DRONE WARS
A BRIEFING DOCUMENT

The use of unmanned aerial vehicles, or drones, in conflict arenas is increasing at an alarming rate, and technological developments are producing systems that are not only autonomous but self-aware.
It's time for some serious public debate.

by Chris Cole © January 2012

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"Drone Wars Briefing"

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Introduction

Ten years ago, the United States Air Force successfully launched a missile from a Predator drone for the first time at a test range in the Nevada desert.[1] While unmanned aerial vehicles [UAVs] or "drones", as they are commonly known, had previously been used in military operations for reconnaissance, surveillance and targeting purposes, this was a significant point in the evolution of military drones.

Just months later, in the aftermath of 9/11, the first operational armed strike by a remote-controlled unmanned drone took place in Afghanistan when a CIA-operated Predator drone attacked al-Qaeda leader Mohammed Atef. According to media reports, Atef was killed along with seven other people.[2] Since that first attack, the use of armed drones has risen, slowly at first but more dramatically since 2009, to the point where at times drone strikes are almost a daily occurrence.

In 2011, the use of drones continued to rise, with drone strikes in at least six countries: Afghanistan, Pakistan, Yemen, Somalia, Libya and Gaza.[3] The vast majority of these strikes were carried out by the United States. The UK also uses armed drones, announcing in September 2011 that it had reached the "landmark" of 200 drone strikes in Afghanistan. Israel continued to use armed drones in the Occupied Territories, and the Italian Air Force flew Reaper drones during the Libyan conflict. With both the United States and the UK stating that they are to double the size of their drone fleets, and with 50 countries reportedly developing or buying unmanned aerial vehicles, drone strikes can only increase.

As the use of drones expands, however, controversy about their use also grows. Supporters of armed drones argue that their ability to loiter over a particular area with their highly accurate sensors and cameras gives the ability to have increased control over when and where to strike, thus enabling greater accuracy and less "collateral damage". Opponents argue that by removing one of the key restraints to warfare—the risk to one's own forces—unmanned systems make undertaking armed attacks too easy and will make war more likely.

The "persistent presence" of drones over a particular area looking for suspicious behaviour and "targets of opportunity" is also leading, it is suggested, to large numbers of civilian casualties, while legal experts and human rights organisations condemn the rise in targeted extrajudicial killing enabled by the use of armed drones.

Despite the increased use of armed drones—and the controversy surrounding their use—accessible, accurate and reliable information about drones, about how they are being used and about future developments remains difficult to find. In particular, details of how armed drones are actually being used in conflicts remain shrouded in secrecy. To counter this, Drone Wars UK has published the "Drone Wars Briefing".

UK Drone Operations

It was the USA and, later, Israel that began experimenting with using drones for surveillance and targeting purposes in military operations in the 1960s and 1970s. It was not until the 1980s that the UK issued a contract for a reconnaissance drone to be used in conjunction with its artillery systems. GEC–Marconi's Phoenix drone won the contract but was plagued with problems.[5] It eventually managed to stagger into service in 1999 and saw limited service in the Kosovo war. In all, 198 Phoenix drones were delivered to the British Army, each costing £1.5 million.[6] Phoenix suffered a high attrition rate in active service. Introduced in 1998 and supposed to remain in service until 2013, it was retired in 2006.

In July 2005, the UK government announced that it was placing an £800-million contract for the development of the Watchkeeper drone to provide surveillance, reconnaissance and targeting for the British Army's artillery regiment.[8]

In June 2007, UK forces began using Israeli Hermes 450 drones in Afghanistan as a stop-gap measure until the Watchkeepers were ready. The UK began using Reaper drones in operations in Afghanistan in October 2007,[13] with the first British Reaper drone strike taking place in June 2008.[14]

The Royal Air Force (RAF) currently has five General Atomics MQ-9 Reapers operated by RAF 39 Squadron. Although the Reaper drones themselves are physically in Afghanistan (based at Kandahar Airport), they are controlled from Creech Air Force Base in Nevada via satellite.[16] The Reaper drone, which can fly for around 18 hours and has a range of around 6,000 kilometres, normally operates at around 25,000 feet [7,600 metres] but can fly at twice that height. It carries up to four Hellfire missiles and two 500-pound laser-guided bombs.[17]

The General Atomics MQ-9 Reaper, used by the US Air Force, US Customs and Border Protection, Royal Air Force (UK) and Aeronautica Militare (Italian Air Force).

The UK Ministry of Defence [MoD] has repeatedly refused to give details about the circumstances in which Reaper drones launch their weapons, arguing that the rules of engagement for unmanned drones are the same as those for manned aircraft. The rules of engagement, however, remain classified.

At the end of 2010, the UK Prime Minister David Cameron announced the purchase of a further five Reaper drones and associated ground-control stations at a cost of £135 million.[18] These additional drones are due to be operational in Afghanistan by 2013.

In September 2011, RAF Wing Commander Gary Coleman briefed defence industry delegates on Reaper operations at a UAV conference. His presentation,[29] obtained by Drone Wars UK under the Freedom of Information Act, revealed that:

• from mid-2012, there will be 44 Reaper crews operating UK Reapers with three Reapers constantly flying 24/7;

• Hellfire missiles are three times more likely to be used in British drone strikes than the 500-pound Paveway bomb;

• if "lower-yield weapons" had been available, more strikes would have been undertaken.

In April 2011, the MoD announced that it had reached a significant landmark in its operation of Reaper drones: 20,000 operational flying hours over Afghanistan.[31] In September, another milestone was passed: the 200th British drone strike. As always, details about the circumstances of the strike remain secret.

Future UK Armed Drones

The UK has two separate ongoing programmes to develop new armed drones. In December 2006, the Ministry of Defence signed a £127-million contract with BAE Systems and others to design and build an experimental armed combat drone.[34] The product of this research and development is the one-off Taranis drone, which was unveiled at BAE's Warton site in July 2010.[35]

Separately from the Taranis programme, the UK and BAE Systems have been jointly funding the development of the Mantis drone since 2007. Mantis is an armed, Medium Altitude, Long Endurance (MALE) drone similar to the Reaper. Unlike Reaper, however, Mantis is not remotely controlled but flies autonomously, following a pre-programmed flight plan. Mantis reached the end of its first stage of development when it flew for the first time at the Woomera range in Australia in October 2009.[37]

In November 2010, a significant

step forward in the proposal to have a joint UK–France drone came when David Cameron and French President Nicolas Sarkozy jointly signed the "Declaration on Defence and Security Co-operation",[41] committing the two countries to work together on a number of military projects. The treaty contains the following on drones:

"Unmanned Air Systems have become essential to our armed forces. We have agreed to work together on the next generation of Medium Altitude Long Endurance Unmanned Air Surveillance Systems. Co-operation will enable the potential sharing of development, support and training costs, and ensure that our forces can work together. We will launch a jointly funded, competitive assessment phase in 2011, with a view to new equipment delivery between 2015 and 2020."

US Drone Operations

The United States is the leading user of armed drones, and operates two separate "fleets": one controlled by US military forces and one by the Central Intelligence Agency (CIA).[58] The US first used unarmed versions of the General Atomics Predator drone in the Balkans war in 1995 and during the 1999 NATO bombing of Yugoslavia.[59]

Armed versions of the Predator were later developed, with the first armed strike by a US Predator drone taking place in Afghanistan in November 2001.[60] The Reaper, a larger version of the Predator and able to carry more weaponry, was introduced into service in 2007.[61] As of August 2011, the USAF has 268 Predator drones and 79 (of a planned 400) Reaper drones in service.[62] It is not known how many Predator drones are operated by the CIA.

While the Predator and Reaper drones themselves are physically located in or near the conflict areas, they are flown remotely via satellite communication from bases in the United States, primarily Creech Air Force Base in Nevada. A two-person crew controls the drone, operates the sensors, camera and weaponry, and is in touch with the "customers"—that is, ground troops and commanders in the war zone.[63]

• Pakistan

Since 2004, the CIA has been undertaking covert drone strikes in Pakistan against so-called high-value targets as well as groups of alleged militants. The number of strikes has increased dramatically in recent years. In the four years from 2004 to 2007, there were just nine Predator drone strikes in Pakistan. In 2010 alone, there were 118 strikes.[64]

While the US has never officially confirmed that it is undertaking the strikes, unnamed official sources

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regularly confirm the strikes to media organisations. The US argues that it has the approval of Pakistan's government to undertake the strikes, but this is denied by Pakistan officials. However, a US diplomatic cable released by WikiLeaks quotes Pakistani Prime Minister Yousuf Gilani, in relation to the drone strikes, as saying: "I don't care if they do it as long as they get the right people. We'll protest in the National Assembly and then ignore it."[65]

The number of civilian casualties attributed to the drone strikes has been fiercely contested, with estimates of the proportion of civilians killed in drone strikes ranging from 90 per cent to 10 per cent.[66]

The strikes are hugely unpopular in Pakistan, and there are regular protests and demonstrations against them. NATO supply routes to US forces in Afghanistan, which traverse Pakistan, have been blocked and convoys burned and destroyed. A number of suicide bombings carried out in Pakistan have been reported to have been in response to the drone attacks.[67] Two attempted terrorist attacks in the US were also reported to have been in response to CIA drone strikes in Pakistan.[68]

In March 2011, a drone strike on a tribal gathering in Miranshah, North Waziristan, killed at least 40 people.[79] The gathering (*jirga*) had been called to discuss the ownership of mineral rights, and many children attending with their families and several members of a pro-government militia were among the dead.[80] The deaths caused outrage in Pakistan, with even Pakistan's Army chief, General Ashfaq Parvez Kayani, publicly condemning the attack.[81]

In August 2011, the British-based Bureau of Investigative Journalism (TBIJ) released a detailed report examining civilian casualties caused by US drone strikes in Pakistan.[87] It found that 175 children were among at least 2,347 people reported killed in US attacks in Pakistan since 2004, with credible reports of at least 392 civilians among the dead. In October, TBIJ reported that according to its analysis, the number of US drone strikes in Pakistan since 2004 had reached 300; of those 300 strikes, 248 had taken place since Barack Obama had become US President and were occurring on average once every four days.[88]

In October, the British human rights organisation Reprieve organised a meeting with tribal leaders in Islamabad on the issue of drone strikes, encouraging them to document strikes in their local area. Three days after the meeting, one of those attending, Tariq Khan, a 16-year-old boy from North Waziristan, was killed along with his 12-year-old cousin, Waheed Khan, in a drone strike.[89]

• Yemen

In August 2010, the *Washington Post* and the *Wall Street Journal* both reported that the CIA was redeploying some Predator drones from Pakistan to Yemen, Djibouti, Kenya and Ethiopia in order to "step up targeting of al Qaeda's Yemen affiliate, al Qaeda in the Arabian Peninsula, known as AQAP, and Somalia's al Shabaab".[69]

Clearly opposing the idea, Yemen's Ambassador to the United Nations, Abdullah al-Saidi, said that CIA drones would be a "nonstarter". He added: "To even posit this theory about US drones only builds support for radicalization."[70]

Yemen had previously seen US drone strikes. In May 2010, a drone strike killed a Yemeni mediator seeking to persuade al-Qaeda members to surrender,[71] while a cable released by WikiLeaks confirmed that it was a US drone strike that killed 41 people in December 2009, rather than a strike by Yemeni forces as was claimed at the time.[72] The cable quoted Yemeni President Ali Abdullah Saleh saying to US General David Petraeus: "We'll continue saying the bombs are ours, not yours."[73]

In August, Amnesty International published a report on the human rights situation in Yemen, criticising both the Yemeni government and the United States: "The USA appears to have carried out or collaborated in unlawful killings in Yemen and has closely co-operated with Yemeni security forces in situations that have failed to give due regard for human rights."

Amnesty makes this recommendation to the US government: "Investigate the serious allegations of the use of drones by US forces for targeted killings of individuals in Yemen and clarify the chain of command and rules governing the use of such drones."[74]

In June 2011, anonymous US officials briefed the *New York Times* that US drone strikes in Yemen would intensify, as it was feared that it would be much harder to undertake the strikes if the Saleh regime fell due to increasing protests.[95]

In September 2011, the *Washington Post* reported that, according to senior Obama administration officials, drone strikes in Yemen and Somalia, unlike strikes in Pakistan, needed direct approval from the White House. The *Post* article also noted that local Yemeni media were reporting several unconfirmed drone strikes each week.[96]

Also in September, the US revealed that it was constructing new bases for drones in Ethiopia and the Seychelles in order to conduct strikes inside Somalia and Yemen. Drones would also continue to be flown from Djibouti.[97]

On 30 September, Anwar al-Awlaki was killed in a US drone strike on a convoy 90 miles [~145 km] east of the Yemeni capital, Sana'a.[98] Three other men also died in the attack, including another US citizen, Samir Khan.[99] Two weeks later, al-Awlaki's 16-year-old son, Abdulrahman al-Awlaki, was one of nine people killed in a US drone strike near the town of Azzan in southern Yemen. According to the boy's family, Abdulrahman was on his way to dinner and was not at all involved in terrorism.[100]

• Somalia

In June 2011, an unnamed US military official confirmed to the *Washington Post* that the Joint Special Operations Command had carried out a drone strike in Somalia, aimed at two senior members of al-Shabab.[101]

Although Predator drones have previously been used for surveillance in Somalia, this was seemingly the first time that an armed drone had been used in the country. In September, Reuters reported that a US drone had crashed near Somalia's southern port city of Kismayu.[102]

From September 2011, there were numerous reports by the Tehran-based Press TV service of US drone strikes in Somalia, resulting in hundreds of civilian casualties; however, none was confirmed by other news networks.[103] In December, a TBIJ investigation found that the Press TV reports had been fabricated.[104]

The General Atomics MQ-1 Predator, used by the US Air Force.

• Libya

In April 2011, US Defense Secretary Robert Gates announced that armed Predator drones had been approved for use in Libya.[105] Although the military refused to say from where the drones were flying, it was believed they were based in Italy. In May, the US also dispatched "several" unarmed Predator drones to the NATO war effort in Libya. A few months later, NATO commanders requested more, as according to a senior NATO official it was "getting more difficult to find stuff to blow up".[106] The US granted the request and sent two further unarmed Predators.[107] In October, at the end of "hostilities", the Pentagon stated that their drones had launched a total of 145 armed strikes on Libya.[108]

• Afghanistan

In November 2011, the USAF confirmed that it had moved four Predator drones from Iraq to the Incirlik Air

Base in Turkey.[109] According to reports, Turkey sought the deployment as a measure to be used against the Kurdistan Workers' Party (PKK).

Little information about the US's (or, for that matter, the UK's) use of armed drones in Afghanistan is available. However, two US military investigations into tragic deaths in Afghanistan give some insight. In April 2011, the *Los Angeles Times* reported that a US military investigation into the deaths of multiple Afghan civilians in a US attack on a convoy of trucks in February 2010 found that evidence that the convoy was not a hostile force was "ignored or downplayed by the Predator crew".[110]

In October 2011, the *Los Angeles Times* reported on a separate US military investigation into the deaths of two US servicemen, Jeremy Smith, 26, and Ben Rast, 23, mistakenly killed in a US drone strike in April 2011. While the 390-page Pentagon report has yet to be released, the *Times* stated: "The report blames poor communications, faulty assumptions and 'a lack of overall common situational awareness'." The *Times* interviewed Jerry Smith, father of one of the victims, after he had been briefed by US military officers and shown video images of the attack taken by the Predator drone: "He saw 'three blobs in really dark shadows'—his son, Rast and the other Marine mistakenly identified by the Predator crew as Taliban. He said it was impossible to see uniforms or weapons. 'You couldn't even tell they were human beings—just blobs,' he said."[111] This is an indication that the high-resolution images that drones are supposed to provide may not be all they are supposed to be.

In December 2011, Iran put on display a US [Lockheed Martin] RQ-170 Sentinel drone that it claimed it had brought down via electronic hijacking.[112] While the US initially denied knowledge of the drone and then claimed that it had been lost over Afghanistan, the CIA eventually admitted, through the usual unnamed sources, that it had been operating over Iran.[113]

Israel and Drones

According to Jacques Chemla of Israel Aircraft Industries, Israel is the world's leading exporter of drones, with more than 1,000 sold to numerous countries around the globe and netting Israel around $350 million a year.[145]

Israel's own armed forces use drones, with its primary combat drones being the Hermes, produced by Israeli company Elbit Systems Ltd, and the Heron, produced by Israeli Aerospace Industries Ltd. In 2011, the Israeli Air Force marked 40 years of its first drone squadron.[147]

According to Ed Kinane: "As far back as 1982 Israel used drones against Syria. In the early nineties Israeli drones were used in the Kosovo campaign. Israeli drones invade the skies over Lebanon and patrol occupied West Bank and besieged Gaza."[148] A 2009 Human Rights Watch report went into great detail about the use of armed drones by Israel in Gaza.[149] Throughout 2011, Israel continued to use drones in Gaza, both for surveillance purposes and for armed strikes.[151]

Armed, Self-Aware Drones

While current armed drones are remotely controlled from the ground, the next generation will be much more autonomous. Drones now in development can take off by themselves, fly their pre-programmed mission, return and land, all without the intervention of a human pilot. Some argue that this is merely an extension of the "autopilot" currently in use on most aircraft, while others see the growing autonomy of armed drones as a dangerous step towards autonomous weaponry.

The UK MoD has regularly stated that it "currently has no intention to develop systems that operate without human intervention in the weapon command and control chain", but that it is "looking to increase levels of automation where this will make systems more effective".[142]

In the MoD document "The UK Approach to Unmanned Aircraft Systems", released in March 2011, the MoD takes

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The BAE Systems Mantis, the world's first unmanned autonomous aircraft, i.e., able to pilot itself and to plot its own course. The prototype first flew on 21 October 2009 at Woomera Test Range in South Australia.

what could be called a "maxim" approach to the understanding of autonomy. The document argues that machines or systems can only be called autonomous when they are self-aware or their understanding is indistinguishable from humans:

"Autonomous systems will, in effect, be self-aware and their response to inputs indistinguishable from, or even superior to, that of a manned aircraft. As such, they must be capable of achieving the same level of situational understanding as a human."[143]

This would be a substantially different definition of "autonomy" than is being used by many scientists and companies involved in developing autonomous systems, as the document itself recognises.

There are very serious legal, not to mention ethical, issues raised by the prospect of unmanned systems deciding themselves whether to launch their weapons. Under international law, a human must be "in the loop" when it come to launching weapons.

The MoD's assurances that it is not *currently*, as it puts it, developing these systems, while at the same time blurring the distinction between "autonomous" and "automated", is unhelpful. This, together with the fact that exploration into the "technological challenge" to achieve such a capability appears to be continuing, is extremely worrying.[144]

Civilian Use of Drones

While military use of drones has soared over the past decade, the drone industry sees the civilian use of drones as a potentially huge and lucrative market.

Freedom of Information requests by Drone Wars UK suggest that around 50 to 60 companies and public institutions have been given "blanket permission" to fly small drones weighing less than 20 kilograms within the

The BAE Systems Taranis, a semi-autonomous unmanned warplane utilising stealth technology, is able to attack both aerial and ground targets while on intercontinental missions.

UK, although these drones must still remain under 400 feet [~122 metres] and within 500 metres of the operator.[154] Although the names of the institutions and companies which have been granted permission to fly the drones have not been revealed, the type of work being undertaken includes aerial photography and filming, surveying of buildings and land, emergency services work, and surveillance in support of law enforcement, data collection, evidence gathering and security.[155]

While a number of police forces in the UK have trialled the use of drones, recent reports seem to suggest that under current Civil Aviation Authority regulations they have not been too successful.[156] However, it is expected that drones will be used in London during the Olympic Games.[157]

Both within the European Union and specifically within the UK, drone manufacturers are working hard to get the "barriers [that] have hindered the development of the civil market" removed.[159]

The Need for Accountability and Public Debate

There are several "fronts" in the ongoing war over whether it is acceptable to use armed drones:

• Does the geographic and psychological distance between the operator and target make attacks more likely?

• Does using unmanned systems mean that attacks happen more often?

• Does the supposed accuracy of drone sensors and cameras mean that commanders are more willing to undertake "riskier" strikes (in terms of possible civilian casualties) than they would previously have undertaken?

All of these questions, and many more, need to be debated openly and honestly, and they require careful analysis and clear-headed judgement based on evidence. Unfortunately, that evidence is being kept strictly under wraps. While it may be necessary to keep some information secret, we do not believe it is appropriate, or legitimate, to refuse to disclose any and all information about the circumstances of the use of Reapers over the past three years.

There is, at the very least, the sense that public discussion is being manipulated. With the use of armed drones only set to increase, we need a serious, public and fully informed debate on all these issues and to ensure that there is full public accountability for the use of these drones.   ∞

About the Author:

Chris Cole maintains the Drone Wars UK blog and is happy to speak to groups and conferences about the growing use of drones in conflicts. The complete Briefing text, including endnotes, is available at http://www.dronewars.net.