another aspect that humans have greater control over is that of multi-tasking. A human can for instance hold a telephone conversation while walking across a busy intersection, all the while respecting the crossing lights and avoiding collision with other pedestrians. Research has also addressed this shortcoming as well. Singer notes, “For this reason, researchers are at work on all sorts of advanced AI, such as ‘expert systems’ that organize behavior into millions of rules to follow, to ‘evolutionary’ or self-
educating AI, such as neural networks that mimic the human brain, to genetic algorithms that continually refine themselves.”241 For further clarification of these, as well as other concepts concerning AI please refer to Appendix C.242 It must be born in mind that the development of any program of artificial intelligence is initially based upon human logic and reasoning, c.f., that of the programmer. There needs to be a constant evolutionary process involved. This process must, by necessity match user needs, while at the same time, reflecting the constantly changing legal, moral and ethical environment in which these machines operate.

Tom Keeley, developer of the unique KEEL® system, writes, “Human reasoning and judgment is often required to address much more complex problems. Humans are continuously tasked with addressing problems with many inter-related inputs and outputs. They balance their decisions and actions by continuously evaluating risks and rewards.”243 It is precisely this multi-tasking which currently differentiates man and machine. Yet there are advantages to both systems, while the human being can rely upon historical referencing it may also interfere with his cognitive judgment. Carlo Kopp notes, that while autonomous discretion is not totally infeasible, “In practical terms, replacing the autonomous capabilities of the human crew in a UCAV will require the computing technology to wholly emulate the thought processes of that human crew.”244 Professor Kopp rightly raises several points worthy of consideration:

- The economies of scale. Will the cost of the new technology and its development justify the transition from manned to unmanned aircraft?
- Will the wetware dynamics of humans be able to be accurately captured in the “psychological” construction of artificial intelligence?
- Will the new platforms be able to meet, match and hopefully surpass the manned vehicles capabilities for stealth and evasion?
- Can the unmanned platforms be made to conform to the requirements of range performance and how will aerial refueling be conducted?245
In response to each of these arguments, although valid, it must be pointed out that in a man versus machine paradigm, the machine wins hands down every single time, without failure. The reaction time, the accuracy and the lack of human constraints give robotics a substantial edge performance-wise. Nearly everything man can do, a machine can conceivably do better. Technological shortcomings and eventual limitations have been discussed elsewhere in this research. It would be unwise, however, to apply possible limitations, as an impediment to progress, where none exist.

**Autonomy: Life in the Fast Lane.**

Autonomy is a misleading concept, since, at least of the present, the “human in the loop,” is an absolute requirement, at least for the present. This technological boundary, however, is rapidly giving way to full autonomy, at least in some systems and the trend is toward increasing this characteristic. Elizabeth Quintana writing for the British think tank the Royal United Services Institute (RUSI) indicates that, “Next generation systems are likely to exhibit much higher levels of autonomy while co-operative systems (i.e. robot teams of two or more) are also being investigated.”

Once again, the camps are divided with the skeptics to one side and the techno-fans to the other, with little margin between. Autonomy is a slippery concept in that it conveys varying degrees of human interaction and oversight. Linda Johansson agrees, “…the term ‘autonomy’ is ambiguous and used with different meanings when it comes to UAVs or robots in General.” Peter Singer eloquently clarifies, “Autonomy, then, relates to many of the same questions that we usually use to define a human being’s maturity.” Strawser, on the other hand uses the following definition: “That is, so long as a human agent makes a decision whether or not to employ lethal
force, the weapon is not an IAW as I use the term.”249 Autonomy has less to do with intelligence, per se, than with trust and discretionary decision making. While trust may seem an awkward term to use in relation to a mechanical robot, it remains, nonetheless, a vital component to assuring any eventual authorization for autonomous action in general and discretionary targeting in particular.

There are varying degrees of autonomy as displayed in appendix D. There is a sliding scale which ranges from what Quintana refers to as “remote controlled” which expands to a more co-operative arrangement referred to as “semi-autonomous,” and finally, completely independent action and decision making which she refers to as “fully autonomous.”250 As mentioned elsewhere, autonomy is an important concept, particularly when considering the question of bandwidth requirements and the possibility of signal interference or obstruction.

Kolff predicts, “Autonomous operations are a requirement, as the enemy will ultimately cut the communications link between the system and the controller.”251 A more clear definition of what exactly autonomy entails is offered in the DoD 2012 Report, The Role of Autonomy in DoD System, which clarifies that, “Instead of viewing autonomy as an intrinsic property of an unmanned vehicle in isolation, the design and operation of autonomous systems needs to be considered in terms of human-system collaboration.”252 While politically soothing, to the public, his is the concept of CONOPS. It represents but one possibility in a number of possible scenarios. An interesting perspective, concerning autonomy and the bandwidth problem is offered by Dr. Kopp, relating to band width is presented by comparing what he refers to as “dumb” RPVs versus the fully autonomous type. According to Kopp, if the bandwidth problem persists then the use of fully autonomous RPVs becomes, ceteris paribus, sine qua non. 253
Fighting the Loop

There have been numerous limitations raised, within this research concerning the eventuality—or not, of complete autonomy in robotic warfare. This is as contentious an issue as that of the previous legal debate, and thus merits greater exploration. Much like the three positions adopted in the discussion of legal, moral and ethical appropriateness of the use of UCAVs, there are also three stances in regards to the possibilities of autonomy. At one end of the continuum is a group that might be referred to as the “techno-nihilists,” who believe that full autonomy is impossible. More toward the center are the “techno-skeptics,” who while not entirely discounting such a possibility, nonetheless do not see it as part of the immediate future. Finally, on the other end are the “techno-protagonists,” who overlook the limitations and boundaries, see no major obstacles to progress and feel that technology is not a measurable linear concept, rather one which is prone to rapid and unexpected developments. If not already obvious, this research supports this latter position.

As Peter Singer so artfully elucidates, “When people think about change in business, technology or war, they usually imagine a linear process. Over time, slight improvements are made that make systems better, faster, cheaper, or give them a bigger bang.”254 Those lying in the middle spectrum often refer to temporally limited models such as Moore’s law of dynamic doubling progression in transistor components.255 What such a view fails to observe, or at least admit, is that, while Moore’s Law might well apply to the progress of integrated circuitry (even this may not hold true), it does not necessarily equate with advances in others fields, such as robotics and artificial intelligence! This perception is based upon the dynamic progression in technology. This research postulates that it is no longer safe or sound to preclude major advances in science and technology. This is confirmed by two solid irrefutable observations. The first, is
the obvious geometrically, exponential growth of modern technology itself, while secondly, and relatedly, the current tendency for intertwined technological discoveries to “piggy-back” and “feed off” one another. When considering Kurzweil’s focus upon the concept of singularity, it seems safe to say that military is not yet facing a state of singularity. Through the auspices of military and university laboratories and organizations such as DARPA, it has become, rather singular in composition.

Tom Keeley, a future looking protagonist, speaking of his own progress interjects, “KEEL ‘Engines’ are ‘expert systems’ in that humans encode policies that tell them how to think (or how to value and fuse information, make decisions / allocate resources). They are 100% traceable to the humans that created the policies. The KEEL “dynamic graphical language” is just a new way to program complex behaviors.” KEEL technology while very promising, in the quest for greater autonomy, has unfortunately as yet received negligible official consideration. Elizabeth Quintana also echoes such a view, “Removing humans from the decision-making cycle can improve performance and allow them to concentrate on other tasks.”

**Moral Ethical and Legal Facets of Technology**

Warfare carries its own burden of legal, ethical and moral constraints. Technology when it is developed and used to conduct armed conflict must, by necessity be constrained even further. Science, technology and weapons are, *ceteris paribus*, neutral entities and merely an extension of human aggression. Weapons systems do not enter the lethal decision making loop; at least not yet. Many of the proponents for the use of advanced lethal technology adopt a utilitarian view, which advocates their use for exercising the greatest good for the greatest number. Strawser, according to Gaillot, adopts such a view in his ‘principle of unnecessary risk’. Gaillot explicates
Strawser’s principle as”…trying to accomplish some objectively good goal” with the further condition that the means to do so, “…do not violate demands of justice, make the world worse off entail more risk than necessary to achieve the good goal.”\textsuperscript{259} One morally troubling aspect, when considering robotic warfare, is the idea of diminishing risk, and thus rendering the conflict, uneven, and by association, ‘unjust.’ Ofek rightly acknowledges that, “And drones have obvious benefits over other tactics, especially in reducing the risk to American personnel.”\textsuperscript{260}

Ironically, although the concept of \textit{just war} generally reaches as far back as the Bible and the writings of such theological luminaries as St. Augustine and St. Thomas Aquinas, it lays down the moral ground rules, much as if it were a tennis match being conducted rather than a war. Thus, when viewed, through the prism of such a moral perspective, both sides must have an equal or near equal chance of success in any given conflict. Amos Guiora however depicts this as a rather absurd notion, given the inherent disparity of logistics and technology and emphasizes, “There is no—and there cannot be—proportionality between the conduct of the two sides,” and more significantly “The more appropriate inquiry is to determine whether operational counterterrorism measure applied by the state are proportionate to the threat posed by the non-state actor.”\textsuperscript{261} One of the problems broached in the previous discussion concerning asymmetry was that of \textit{technical asymmetry}.

Technical asymmetry creates a \textit{morality dilemma} because the substantial imbalance serves as a force multiplier for the more powerful belligerent. Technical asymmetry is present when one or more of the belligerents of a conflict has access to far superior technology and weapons systems than the other. This often creates the effect of making the conflict one-sided and hence manifestly unjust. Drones upset this equation, this view of equitable conflict. Human nature has however pushed society to outperform and outpace their adversaries in every walk of life from
cinema to sports and from learning to warfare. One is the ideal, the other the reality. Gaillot succinctly clarifies this point, “It is this kind of scenario—where one side can inflict damage on the other with virtual impunity—that many find morally troubling.”\textsuperscript{262} Yet, in an effort to find an acceptable middle ground, it is first necessary to define their precise limits and determine whether such killing machines are actually fueling or deterring further conflict. Ethically, however, it is difficult to argue with the saving of lives and the reduction of risk. Lest the critics of such technology forget, “Hundreds of lives have been saved by UAV crews spotting roadside bombs, taking out snipers and mortar teams and thwarting ambushes,”\textsuperscript{263} Mockenhaupt recalls. To date there is very little agreement or consensus concerning robotics and ethics and there is no formal set of established rules, general principles of ethical conduct or guidelines.

There is the all-important question of responsibility as well, which differs considerably when considering the impact of actions related to non-human action. Machines cannot be held legally responsible, and until recently manufacturers and strategic users have also been shielded from responsibility. Peter Singer asserts a fine distinction concerning responsibility, “The outcome, and thus the responsibility, is the same. The question should instead focus on whether the action was deliberate or an accident and, if so, criminally negligent in some way.”\textsuperscript{264} Thus he is advocating the traditional distinction inherent in the legal system of differentiating between civil and criminal responsibility. As Patrick Lin indicates, “Further, a robot with a certain degree of autonomy may raise questions of who (or what) is responsible for harm caused by the robot, either accidental or intentional: Could it be the robot itself or the programmer?”\textsuperscript{265} While Lin limits the options with these two alternatives, there is no reason not to imagine that responsibility might be also attributed at the tactical, operational, organizational or even strategic levels of decision making and implementation as well. With regards to technology, the time to develop
ethical guidelines is sooner, rather than later. The research and development phase is the ideal point for building is a robust framework of ethical ideology. Presently there has been precious little concerned evidenced in this realm.

The Future Is Now…

It may come as a surprise to some the actual level of progress which has been made in research and development in the field of robotics. Ironically, the creative source of new technology often finds its birth seed within that most destructive of forces, warfare. Many of today’s most useful inventions found their genesis in the blood and gore of the battlefields, nuclear power (for better or for worse) being but one example. Thus the field of robotics has made tremendous progress, built from necessity. If the current trend of development and use can be used as a measure, then the future use of drones will not be limited merely to warfare and terrorism but to organized crime as well. There are also other, more positive, current and projected uses such as in, law enforcement, border control, agriculture, disaster relief, and even quite possibly pandemic interdiction.

Robots and robotic vehicles may be programmed to carry out various criminal activities. Goodman surmises, “A future in which they commit crimes may yet seem like the realm of science fiction, but it is closer than you think. Criminal organizations are early adopters of technology, and some have already used UAVs and other forms of robotics to violate the law while reducing their risk of arrest and apprehension.”

Some of the technological advances which exist, and can be expected to develop in the very near future, will revolve around the areas of miniaturization, biorobotics and swarm intelligence. “The University of Pennsylvania GRASP Lab recently unveiled a network of 20 small drones
flying in synchronized formations to operate ‘with little or no direct human supervision’ in ‘dynamic, resource-constrained, adversarial environments.’\textsuperscript{267} The future shall, certainly see a drastic rise in the use of nano and micro-UAVs (NUAVs/MUAVs). The denomination of ‘unmanned’ being rather an oxymoron, since, they are well below the size possible for such an event, particularly in the case of the atomic sized nano-vehicles. There are many of these platforms already in production and they vary greatly both in degree of size and performance capabilities. Robert Johnson reports, “Flight International reported that the CIA had been developing micro UAVs as far back as the 1970s and had a mock-up in its Langley headquarters since 2003.”\textsuperscript{268} One of the smallest (MUAVs) to date has been the British \textit{Black Hornet}. Weighing in at only 4 inches it can both hover and reach speeds of up to 22 mph. Unit price is estimated at $125,000.\textsuperscript{269} Some of the possible functions for these MUAVs could be, jamming platforms against radar, collectors for biological [i.e. DNA] and chemical samples, EO/IR imaging, and SIGINT collection of cell phone exchanges.\textsuperscript{270} This area of robotic research has taken on increasing importance and is further related to the advances in “swarm” or “dust” intelligence. Swarm or dust intelligence is basically a system whereby a single unit is broken down into micro subcomponents which can rejoin with enhanced efficiency. While the autonomous units can function and communicate individually and carry out mission specific oriented functions, their analytic and performance capacity is magnified upon once grouped. This concept—biomimetic research or imitating nature in engineering evolved directly from nature; in this instance particularly through studying bird flocks and ant and bee colonies. Thus as in nature the whole is stronger than its individual parts. The inherent weakness to the swarm or dust concept, which establishes its effective limitations or boundaries, resides in the fact that there needs to be constant and uninterrupted communication flow. The difference between the
mothership concept and the swarm is clarified by Peter Singer, “Swarms are decentralized in control, but concentrate firepower, while motherships are centralized but disperse firepower.”

It has been forecasted that the early Predator and Reaper models, as well as the land and sea robotics, will be substantially outmoded within a decade. This is a logical progression if one compares the development of rudimentary earlier models with those currently in service. Proponents foresee technology astronomically advancing in leaps and bounds in the very near future. Here again the debate rages on both sides of the fence, with the proponents falling onto Moore’s law of exponential growth in support of their position and the critics, are just as staunchly adamant in their opposition to such a view.

Other possible enhancements include using UCAVs as proactive radar jamming platforms. As Professor Kopp indicates, “High power support jamming of hostile radar systems, the Prowler/Raven role, is another environment where the UCAV might prove particularly useful. He goes on to indicate another experimental platform being considered, “A UCAV role proposed in the US has been its use as a carrier vehicle for a high power microwave (HPM) directed energy weapon intended to defeat opposing radars and computer systems.” The problem with fielding such systems are the possible counter-reprisals and retaliatory strikes which might occur, including the much dreaded development of an electro-magnetic pulse (EMP) device.

Weaknesses, limitations and even misuse must be borne in mind in the development of robotic systems. For instance, as a mobile platform there is always the inherent threat that these aircraft may serve as launch pads for more deadly armament, notably, nuclear, biological chemical or radioactive in nature. Gormley and Speier make a most pertinent observation, “…a country or terrorist group motivated to develop a crude cruise missile or UAV either on its own
or with some foreign assistance could readily take advantage of the last decade’s quantum leap in
dual-use technologies that comprise the chief components of autonomous air-vehicle
development.”

One inherent weakness is system related. Unmanned Control Systems (UCS) have
conspicuously lacked an integrated architectural framework which has impacted and reduced the
efficacy of missions. This concern is now being dealt with by the Department of Defense, which
is seeking to use more ordinary PC technology. One of the most dangerous aspects however is
this exact same approach. It is currently, impossible to determine if the Department of Defense
has considered the vulnerability of adopting more integrated and simplistic technology.

The danger that this research stresses to point out comes from the supply side of technology
itself. The electronic supply chain, upon which drones are currently reliant risks becoming the
military’s Achilles heel. Secondary sourcing and third part suppliers, in effect, often use
counterfeit knock-offs, either intentionally or not. Singer notes significantly, “With the huge
amount of ‘civilian-off-the-shelf’ technologies used in military robotics, these trends, actually
create a massive dependence on foreign manufacturers to supply America’s next generation of
weapons.” There is a specific threat of compromising backdoors for the copying of sensitive
intelligence, insertion of Trojans, or viruses or hidden recording devices. These concerns are
serious threats to national security and require attentive reflection.

Summary

The only limitations are those created by the human mind, the belief that something is
impossible, inevitably renders it thus. Such a pattern of anchored reflection relegates possible
solutions to a cognitive waste bin. Preconceived failure has, always, ultimately ended in defeat.
Technology has always responded to military necessity, sometimes later than sooner, but has always provided a response to the needs of defense. Some examples are the advent of the English longbow, the crossbow, gunpowder, rockets, cannons, firearms, the machine gun; tanks and armored vehicles; aircraft, ironclad ships and submarines.

Technological innovation did not however stop with offensive capability, however but included aspects of defensive and strategic importance as well. Thus, battlefield medicine and triage, the development of personal protective gear and body armor; the use of K9s in combat; development of the phalanx, the square and squad tactics all represent other developments related to revolutions in military affairs (RMA).

Today, the latest link in this long chain is represented by autonomous robotic weaponry. The “yes but” versus “what if” dichotomy has been the bane of the advance of technology. What is known is comfortable and familiar, what is not, less so. Using a simple cost/benefits analysis, it becomes strikingly clear that the benefits of experimental technology outstrip the associated costs. It must be borne in mind, however that deep, critical reflection must be allotted to the legal, moral, ethical and technological aspects of any new technology, without, however, stifling the intended promise it holds. This may be a difficult balance to strike yet; it is nevertheless, an essential one.
Chapter VII

“It is good that we find war so terrible, or else we would become fond of it.”

From Here to Eternity

Postcards from Hell: Collateral Damage.

What we do not see does not generally disturb us. Public awareness has been muted due to a lack of both willingness and access on the part of the press. While there are a few independent journalists and organizations who have taken an effort to discover the real truth (as opposed to the “official truth”) they have often taken such extreme positions as to become the object of ridicule. One of the most telling and tragic aftermaths to come out of the war on terror is the abundance of civilian casualties, often heedlessly referred to as “collateral damage.” Despite the constraints of international humanitarian law the number of civilian deaths has continued to steadily increase in the face of ever increasing international outrage. “This year’s drone attacks have so far done little to spare civilians: the Long War Journal found that US drones have killed at least 11 civilians since Jan.1, which exceeds the number of civilians US officials say were killed in all of 2012.”276 This amount represents twenty-five percent of the total casualties (40) since the beginning of the year.

Additionally as if to throw a spanner into the works, al-Qaeda and the Taliban have been camouflaging the strikes of legitimate targets, by removing weapons and other incriminating evidence found on the scene, thus magically transforming an ostensibly legitimate target into a martyred civilian. In a vein, similar to that previously espoused by O’Connell, Sarah Kreps and
John Kaag, point out, in their paper, *The Use of Unmanned Aerial Vehicles in Contemporary Conflict*, some of the unique features of modern warfare. Speaking of the propensity for terrorists to conduct their warfare and fighting in built up urban areas, or FIBUA, they write, “This trend has blurred the line between combatants and civilians and made it difficult to distinguish between legitimate and illegitimate targets.” Operationally al-Qaeda and the Taliban have also taken to this practice referred to as shielding, which is not only ethically condemned but also against IHL. This shielding can be either active or passive, according to Schmitt. This practice is often a direct consequence of the desperation of the enemy in the face of disproportionate asymmetry. Speaking of an incident where three children, ages 12, 10 and 8, were killed in an airstrike, Lamothe and Gould write, “The incident underscores a continuing problem across Afghanistan. The use of children by the Taliban—through recruitment and as human shields—complicates coalition forces’ efforts to eliminate the enemy fighters from the battlefield without angering civilians.”

More recently the debate concerning the civilian casualties has begun to keep pace with the attacks themselves with more calls for greater transparency from the current administration and enhanced oversight. Until recently most of the concern has been dispersed and disorganized, however, increasingly this discontentment is finding a voice; an outlet of expression. The UN, for instance has launched an investigative unit, under the auspices of the UN special rapporteurs, for extra-judicial killings, Cristof Heyns and special rapporteur on counter-terrorism, Ben Emmerson QC. There is an air of irony, however, in the recent calls for an investigation which have emanated from two members of the UN Security Council (UNSC); China and Russia. Russia, has had its share of questionable activity in Chechnya, while China, has been involved in questionable human rights abuse in both the Uyghur’s of the Xinjiang region and the Tibetans.
The adages about living in glass houses and casting stones pops readily to mind in such an instance. Pakistan also called for investigations but it is difficult to determine whether this was sincere or an effort to assuage mounting public dissatisfaction. Shuja Nawaz clarifies the situation, “Compounding the confusion about the legality of such attacks and the anger directed against them is the behavior of the Pakistani authorities, who publicly condemn these attacks and privately condone them.”

Two of the most in-depth and informative studies to have examined the question of civilian casualties and collateral damage, to date, are the impressive one hundred eighty-two page combined effort by the Stanford and New York Law Schools, Living Under Drones and the outstanding Columbia Law School report, The Civilian Impact of Drones. While the access to the region, as mentioned elsewhere in this research, has been extremely limited to NGOs, and journalists information has nonetheless been received. Of the three leading databases (LWI, NAF and BIJ) covering the events in the Federally Administered Tribal Areas, (FATA) the Stanford/NYU report, while recognizing the limitations of the three sources and the possibility of bias, sees the Bureau of Investigate Journalism and being the most reliable and bias free. One of the leading sources of statistical analysis concerning collateral fallout has indeed been the Bureau of Investigative Journalism (BIJ). “A report published by the UK-based Bureau last month suggested that at least 385 of the casualties caused by unmanned robotic American drones in Pakistan have been civilians. Additionally, the Bureau claims that at least 160 of those deaths were of children under the age of 18.” Furthermore, concerning the reporting of civilian deaths and the difficulty involved in obtaining any type of figures for the actual number for casualties involved the BIJ emphasizes that, “Reporting on drone strikes in Waziristan is extremely complex: it is very hard for outside journalists to enter the region, so reports often contradict one
another on even the most basic details, such as the number of individuals killed and whether they are civilian or militant. For this reason, we do not claim that the casualty counts are definitive. But tracking reports of casualties sheds at least some light on a highly secretive campaign."  
There are no definitive studies to date which offer entirely conclusive or reliable reports concerning the number of civilian casualties inflicted. Michael Keifman importantly indicates, “It doesn’t take a math degree to see the wide range between the Pakistani estimate of 700 dead civilians, and the U.S. government’s official [citing an article in the New York Times by Scott Shane, September 10, 2012], who cited just over twenty civilian casualties.” Thus, it becomes readily apparent that the reporting of civilian casualties is both highly interest dependent and interest oriented.  

One aspect of the war on terrorism, which appears to have failed to capture the public eye, is the question of collateral damage in those states where the US is practicing drone warfare, Yemen, Sudan, the Philippines, Uganda, Libya and Somalia. There is no source for the afflicted public to address their grievances to or with whom to seek fair treatment and equitable justice. As Holewinski presciently states, “In the long run, the United States’ counterterrorism policy may suffer as a result of its failure to respond to civilian anger.” While Holewinski is addressing the issue here to those actions outside the zone of conflict, they are equally applicable within.  

**Psycho-Social Considerations**  
Considering some of the social impacts related to the drone wars, many critics of the US policy are of the view that the rights of state self-defense simply evaporate, once the enemy flees the geographically designated region of conflict. This position is held in the face of transnational
conflict, despite the persistence of sanctuaries and safe-havens provided by failed states. This is, of course, an absurdly naive notion which would, if accepted, leave all nations-states a peril and in conflict with their primary obligations to provide national security to its population. Additionally, the reputation of the US as a harbinger of democracy and freedom is not negligible as an inducement for adhering to international accepted standards, rules and laws. Other important social aspects revolve around the concept of winning hearts and minds. While drone strikes may be an effective tool of war they are not an ultimate panacea. How it might be possible to wreak mayhem, havoc, death and destruction upon a population, and at the same time, win their hearts and minds, still remains to be determined.

Despite all the jokes about: ‘joystick warriors,’ ‘Predator porn,’ ‘squirters,’ and video game heroes, the current platform of electronic warfare does have real and perceived risks to the emotional and psychological well-being of its operators. There is the inherent sense of dehumanization which takes place in such a surrealistic atmosphere. While some are negatively impacted, others it seems may have lost their moral compasses. Keifman importantly reminds that, “It is from this situation [of dehumanization] that war atrocities and poor decisions in combat can come about.”\textsuperscript{286} The effects of this new type of warfare have not yet been adequately measured. This dichotomous behavior is pointed out by Lin, “Some critics have worried that UAV operators—controlling drones from half a world away—could become detached and less caring about killing, given the distance… But other reports seem to indicate an opposite effect: These controllers have an intimate view of their targets… following them for hours and days, and they can also see the aftermath of a strike, which may include strewn body parts of nearby children. So there’s a real risk of post-traumatic stress disorder (PTSD) with these operators.”\textsuperscript{287} Thus, the ultimate consequences are both negative in either event.
One of the ways to counter this robotic desensitization has been by the services offering cultural awareness classes. This tends to make the individuals on the ground more understandable, realistic and lifelike rather than mere data points. "In the future, the so-called 'Play-Station' operator may never have experienced actual combat in a manned platform; he has no connection with these other units, no shared experience,"288 writes Sir Burridge. The catch is, however, the killing then becomes more granular and has deeper psychological impact upon the operators. It has already resulted in a long-lasting and lingering toll. This can be compounded with the complications of the factor of distance already discussed elsewhere in this research. “One of the paradoxes of drones is that, even as they increase the distance to target, the also create proximity, “289 remarks Abé. Robert Taylor also acknowledges the probability of increased operator stress and complexity when he posits, “In the future, the possibility of increasingly autonomous UAVs can be expected to place greater cognitive demands on the operator, with little or no manual control required.”290

Humans are imbued with instinctive and natural prohibitions against taking human life as pointed out in Colonel Grossmans, On Killing. These constraints are emphasized by Randall Amster who notes, “Remote-controlled bombing contributes to a greater sense of ‘action at a distance’ that works to overcome a natural human prohibition against killing our own kind—one that soldiers have to be conditioned to surmount.”291 There is an increasing sense of awareness of the impact of being intimately related to death and destruction, while at the same time being isolated in a remote area thousands of miles from the actual combat. The ultimate repercussions depend upon individual strengths and character development, but even the most stable of individuals can suffer setbacks years after the events. Suppression, one method of coping with the stress and anxiety may serve as a temporary outlet and stress reliever but the risk of having to
face themselves and the harsh reality of their own responsibility, years later, may prove to be
devastating in the long run. The complexities of their jobs may also be compounded by feelings
of alienation awkwardness and sometimes outright rejection. For instance, as Abé reminds,
“Drone pilots were seen as cowardly button-pushers. It was such an unpopular job that the
military had to bring in retired personnel.”

One example can be seen in the story of Brandon Bryant, interviewed for Das Spiegel
Magazine by Nicola Abé. “Doctors at the Veterans’ Administration diagnosed Bryant with
post-traumatic stress disorder. General hopes for a comfortable war—one that could be
completed without emotional wounds—haven’t been fulfilled.” Many of the pilot/operators
speak of a feeling of disconnect as separation with humanity. Brandon Bryant’s first kill seemed
to scar him, dehumanize him; he related to Abé, “I felt disconnected from humanity for almost a
week.” There is indeed a serious risk of psychological complications, which presently remain
poorly understood and understudied. O’Connell notes, “The rules governing appropriate resort to
missiles and bombs are well established in international law. More study is needed with respect
to the psychological effects of distance killing without the risk of losing an operator.” What
O’Connell appears to be inferring here, when speaking of ‘without losing an operator,’ is related
to the ethical and social dynamics of morality of distance.

Another related problem is considered by Brian Mockenhaupt who points out, “The crews
can also struggle with feelings of impotence, watching events unfold below, hearing firefights
over the radio and breathless calls for help, when sometimes there’s nothing to be done.”
Thus they become involuntary and hapless witnesses to the death and destruction they observe.
Keifman reminds that, there is “…an ethical mandate to provide the right support for those who
engage in drone warfare to prevent excessive mental anguish and suffering.”
In addition to the numerous problems already discovered lay a host of others, still waiting to be declared. The psychological trauma and scarring are difficult to measure and will require far more research in the immediate future. Many of the stressors involved however have been common to the battlefields of the past. Physical isolation and the inability to intervene and render assistance are nothing new; if much more amplified now. The problems, and the deep psychic wounds they induce, however, are also the same. Some of the effects are physical as opposed to being merely psychological. The long 12 hour shifts at the controls have resulted in sluggish performance and a lack of situational awareness. Exhaustion, fatigue and sleepiness, wreak havoc on pilot and sensor operator effectiveness. Finally, the mental to physical shift of transitioning ‘being in’ Afghanistan inside the control containers to exiting into the setting sun of a Nevada evening is certainly enough to boggle anyone’s mind and force them to question which reality they are actually part of.

**Us and Them: We Are Not Alone**

The US is not the only producer of unmanned aircraft and the number of states developing or producing UAVs is expanding as geometrical proportions. According to most current calculations, by scholars researchers and official spokespersons, there are between 40 and 77 different states in various stages of research development and production of UAV/ UCAV platforms. “Other states and non-state actors are also acquiring drones, including Pakistan, Russia, Georgia, Brazil, China, Hamas, Iran, and Israel,” according to Mary Ellen O’Connell among others. “Two countries so far have realized the first flight of stealth UAV: the U.S. and France. The Neruon, Europe’s the newest stealth technology UCAV, produced by Dassault Aviation, was successfully tested on Monday December 3, 2012. The system is a joint effort of collaboration between Saab of Sweden; Alenia Aiermacchi of Italy; EADS-CASA Spain; Thales
of France and HAI, Greece. The Altitude Heading Reference System (AHRS) was provided by
aviation giant Northrop Grumman’s German subsidiary, Northrop Grumman LITEF, for the
demonstrator. Concretely, there has been a rapid expansion in the development of unmanned
systems. According to Lu Na, reporting for China.org, “Three countries have built the
prototypes, namely China, the U.S. and France. In addition, six more countries now intend to
develop stealth UAV: China, the U.S., France, Britain, Russia and India.” A major point of
concern is that, while the United States still respects the laws of armed conflict, despite the
controversy surrounding drone warfare, other states have different ethical views and laws and
some may not be so inclined to respect the laws of armed conflict in respect to drone warfare.

The Chinese have become increasingly aware of their economic and strategic power. “The
future space battlefield can’t be controlled by other countries’ UAV only!” Professor with the Air
Force Engineering University Huang Changquiang x said.” Other Chinese officials have also
portended that should US unmanned systems expand to the outer atmosphere they will not be
alone. “Two Chinese drones, apparently modeled on the American Reaper and Predator
unmanned aerial vehicles were unveiled at the Zhuhai air show in November [2012].” Chinese
development in the area of UAV’s has made exceptional progress over the past decade
and is rapidly expanding both in research and development as well as in strategic application.
“Liu Yuejin, the director of the public security ministry’s antidrug bureau, told the [Chinese
state-run] newspaper that the plan called for using a drone carrying explosives to bomb the
outlaw’s hide-out in the opium growing area of Myanmar…”

Patrick Lin, citing Singer and Harris, also adds, “For instance, while much of the
international media focuses on the US military robots in the Middle-East [sic], more than 40
other nations have them as well, including China, Russia, Pakistan, and Iran.” Patrick Lin
later redresses this figure to fifty and throws in the Libyan rebels as a bonus. With so many actors entering the unmanned arena, the airspace promises to become ever more crowded. Quintana predicts, “The first groups to make use of autonomous systems are likely to be hybrid irregular forces with access to regular means.” Terrorists groups and drug cartels have even gotten a taste of the new technology and have begun using it as well. As Goodman suggests, “But drones are no longer the sole domain of the military, and just as with many new technologies, they can easily fall into the wrong hands.” This was almost certainly the case of the RQ-170 which was, apparently, hacked and taken in by the Iranians. Bergman also recalls, “The Ababil is a relatively cheap weapon and, anyway the Iranians are supplying Hezbollah with Ababil drones for free.” It would appear that the hypothesis concerning expanded use is not only being confirmed, but expanded on in different contexts as well.

**Examination of the Three Hypotheses**

**The first hypothesis** which stated, “The use of drones will become ever more prevalent in the modern battlespace”, has been confirmed by a wide variety of sources, and barring any unforeseen changes in the geo-political, environmental or economic climate, is destined to be realized in the near and immediate future. This has been confirmed by numerous official and academic writers and has followed a predictable trend since the inception of the drone campaigns in 2002. Nawaz, for instance states, “Drone warfare is a sign of the times. Unmanned weapons systems and aircraft, whether operating on land or sea, appear to be ascendant in terms of preference and costs.” Mary Ellen O’Connell adds, “The next developments in drone technology will be improvements in precision, reliability and automation.” Such development portends an increase not only in numbers but in usage as well. Of course more production and greater use shall also require more intensive training and more hours ‘in the air.’ Mockenhaupt
writing in 2009 presciently underlined, “...in coming years, the Air Force figures it will need more than one million UAV hours annually to be prepared for future wars.” Jane Mayer bears witness to this prediction when she adds, “The government plans to commission hundreds more [drones], including new generations of tiny ‘nano’ drones, which can fly after their prey like a killer bee through an open window.”

While some critics discount the possibility of such seemingly outrageous developments—particularly that of complete robotic autonomy, history has often shown that society has a propensity for underestimating its own technological wizardry. Singer also underscores this important point, concerning the promise that future technology can hold, compared with rash judgments of the period. He compares the reluctance to adopt the machine gun during WWI and the tank to replace the faithful and trusted horse; both decisions, which had their own catastrophic consequences for the skeptics.

**The Second Hypothesis**

Proposed that, “A new, revised, and enforceable set of laws and rules of engagement should be developed and clearly defined. They shall succeed if they are shaped through unified political will and coherent, but flexible policies. This has been the thrust of the contention of this research. While there have been numerous efforts, outlined within the corpus of this research, none of them have had any real or significant impact. While the efforts have been meritorious, a group of researchers bantering ideas back and forth over a period of ten years does little to advance the cause of establishing an effective framework. Meanwhile innocent people die. The only way to instill a change is through international mediation in the form of treaties and protocols. The time for doing so has already past, and it is now time to play catch up.
The Third Hypothesis

The third hypothesis, more rhetorical in nature and a given, at least to those in the optimistic camp. *Unmanned aerial vehicles will become more independent and autonomous in the decision making process*, has been proven throughout the research. The trend is an ever increasing, steady pace which places more than fifty different nations currently at various stages of development.\(^{311}\) Recent statements by the Obama administration, concerning possible international regulation, hint at the concern for this expanding trend for proliferation. Such a call for international regulation was the main thrust of the current research and appears to be inevitable in the future given the current state of affairs. Singer alludes to such a paradigm, “We may even one day see the need to set up an international body to help the world navigate the tough issues that surround robotics, much like the World Health Organization or the International Atomic Energy Agency.”\(^{312}\) All three hypotheses therefore appear to be validated and provide the basis for further research on establishing the actual specific boundaries and limitations associated with this new technology and its use.

**Summary**

Many of the sources utilized in the course of this research offered valuable insights, when examined collectively offer the possibilities for the formation of a logical and cohesive approach towards defining strategic policy in regards to targeted killing and the issue of drone warfare. For a general approach and understanding of the ethical and technical issues surrounding robotic warfare, there is no better single source than Singers invaluable, *Wired for War*, despite the authors unfortunate, misplaced and gushing eulogy in admiration of science fiction (chapter eight). What is required, in order to draw an objective and critically sound judgment, is an
extensive examination of the various contributions of empirically sound literature and the
positions adopted by various authors. Once such a thorough examination of the literature has
been completed then, the best elements from both poles can perhaps be melded into a more
reasonable and centralized approach.

As the situation currently stands there is a need for informed critical debate, or there can be
no solution. This extreme polarization precludes any progress toward defining the absolutes in
regards to the limitations and boundaries first broached in the research question of this study. .
The propositions of Professor Guiora’s (notably his various matrixes set out in *Determining a
Legitimate Target* pp. 333-335), work has been cited extensively throughout this research since it
is both significant, timely and accords perfectly with the views of this study. Sarah Holewinski
and others are certainly commendable offer worthwhile recommendations. Such views provide a
functional framework for further expansion. For instance Professor Guiora speaking of the
balance between strategic and diplomatic effectiveness of drones stated, “The drone campaigns
are lawful BUT…”313 This represents a big but. Professor Guiora’s involvement for over 20
years in counter terrorism and covert operations has afforded him a unique and measured view,
he went on to state that, “Drone attacks are and can be effective BUT…”314 Such a “but” is
weighted with meaning. Such as the definition and questions surrounding target discrimination
and civilian casualties. Keifman recalls that, “Currently, concerning drone strikes, what
constitutes as indiscriminant attack lacks definition.”315 The assertions of Travalio and Altenberg
are no less relevant. Their ringing statement, “The combination of the law enforcement approach
where appropriate, and the use of military force, where justified, should serve the community of
nations well in the fight against global terrorism,”316 underscores the premises and
recommendations of this research. Furthermore, bearing in mind the responsibilities for the state
to conduct war with humanitarian awareness, Guiora emphatically concludes that, “…the state has both the right to engage in preemptive self-defense and the obligation to protect its own innocent civilian population.”317 These perceptions must of course, however, be nuanced by the constraints of the respect of the laws of war in conjunction with a call for enhanced and more flexible doctrine in regards to modern warfare. It is, after all, the peculiar vagaries of the rules surrounding international humanitarian law which afford both sides the ability to be wrong, while, at the same time, remaining right.

Holewinski formulates the following recommendation, “On both ethical and strategic grounds, the United States should turn what it has learned about saving lives and dignifying losses into standing policy.”318 This appears to be very sound advice and worth incorporating into the ethical framework of the current drone policy; something sorely lacking. The probing moral and ethical examination concerning precision munitions and the naturalistic fallacy inherent in the fact-value dichotomy, also raises serious questions in regards to national security policy and its relationship to IHL. This sentiment is echoed in the props of Kreps and Kaag who make two memorable points for policy makers to bear in mind:

- The legitimate definition of targets may not be answered by technologically precise munitions, and secondly,
- Undefined and imprecise goals lead to vague, undefined target discrimination and an ultimate lack of legitimacy.319

Conclusion

The function of this research was essentially to examine the boundaries and limitations involved in the use of unmanned aerial vehicles in modern warfare, more specifically the armed variants. Boundaries represent the things that should be done—the frontiers, while limitations relate more
to what can be done. Singer recalls that “Tough Budgetary environments, first generation limits and reliance on the ‘proven’ are often crucial barriers to change, but history also shows that they can’t prevent the future from happening. They can only delay our effective adaptation to it.”

The primary focus of this research has been to examine and evaluate the expansive literature and vastly divided opinions on the topic of drone warfare. The second thrust of this research, with reference to limitations and boundaries, has been to explore and establish plausible international guidelines for their regulation, and provide an opportunity for more extensive and fruitful research.

In parallel this examination has revealed certain shortcomings, provided a critical reflection for further research. It allows the reader to draw their own conclusions on the expanded use of drones and robotic warfare and the important repercussions which their use implies. They are cost effective and reduce the inherent risk of the loss of life during armed conflict. They also risk minimizing the constraints associated with conducting war. The United States has been embroiled, for twelve years, in a never ending and costly conflict which has taken a severe toll on morale. It is the longest running conflict to date. Nawaz insightfully notes, “The [drone] attacks…are driven by budgetary pressures and war weariness among populations in Europe and North America.”

There are no “silver bullet” solutions and many different variables figure into such a complex equation. There are still the questions surrounding: threat and imminence; preemption, or anticipatory self-defense; necessity, proportionality; collateral damage and target discrimination, the doctrine of moral equality, the asymmetry threshold, and the principle of unnecessary risk, which require further research and clarification. Concerning the thorny question of preemption, this research falls on the side of the measured proponents for legitimate, limited and controlled anticipatory self-defense. It appears logical that the framers of Article 51
had no intention of replacing the traditional customary conception of the right to state self-defense with a stricter more constraining statutory form of legislation. A margin of flexibility was most likely intended through the instrument of vague language. Adopting the restrictive view, of responsive self-defense, is self-defeating logic and would leave states open for annihilation. This does not imply that there should be unrestricted freedom or abuse. The measures of threat and intent must represent a clear and present danger and thus, in turn, justify the legitimacy of preemption.

While the intervention of these new technologies has saved lives, it has also taken them as well. Singer recalls, “While I am optimistic about the robotics revolution, potential roadblocks abound in everything from software and hardware advancements to legal and ethical concerns.” Taking into consideration the various elements thus presented in this research: hostile intent and preemption; the right to self-defense under the auspices of the now dated, and ethically weary 2001 AUM authority and the ineffective and poorly presented Article 51, of the UN Charter, it is extremely difficult to conceivably justify the intensity, lack of constraint and oversight of the current drone campaign and its related disproportionate collateral damage. Enhanced security measures have been put into place, since the tragic events of 9/11. Despite the vague and inexact language encompassed within Article 51 of the UN Charter, the current research, nonetheless, still argues for the use of drones to enforce the right to self-defense, however, this must be tempered by a more transparent and well-structured framework, than has hitherto been the case.

Improvements in security technology have been further counter balanced with an equivalent reduction in the force and scope of al-Qaeda and its various affiliates. One may logically question such a policy faced with the cost of human life on both sides of the equation and in light
of the much diminished threat. In a simple cost benefits analysis the benefits of continuing the current policy, at the present level, are far outweighed by the costs—economically, politically, ethically, moral and spiritually—and particularly the tragic cost in human life and suffering.

Considering the limits and boundaries concerning technology and the aspects of autonomy this research has also provided various insights and drawn several conclusions. Indeed the research has led to the confirmation of the third hypothesis: *Unmanned aerial vehicles will become more independent and autonomous in the decision making process.* Certain technologies such as that of KEEL® engines have been proposed as possible solutions to the limitations imposed upon autonomy, by such variables as bandwidth, and trustworthiness. The viability of robotic systems is directly correlated to increased autonomy. The communications link between the operator and the device is the operational weak link in the chain. These shortcomings might be overcome initially by several intermediate fixes:

- The sharing of satellite transmission capacity and geo synchronous beam distribution between allied nation states, especially in crucial periods.
- Maritime to aerial line of sight communications is yet another possibility that has not been fully explored

While targeted killing can be a viable and ethically sound strategic policy, the indiscriminate and overzealous application that has been the wont of the administration is both inadequate and shortsighted. Greater concern for respect of the law of war and the concepts of target discrimination, proportionality, necessity and humanity are paramount. The sacrifices borne on both sides of the equation must be borne in mind and dealt with in an equitable and just manner. Masters notes that, “Blowback from civil liberties and human rights groups is likely to grow in direct proportion to any increase in targeted killings.”\(^{324}\) The need for a clear, definitive and enforceable revision of the current rules of warfare needs to be undertaken. This must, of
necessity, be an international effort and include: flexibility for adapting to changing needs and future challenges and strong sanctions and enforcement based upon international consensus. The failure to develop such rules, encompassing, not only the role of UCAVs, but robotics in both war and peace, could have disastrous results, such as another arms race, on land sea air and in space. Getting the United States to surrender any portion of its sovereign rights may well prove to be the largest hurdle in the development of a more appropriate set of international guidelines to humanitarian law. However, the fact that there are important interests for the United States may provide the necessary ethical carrot.

This research has indicated that clear and distinct boundaries must be established for the use of robotics in warfare. There needs to be a continued balance in the aspect of humanity, based upon moral and ethical criteria. It is not because warfare may become robotic, automated and more humanly isolated that these constraints are any less important. The victims, as well as their suffering, will always remain very human.

Quite ironically, as this research was nearing its final phase of completion new and surprising developments came to light. Tabnassum Zakaria, reporting for Reuters declared, “President Barack Obama, who vastly expanded the U.S. drone strikes against terrorism suspects overseas…is now seeking to influence global guidelines for their use as China and other countries pursue their own drone programs.” This statement if carried forth into policy would confirm, not only the research question developed at the outset of this study: What are the existing moral, ethical, legal and technological boundaries involved in the use of UAVs and UCAVs and how do these boundaries relate to autonomy and discretion? Furthermore, how do these disparate phenomena interact and what specific criteria can actually be formally established and articulated between them? It would appear that the prediction that the US would
be forced to react due to ever increasing expansion of development has been proven beyond question. Although the actual motives of the administration remain veiled, and this maneuver may represent little more than a political sleight of hand, the fact remains that the Obama administration has been forced to recognize the mounting disenchanted and acquiesce to external pressures, both at home and abroad. Concerning this newly developed approach by the administration, Zakaria emphasizes that, “Obama’s new position is not without irony. The White House kept details of drone operations- which remain largely classified – out of public view for years when the U.S. monopoly was airtight.”

The first two hypotheses have also been validated or are in the process of validation, while the third shows a strong positive correlation. The thrust of this research asserts that unmanned vehicles are an instrument of war, like other tools of combat, if more complex in nature. Like other weapons systems it is imperative to maintain an ethical approach in waging warfare and to evaluate the fundamental principles of necessity, proportionality, humanity and duration of the conflict. While certain restrictions, limitations and boundaries must be applied in order to maintain balance and humanity, there is also non-negligible a flip-side, which is expressed in capabilities and possibilities, through advances in technology and engineering, as well. Elizabeth Quintana poses an insightful question, in this sense, “Even if an autonomous system can be programmed to do the ‘right’ thing, is that necessarily the ‘good’ thing?”

When reflecting upon an appropriate title for this research there were many possibilities. The importance was to transmit, to policy makers, the sense of inherent danger in the failure to realize well-defined and realistic limitations and boundaries. Perhaps mythology holds a lesson for policy makers. By allowing themselves to be blinded by the splendors of modern technology (in much the same way Icarus overestimated his personal strength and power), in the face on the
unknown and the unforeseen, they may be unable to avoid the siren call and blindly approach the brilliance of success only to fall and burn in ignominy.
References


Aftergood, Steven. "Lawfulness of a Lethal Operation Directed Against a U.S. Citizen Who Is a Senior Operational Leader of Al-Qa'ida or An Associated Force." *FAS.org* (US Department of Justice), 2013: 1-16.


Choong, William. "Drones may win battles, but not the war." *The Straits Times (Singapore),* 2011.


Dilanian, Ken. 2012. "In legal battle against drone strikes, she's on the front lines." Los Ageles Times,


Keeley, Helena. Interview by author, 21, January 2013. Brookfield WI, Phone interview.


La Franchi, Peter. "Golden age; Swarms of New UAVs are emerging into the global market." *Flight International*, 2004: 44.


McChrystal, Stanley A. "We Need To Fight More Like the Taliban." *Foreign Policy*, March/April 2011: 66-70.


—. Intelligence 2-0 FOUO. Edited by US Army intelligence Center of Excellence. Fort Huachua, Arizona: Headquarters Department of the Army, 2010.


Rowland, Jenifer. "CIA drone campaign in Pakistan to be exempt from rules - report." Foreign Policy, January 2013.


## APPENDIX A - GLOSSARY

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<th>AAR: Air-to-air refueling</th>
<th>BIJ: Bureau of Investigative Journalism, based in the UK</th>
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<tr>
<td>AGI: Artificial General Intelligence (Strong AI)</td>
<td>BVR: Beyond visual range</td>
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<tr>
<td>AI: Artificial Intelligence/Airborne Interceptor</td>
<td>C2: Command and Control</td>
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<td>AOR: Area of responsibility.</td>
<td>C3I: Command Control Communication and Intelligence</td>
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<tr>
<td>AQAP: Al-Qaeda in the Arabian Peninsula</td>
<td>C4ISR: Command, control, communications, computers intelligence, surveillance and reconnaissance</td>
</tr>
<tr>
<td>ARGUS-IR: Autonomous Real-time Ground Ubiquitous Surveillance – Infrared (proposed successor to Gorgon Stare)</td>
<td>CAS: Close air support</td>
</tr>
<tr>
<td>ASEA: Active Electronically Scanned Array</td>
<td>CMT: Continuous memory task</td>
</tr>
<tr>
<td>ATR: Automatic target recognition</td>
<td>CONOPS: Concept of Operations</td>
</tr>
<tr>
<td>BAI: Battlefield Air Interdiction</td>
<td>COTS: Commercial off-the-shelf hardware or technology.</td>
</tr>
<tr>
<td>BAMS: Broad Area Maritime Surveillance (unmanned aerial system)</td>
<td>CPU: Central Processing Unit</td>
</tr>
<tr>
<td>Bellum iustum: Just war theory comprised of Jus ad bellum and jus in bello</td>
<td>CSAR: Combat search and rescue</td>
</tr>
<tr>
<td></td>
<td>D3: Dull, Dirty and Dangerous</td>
</tr>
<tr>
<td></td>
<td>D4: Dull, Dirty, Dangerous and Dollars</td>
</tr>
</tbody>
</table>
**APPENDIX A - GLOSSARY**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DARPA:</td>
<td>Defense Advanced Research Projects Agency</td>
</tr>
<tr>
<td>DAS:</td>
<td>Defensive Aids Suite(s)</td>
</tr>
<tr>
<td>DASS:</td>
<td>Defensive Aids Sub-System(s)</td>
</tr>
<tr>
<td>DEAD:</td>
<td>Destruction of enemy air defenses</td>
</tr>
<tr>
<td>DPH (-ing):</td>
<td>Direct participation in hostilities</td>
</tr>
<tr>
<td>EBO:</td>
<td>Effects Based Operations</td>
</tr>
<tr>
<td>EC:</td>
<td>Electronic Combat</td>
</tr>
<tr>
<td>ECM:</td>
<td>Electronic Counter-Measures</td>
</tr>
<tr>
<td>EMP:</td>
<td>Electro-magnetic pulse</td>
</tr>
<tr>
<td>EO:</td>
<td>Electric orbital</td>
</tr>
<tr>
<td>FATE:</td>
<td>Future Aircraft Technology Enhancements</td>
</tr>
<tr>
<td>FEBA:</td>
<td>Forward edge of the battle area</td>
</tr>
<tr>
<td>FIBUA:</td>
<td>Fighting in built-up areas</td>
</tr>
<tr>
<td>FOIA:</td>
<td>Freedom of Information Act</td>
</tr>
<tr>
<td>GCS:</td>
<td>Ground Control Station</td>
</tr>
<tr>
<td>GLOC:</td>
<td>Abbreviation for G-force</td>
</tr>
<tr>
<td>GRASP:</td>
<td>General Robotics, Automation, Sensing and Perception</td>
</tr>
<tr>
<td>HALE:</td>
<td>High-altitude long endurance</td>
</tr>
<tr>
<td>HCI:</td>
<td>Human – computer interface</td>
</tr>
<tr>
<td>HF:</td>
<td>Human factor</td>
</tr>
<tr>
<td>HFACS:</td>
<td>Human Factors Analysis and Classification System</td>
</tr>
<tr>
<td>HMLV:</td>
<td>High Maneuverability Lethal Vehicle (concept)</td>
</tr>
<tr>
<td>HPM:</td>
<td>High power microwave systems</td>
</tr>
<tr>
<td>HRC:</td>
<td>The Human Rights Council of the United Nations</td>
</tr>
<tr>
<td>HSI:</td>
<td>Human System Integration</td>
</tr>
<tr>
<td>HVT:</td>
<td>High Value Target</td>
</tr>
<tr>
<td>IAC:</td>
<td>International armed conflict: conflict involving 2 or more states</td>
</tr>
<tr>
<td>IAW:</td>
<td>Independent Autonomous Weapon</td>
</tr>
<tr>
<td>ICCPR:</td>
<td>International Covenant on Civil and Political Rights</td>
</tr>
<tr>
<td>ICJ:</td>
<td>International Court of Justice</td>
</tr>
<tr>
<td>ICRC:</td>
<td>International Committee of the Red Cross</td>
</tr>
<tr>
<td>Term</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>IHL</td>
<td>International humanitarian law</td>
</tr>
<tr>
<td>IHRL</td>
<td>International human rights law</td>
</tr>
<tr>
<td>ISAF</td>
<td>International Security Assistance Force</td>
</tr>
<tr>
<td>ISR</td>
<td>Intelligence Surveillance and Reconnaissance</td>
</tr>
<tr>
<td>Jus cogens: peremptory norms</td>
<td></td>
</tr>
<tr>
<td>JDAM</td>
<td>Joint Direct Attack Munitions</td>
</tr>
<tr>
<td>JSOC</td>
<td>Joint Special Operations Command</td>
</tr>
<tr>
<td>JSTARS</td>
<td>Joint Surveillance Target Attack Radar System</td>
</tr>
<tr>
<td>Jus ad bellum: Just declaration of war</td>
<td></td>
</tr>
<tr>
<td>Jus in bello: Just conduct during war</td>
<td></td>
</tr>
<tr>
<td>KEEL® Technology “Knowledge Enhanced Electronic Logic”</td>
<td></td>
</tr>
<tr>
<td>LCC</td>
<td>Life Cycle Cost</td>
</tr>
<tr>
<td>LOAC</td>
<td>Law of armed conflict</td>
</tr>
<tr>
<td>LOW</td>
<td>Law of war</td>
</tr>
<tr>
<td>LRE</td>
<td>Launch and Recovery Element</td>
</tr>
<tr>
<td>LWR</td>
<td>Laser Warning Receiver</td>
</tr>
<tr>
<td>M2M</td>
<td>Man to Machine: A view of integrated and cohesive joint teamwork between man and machine. Developed in the course of this research</td>
</tr>
<tr>
<td>MALE</td>
<td>Medium-altitude long endurance</td>
</tr>
<tr>
<td>MANPADS</td>
<td>Man Portable Air Defense Systems</td>
</tr>
<tr>
<td>MAUV</td>
<td>Maritime unmanned aerial vehicle</td>
</tr>
<tr>
<td>MAV</td>
<td>Micro air vehicle</td>
</tr>
<tr>
<td>MFAS</td>
<td>Multi-function active-sensor radar system</td>
</tr>
<tr>
<td>MCE</td>
<td>Mission control element</td>
</tr>
<tr>
<td>MITL</td>
<td>Man-in-the-loop</td>
</tr>
<tr>
<td>Morality of Altitude</td>
<td>Morality of Altitude: psychological separation of pilot from destruction.</td>
</tr>
<tr>
<td>MLAW</td>
<td>Missile Launch and Approach Warner</td>
</tr>
<tr>
<td>MTI</td>
<td>Moving Target Indication</td>
</tr>
<tr>
<td>MTS-A</td>
<td>Multi-spectral Targeting System</td>
</tr>
</tbody>
</table>
## APPENDIX A - GLOSSARY

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUAV</td>
<td>Miniature unmanned aerial vehicle</td>
</tr>
<tr>
<td>NCW</td>
<td>Net Centric Warfare</td>
</tr>
<tr>
<td>NIAC</td>
<td>Non-international armed conflict. Internal state conflict, e.g., insurgency</td>
</tr>
<tr>
<td>NPR</td>
<td>National Public Radio</td>
</tr>
<tr>
<td>NSS</td>
<td>National Security Strategy</td>
</tr>
<tr>
<td>NUAV</td>
<td>Nano-unmanned aerial vehicles</td>
</tr>
<tr>
<td>OOA</td>
<td>Out of Area</td>
</tr>
<tr>
<td>OODA</td>
<td>Observe, orient, decide and act</td>
</tr>
<tr>
<td>OODR</td>
<td>Observe, Orient, Decide, React</td>
</tr>
<tr>
<td>Pd</td>
<td>Probability of damage</td>
</tr>
<tr>
<td>PPSL</td>
<td>Predator Primary Satellite Link.</td>
</tr>
<tr>
<td>QC</td>
<td>Queens Counsel recognized and appointed by the Crown. Merit based</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research and development</td>
</tr>
<tr>
<td>RDT&amp;E</td>
<td>Research development test and Evaluation</td>
</tr>
<tr>
<td>Reachback/Remote split Operations.</td>
<td>This is a system whereby the takeoff and landing are done in-theatre while actual in-flight control is handled as far as 7500 miles away.</td>
</tr>
<tr>
<td>RISTA</td>
<td>Reconnaissance, Information Surveillance and Target Acquisition</td>
</tr>
<tr>
<td>RoE</td>
<td>Rules of engagement</td>
</tr>
<tr>
<td>RMA</td>
<td>Revolutions in military affairs</td>
</tr>
<tr>
<td>RPA</td>
<td>Remotely piloted aircraft</td>
</tr>
<tr>
<td>RPV</td>
<td>Remotely piloted vehicle</td>
</tr>
<tr>
<td>RSO</td>
<td>Remote split operations</td>
</tr>
<tr>
<td>RUAV</td>
<td>Rotary unmanned aerial vehicle</td>
</tr>
<tr>
<td>RUSI</td>
<td>Royal United Services Institute. Founded 1831, oldest strategic think tank of its type.</td>
</tr>
<tr>
<td>SAR</td>
<td>Synthetic Aperture Radar</td>
</tr>
<tr>
<td>SEAD</td>
<td>Suppression of enemy air defenses</td>
</tr>
<tr>
<td>Signature Strike</td>
<td>A method of targeted individuals based upon patterns of suspicious activities.</td>
</tr>
<tr>
<td>SMAVNET</td>
<td>Swarming Micro Air Vehicle Network</td>
</tr>
</tbody>
</table>
## APPENDIX A - GLOSSARY

<table>
<thead>
<tr>
<th>STUAS: Small Tactical Unmanned Aircraft Systems</th>
<th>UxS: Unmanned vehicle systems (examples: “x” is “aerial”, “aircraft”, “underwater”, “combat air”, “manned”, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TK: Targeted Killing</td>
<td>Wetware: hardware/software concept as applied to human biology</td>
</tr>
<tr>
<td>TSTs: Time sensitive targets</td>
<td>WMD: Weapons of mass destruction</td>
</tr>
<tr>
<td>UAS: Unmanned Aircraft System:</td>
<td>WSO: Weapon Systems Officer</td>
</tr>
<tr>
<td>consists of: GCS, PPSL, 4 Sensor/weapons craft, operations and maintenance crews and spare equipment.</td>
<td></td>
</tr>
<tr>
<td>UAV: Unmanned aerial vehicle</td>
<td></td>
</tr>
<tr>
<td>UCAV: Uninhabited combat aerial vehicle</td>
<td></td>
</tr>
<tr>
<td>UMS: Unmanned systems</td>
<td></td>
</tr>
<tr>
<td>UMV: Unmanned Vehicle</td>
<td></td>
</tr>
<tr>
<td>UNHCR: United Nations Commission of Human Rights</td>
<td></td>
</tr>
<tr>
<td>URAV - Uninhabited Reconnaissance Air Vehicle</td>
<td></td>
</tr>
<tr>
<td>UTA: Unmanned/uninhabited Tactical Aircraft</td>
<td></td>
</tr>
<tr>
<td>UTAV: Unmanned Tactical Air Vehicle</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX B – GOOGLE EARTH INTELLIGENCE

Figure 1: The Federally Administered Territories of Pakistan - Overview
Figure 2: The Federally Administered Territories of Pakistan - Area of Drone Strikes 2009 - 2010
Figure 3: Yemen - Overview
APPENDIX B – GOOGLE EARTH INTELLIGENCE

Figure 4: US Drone strikes which killed al-Awlaki (Sept 30, 2011) and is son (Oct 14, 2011).
# APPENDIX C

## Technology Comparison

<table>
<thead>
<tr>
<th>General Concept</th>
<th>Neural Nets</th>
<th>Fuzzy Logic</th>
<th>Bayesian Belief Nets</th>
<th>AI - Forward / Reverse Chaining</th>
<th>KEEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source of Understanding</td>
<td>Pattern Matching</td>
<td>Geometric Fuzzification / Defuzzification</td>
<td>Probabilities of Probability</td>
<td>Trial and Error</td>
<td></td>
</tr>
<tr>
<td>Pattern Training Required</td>
<td>Patterns</td>
<td>Human Designer</td>
<td>Human Designer / Statistics</td>
<td>Human Designer</td>
<td></td>
</tr>
<tr>
<td>Explainable Decisions</td>
<td>Major Problem</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Small Memory Footprint</td>
<td>No</td>
<td>Difficult</td>
<td>Difficult</td>
<td>Somewhat</td>
<td></td>
</tr>
<tr>
<td>Easily Extensible</td>
<td>Must start over with retraining</td>
<td>Somewhat</td>
<td>Statistics may have to be regenerated</td>
<td>Possibly</td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td>Determined by Application</td>
<td>Determined by Application</td>
<td>Determined by Application</td>
<td>Possibly</td>
<td></td>
</tr>
<tr>
<td>Suitable for Control</td>
<td>Yes</td>
<td>Yes</td>
<td>Probably Not</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Interactive Development</td>
<td>No</td>
<td>No</td>
<td>Probably Not</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Portable Design (device, software, web)</td>
<td>Probably Not</td>
<td>Probably Not</td>
<td>Probably Not</td>
<td>Partial</td>
<td></td>
</tr>
<tr>
<td>Weaknesses</td>
<td>Pattern Training / Surprise Information</td>
<td>Validated Reasoning</td>
<td>Statistics may not be available for non-linear systems; Difficult to explain</td>
<td>Fragile / Brittle - Hard to maintain</td>
<td></td>
</tr>
</tbody>
</table>

KEEL: Adaptive Functional Relationships between Data Items
APPENDIX D – AUTONOMY MATRIX & BANDWIDTH MODEL

Autonomy matrix

<table>
<thead>
<tr>
<th>Restriction of Control</th>
<th>Shared Control</th>
<th>Freedom from control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote Control</td>
<td>Mixed Initiative (adjustable)</td>
<td>Adaptive</td>
</tr>
</tbody>
</table>

Humanized control     Human Delegated     Human Assisted     Human supervised     Full autonomy

HA: operator responsible for take-off and landings little else. HD: Operator only provides instructions and coordinates. HS: Operator merely serves in a supervisory and oversight capacity. MI: Human provides the mission program but no oversight required. Adaptive is the ability to actually learn and is thus, beyond the function of ‘mere’ autonomy.

BANDWIDTH DISRUPTION MODEL

Operator

Interruption from weather, enemy interruption, jamming and other intrusion

Communications are reduced or cutoff completely due to intervening forces. This is a strong argument for autonomy such as proposed by KEEL® technology

††Ibid
APPENDIX E – CIA DRONE STRIKES & MINIMUM ESTIMATED CIVILIAN CASUALTIES

†The information provided above was drawn from statistics provided courtesy of the Bureau of Investigative Journalism.
APPENDIX F - SCALE OF INTENT: Basic Model

Levels of Threat and Intent:

1. As the intent increases so does the threat and level of imminence.
2. As the level of threat increases so too does the inherent right to self-defense

<table>
<thead>
<tr>
<th>Unprovoked</th>
<th>Hostile Declarations</th>
<th>Menacing Exercises and Speech</th>
<th>Denial and Deception</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obvious preparations</td>
<td>Armed Aggression</td>
<td>Invasion</td>
<td></td>
</tr>
</tbody>
</table>

A vast array of actions may serve to prompt state self-defense: Cyber-attacks, counterfeiting a state’s currency cross border raiding, harboring or supplying logistical support to enemy and insurgent warriors, interfering with national interests or vital resources.
Endnotes:


24 Ibid p. 24


26 Ibid p. 23


33 These were a set of three legal documents, concerning enhanced interrogation techniques such as sleep deprivation and water-boarding, drawn up by Assistant Attorney General of the United States John Yoo and signed by Assistant Attorney General Jay S. Bybee.


38 Cullen, Colonel Peter M. "The Role of Targeted Killing in the Campaign Against Terror." Joint Forces Quarterly, 2008: p.23


49 Ibid

50 Cullen, Peter M. "The Role of Targeted Killing in the Campaign Against Terror." Joint Forces Quarterly, 2008.p 27


52 Mokenhaupt, Brian. "We’ve Seen the Future and It’s Unmanned." Esquire, November 2009: p. 136


74 Dr. Carlo Kopp PEng. e-mail message to author, January 26, 2013.

75 Mokenhaupt, Brian. "We’ve Seen the Future and It’s Unmanned.” Esquire, November 2009: 137


81 The intelligence cycle contains the following procedures: Requirements, Planning, Collection, Processing and Exploitation, Analysis and Production, finally Dissemination.


86 Ibid p.100

88 This idiomatic expression is most often attributed to Napoleon Bonaparte and seemingly derived from the King of Sweden, King Charles XIV, John of Sweden.


95 Ibid..


99 Ibid p. 89


104 Ibid.


106 Guiora, Amos N., interview by James Welch. Skype Interview with Professor Amos Guiora: S. J. Quinney College of Law, University of Utah (January 22, 2013).
See for instance: Dilanian, Ken. "In legal battle against drone strikes, she's on the front lines." Los Angeles Times, 2012: N.P.

108 Guirao, Amos N., interview by James Welch. Skpe Interview with Professor Amos Guirao:S. J. Quinney College of Law, University of Utah (January 22, 2013).


114 Guirao, Amos N., interview by James Welch. Skpe Interview with Professor Amos Guirao:S. J. Quinney College of Law, University of Utah (January 22, 2013).


116 Aftergood, Steven. "Lawfulness of a Lethal Operation Directed Against a U.S. Citizen Who Is a Senior Operational Leader of Al-Qa'ida or An Associated Force." FAS.org (US Department of Justice), 2013: p.6


118 Guirao, Amos N., interview by James Welch. Skpe Interview with Professor Amos Guirao:S. J. Quinney College of Law, University of Utah (January 22, 2013).

119 Aftergood, Steven. "Lawfulness of a Lethal Operation Directed Against a U.S. Citizen Who Is a Senior Operational Leader of Al-Qa'ida or An Associated Force." FAS.org (US Department of Justice), 2013: p.2


124 Aftergood, Steven. "Lawfulness of a Lethal Operation Directed Against a U.S. Citizen Who Is a Senior Operational Leader of Al-Qa'ida or An Associated Force." FAS.org (US Department of Justice), 2013:p. 7.


140 Ibid.


147 Cullen, Peter M. "The Role of Targeted Killing in the Campaign Against Terror." Joint Forces Quarterly, 2008, p. 25


153 Ibid


159 Ibid


162 Ibid


168 Ibid


170 Nawaz, Shuja. "Drones Inside Pakistan." Georgetown Journal of International Affairs, 2011: p. 84


193 Refer to Cornell Law. Legal Information Institute: http://www.law.cornell.edu/uscode/text/18/1119


Ibid


NCW was first introduced as a war fighting concept in the 1990s by: David Alberts, Vice Admiral Art Cebrowski, and John Gartska.


Ibid


Ibid


224 Ibid


227 Ibid p. 8


233 Dr. Carlo Kopp PEng, e-mail message to author, January 26, 2013

234 Helena Keeley, e-mail message to author, February 28, 2013

235 Mokenhaupt, Brian. "We've Seen the Future and It's Unmanned." *Esquire*, November 2009: p. 137


240 Ibid p. 77

241 Ibid.

242 Developed and graciously provided by Compsim LLC.


247 Johansson, Linda. "Is it Morally Right to Use Unmanned Aerial Vehicles (UAVs) in War?" *Philosophy and Technology* (Springer Verlag) 24, no. 3 (2011): p. 280

248 Ibid p. 75


253 …the use of fully autonomous RPVS becomes, all things being equal, imperative or essential


256 Compsim PDF file, comments on the 2012 DoD report *The Role of Autonomy in DoD Systems*. For further reference refer to: Measuring Compsim’s Knowledge Enhanced Electronic Logic (KEEL®) Technology against Autonomous Technology Metrics, 2012;

257 http://www.compsim.com/


Galliot, Jai C. "Uninhabited Aerial Vehicles and the Asymmetry Objection: A Response to Strawser." Edited by Taylor & Francis. Journal of Military Ethics (Routledge) 11, no. 1 1 p 59

Mokenhaupt, Brian. "We’ve Seen the Future and It’s Unmanned." Esquire, November 2009: p.136


293 Ibid

294 Ibid

296 Mokenhaupt, Brian. "We’ve Seen the Future and It’s Unmanned." *Esquire*, November 2009: p.160


303 Ibid


313 Guiora, Amos N., interview by James Welch. *Skpe Interview with Professor Amos Guiora*: S. J. Quinney College of Law, University of Utah (January 22, 2013).
Ibid


323 Nothing in the present Charter shall impair the inherent right of individual or collective self-defence if an armed attack occurs against a Member of the United Nations, until the Security Council has taken measures necessary to maintain international peace and security. Measures taken by Members in the exercise of this right of self-defence shall be immediately reported to the Security Council and shall not in any way affect the authority and responsibility of the Security Council under the present Charter to take at any time such action as it deems necessary in order to maintain or restore international peace and security. Refer to: http://www.un.org/en/documents/charter/chapter7.shtml

