



ISRAEL AND THE DRONE WARS

**Examining Israel's production,
use and proliferation of UAVs**

Drone Wars UK

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Front Cover image: Israel's Heron TP drone at the Tel Nof Air Force Base,
February 2010. Credit: UPI/Debbie Hill

Executive Summary

Israel and the Drone Wars examines Israel's growing production, use and proliferation of military unmanned aerial vehicles (UAVs) commonly known as drones. Israel is one of only three countries (as well as the US and the UK) that have used armed drones in conflict. While all three countries are extremely secretive about their use of armed drones, Israel takes this lack of transparency a step further by never officially acknowledging that it has in fact used armed drones.

Nevertheless, using secret diplomatic cables released through WikiLeaks, reports from the defence press and other sources in the public domain, Drone Wars UK has established beyond doubt that Israel has launched numerous airstrikes in Gaza using its armed drones. There is also evidence that Israel has used its armed drones to undertake attacks in Egypt and Sudan.

In many ways, Israel has led the way in the use of unmanned aerial vehicles in conflict, with its development and use of military UAVs going back at least four decades. Israel's persistent use of surveillance drones over Gaza is without precedent and has a serious and detrimental impact on the lives of Palestinians. Israel's use of armed drones in Operation Pillar of Defence, the November 2012 military offensive into Gaza, appears to be the first major military incursion not to use ground forces at all and sets a precedent for military intervention.

Israel also has a claim to be the major player in global drone proliferation. Drone Wars UK research has discovered that about fifty countries out of the more than seventy known to have some form of military UAV capability have received drones or drone technology transfers from Israel. It should be said that we have found no evidence that Israel has directly exported any armed drones.

The UK's Watchkeeper drone, being developed and built in conjunction with Israeli company Elbit Systems, is a good example of how Israel profits from its long experience of this new way to wage war. Indeed it could be said that if you scratch any drone you will likely find Israeli technology underneath.

1. Introduction

“There are three explanations for Israel’s success in becoming a world leader in development and production of UAVs. We have unbelievable people and innovation, combat experience that helps us understand what we need, and immediate operational use since we’re always in a conflict which allows us to perfect our systems.”

Israeli Defence Ministry official.¹

Over the past decade the military use of unmanned aerial vehicles (UAVs), commonly known as drones, has risen dramatically. While much attention is focused on the United States’ use of drones, this briefing concentrates on Israel’s manufacture, use and export of military drone technology. In a time when many defence companies around the world are facing cuts due to global recession and austerity, Israel’s drone businesses are thriving with a May 2013 report naming Israel as the world’s leading exporter of drones.²

While countries such as Turkey and China have recently begun to develop an unmanned systems’ manufacturing capacity, Israel has led the way for decades having produced drones since the late 1970s³ and exported them since the mid-1980s.⁴ However Israel not only manufactures and exports drones but also uses them for its own military purposes, being one of only three states, alongside the US and the UK, to have used armed drones in conflict.

Reducing Risk?

Drones or unmanned aerial vehicles (we use the terms interchangeably) can provide persistent surveillance over populations, territories and targets without the need for an on-board pilot, thus reducing the risk to military personnel by removing them from the battlefield. While the vast majority of military drones are used for surveillance, targeting and intelligence gathering, remotely controlled drones capable of armed attack are the latest ‘must have’ weapon system in today’s conflicts.

Using on-board sensors and cameras, drone operators can gather intelligence, provide ‘command and control’ functions, select targets and fire missiles and bombs from hundreds, sometimes thousands of miles away. This has been likened to a kind of video-game warfare – using a computer joystick to fire missiles at blips on a screen from the comfort of an air-conditioned office far away from the battlefield. It is claimed by proponents that missiles fired from drones are far more accurate than those fired from piloted planes, although there is little or no evidence to support such claims due to the secrecy surrounding the day-to-day use of armed drones.

Arms exports have become an important part of Israel's economy and drones now account for between 3% and 10% of Israel's defence exports.⁵ According to the SIPRI arms transfers database⁶ Israel has exported unmanned drone technology to 24 out of the 76 countries known to have some form of military drone capability.⁷ However we believe that this is a serious under calculation with our research showing that at least fifty countries have received drones or drone technology from Israel.⁸ The reality is that if you scratch any military drone and you will likely find Israeli technology underneath.

Forty years

Israel has been committed to developing and using unmanned drones since the 1970s. In order not to be dependent on expensive imports, or the good will of other nations, Israel developed its own drone manufacturing capacity. Since the 1980s drone exports have also been an important source of revenue.

While Israel's drone use stretches back decades, the November 2012 assault on Gaza Operation Pillar of Defence was described by Israeli sources as marking a peak in Israel's use of drones: "The type of surgical warfare fought over Gaza could not have been performed without the massive use of unmanned platforms," an unnamed Israeli source told Arie Egozi of *Flight Global*.⁹ Egozi himself wrote at the time:

"In the history of combat involving massive use of unmanned air systems (UAS), Israel's Operation Pillar of Defence in Gaza last week is without doubt a milestone, not only for Israel but for any other UAS user."¹⁰

For the first time there were no Israeli 'boots on the ground' in Gaza during a major military offensive.¹¹ By the end of hostilities on 21 November 2012, according to the United Nations' Office for the Coordination of Humanitarian Affairs (OCHA), 165 Palestinians had been killed in Israeli attacks, of whom 99 were believed to be civilians, including 33 children and 13 women. Three Israeli civilians, two soldiers and a civilian-military contractor were killed as a result of the Palestinian rocket attacks into Israel, and 224 others were injured.¹²

Like many countries, Israel perceives unmanned drones as a critical development in military technology. As Israeli Defence Minister Moshe Ya'alon stated in July 2013 "we are using it and adapting it to the new reality wherein the army vs. army conflicts that we last saw 40 years ago in the Yom Kippur War are becoming less and less relevant."¹³

Secrecy

Details of how armed drones are being used, in or outside of declared wars, are closely guarded secrets by all three states known to use them. Israel takes this secrecy a step further in never officially admitting that it has ever used armed drones. Israeli newspaper *Haaretz* pointed out:

“While the subject [of targeted killing using drones] is dominating headlines around the world, there is one country which has pioneered drone warfare, where the debate is yet to kick off... therefore, we can only rely on foreign sources that maintain that Israel has been using drones for years to carry out targeted killing.”¹⁴

This briefing attempts to unpick the shroud of secrecy surrounding Israel’s military drone use, manufacture and exports. It also aims to stimulate debate about the military use of remote controlled technology by Israel and to highlight the need for transparency and accountability.

Chapter Two examines the history of Israel’s military drones over the past forty years of conflicts, while Chapter Three goes on to describe the impact of Israel’s use of drones on Palestinians in Gaza. Chapter Four looks at the proliferation of Israeli drones around the globe, including an examination of the UK’s Watchkeeper programme based on Israeli technology. Table 1 details Israeli drones in production while Table 2 records Israel’s proliferation of drones across the globe over the past few years.

Table 1: Israeli drones

Company	UAV name	Class	Reports of strike capability and use
Aeronautics Defence Systems (ADS)	Orbiter I; Orbiter II; Orbiter III	I	
	Aerolight	I	
	Aerostar	II	
	Dominator II	III	
	Picador	III	
AeroTactiX Ltd	Skyzer	I	
BlueBird Aero Systems Ltd	Thunder B	I	
	Blueye	I	
	Boomerang	I	
	MicroB	I	
	SpyLite	I	
	WanderB	I	
Elbit Systems Ltd	Skylark I LE; Skylark II	I	
	Hermes 90	I	
	Hermes 180	II	
	Hermes 450	II	Yes
	Hermes 900	III	Yes
	Hermes 1500	III	
EMIT Aviation Consult	Blue Horizon	I	
	Dragonfly 2000	I	
	Sparrow-N	I	
IAI	Bird Eye 400	I	
	Mini Panther	I	
	Mosquito 1; Mosquito 1.5	I	
	Panther	I	
	*Harpy; *Harop (Harpy 2)	I	
	Searcher I	I	
	I-View-150	II	
	Scout	II	
	Searcher II; Searcher III	II	
	B-Hunter	III	
	Heron 1 (Shoval)	III	Yes
	Heron TP (Eitan)	III	Yes
Innocon	MicroFalcon I; MiniFalcon I;	I	
	MiniFalcon II	I	
Steadicopter	Black Eagle 50	I	
Top I Vision	Casper 200; Casper 250;	I	
	Casper 350	I	

UAVs are divided into three broad categories based on weight. Class I UAVs weigh under 150kg (further sub-divided into Micro (less than 2kg); Mini (2kg - 20kg) and Small (greater than 20kg). Class II weigh between 150kg and 600kg, while Class III weigh over 600kg. Generally speaking the larger the drone the further it is able to fly and the more sensors and munitions it is able to carry.

*Harop and Harpy are loitering munitions (i.e. they are the munition themselves and not the delivery platform, and once launched cannot be re-used) but are often referred to in the general press as UAVs so we include them in this table for completeness sake

2. Israel's use of drones: a history

"UAVs have become indispensable in performing a full range of missions in support of our defensive strategy. Not a day goes by without multiple operational deployments of our unmanned assets"

Tal Inbar, Head of the Space and UAV Research, Fisher Center, Israel ¹⁵

Israel has a long history of developing and using unmanned aerial vehicles. According to the Israeli Air Force (IAF) unmanned drones were first used for surveillance over Egypt in 1971 in the lead up to the Yom Kippur War, The earliest mention of the use of Israeli drones for target acquisition was in 1981 in the run up to the 1982 First Lebanon War where drones were used to locate targets for piloted aircraft to follow and strike with weapons.¹⁶

Israel is often credited with pioneering the use of missile-armed drones for targeted killings, but the evidence is obscure and Israel has never publicly admitted to using armed drones.¹⁷ The first reliable record of missiles being fired from drones by any nation was by the US in November 2001 at the start of the war in Afghanistan.¹⁸

Perhaps the most compelling evidence that Israel uses armed drones was revealed in secret US Embassy cables published by Wikileaks detailing drone strikes in Gaza during Operation Cast Lead in 2008-09.¹⁹ The 2009 cable details a meeting between US and Israeli officials to discuss legal and operational issues related to IDF activities during Operation Cast Lead, as well as specific incidents of alleged Israeli international humanitarian law (IHL) violations during the fighting. One section of the cable reports what IDF Judge-Advocate Brigadier General Avichai Mandelblit said about a specific incident in which 15 people were killed and 40 injured:

*"the UAV fired two missiles against the [two armed Popular Front] operatives; the first missile failed, but the second hit the operatives. UAV footage of the strike provides evidence that shrapnel entered the mosque through an open door. While the mosque was not intentionally targeted, Mandelblit said, the shrapnel from the attack hit civilians located inside."*²⁰

We shall return to this specific episode later as we now examine in more detail Israel's use of drones.

Forty years of Israeli drone warfare 1970 – 2013

“While Jerusalem does not admit to possessing armed UAVs, it has been reported in the rest of the world that Israel has been using them for nearly a decade.”

Yaakov Katz, *Jerusalem Post*²¹

During Israel’s War of Attrition with its Arab neighbours following the 1967 Six Day War, Egypt’s anti-aircraft systems shot down a number of Israeli Air Force (IAF) planes. Looking for a method of intelligence gathering that would not put the lives of air crew at risk, Israel first bought Firebee surveillance drones from the United States in 1971. In the same year the first Israeli drone squadron was established at Palmahim airbase near Tel Aviv.²²

According to the IAF, during the twelve days of fighting of the 1973 Yom Kippur (or Arab-Israeli) War, Israel used US-made Chukar decoy drones for the first time, flying them towards the Golan Heights, and duping the Syrians into thinking that a mass strike had begun against their anti-aircraft positions. Throughout that war Israel continued to use US-made Firebee drones for intelligence gathering.²³

Like many other countries at that time, Israel decided to try to re-coup the cost of weapons development by using arms exports as a way of subsidising their own weapons. At the same time the US started to provide \$3bn aid annually to Israel comprising mostly of military aid.²⁴

Israel Aerospace Industries (IAI) started to manufacture drones in 1974²⁵ and in 1979 IAI’s Scout surveillance drones were brought into service.²⁶ Another Israeli company, Tadiran, developed the Mastiff drone in competition with the Scout.²⁷ During Israel’s Lebanon crisis of 1981, a Scout drone was sent over Lebanon and sent back real-time pictures of Syrian anti-aircraft systems. During Israel’s First Lebanon War in 1982 Israel’s Scout drones were used for surveillance and target acquisition, alongside US-made Firebee II and Chukar drones.²⁸

The Pioneer drone, made jointly by US AAI Corporation and Israel’s IAI and developed from IAI’s Scout and Tadiran’s Mastiff drones, was acquired for the Israeli Navy in 1985,²⁹ and in 1988 IAI’s new Searcher drones also came into service.³⁰ In January 1991, Pioneer surveillance drones, bought second-hand from the Israel, were used in the First Gulf War by the US Navy, to guide shells fired from battleships.³¹

On February 16 1992 an Israeli Scout drone was used in an attack on a convoy of vehicles in Southern Lebanon in which Hezbollah leader Sheikh Abbas al-Musawi was targeted and killed. The drone was used to locate the vehicle for targeting and

to report the results of the subsequent air-strike.³² Accounts of this incident suggest that the missile was fired from a piloted helicopter.

From July 25 - 31 1993, during 'Operation Accountability', Israeli forces conducted 27 drone flights over Lebanon concurrently with a number of air strikes against militant organisations, in particular Hezbollah. The IAF later said that the success of this operation led to an increase in the pace at which "new weapons systems were absorbed" into their UAV squadron. In April 2000 Israel's latest Searcher II drone, capable of longer range flights of hundreds of kilometres started flying over Lebanon. A month later Israeli forces withdrew from Lebanon with drones providing air support.

September 19, 2000 saw the start of second Palestinian (or Al Aqsa) Intifada during which Israeli forces used "controlled helicopter fire aimed at terrorist targets and operators."³³ The IAF says their drone unit played an active role in "gathering intelligence, continuous observation and joint operations with the security services." Two years later *Aviation Week* reported "during the urban fighting in Jenin... armed helicopters masked themselves behind terrain and fired on coordinates provided by UAVs."³⁴

In 2004 the first reliable reports of drones being used by Israel to undertake air strikes in Gaza emerged. The *Jerusalem Post* reported that on 24 October "Eyewitnesses said the pilotless aircraft was used... in a pre-dawn attack in Khan Yunis in which two Islamic Jihad gunmen were killed – Ziad Abu Mustafa and Omar Abu Mustafa, both in their late 20s."³⁵ And on December 7 the same year a further drone strike killed a "PIJ [Palestinian Islamic Jihad] militant" referred to in a cable from the US Embassy in Tel Aviv.³⁶

The IAI's new Heron 1 UAV (or Shoval as it's called in Israel) took over from the Searcher II drone in 2005 and the IAF's UAV Squadron website states that "during the fourth year of attacks against terrorist targets in the West Bank and Gaza... an increase in the use of intelligence gathering equipment came about primarily because of the need to focus on pre-emptive strikes against terrorists and to minimize the harm to civilians."³⁷

Following the shooting of two Israeli soldiers and the capture of Corporal Gilad Shalit on 25 June 2006 by Palestinians from Gaza, Israel launched a huge ground and air offensive between June 28 and November 26, including the use of drones. Named 'Operation Summer Rains' this offensive saw nearly 400 Palestinians killed and much of Gaza's infrastructure destroyed, including Gaza's only electricity power plant.³⁸

Meanwhile from July 12 to August 14 the same year, the Second Lebanese War (or July War) saw more Israeli-made drone action. *Flightglobal* reported that there was "clear evidence" that Israel had armed a number of drones to reduce engagement times for "time-sensitive targets" and used them in Gaza and Lebanon in July 2006.³⁹ According to the report, the drones concerned were

believed to be Heron 1 drones (in service with IAF since 2005) armed possibly with Rafael Spike missiles. Human Rights Watch (HRW) counted nine Israeli drone strikes which killed 25 people in Lebanon during this operation.⁴⁰ According to HRW's munitions experts, blast and fragmentation marks at the site of an attack by Israel on a Lebanese Red Cross ambulance suggested drone fired Spike missiles.⁴¹

Around the same time, the IAF appears to have adapted its Elbit Systems' Hermes 450 drones for armed operations, equipping them with two Rafael-made missiles.⁴² Israeli, Palestinian, Lebanese and independent reports suggest the Hermes 450 has seen extensive service in the Gaza and was used intensively in the Second Lebanon War, as well as in the Sudan air raids in 2009.⁴³

In May 2007 Palestinian sources said Israel had sent armed drones to detect and destroy Palestinian missile squads and launchers in northern Gaza, noting that armed drones appeared to have replaced the attack helicopters that usually conducted such missions over Gaza.⁴⁴

In October 2007 a new Heron drone, called Heron TP Eitan, was unveiled at Israel's Tel Nof Air Force Base. At the media event an IAF official said the IAI and the IAF had tested "all kinds of payloads, in all kinds of configuration schemes." Apart from its intelligence, surveillance, target acquisition, and reconnaissance (ISTAR) role, *Haaretz* said the Eitan can also be armed for defence and long-range strategic strikes.⁴⁵ Britain started its Watchkeeper drone programme at this time based on the Israeli Hermes 450 drone (see page 21).

February 27 to March 3 2008 saw another Israeli offensive against Gaza using drones, dubbed 'Operation Hot Winter', and started in response to the killing of an Israeli in a Palestinian rocket attack. More than 120 Palestinians were killed and 350 wounded.⁴⁶

In December 2008, Israel launched a massive airborne offensive against Gaza called 'Operation Cast Lead'. Its stated objective was to put an end to the firing of rockets into Israel. In the first days of the operation, at least 400 Palestinians were killed. By the ceasefire on January 17 the Israeli offensive had killed 1,330 Palestinians, of whom more than 430 were children, and left 5,450 wounded according to Palestinian medical sources. On the Israeli side, 10 military personnel and 3 civilians were killed according to official figures.⁴⁷ The Heron TP Eitan drone, brought into service just over a year earlier, was first used during Israel's Operation Cast Lead.⁴⁸

According to Michele Esposito, Senior Research Associate at the Institute of Palestine Studies, Operation Cast Lead started with an initial 'shock and awe' campaign involving 64 warplanes hitting more than 50 Hamas related targets across the Gaza Strip, followed by more than 100 tons of explosives dropping in the first 9 hours of combat.⁴⁹ After striking all the targets that could be attacked

from the air, the second phase saw ground troops going into Gaza. According to Esposito:

“infantry units typically entered Gaza preceded by UAVs at a distance of 500 yards. The UAVs were used to clear the area ahead (firing antitank and antipersonnel weapons as needed) and to guide troops by relaying advice regarding safe routes.”⁵⁰

This tactic was the first time Israeli infantry commanders on the ground were allowed to direct drones, helicopters, and warplanes independently of the air force. Each brigade commander was assigned a dedicated drone squadron and an air-support controller team to provide them with real-time surveillance information from the drones. At least a dozen drones were kept in the air over Gaza at all times to detect Palestinian movements and to direct aircraft, tanks, and artillery (including naval artillery) to targets.⁵¹

Beyond the immediate region, reliable sources have reported that an Israeli drone was used to carry out an airstrike against an allegedly Gaza-bound Iranian arms convoy traveling through Sudan in 2009.⁵² The *Jerusalem Post*, which described the operation in some detail, stated that Israel used drones that could loiter for long periods over the vast Sudanese desert “where they could just sit and wait for the convoy to show up.” The drones used were probably the Heron TP Eitan Israel’s largest drone, to provide surveillance, together with the Hermes 450 “Israel’s main attack drone”. The *Post* states that it received its information from foreign sources.⁵³

Asked about the Sudan incident at the time, then Israeli Prime Minister Ehud Olmert said:

“We operate everywhere we can hit terrorist infrastructure - in nearby places, in places further away, anywhere we can strike them in a way that increases deterrence... everyone can use their imagination. Those who need to know, know there is no place where Israel cannot operate. Such a place doesn't exist.”⁵⁴

2010 saw the advent of Elbit System’s Skylark 1 ‘mini man-pack’ drone, given to IDF battalions to provide commanders with quick ‘over-the-hill’ intelligence without being dependent on the air force.⁵⁵ At the other end of the size scale Elbit announced that it had won a US \$50 million, three-year contract to supply the IAF with Hermes 900 drones which boast “full interoperability capability” with the Elbit Hermes 450 drones already in service.⁵⁶

According to *Aviation Week* a new Israeli unit ‘Depth Command’ was formed in 2012 with the aim of coordinating long-range operations and to take greater advantage of the long-range drones equipped with precision, multifunction sensors and weapons, such as the Heron TP Eitan drones.⁵⁷ *Aviation Week* goes on to

say that Heron 1 drones have been photographed monitoring the fighting in Syria, but whether they were being operated by Turkish or Israeli air forces is unknown.

Like many nations operating UAVs, drone crashes have become a regular event. In 2012, a giant 5 tonne, 86 foot wingspan Heron TP Eitan drone crashed in southern Israel on a test flight grounding the entire Israeli fleet.⁵⁸ In May 2013 Israel's Heron 1 drones were grounded after one had to be shot out of the sky over the sea because of a malfunction, and an Israeli Hermes 450 drone was crash-landed deliberately near the Egyptian border when it got in to trouble.⁵⁹

In November 2012 Israel launched another massive military assault on Gaza, called Operation Pillar of Defence. Investigations by Human Rights Watch showed that 18 airstrikes, of which at least seven were conducted by drones, were "in apparent violation of the laws of war."⁶⁰ Arie Egozi writing for *Flight Global* said of Operation Pillar of Defence: "the eight days of fighting over Gaza have brought the use of unmanned air vehicles and intelligence sensors to a peak that some Israeli sources have described as "unprecedented"."⁶¹

Israeli drone strikes continued into 2013. On April 30 2013 *Middle East Monitor* (MEMO) reported that a Palestinian had been killed by a drone fired missile as he was riding his motorcycle in Gaza City. MEMO said a spokesman for the Ministry of Health identified the dead man as Haitham Al-Meshal, 29, and a member of the security staff at Al-Shifa Hospital.⁶²

In August 2013 there were reports of a missile killing four militants on the Egyptian side of the Sinai border with Israel at El Agra. The casualties were variously described as Jihadist or Al Qaida and allegedly engaged in preparing to fire rockets into Israel from Egypt. *Associated Press* and *Haaretz* reported Egyptian sources as telling them that the missiles were fired from an Israeli drone, but as ever Israel has "maintained official silence about the strike".⁶³

In spite of Israel's official silence, the evidence points to an established pattern of armed drone use, especially in Gaza, since 2004. In the next chapter we outline what it's like living under drones in Gaza.

3. Impact: The effect on the ground

“The most enduring reminder of Israel’s unblinking vigilance and its unfettered power to strike at a moment’s notice is the buzz of circling drones.”

Scott Wilson, *Washington Post*⁶⁴

Although Israel has never publicly admitted to using armed UAVs, there is evidence of Israel drone strikes on Gaza and elsewhere as detailed in the previous chapter. Palestinian, and what the Israeli press refer to as ‘foreign sources’ have reported drone strikes on Gaza since 2004.

Undoubtedly Israel’s use of armed drones has had a devastating impact on the ground in Gaza. Two major military offensives, in 2008-09 Operation Cast Lead and in 2012 Operation Pillar of Defence, exemplify the human cost of Israel’s armed drone use.

Israel’s Operation Cast Lead over fifteen days in the winter of 2008-09 saw a massive mobilisation of Israeli forces against Palestinians in Gaza. In one incident, on January 3 2009, there was an Israeli armed drone attack at the doorway of the Al-Maqadmah Mosque in Gaza while 200-300 people were at evening prayer inside. A subsequent UN fact-finding mission found the munitions used matched the “shrapnel fragmentation sleeve fitted onto an air-to-ground missile” and at least 15 Palestinians were killed and 40 wounded while at prayer inside the mosque.⁶⁵

Initially Israeli officials twice denied firing at the mosque.⁶⁶ Then they said they did not know the building was a mosque or that there were so many people inside.⁶⁷ IDF’s Military Advocate General Mandelblit eventually admitted to the US Ambassador that an Israeli drone had undertaken the attack as revealed in a cable from the US Tel Aviv Embassy released through Wikileaks. Mandelblit said an armed drone had fired two missiles at targets outside the mosque and shrapnel had entered the mosque through an open door causing the casualties inside.

The large-scale Israeli assault on Gaza, Operation Pillar of Defence, took place over eight days in November 2012 and marked the culmination of Israeli high-tech remote warfare to date.⁶⁸ According to the IDF over 1,500 targets were attacked by Israeli forces during the military operation. UN reports state 165 Palestinians were killed although there were no Israeli ‘boots on the ground’ inside Gaza.⁶⁹

Writing for *Defence Today* Peter Layton describes piloted Israeli aircraft being complemented by Hermes 450 and Hermes 900 drones which can be armed with Spike missiles.⁷⁰ He goes on to give a detailed account of armed drones used in this offensive:

“Operation Pillar of Defence began with a precision attack on a car in the middle of Gaza by an armed IAF Hermes 450... that fired a Spike anti-tank missile. Ahmed Jabari, chief of Hamas’s military wing, and considered responsible for the rapid development of Hamas’s formidable rocket forces was killed... Armed Hermes 450 UAVs also are reported to have continued with leadership attacks and in quickly responding to pop-up rocket launches by the mobile missile teams.”⁷¹

In its report on the operation, Human Rights Watch said that while they were unable to investigate all the airstrikes, they had found 18 specific strikes that had violated the Laws of War, at least seven of which appeared to involve aerial drones launching guided missiles. Of the remaining attacks from the air, the type of aircraft or the munitions is not clear. HRW described incidents where the victims were civilians:

Investigations found that Israeli drone strikes on November 19 killed three men in a truck carrying tomatoes in Deir al-Balah, and a science teacher who was sitting in his front yard with his 3-year-old son on his lap, talking to an acquaintance – only the toddler survived, but was seriously wounded.

Other drone-launched missile attacks killed a 79-year-old man and his 14-year-old granddaughter in the family’s olive grove in Abasan; a farmer and his nephew as they were walking on a road near their olive trees in the Khan Yunis area; and a 28-year-old woman carrying a blanket in the yard of her home in the town of Khuza’a.

An Israeli Hellfire missile struck a hospital in Gaza City on November 19, puncturing the roof and cutting electricity and water. There were no casualties. Hospitals are protected objects under the laws of war unless being used for military purposes and targeted after giving a warning.⁷²

Israel claims that their drone strikes are legitimate because of their surgical precision, and that the operators firing the weapons can have a clear view of targets as they fire.⁷³ However, Defence for Children International maintain that during Operation Cast Lead, of the 353 children killed and 860 injured, 116 of them died from missiles launched by drones.⁷⁴ This is not surprising when, with a population of more than 1.7 million, confined to a small area, Gaza is one of the most densely populated areas in the world.⁷⁵

Lt. Col. Shay, commander of a unit controlling drones from a base south of Tel Aviv said: "Ultimately, we are at war. As much as the IDF strives to carry out the most precise surgical strikes, mistakes can happen in the air or on the ground."⁷⁶

HRW’s field investigations of the attacks recorded above found no evidence of Palestinian fighters, weaponry, or other military objectives at the times of the attacks. HRW added “individuals who deliberately order or take part in attacks targeting civilians or civilian objects are responsible for war crimes.”⁷⁷

Gazan voices

“These drones - they don’t always know... At night, if I hear one, I’ll cancel my plans to see friends. It’s easy - if one is above me, I won’t go out.”

Walid Dawoud⁷⁸

Due to the secrecy surrounding Israel’s use of armed drones it is not possible to know with any certainty the numbers of casualties from such strikes.

The Palestinian Center for Human Rights estimates that 825 Palestinians were killed by drones in Gaza between the capture of Israeli soldier Gilad Shalit in June 2006, and his release in October 2011. Most of those killed, according to the organization, had been civilians mistakenly targeted or caught in the “deadly shrapnel shower” from a drone strike.⁷⁹ According to research carried out amongst the families of victims by the Al Mezan Centre for Human Rights, 79% of children killed in the incursion died from drone strikes.⁸⁰

But it is not only armed drones that have an impact on the civilian population. Surveillance drones, operating at lower levels, often cause terror and panic as it is impossible for those on the ground to know the difference between a drone undertaking surveillance and one about to launch or ‘cue’ an airstrike. Palestinians living in Gaza talk about the fear of drones which are present day and night emitting a loud whining engine noise which they call ‘zenana’.

Nader Elkhuzundar, a Palestinian from Gaza interviewed by Drone Wars UK said “some surveillance drones operate from a considerable altitude and are soundless at ground level, but when the drone engine noise gets closer and louder it prompts fear of a missile strike in those on the ground.”

Nader Elkhuzundar also spoke about the intense worry and stress experienced by his family, and particularly his mother, whenever the noise of a drone engine gets louder and more persistent near their apartment, which can mean the drone is looking for a target nearby and there is danger of a missile strike.

The Elkhuzundar family home used to be near the UNRWA Headquarters which was targeted by Israeli forces on January 15 2009, during the Israeli Cast Lead offensive.⁸¹ Since experiencing at close hand the missile strikes and subsequent fire at UNRWA HQ, the Elkhuzundar family is fearful of drone strikes and particularly of being hit by shrapnel. Nader Elkhuzundar told of how, whenever the drone noise grew louder, his mother would make the whole family gather up valuables and important documents, move away from the windows and retreat to the bathroom which they felt was the safest place from missile strikes or shrapnel. “We also made sure to open all the windows when the drones came near, as the pressure from nearby explosions could break all the glass and cause injury,” he added. Nader told Drone Wars UK that when he first came to London he could not sleep as he was so habituated to the constant sound of drone engines in the skies above Gaza where he lives, that the lack of the noise kept him awake.⁸²

Scott Wilson of the *Washington Post* also reported what it is like for Gazans living under Israeli drones:

“Nabil al-Amassi, a mechanic, watched in the summer of 2006 as Israeli tanks rolled into Beit Lahiya (Gaza Strip) in an operation designed to pressure the Hamas leadership to release Shalit in the days following his capture. A half-dozen armed men stood at the bottom of his sandy street when, suddenly, the drone buzzing above fired. Three of them were killed, including one whose armless torso was carried by screaming survivors from the scene... “It’s continuous, watching us, especially at night,” said Amassi, a father of eight children. “You can’t sleep. You can’t watch television. It frightens the kids. When they hear it, they say, ‘It is going to hit us.’ ” Among his children is Ahmed, a leery 3-year-old who patrols the street in a tiny track suit on fast-moving legs. When he hears the drone arrive, often in the early evening, Ahmed runs to his father and sits deep in his lap, frightened. “We try to tell them its fireworks,” Amassi said.”⁸³

The effect on children of experiencing war and drone attacks at first hand is devastating. Ismail Ramadan, Principal of Qasteen school, brings in psychiatrists several times a week to calm the children and explain that the sound of the drones does not mean war is imminent, continued Scott Wilson of the *Washington Post*. He interviewed Eyad Sarraj, of the Gaza Community Mental Health Program, who said the drones’ noise is something “you can’t escape”. Whether intentional or not, Sarraj said, their constant presence induces a sense of helplessness among Gaza’s residents. “In the back of the minds of everyone here is fear, from the psychiatrist to the student, a sense that something terrible is going to happen,” Sarraj said, adding “The drones are part of that story. They are part of the conditioning, every time we hear them, we go back to those events of violence and death.”⁸⁴

Ahmed Tawahina, a psychologist running clinics in Gaza as part of the Community Mental Health Programme described the constant drone noise as a “form of psychological torture, which exhausts people’s mental and emotional resources. Among children at school, this can be seen in poor concentration and unruly behaviour.”⁸⁵

Although the total number of civilians killed in drone strikes by Israel during the ‘Cast Lead’ offensive in the winter of 2008-09 is unclear, Israeli and Palestinian human rights organisations report that there were 42 drone attacks that killed 87 civilians.⁸⁶ Mahmoud Abu Rahma from Al Mezan Center for Human Rights said that from their observations, the weapons that killed most civilians during the ‘Cast Lead’ offensive were the drones.⁸⁷ Often, the first drone-fired missile would be followed minutes later by a second or third, striking those who came to rescue the injured.⁸⁸ This ‘double-tap’ strike tactic has been reported to have been undertaken by US drones in Pakistan and Yemen as well.⁸⁹

4. Israeli drone exports

“With an unsurpassed track record of over 1,100,000 operational flight hours for over 49 users on five continents, IAI-MALAT is a global leader in comprehensive UAV-based solutions - offering the widest range of combat-proven systems.”

Israeli arms company, Israel Aerospace Industries ⁹⁰

Israel’s war economy and combat history, combined with its early entry into the drone field have provided Israel with a competitive edge in exporting drones. 41% of the world’s drones came from Israel between 2001 and 2011 according to SIPRI⁹¹ and drones now account for up to 10% of all Israel’s military exports. ⁹²

According to Drone Wars UK’s research, Israel has exported drone technology to some 50 out of the 76 countries thought to have drones.⁹³ However due to the secrecy associated with arms transfers, the table below can only be indicative. Drone Wars UK found no evidence of armed drone capability being exported from Israel, although the Israeli military have used weaponised variants of drones that have been exported.

In addition to direct exports, Israeli military companies often set up subsidiaries in target markets in order to establish and enable joint production of drones. Israeli companies have also led the way in creative arrangements whereby drones are leased for military operations. Such arrangements have been concluded with Australia, Canada, Germany, Netherlands and the UK for use in Afghanistan.

Table 2. Israel’s drone export destinations

Given the nature of the arms business, obtaining detailed and comprehensive information about transfers is extremely difficult. It is even more difficult when Israel is one of the partners involved. This table is an attempt to present an overview of Israeli drone exports over the past few years using public information, background knowledge and our best judgement. It is, however, unlikely to be a complete picture. Public sources sometimes give incomplete and conflicting information about individual transfers. In addition, it can be years from when an order is signed to deliveries and then completion of deliveries. Licensed production and joint ventures introduce yet more complications. Nevertheless, we hope this table shines some much needed light on the global spread Israel drone exports. Information to clarify or correct information contained in the table is welcomed.

Country	Israeli UAV	Order /delivered	Notes	Date
1. Angola	Aerostar Heron		Sale Sale reported	2003 2011
2. Argentina	Elbit Systems Hermes 1500		Joint production (with Brazil) Sale (unconfirmed)	Unknown Unknown
3. Australia	Heron Skylark I	10/10 6/6	Leased from MDA via Canada Sale	2010 2005 (and 2008)
4. Azerbaijan	Aerostar Aerostar Hermes 450 Heron Orbiter Searcher	4/4 10/10 10/6 5/? 5/?	Sale License and joint venture/Sale On order Sale (unconfirmed) On order Unknown	2008 2011 2011 Unknown by 2011 by 2011
5. Belgium	Hunter RQ-5A	18/18	Sale	By 2006
6. Botswana	Hermes 450	1/1	Sale	2001
7. Brazil	Hermes 450 Heron	2/2 (15) 14/3	License (on order) Sale	2010 2011
8. Canada	Heron Skylark I	3/3	Lease Sale	2008 By 2006
9. Chile	Hermes 900 SpyLite	3/?	On order On order	After 2011 2013
10. China	Harpy		Sale	2002
11. Colombia	Hermes 450 Hermes 900	2/? 2/? 2/2	On order On order Sale	2014
12. Cote d'Ivoire	Aerostar	2/2	Sale	2004
13. Croatia	Hermes 450 Skylark I	2/2	Sale Sale (unconfirmed)	2006 unknown
14. Cyprus	Searcher	2/2	Sale	2002
15. Czech Republic	Skylark I		Sale (unconfirmed)	unknown
16. Ecuador	Heron 1 Searcher	2/4 2/4	On order On order	2009 2009
17. Ethiopia	Boomerang/Spylite		Sale (unconfirmed)	2011
18. Finland	Ranger	12/11	Sale via Swiss/IAI joint venture. Based on IAI Scout UAV	2001-2007
19. France	Eagle/Harfang Heron 1 Heron TP Eitan Heron TP Eitan Hunter Skylark 1	24/24 3/3 and 1/1 6/6	Joint venture (Heron 1 variant) Sale Joint venture Lease offered Sale Sale	2009 2001 2008 2011 1997 by 2006
20. Georgia	Aerostar Hermes 450 Skystar	2/2 5/5	Sale Sale Sale	2005 by 2008 unknown
21. Germany	Harop Heron 1	3/3	Joint Venture Lease	2009 2010 - 2014
22. Hungary	Skylark I Sofar	2/?	Sale (unconfirmed) On order from Hungarian/Top I Vision joint venture. Based on Caspar 250 UAV	unknown 2006
23. India	Harop Harpy Heron Heron Heron Searcher I Searcher II Searcher II Searcher II	12/12 22/22 34/34 36/36 32/32 38/38 2/2	Sale (unconfirmed) Sale Sale Sale Sale Sale Sale Licence – made in India from '06	Unknown Not stated 2001-2002 2005-2006 2006 -2012 1998-2000 10 in 2001 2003 2006
24. Indonesia	Searcher II	4/4	Sale	2012
25. Ireland	Orbiter	6/6	Sale	2007
26. Italy	Casper 200 "Hermes 2000"		Sale Joint venture (unconfirmed)	2004 unknown

27. Kazakhstan	Orbiter		Sale (unconfirmed)	unknown
28. Macedonia	Skylark I		Sale (unconfirmed)	unknown
29. Mexico	Hermes 450 Hermes 900 Skylark I	2/2	Sale Sale (unconfirmed) Sale	2009 unknown 2008
30. Netherlands	Aerostar Skylark I	5/5	Lease Sale (unconfirmed)	2009-10 unknown
31. Nigeria	Aerostar	9/9	Sale	2007
32. Philippines	Blue Horizon	2/2	Sale	2001
33. Poland	Aerostar Skylark I Orbiter	8/8 9/3	Sale Sale (unconfirmed) Sale	2010 unknown 2005 and 2007
34. Russia	Aerostar Bird-Eye 400 Heron 1 I-View-150 Searcher II Searcher II	8/8 2/2 10/2	Sale Sale Licence Sale Sale Joint venture	2003 2009-2011 2010? 2010 2009 2011
35. Singapore	Blue Horizon Hermes 450 Hermes 1500 Heron 1 Scout Searcher II Skylark	5/5 5/5 60/60 42/42	Sale Sale Sale (unconfirmed) Sale Sale Sale Sale	1998 2007 unknown 2012 1991 1995 2006
36. Slovakia	Skylark I		Sale (unconfirmed)	unknown
37. South Africa	Scout Hermes 1500	64/64	License and joint venture Sale (unconfirmed)	1986 unknown
38. South Korea	Harpy Searcher Skylark II	100 3/3	Sale Sale Sale (unconfirmed)	1999 unknown 2007
39. Spain	Harpy Heron 1 Searcher II Heron TP Eitan	4/4	Sale Sale (unconfirmed) Joint venture Joint Venture	2000 unknown 2008 2008
40. Sri Lanka	Blue Horizon-2 Searcher II Super-Scout Super-Scout Super-Scout	7/7 2/2 3/3 2/2 6/6	Sale Sale Sale Sale Sale	2009 2009 2007 2001 1998
41. Sweden	Skylark I		Sale	By 2006
42. Switzerland	Ranger	28/28	Joint venture with IAI, based on Scout UAV	2001
43. Taiwan	Searcher II		Sale	Unknown
44. Thailand	Aerostar Searcher II	4/4 4/4	Sale Sale	2011 2011
45. Turkey	Aerostar Harop Harpy Heron 1 Heron 1 Searcher	3/3 108 1/1 10/10 1/1	Sale Sale (unconfirmed) Sale Lease Sale/joint venture Sale	2008 Unknown 2002 2007 2008 2008
46. Uganda	Orbiter II Falcon Eye/Mini	2/2	On order Sale (unconfirmed)	2011 2011
47. United Kingdom	Eagle 1 (based on Heron I) Hermes 450 Hermes 450 Watchkeeper	1/1 20/20 5/5 54/54	Sale Lease Lease Licence and Joint Venture. Based on Hermes 450	2003 2007 2012 2009
48. United States	Aerostar Hermes 450 Hunter RQ-5A Pioneer	2/2 2/2 62 48	Licence Sale or Lease Joint venture Sale	2004 2003 1996 1990
49. Uzbekistan	Hermes 450		Sale (unconfirmed)	2012

Israeli drone manufacturers have established joint venture agreements with companies in Argentina, Azerbaijan, France, Italy, Russia, South Africa, Turkey and the UK. A further way that drone technology is transferred is through third country suppliers. For example, Australia's Israeli drones are leased via a Canadian Company; Finland ordered its Israeli drones via a Swiss company; Indonesia's drones were reportedly purchased through a Philippines company and some Philippines drones are rumoured to be supplied from Singapore.

Most recently there is a growing market for Israeli drones in African countries. According to drone expert and journalist Arie Egozi, almost all the major Israeli UAS manufacturers have sold their systems in Africa, and are either fully operational or in the process of gaining this status. Specifically Egozi says Israel Aerospace Industries (IAI), Elbit Systems and Aeronautics have sold UAS to Angola, Kenya, Cote d'Ivoire, Nigeria, Ethiopia and Tanzania with the Israeli ministry of defence clearing the Heron UAV for export to some African nations in 2012.⁹⁴

The UK Watchkeeper Programme

In July 2005 the UK government announced that it was placing an £800m contract with Israel for the development of a new unmanned drone. 'Watchkeeper' was to be a new British drone to provide surveillance, reconnaissance and targeting for the British Army's artillery regiment.⁹⁵ Although the Watchkeeper is currently unarmed, Thales had presented "a version of the Watchkeeper drone" armed with missiles at various global exhibitions⁹⁶ and the *Jerusalem Post* reported that Thales suspended a Watchkeeper UAV from the ceiling at the DSEI Arms Fair in London in 2011, armed with two missiles hanging from its wings.⁹⁷

Watchkeeper is based on Israel's Hermes 450 drone and is being built by U-TacS Limited, a joint venture company owned by Israel's Elbit Systems and Thales UK. U-TacS had 110 British employees and 'a few Israelis' in December 2012. Elbit Systems is a privately owned Israeli company and holds 51% of U-TacS shares.⁹⁸ The engines for Watchkeeper are being provided by UAV Engines of Shenstone, outside Birmingham, a wholly owned subsidiary of Elbit Systems.⁹⁹ *The Guardian* reported that twenty seven aircraft had been delivered by Thales UK by May 2013.¹⁰⁰

In October 2008 the British Foreign Office discovered that early testing of the Watchkeeper drones was due to be carried out in the Golan Heights which are Israeli occupied Syrian territory. After objections the tests were moved within 1967 Israel.¹⁰¹ The first ten Watchkeeper drones were built in Israel with the production then switching to a purpose built facility at the Thales factory in Leicester. In April 2010 the first test flights of Watchkeeper took place at the Parc Aberporth UAV Centre in West Wales.¹⁰²

In June 2007 British forces began using leased Israeli Hermes 450 drones in Iraq and then Afghanistan as a stop-gap measure until Watchkeeper was ready to enter service.¹⁰³ Under an Urgent Operational Requirement (UOR) the UK rents a number of the Israeli drones in an innovative 'pay by the hour' basis through Thales and Elbit Systems. Thales announced in December 2012 that the UK-hired Hermes 450 drones had flown over 70,000 hours in Afghanistan adding that "this is more than all the other UAVs employed by other member states of the multinational force (other than the U.S.)."¹⁰⁴ UK's Israeli Hermes 450 drones are operated from Camp Bastion in Helmand province, Afghanistan and the MoD said in October 2013 that roughly 1,460 flights a year are being conducted with the fleet.¹⁰⁵

Watchkeeper was originally to be in service with British forces in Afghanistan by February 2010 but delays pushed back the in-service date first until 2011 and then to early 2012.¹⁰⁶ Both these dates have been missed. In March 2012 the British government admitted in a written parliamentary answer that it had no idea when the Watchkeeper would be ready to enter service. According to the MoD the delays were because the Watchkeeper drone was "trying to secure all the necessary airworthiness certification to fly in both a civil and a military environment."¹⁰⁷ Yet, as recently as July 2012 the MoD stated it had no requirement to operate military UAVs in UK civilian airspace.¹⁰⁸

In December 2012 the Ministry of Defence (MoD) revealed that Thales UK has been picking up the cost of the UK's use of the Israeli Hermes 450 drones in Afghanistan because of the delays to Watchkeeper since 2011.¹⁰⁹ These costs are likely to be very high as it was also revealed that eleven Hermes 450 drones had crashed on British operations in Afghanistan since 2007.¹¹⁰

At the time of writing test flights of the Watchkeeper continue to take place at Parc Aberporth in West Wales.¹¹¹ Residents living around Parc Aberporth in Wales complain about the noise, and they fear for their safety after the instigation of night flights in 2012.¹¹²

In October 2013 Watchkeeper gained a Statement of Type Design Assurance (STDA) from the UK Military Aviation Authority (MAA) but does not have a full Release to Service (RTS). With the planned drawdown of British forces at the end of 2014, it is questionable whether the system will actually be deployed to Afghanistan, the purpose for which it was procured at a cost of £831 million.¹¹³

Israel's 'dodgy' drone deals

While space forbids a detailed examination of Israel's drone exports there are a number of aspects of Israel's drone deals that should cause particular concern to the international community including where Israel has sold drones to both sides of an ongoing conflict, to countries with poor human rights records and to countries engaged in local arms races.

Both Sides

Israel has sold drones to both Russia and Georgia who are engaged in an active dispute over control of South Ossetia and Abkhazia. This conflict turned into 'hot war' for ten days in August 2008. For months before, Georgia flew their Israeli-made Hermes 450 drones over the conflict regions and there were reports of between three and seven drones being shot down over Abkhazia in April and May 2008.¹¹⁴ A video was published of one of Georgia's drones being shot down filmed by the drone's own camera.¹¹⁵ From the footage a UN investigation confirmed¹¹⁶ that it was shot down by a laser guided missile from either a Russian MiG-29 or Su-25 fighter plane.¹¹⁷ In September 2008 Georgia claimed it shot down a Russian drone over territory close to the breakaway province of South Ossetia.¹¹⁸

Military commentators argued that Russia had been outflanked by the sophistication of the Georgian unmanned drone fleet bought from Israel. Within twelve months Russia announced it too had bought 12 drones for \$53 million from Israeli Aircraft Industries.¹¹⁹ According to one source: "If Russia was drone-poor and Georgia drone-rich before the conflict, everything changed when Israel switched sides"¹²⁰

Human Rights Abusers

Israeli UAVs have also been used to help carry out human rights abuses.¹²¹ The government of Sri Lanka used Israel's IAI Super-Scout and Searcher II drones in operations against Tamil Tiger rebels (LTTE) from 1996, when the Sri Lankan Air Force's No. 11 Unmanned Aerial Vehicle Squadron was established.¹²²

In January 2008 the Sri Lankan government abandoned a truce with the LTTE to pursue victory in a military offensive called the "Humanitarian Operation", in which it used "some significant advanced surveillance systems in the form of unmanned aerial vehicles (UAVs) from Israel".¹²³ International Crisis Group's (ICG) investigation found that it was during the final offensive against the LTTE, between January and May 2009, that the fiercest fighting occurred and Gordon Weiss, a former UN spokesman in Colombo, told *The Independent* he estimated up to 40,000 civilians were killed.¹²⁴ While commentators agree that there were atrocities committed by both sides during the long civil war, ICG found "there is an increasing body of evidence that the government security forces repeatedly violated [international humanitarian law] by attacking civilians, hospitals and humanitarian operations."¹²⁵

ICG were told that surveillance drones were seen in the sky over Mullvaykkal Hospital on 2 May 2009 while it was being shelled, and multiple civilian targets were shelled in a 'No Fire Zone' in Vanni while drones were seen flying overhead.¹²⁶ Meanwhile the Sri Lankan Air Force's website says that its Israeli-made Searcher MK II drones were among "the key contributors to operational success against the LTTE with 1665.49 operational hours during 265 operational missions."¹²⁷

Fuelling Arms Race

Israel's drone exports to India have helped to fuel a drone 'arms-race' with Pakistan according to industry experts.¹²⁸

India is a major purchaser of Israeli drones, and in 1999 they were used during the Kargil conflict with Pakistan, "thereby starting an unmanned arms race with the country's neighbour" according to Andrew White of *Shephard's Unmanned Vehicles*.¹²⁹ Mark Sofer, former Israeli Ambassador to India, said to India's *Outlook* magazine "We have a burgeoning relationship and the defence relationship got a major boost during Kargil, when Israel came to India's assistance when India was in great need and brought about the turnaround in the situation on the ground."¹³⁰ Arielle Kandel, an expert on India at the Jewish People Policy Institute, a Jerusalem-based think-tank, was more specific and told the *India Times* "during the Kargil war, Israel... promptly supplied India UAVs for high-altitude surveillance, laser-guided systems, etc. within a day of being asked for help."¹³¹

India has traditionally leaned on Israel for its supply of UAVs, Derrick Maple, principal analyst at IHS Industry Research and Analysis said, but has recently ramped up development of indigenous manufacturing.¹³²

As well as being wrong-footed by India's surveillance drone capability in 1999, Pakistan is also subject to US drone strikes in the Federally Administered Tribal Areas.

Pakistan has responded by developing its own drone industry. Manufacturers Integrated Dynamics and Satuma, make a range of small surveillance drones. Satuma's Jasoos II is described by the manufacturer as Pakistan's "primary work horse for UAV Operations and Training Program" and went into service in 2009.¹³³ There are rumours of Pakistan buying Chinese CH-3 and CH-4 drones, the latter of which can carry four precision guided bombs¹³⁴ but there is no date for these going into service. Pakistan Aeronautical Complex (PAC) is co-producing Falco drones with Selex Galileo,¹³⁵ and Pakistan seeks US drones too such as the RQ-7 Shadow.

5. Conclusion

“Already today we see that the technology can work faster and better than our five senses, which are limited... When you take away the human factor in battle and send tools that know how to do it better, it’s easier.”

Tzvi Kalron, a marketing manager for Israel Aerospace Industries¹³⁶

This briefing has attempted to break the silence surrounding Israel’s development, use and proliferation of drones. There has been much media investigation into the US use of drones in Pakistan and elsewhere, and some investigation into the UK use of armed drones in Afghanistan. Israel’s involvement in the drone wars, however, has received much less attention due to the great secrecy with which it is surrounded.

Ben Emmerson, the British lawyer and UN Special Rapporteur on counterterrorism and human rights, who is leading a UN investigation into the use of armed UAVs, recently appealed to Israel through the Israeli newspaper Haaretz for co-operation:

"This technology is being used by three democracies and there needs to be a public debate. It would be extremely helpful if Israel cooperated and it would be remiss of me to ignore Israel in an investigation of technology used by three states, one of which is Israel."¹³⁷

Israel, as we have seen, has been using drones over the past forty years for surveillance and intelligence purposes. In addition, despite no official confirmation, since as early as 2004 reliable reports have described the use of armed drones by Israeli forces in the ongoing conflict in the occupied Palestinian territories. More recently Israel’s increasing use of remote warfare as seen in Operation Pillar of Defence in 2012, has removed altogether the need for ‘boots on the ground’ setting a worrying precedent for future military operations.

We have also attempted to detail the proliferation of Israeli drones across the globe. Israel is the world's sixth largest weapons exporter securing deals amounting to \$2.4 billion in 2012.¹³⁸ Israel’s trade in drones is an increasing part of this with recent figures putting Israeli drone exports as the highest in the world.

The price for Israel’s booming drone export industry is being paid for however by Palestinians who are forced to live under Israeli drones, and by the growing number of victims of current, and no doubt future drone wars around the globe.

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Drone Wars UK

Drone Wars UK is a small British NGO, founded in the Spring of 2010, to undertake research, education and campaigning on the use of Unmanned Aerial Vehicles and the wider issue of remote warfare. Drone Wars UK has become recognised internationally as a credible and reliable source of information on the use of drones and unmanned technology. The research and information produced by Drone Wars UK is used by journalists, NGOs, lawyers, human rights organisations, campaigners and the general public. Drone Wars UK has been one of the key voices publicly expressing serious concerns about the expansion of this new way to wage war.

Abbreviations

HRW	Human Rights Watch
IAF	Israeli Air Force
IAI	Israeli Aircraft Industry
IDF	Israeli Defence Forces
IHL	International Humanitarian Law
SIPRI	Stockholm International Peace Research Institute
UAS	Unmanned Air Systems
UAV	Unmanned Aerial Vehicle
UK	United Kingdom
US	United States
UN	United Nations
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
UNRWA	United Nations Relief and Works Agency

Israel and the Drones Wars

Israel and the Drone Wars examines Israel's growing production, use and proliferation of military unmanned aerial vehicles (UAVs) commonly known as drones. Israel is one of only three countries (along with the US and the UK) that have used armed drones in conflict.

In many ways, Israel has led the way in the use of unmanned aerial vehicles in military conflict, with its development and use of UAVs going back at least four decades. Israel's persistent use of surveillance drones over Gaza is without precedent and has a serious and detrimental impact on the lives of ordinary Palestinians. Israel's use of armed drones in Operation Pillar of Defence, the November 2012 military offensive into Gaza, appears to be the first major military incursion not to use ground forces at all and sets a precedent for military intervention.

Drone Wars UK research has discovered that about fifty countries out of the more than seventy known to have some form of military UAV capability have received drones or drone technology transfers from Israel. Indeed it could be said that if you scratch any drone you will likely find Israeli technology underneath.