The Weapons Industry Transformed

*by **Jack Gilroy**, September 3, 2022*

Locally, we have two of the top ten weapons makers in the world, BAE Systems (#3 according to their website) and Lockheed Martin, the indisputable #1 weapons maker in the world.

No other world culture comes close to our eagerness to dominate other cultures. We have over 800 military bases around the world and have embraced terror over diplomacy. Terror has failed miserably.

Our greed to dominate other lands and people has been a colossal failure. Militarism backed by our firepower has not subdued Vietnamese, Iraqis, nor Afghans. Yet, the cleverness and plotting of the Pentagon and its contractors each year win increases not decreases in weapons making.

Much has been said about the $739 billion to be spent over the next ten years under the *Inflation Reduction Act. We spend more than that figure each year on weapons of mass killing.*

BAE and Lockheed Martin years ago took baby steps to transform a tiny part of their annual revenue into sustainable products or services such as electric bus production at BAE Endicott while Lockheed Martin received a contract to enhance postal packaging at its Owego facility. $221 million given to Lockheed for postal work amounts to about three tenths of one percent of the $78 billion given to them by the US government in fiscal year 2022.

The major arms industry uses these tidbit nonmilitary expenditures to claim they are doing economic conversion from military to real needs. It’s a sham and they know it.

If workers in the weapons industry were told their jobs would now focus on systems research and production to make our world more livable a sense of joy and purpose would sweep through the arms industry. They would know

they were doing work to save our planet from climate disasters. If workers awoke each morning with a resolve to get to work and find ways to get pure water to people around the world (including our own native and poor people who have to live with contaminated water) they would have renewed purpose to help others, not with daily plans for more destruction and blood letting.

Lockheed Hellfire missiles and BAE laser systems to kill do not address the existential danger of climate crisis. The work of the arms industry could transform to work to cure diseases, to stopping the next pandemic before it starts, to ensuring clean soil and air, to ending malnutrition and hunger, to saving our plant and animal life.

Waking up each day with a zest to do good must be difficult for employees whose job is to design and produce weapons of death and destruction. Yet, our strange culture each year allocates 54% of our discretionary federal spending to our war industry.

Arms industry workers need to demand a sense of moral purpose in their work. Making electric buses and organizing mail distribution is a start to celebrate. The tasks to improve our nation and world are endless, economically profitable and morally joyous.

CEO letter supporters September 9th War Merchants Exposure Day

Veterans for Peace: veteransforpeaceusa.org

World Beyond War: worldbeyondwar.org

Code Pink: Codepink.org

Peace Action: Peaceaction.org

Upstate Drone Action: upstatedroneaction.org

United National Antiwar Coalition: UNACPeace.org

Catholic Worker: Catholicworker.org

Pax Christi USA: Paxchristiusa.org

Pax Christi DC-Baltimore: www.PaxChristiMDCB.org

Nevada Desert Experience: NevadaDesertexperience.org

Brandywine Peace Community: BrandwinePeace.com

Friends of Franz & Ben: bensalmon.org

Broome County NY Peace Action: BCPeaceAction.org

Association of United States Catholic Priests

Pax Christi NYC: PaxChristiNYC.org

Pittsburgh Anti-War Committee

Florida Peace Network

Can the Drone War Be Made More Humane?

*by **John Kiriakou**, published on **Covert Action Magazine**, January 23, 2022*

An article in the latest issue of Foreign Affairs magazine, widely seen as the official mouthpiece of the neoliberal foreign policy establishment, posits that the U.S. government's drone program could be made more humane, killing "*fewer innocent civilians*," while still targeting the bad guys who find themselves on the White House "*Kill List*".

Billboard in Sana, Yemen pointing to human costs of U.S. drone war there. [Source: peoplesdispatch.org]

The authors, three professors from Cornell University[1], point to a recent *New York Times* article that said,

> *"Airstrikes (during the Afghanistan and Iraq conflicts) allowed America to wage war with minimal risk to its troops. But for civilians on the ground, they brought terror and tragedy."*

They write that the Pentagon admitted to 188 civilian deaths by drone since 2018, but that the real total "*is likely hundreds more than that*." My own educated guess is that civilian deaths by drone number well into the thousands. But that's not the only problem with the drone program.

Any drone program, whether it's run by Americans at the Pentagon or the CIA, Saudis in Yemen, or any other combatant anywhere in the world, is illegal, immoral, and unethical.

Lamenting the loss of civilian lives, promising to make drones more precise, and paying off the families of dead civilians doesn't make it right. And the mainstream media seem either unable or unwilling to recognize this.

The New York Times published an interview with a spokesman for the U.S. Central Command, in which he said without any challenge from the journalists,

> *"Mistakes do happen, whether based upon incomplete information or misinterpretation of the information available. We try to learn from those mistakes."*

That's simply not true.

Did the Pentagon learn anything when it bombed an innocent family in Afghanistan while the father was loading bottled water into the trunk of his car, killing 10 people, including seven children?

Innocent family killed in the last U.S. drone strike in the long Afghan War. [Source: cnn.com]

Did it learn anything when it launched an attack on "*ISIS headquarters*," targeting "*white bags of ammonium nitrate*" and a "*homemade explosives factory*," which turned out to be the longtime home of two brothers and their wives and children; the white bags turned out to be bags of cotton. And a "*heavy object being dragged into a building*" was a child. What was the lesson learned there?

What *The New York Times* and other outlets won't tell you is

that many drone strikes are specifically meant to attack civilians.

Image of a mosque that was destroyed by a U.S. drone strike in Jinah Syria in March 2017 that killed 46 civilians. [Source: chicagotribune.com]

Just look at what's happening in Yemen, where the Saudi and Emirati governments are using U.S.-made drones to terrorize the civilian population under the guise of fighting the Shia Muslim Houthi "*rebels*." The U.S. and its allies deem the latter to be Iranian proxies.

Even the pro-Pentagon Military Times reported that in 2018 fully one-third of all drone strikes in Yemen were against civilian targets.

People are seen near a bus destroyed by an airstrike that killed dozens of children, in a photograph taken on August 12, 2018 in Saada, Yemen.

People are seen near a bus destroyed by an airstrike that killed dozens of children, in a photograph taken on August 12, 2018 in Yemen. [Source: hrw.org]

In one such incident in August 2018, the Saudi military, using U.S. drones and U.S. missiles, blew up a school bus in Dhahyan, Yemen, killing 26 children and wounding another 19, a clear war crime.

In 2019, a Saudi drone strike on a Yemeni vegetable market killed 13 people, including children, and wounded another 23. Also in 2019, the U.S. rocketed a wedding in Afghanistan, killing at least 40 civilians. (The Pentagon had claimed that it was an attack on the Taliban and bragged that a "*foreign fighter*" from Bangladesh also had been killed.)

Afghans wheel victim of wedding attack to their grave. [Source: cnn.com]

The truth of the matter is that the drone program makes Americans less, rather than more, safe. I can tell you from first-hand experience that nearly every al-Qaeda fighter that I captured or interviewed when I headed counterterrorist operations for the CIA in Pakistan told me that he had never had any problem with the United States, *until we launched drone attacks on his village*.
It had never occurred to most young al-Qaeda fighters to take up arms against the United States until they heard the sound of "*the dragonfly*," as they call the drones, until the drone fired rockets indiscriminately at their homes, until the drone killed their fathers, brothers, cousins, uncles, and friends.

What else, then, would we expect them to do? I would probably seek revenge, too.

There is a way to change this situation, of course.

It's not to "*learn from the mistakes of the past*," as the CENTCOM spokesman maintains. It's to end the drone program permanently.

Has nobody at the White House, the Pentagon, or the CIA ever thought that perhaps wars are supposed to be difficult to fight?

Perhaps there should be a danger to soldiers. That might make policymakers think twice before putting U.S. lives on the line.

Drones aren't better for warfighting. They're worse. They put our country in long-term danger.

Every patriot should oppose them.

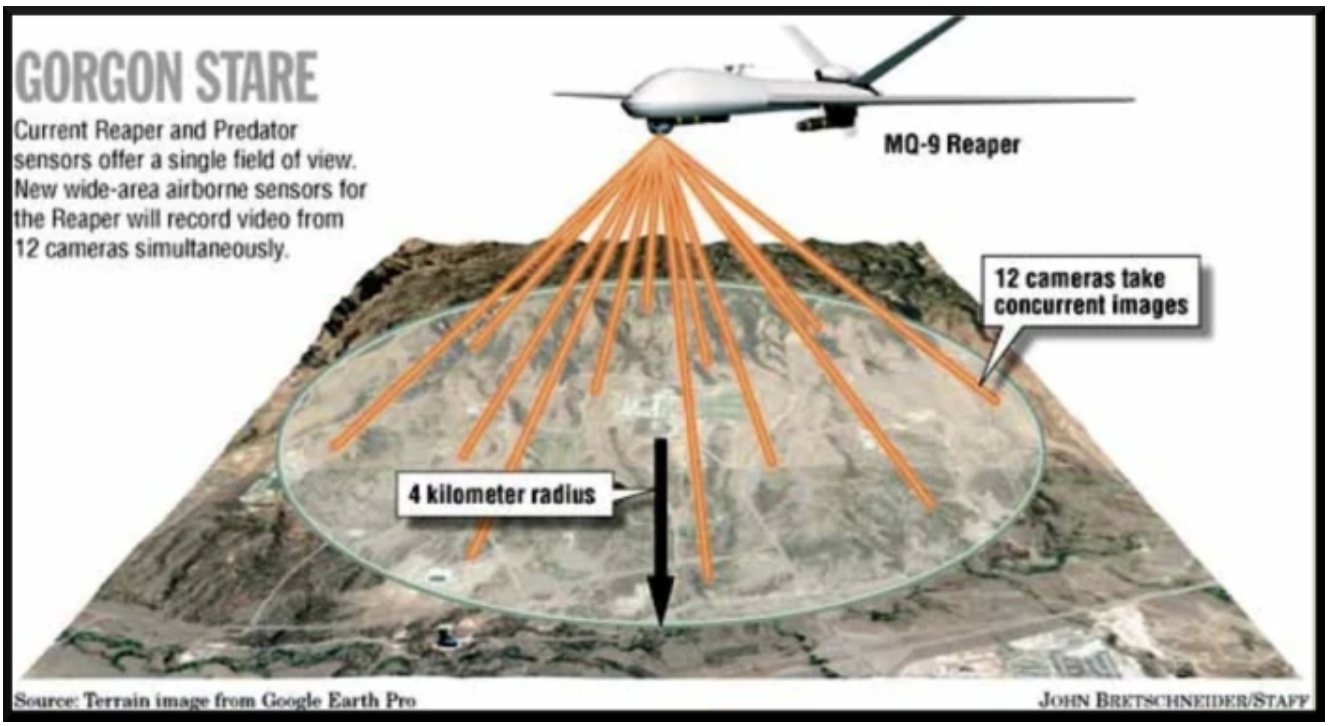
1. Paul Lusehnko, Sarah Kreps, and Shyam Raman. ↑

**Featured Image:* *Billboard in Sana, Yemen pointing to human costs of U.S. drone war there. [Source: peoplesdispatch.org]*

John Kiriakou is a CIA whistleblower. Since he left prison, he has worked as a writer and commentator in the alternative press.

Military Spy Drones: How Domestic U.S. Drone Integration is Propelling Next Wave of Killer Drone Proliferation

*by **Barry Summers**, published on **Covert Action Magazine**, January 21, 2022*



"Gorgon Stare will be looking at a whole city, so there will be no way for the adversary to know what we're looking at, and we can see everything." [Source: wired.com]

Drones, or Unmanned Aircraft Systems (UAS), were developed for war. The idea was first conceived in World War I and they were first adopted for surveillance purposes at the end of World War II and in the Korean and Vietnam Wars. Then military drones like the Predator became armed during the "*Global War on Terror*."

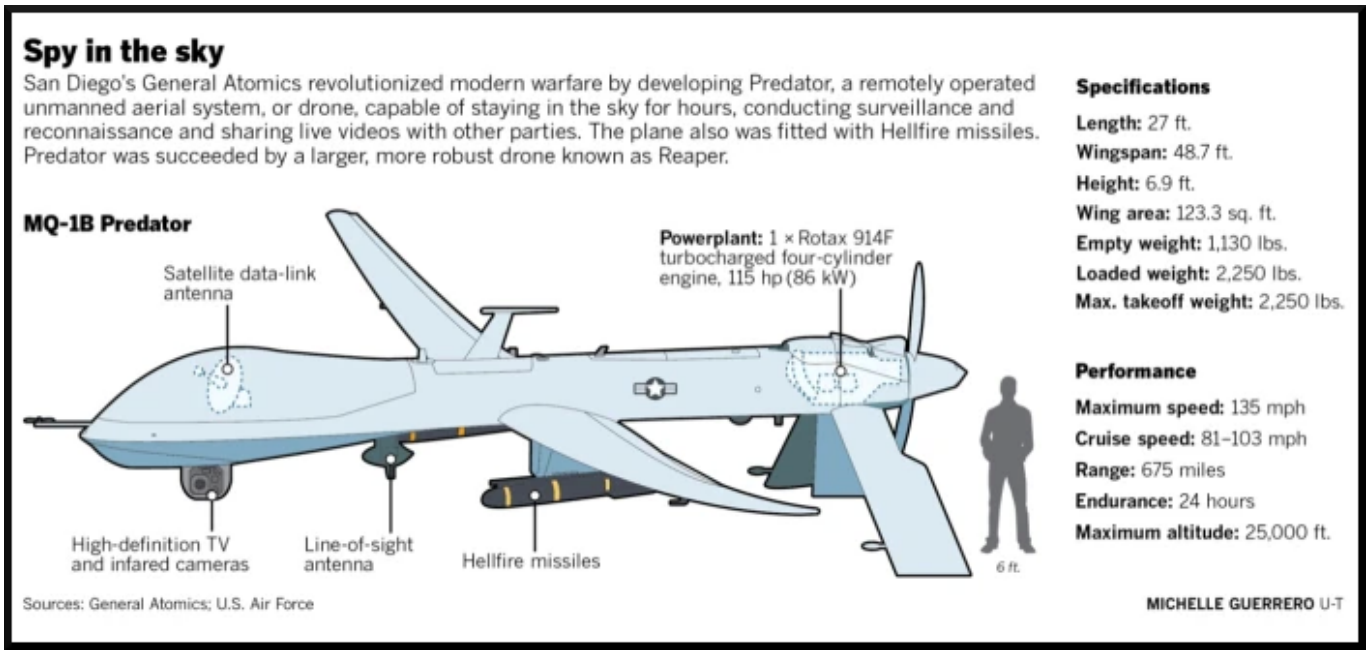
For many years now, people in war zones like Iraq and Afghanistan have had to assume that they were being tracked by a drone they could not see, circling miles over their heads. In the United States, government and corporate surveillance is everywhere. However, other than isolated exceptions like the Predator circling over Minneapolis during the George Floyd protests, military drones have not been allowed to operate in civilian, or "*non-segregated*," U.S. airspace. That is about to change.

SEC. 935. PLAN ON ACCESS TO NATIONAL AIRSPACE FOR UNMANNED AIRCRAFT SYSTEMS.

(a) IN GENERAL.—The Secretary of Defense and the Secretary of Transportation shall, after consultation with the Secretary of Homeland Security, jointly develop a plan for providing expanded access to the national airspace for unmanned aircraft systems of the Department of Defense.

With very little public notice, the U.S. government started the process of opening U.S. civilian airspace to military drones (otherwise known as "*integration*") in 2010. The Department of Defense (DoD) and the Department of Transportation began drafting a "*Plan*," at the direction of Congress, and that Plan was signed into law by Barack Obama in 2012.

The Plan emphasized Federal Aviation Administration (FAA) steps to integrate "*civil*" (civilian, commercial, hobbyist) drones into the National Airspace System (NAS). But the short section devoted to "*public*" (government, military) drones served the original purpose—beginning the opening of U.S. skies to routine operation of Predators, Reapers, and other drones. A plan within a Plan.



Since then, it has become clear that there was another plan within this Plan. It involved using the imprimatur of the FAA to push the next generation of U.S.-made surveillance/attack drones onto U.S. allies across the globe—not all of whom were deemed suitable to receive advanced U.S. drones previously. Countries with a history of human rights violations [like Morocco or the United Arab Emirates (UAE)], or perpetual states of conflict with their neighbors (like India or Taiwan) have not been able to acquire the most advanced U.S.-made drones. Those restrictions are now falling away.

One U.S. drone maker was at the center of the effort from the start: General Atomics (GA). Maker of the Predator, and then the Reaper, its newest, most advanced drone is the MQ-9B SkyGuardian.

Originally called the "*Ceritifiable Predator B*," GA started developing it in 2012 soon after the Plan was signed into law. As the name implies, it was designed from the ground up with the intention that it be certified to operate in domestic airspace. GA has been aggressively marketing it overseas since 2014, with the presumed certification by the FAA as a major selling point. (How aggressively? GA sued the German government to try to force it to reconsider choosing a competitor's drone.)

GA funded this project internally, meaning it placed a gigantic bet that its "*certifiable*" drone would be warmly received by the FAA. If in fact there was prior coordination among the DoD, FAA and General Atomics, it suggests that a U.S. foreign policy initiative, a "*Public-Private Partnership*," huge and unpublicized, was woven into this Plan.

Since it began in 2012, the majority of the reporting on the DoD/FAA's drone integration program has been about the civilian/commercial benefits of small drone integration—package delivery, local law enforcement, infrastructure inspection, etc. But behind the scenes,

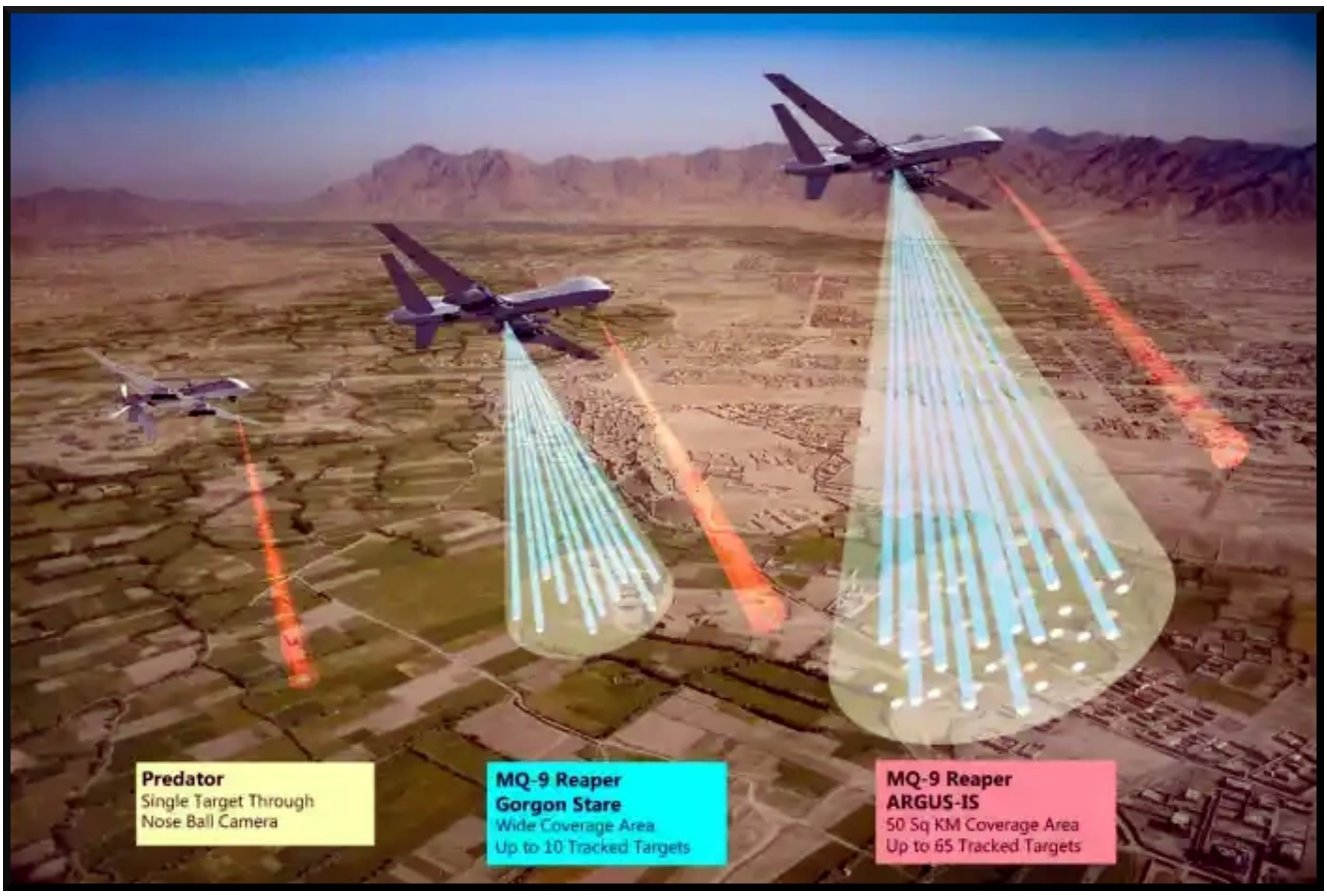
integrating military drones appeared to be the main purpose. And then, there are the foreign sales.

“The foreign sales aspect of these RPAs is potentially huge.”

U.S. Air Force (USAF) Major General James O. Poss, Deputy Chief of Staff for Intelligence, Surveillance, and Reconnaissance, the senior Intelligence officer for the USAF, was quoted in a 2012 article titled “*Military ‘Aggressively Working’ To Ease Drone Sales Abroad*.” He stated that “*the foreign sales aspect of these RPAs [remotely piloted aircraft] is potentially huge.… A less restrictive export policy for unmanned aircraft is “in the national interest of the United States*,” Poss continued. “*It’s something we’re aggressively working with both the OSD [Office of the Secretary of Defense] policy folks and the State Department*.”

Two months after that article appeared, General Poss retired from the USAF. During his career he had, among other things, shepherded the Reaper drone through its certification in 2005. He was central to expanding the role of drones in Iraq and Afghanistan, and for touting their capabilities, like the new “*Gorgon Stare*” technology. Gorgon Stare and its successors allowed the USAF to maintain a constant, high-definition video database of a huge area, which could be searched at a later date.

“Gorgon Stare will be looking at a whole city, so there will be no way for the adversary to know what we’re looking at, and we can see everything.”



[Source: cp-techusa.com]

After leaving USAF, Poss was tapped by the FAA to direct research into integrating drones into domestic U.S. airspace. He was almost certainly one of the authors of the Plan.
While the choice of leadership of the FAA UAS Center of Excellence was billed by the FAA as a "*rigorous competition*," Poss appeared to have known years in advance that he would be holding this office. In a January 2015 interview just before the choice was announced, he said "*We've been preparing for this competition for over five years*." So that was, what—*2010?* From 2010 – 2012, Poss was still at the Pentagon.

The decision to place Poss in this office was likely made by the FAA Assistant Administrator for NextGen, the office that oversees all FAA Centers of Excellence. At the time, that position was held by former USAF Major General Edward L. Bolton, Jr., Director, Space and Cyber Operations. His role is especially interesting as GA was on a path to become a major player in the militarization of space.

Bolton and Poss were two of the dozens of former senior military officers occupying positions at FAA and ancillary organizations involved in drone integration.

General Poss again, from the 2012 article:

> *[T]here are international lawyers out there that think the various treaties dealing with cruise missiles apply," such as the Missile Technology Control Regime (MCTR).*

The MTCR was embraced by the U.S. in part to keep advanced drone technology from countries which were not solid allies of the U.S. Not that U.S. drone technology is unrepresented abroad. The Reaper drone is a major weapons system of many U.S. allies. (A man named Stephen Luxion was instrumental in providing the MQ-9A Reaper to U.S. allies. His name will come up again.)

Another of those likely Plan authors featured in that 2012 article was DoD official Steven Pennington. For the previous several years, he had been the principal public advocate of opening U.S. airspace to military drones.

> *"A senior Air Force civil servant put the stakes bluntly: 'The aviation enterprise is the crown jewel in the U.S. economy by far. It has the greatest number of high value jobs, it has the greatest value that is exported,' said Steven Pennington, director of ranges, bases and airspace. If the U.S. does not take the lead in the global drone market, he warned, Europe, Asia and others will 'quickly fill that void.'*

> *"Poss said, 'The stakes are strategic as well as economic. The military sees foreign military sales of all kinds as a way to build relationships with friendly governments while equipping them with gear that makes it easier to operate alongside U.S forces. Unmanned air vehicles are a*

particularly important area to be interoperable.’”

Poss had been celebrated for his years as a leader of “*interoperability*” between the U.S. and United Kingdom (UK) airborne intelligence forces. If there is any evidence that the drone integration Plan had an international proliferation agenda within it, *this was it*.

When Poss left the USAF in late 2012, his senior Intelligence counterpart in the Royal Air Force (RAF), Sir Stephen Hillier, had left his position several months earlier, to oversee UK Ministry of Defense (MoD) military procurement. This would place him at the center of the decision whether to purchase the newest U.S.-made military drone, GAs MQ-9B SkyGuardian, for the UK’s “*Protector*” initiative. It was one of four career moves for Hillier in ten years, coinciding with steps that would lead to the MQ-9B operating in UK skies. Other steps are explained below.

On the last day of 2013, the FAA announced the winners of the coveted state-level UAS test sites mandated in the 2012 FAA Act, chosen after a supposedly rigorous competition. There was no mention of military activities. However, each site wound up being led by a high-level, recently retired military officer. In one case, North Dakota (ND), it was headed by the state’s active-duty Air National Guard Commander.

DoD official Pennington actually cited ND’s Grand Forks Air Force Base in a 2011 article about the DoD/FAA drone program, months before the legislation was signed into law. He also stated that the funding for these sites would come from the DoD, not FAA. While they would all go on to conduct some civilian, commercial drone integration research, the military leadership, funding and military bases they operated on or next to, signaled what their principal purpose was.

For example, a few years after its founding, it was difficult to see where the FAA’s “*Northern Plains UAS Test Site*”

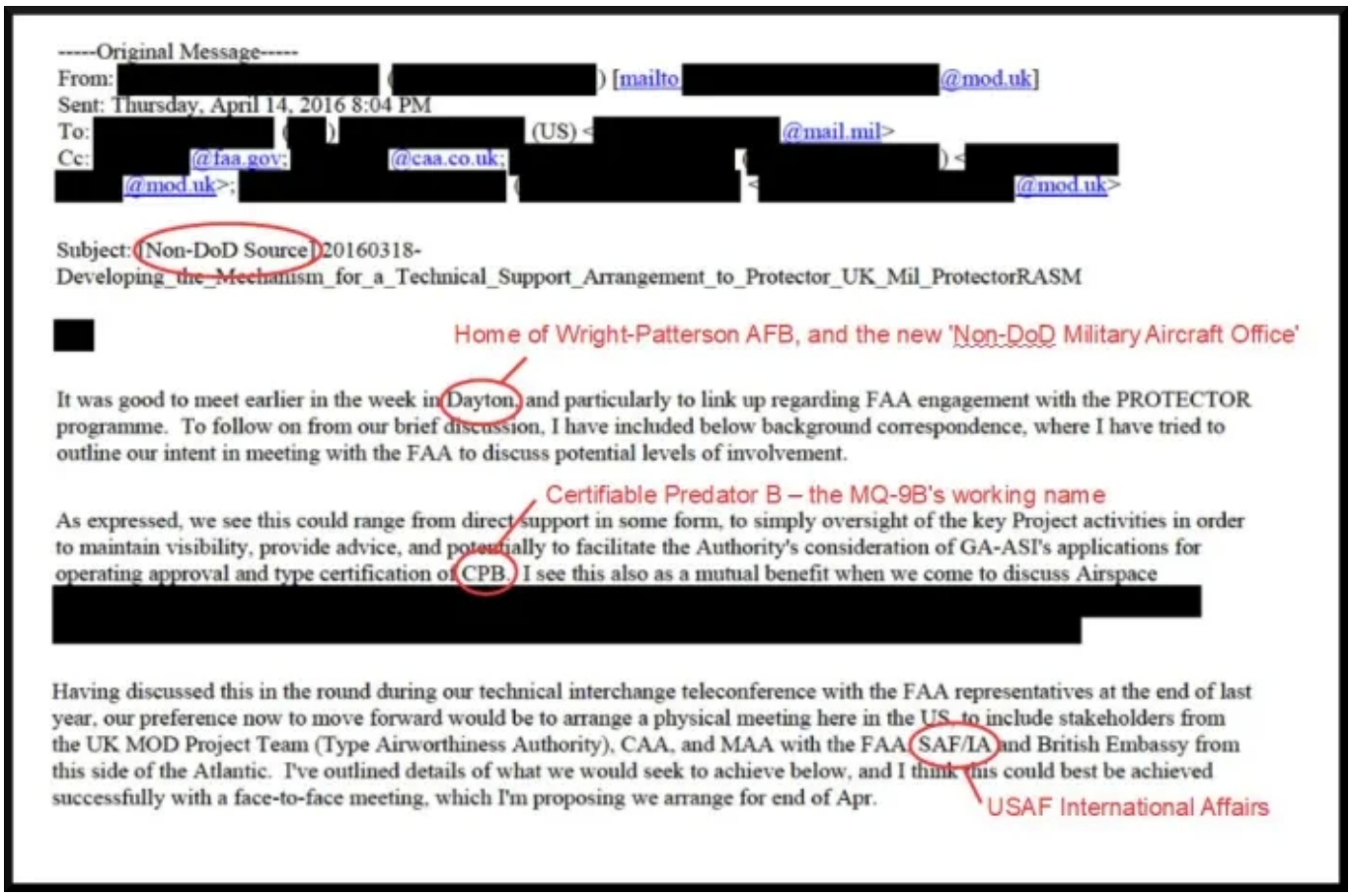
(NPUASTS), Grand Forks Air Force Base, and the large General Atomics facility next door begin and end. This was where the 2018 MQ-9B SkyGuardian flight over the Atlantic would depart from, on its PR mission to the UK's Royal Air Force. It was timed to arrive for the Royal International Air Tattoo airshow, where the newest military aircraft are displayed for potential buyers.

DoD official Pennington, cited above, was quoted in February of 2012 that the DoD would be selecting these sites based on their criteria. The fiction that this was anything but a principally military research operation is pretty thin. In any case, the test sites would share in federal research grants disbursed by former Major General James Poss's FAA UAS Center of Excellence, ASSURE.

By mid-March of 2016, the Unmanned Aircraft Systems Executive Committee (ExCom), created in 2009 to coordinate UAS activities among federal agencies, was expanded. It then included DoD, FAA, NASA, and the Departments of Commerce, Justice, and Interior. When NASA joined in 2010, it understood that the purpose of this coordination was to expedite public (military) UAS access to the NAS. The ExCom was chaired by former Major General Marke "*Hoot*" Gibson, previously Director of Operations, Deputy Chief of Staff for Operations for the USAF. At the time, he was the FAA's "*Senior Adviser on UAS Integration*." A two-star Air Force General would be representing the "*civilian*" FAA on a joint-agency committee overseeing drone integration.

The FAA also stated explicitly that the focus of the ExCom was "DoD's *UAS access into the NAS.*" ExCom was originally named the "*Joint Department of Defense and Federal Aviation Administration Executive Committee on Conflict and Dispute Resolution*," suggesting a history of conflict and disputes between the DoD and FAA on military drone integration which, according to the 2009 National Defense Authorization Act, posed "*a threat to national security*."

At that same time, emails obtained in 2018 by DroneWarsUK revealed extensive coordination between the MoD, GA, USAF, and FAA to persuade skeptical UK civilian air regulators not to block the acquisition of the MQ-9B for the Protector Initiative. One thread of emails had the subject line "*Developing the Mechanism for a Technical Support Arrangement to Protector*."



-----Original Message-----
From: [redacted] [mailto [redacted]@mod.uk]
Sent: Thursday, April 14, 2016 8:04 PM
To: [redacted] (US) <[redacted]@mail.mil>
Cc: [redacted]@faa.gov; [redacted]@caa.co.uk; [redacted] <[redacted]@mod.uk>; [redacted] <[redacted]@mod.uk>

Subject: [Non-DoD Source] 20160318-
Developing_the_Mechanism_for_a_Technical_Support_Arrangement_to_Protector_UK_Mil_ProtectorRASM

[redacted]

Home of Wright-Patterson AFB, and the new 'Non-DoD Military Aircraft Office'

It was good to meet earlier in the week in Dayton, and particularly to link up regarding FAA engagement with the PROTECTOR programme. To follow on from our brief discussion, I have included below background correspondence, where I have tried to outline our intent in meeting with the FAA to discuss potential levels of involvement.

Certifiable Predator B – the MQ-9B's working name

As expressed, we see this could range from direct support in some form, to simply oversight of the key Project activities in order to maintain visibility, provide advice, and potentially to facilitate the Authority's consideration of GA-ASI's applications for operating approval and type certification of CPB. I see this also as a mutual benefit when we come to discuss Airspace

[redacted]

Having discussed this in the round during our technical interchange teleconference with the FAA representatives at the end of last year, our preference now to move forward would be to arrange a physical meeting here in the US, to include stakeholders from the UK MOD Project Team (Type Airworthiness Authority), CAA, and MAA with the FAA, SAF/IA and British Embassy from this side of the Atlantic. I've outlined details of what we would seek to achieve below, and I think this could best be achieved successfully with a face-to-face meeting, which I'm proposing we arrange for end of Apr.

USAF International Affairs

That is when, coincidentally, the USAF committed to opening a "*Non-DoD Military Aircraft Office*" (NDMAO) at Wright-Patterson AFB. It would be dedicated to providing certification services to U.S. companies producing military aircraft that the U.S. did not currently intend to purchase. These services would be provided to private companies for a fee. The email thread then had the words "[Non-DoD Source]" added to the subject line. MQ-9B SkyGuardian is the NDMAO's first customer. The UK would eventually pay the bill.

It appears that did the trick. One month later, the UK

announced it would buy the MQ-9B. Both James Poss and Stephen Hillier resigned their respective posts within weeks, strongly suggesting that the sale of the MQ-9B to UK was the reason they were in those posts to begin with. Hillier would go on to become Air Chief Marshal, Commander of the Royal Air Force. Poss would found his own UAS consulting company. Edward Bolton had left FAA a month earlier, to become a Vice President at the Aerospace Corporation, the private company that manages the launch and space systems of the USAF and the National Reconnaissance Office.

Poss's successor at the FAA UAS COE was former USAF Colonel Stephen "*Lux*" Luxion. His career had two notable high points: He created and ran the first Predator attack unit tasked to the CIA in the "Global War on Terror," the 17th Reconnaissance Squadron. (While this fact was originally included in his ASSURE bio, it has since been deleted.)

Later, when the Reaper was established as the drone of choice for U.S. allies, Luxion was stationed in Europe overseeing basing decisions for the new drone squadrons. It is an unexpected pedigree for the head of FAA research into integrating drones into civilian U.S. airspace, unless one considers that the goal may have been to place advanced U.S.-made drones into *other* countries airspace as well.

A few months later, in July of 2016, ExCom member NASA announced its UAS "*Systems Integration and Operationalization*" (SIO) flight demonstrations. Listed first in the missions of vital importance are "*national security and defense*." However, when GA was later announced as one of the participants, the stated purpose of its flight would be to demonstrate potential civilian, commercial uses of large, military-grade drones. GA floated one civilian/commercial use of the MQ-9B on a defense industry news site: local law enforcement. In a surprisingly candid moment, the pro-industry reporter covering it called the idea "*dystopian*." GA would eventually land on

"*infrastructure surveying*" as a plausible commercial application of the $100 million, 6-ton, 79-foot wingspan MQ-9B.

A May 2017 presentation of NASA's program on drone integration appeared to have the SIO demo flights scheduled for summer 2021 (page 23).

In June 2017, the Trump administration announced its intention to sell the "*SeaGuardian*" MQ-9B variant to India. For the U.S. to sell the MQ-9B to India would require "decoupling UAS from the MTCR." A few months later, the Trump administration confirmed that it was "reviewing" the MTCR.

By October 2017, it appears that NASA's SIO demo flights were moved up one full year to summer 2020 (page 19).

> **November 2017**. General Atomics purchased the U.S. subsidiary of UK-based satellite maker Surrey Satellite Technology. GA is described as "*a defense contractor with a growing interest in building military-optimized spacecraft*."
>
> **August 2018.** NASA announced that General Atomics was one of the three companies selected to participate in its SIO demonstrations.
>
> **September 28, 2018**. General Atomics Awarded NASA Contract for Commercial Satellite.
>
> **January 24, 2019**. The UK's MoD announced they would purchase the "*Sense-and-Avoid*" systems for their MQ-9B Protector drones, after the original contract omitted that option. The decision came after GA went around MoD and lobbied Parliament directly:

"[F]ailure to make appropriate provisions threatens to undermine Protector's operational capability…One of the platform's key design characteristics is provision for the

sense-and-avoid capability required to facilitate operations in non-segregated airspace… MoD aspires to integrate such a sense-and-avoid system but it was not funded within the core program."

August 2019. GA performed a test of the SkyGuardian in civilian U.S. airspace for the benefit of the RAF, U.S. Marine Corps, and Royal Australian Air Force. The USMC was the first U.S. military branch overtly interested in the MQ-9B. GA touted the FAA clearance for the flight, which occurred almost entirely over mountains and desert. A week later, James Poss penned an opinion piece applauding the UK's purchase of the MQ-9B SkyGuardian, and urging the U.S. and all its allies to do the same, to prepare for a possible war with Iran. He claimed that the MQ-9B "*can fly integrated with even civilian manned aircraft*," a statement which two years later, still is not exactly true.

October 7, 2019. GA announced the planned SIO demo flight over San Diego. There are numerous misleading statements in the announcement, such as City of San Diego participation, etc. The principal stated purpose of the demo was infrastructure inspection, although it would be revealed later by the Voice of San Diego (VOSD) that they were still secretly pitching law enforcement uses.

November 28, 2019. Seven weeks after the San Diego SIO announcement, Australia announced it was going to purchase the MQ-9B instead of the cheaper MQ-9A, specifically because "*the MQ-9B is able to be certified to fly in civilian airspace*," again, not yet exactly true.

Mav 7, 2020. The UK announced that Sir Stephen Hillier would resign as Air Chief Marshal of the RAF, in order to take over the Civil Aviation Authority (CAA), just as it was grappling with whether to allow the MQ-9B to operate in UK airspace in the summer of 2021.

June 1, 2020. VOSD announced its lawsuit against the FAA for documents related to the proposed MQ-9B flight over the City. "*We can't get into details about a military aircraft program*," said the FAA. This, despite the fact that every aspect of the SIO flight stated publicly had been civilian: owner, operator, aircraft certification, airspace, sponsoring agency (NASA), stated purpose, etc.

July 9, 2020. GA informed *Forbes* that the SIO flight over San Diego was canceled.

July 24, 2020. The Trump administration officially changed how it "*interpreted*" the MTCR, clearing the way for military drone sales to countries that were previously excluded. New potential buyers of the MQ-9B soon included India, Taiwan, Morocco, and the UAE. Along with the confirmed sales to the UK, Belgium and Australia, it looked like MQ-9B sales would soon exceed $10 billion.

October 26, 2020. The VOSD released FOIA'd emails that showed the deep skepticism that FAA engineers had over the safety claims by GA. The proposed SIO flight over San Diego was eventually canceled, and replaced by a flight over non-populated areas. However, the specific reasons why it did so were redacted. Also, it is clear that FAA personnel were aware that GA would be using this supposed commercial demonstration flight to showcase the MQ-9B to foreign military buyers.

March 26, 2021. Reuters reported that the Biden administration was likely to keep the new MTCR policy.

May 2021. NASA released General Atomics final report on its SIO flight, which GA was required to generate in its SIO contract with NASA. It revealed that the critical safety component for avoiding other aircraft, the "*Detect and Avoid*" system, failed repeatedly during the flight, just as FAA engineers feared it would.

July 24, 2021. After fighting in court not to reveal the reasons for denying the proposed SIO flight over San Diego, the FAA agreed to answer a few more questions from the VOSD. In response to the question of "*Whether General Atomics voluntarily rerouted its flight to the desert, or whether the FAA denied the permit*," its paragraph-long answer could be summarized as: We never denied General Atomics a permit to fly the SkyGuardian over San Diego. We approved its permit to fly, just not over San Diego.

It is also fair to ask if the FAA was keeping the reasons for the San Diego denial under wraps so as to not embarrass GA. GA's sales pitch to foreign customers was that the MQ-9B could be certified for domestic operations. Rejection by the FAA for a demo flight for which it had been preparing for many years might cause potential customers to think twice before committing to a multi-billion dollar weapons purchase.

July 28, 2021. After delaying the decision for months, the UK's CAA (now headed by Sir Stephen Hillier, former Air Chief Marshal of the RAF) approved temporary airspace changes that would allow the MQ-9B SkyGuardian to operate in UK civilian airspace during the NATO "*Joint Warrior*" exercises. Joint Warrior is a major opportunity to demonstrate the MQ-9B to potential allied military customers. This was the exact same drone that was rejected by the FAA for a flight over the City of San Diego one year earlier.

September 8, 2021. In the middle of the Joint Warrior exercises, the MQ-9B appeared to detour to conduct "*Contested Urban Environment*" exercises over the UK Army's Imber Range in southern England. It is not clear if it was part of the official CUE2021 exercise. Some 48 hours after the flight, the Chief of the Air Staff of the RAF announced that, when the Protector drone is operational, it will be available for "*assisting local authorities*."

September 9, 2021. The RAF announced the creation of the "*Protector International Training Centre*" at the Waddington RAF base. That would be a MQ-9B pilot training facility for "*international partners*."

General Atomics is becoming a major player in military space hardware construction, including winning a DARPA contract to design a nuclear reactor to power spacecraft to the moon.

[Source: spacenews.com]

A Freedom of Information Act request to see the report containing the Plan mandated in the 2010 NDAA was placed with the FAA in the spring of 2021. Nine months later, the FAA has yet to acknowledge receipt of the request.
The Plan *appears* to be: civilian drone integration is cover for military drone integration is cover for military drone proliferation. Underlying it all is the familiar argument for foreign military sales: If the U.S. does not do it first, others will. For decision-makers, this dovetails neatly with the economic and political rewards, leading to: ***Drone proliferation is a necessary good.***

Apparently, we have no choice but to stay in the lead of the arms race ***we*** started. Rinse, repeat.

In the coming years, people in more and more countries (including the U.S. and its allies) will be wondering if a high-tech surveillance/attack platform is circling overhead, making a permanent record of everything they do once they set foot outside their homes. Is this the kind of "*freedom*" America should be exporting?

Public Health Professionals Must Demand an End to the Use of Weaponized Drones

*by **William Bruno**, published on **Truthout**, January 14, 2022*

On January 13, 2017, a family including a husband, wife and three small children scurried from building to building in East Mosul, Iraq. They were seeking refuge as a battle between ISIS (also known as Daesh) and U.S.-backed forces swirled around them. The family was huddled in an abandoned school surrounded by other civilians when a U.S.-operated drone struck and destroyed the structure. The father and one of his sons narrowly escaped with their lives. The tragic fate of his wife and other children would not be confirmed until months later when he watched as their bodies were excavated from the rubble.

This account was just one of several described in a recent publication of Pentagon reports documenting the extensive civilian casualties resulting from U.S. drone and air strikes. As the reporting shows, the considerable toll armed drones reap on civilian populations has largely been obfuscated by the U.S. government. What reporting such as this makes clear, however, is that weaponized drones are becoming a serious threat to public health.

The use of weaponized drones for targeted killings is not new and neither is the government's lack of transparency. The U.S. government has been steadily increasing lethal covert drone operations since 2008, and almost everything we know about the program comes from whistleblowers and leakers. Specifics

around the number of civilians killed and the extensiveness of the program are difficult to ascertain, but stories like the one above demonstrate the disregard for human life that results from the use of weaponized drones.

Like all violations of human rights, the public health community, of which I am a part, has an obligation to condemn the use of weaponized drones and demand an end to these targeted killings. If the goal of the public health sector – which includes health care practitioners, researchers, academics and policy makers – is, as the American Public Health Association's (APHA) website states, "*to prevent people from getting sick or injured*," then surely lending an authoritative voice in opposition to weaponized drones is more than appropriate.

U.S. citizens bear special responsibility. Unlike other causes of death or disability, weaponized drones are built, maintained and funded by our tax dollars. It is our elected officials who put them in action. Our complicity is unacceptable.

The APHA has made impassioned arguments advocating for the prevention of armed conflict from a public health perspective. However, little has been written specifically with regard to drones. This omission is important when one considers how our political leaders – even those often seen as advocates for "*peace*" – view the use of weaponized drones. For example, the Nobel-Peace-Prize-winning former President Barak Obama saw drone strikes as an alternative to the more uncouth, "*stupid wars*" that he railed against during his campaign. This perspective resulted in a huge expansion of the program under his administration with well over 500 strikes, including one that explicitly targeted and executed a 16-year-old-boy. Political leaders like Obama see drones as an acceptable "middle ground" that allows for the implementation of U.S. force without, at least ostensibly, the traditional collateral of American casualties or civilian deaths.

Drone strike-related deaths are not the only consequence felt by civilians. One researcher explains how children living in a region such as northern Pakistan – with heavy U.S. drone activity – "*become hysterical when they hear the characteristic buzz of a drone*," which often circle overhead 24/7. The psychiatric toll this constant threat of violence takes on children is hard to imagine.

Despite the common refrain from U.S. government officials that weaponized drones offer an extremely "precise" method of targeting, the truth is that civilian casualties of weaponized drone attacks are a common occurrence. The indiscriminate nature of weaponized drone attacks is reminiscent of a much older though equally brutal weapon – landmines. Over the past several decades, human rights organizations, academics and activists have worked tirelessly to show the world that landmines maim and kill civilian populations, and therefore, their use should be banned. The public health community has played a pivotal role in this movement by, for example, conducting research which adds evidentiary support for the movement's claims. The same tact should be taken with weaponized drones. Public health researchers should work with activists and human rights scholars to form a coalition that demands an end to the use of weaponized drones.

Professional societies such as the APHA could provide guidance highlighting the role of public health in ending the use of weaponized drones. This could take the form of a bold policy statement similar to the one APHA released in 2009 regarding public health's role in the prevention of armed conflict.

With political leaders from both major U.S. parties seeing drones as a convenient workaround to the traditional pitfalls of American use of force, it is imperative that the public health community remind the world that these weapons have tragic consequences. It is our responsibility to lend our voices, research skills and positions of prominence to stop the use of weaponized drones and end the pain and suffering

they cause.

***Featured Image:** Emal Ahmadi surveys the damage to his home after a U.S. drone strike killed 10 of his family members in Kabul, Afghanistan, on October 2, 2021. MARCUS YAM / LOS ANGELES TIMES*

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Keep Your LAWS Off My Planet:Lethal Autonomous Weapons Systems and the Fight to Contain Them

*by **Rebecca Gordon**, published on **Tom Dispatch**, January 9, 2022*

Here's a scenario to consider: a military force has purchased a million cheap, disposable flying drones each the size of a deck of cards, each capable of carrying three grams of explosives — enough to kill a single person or, in a "shaped charge," pierce a steel wall. They've been programmed to seek out and "*engage*" (kill) certain human beings, based on specific "*signature*" characteristics like carrying a weapon,

say, or having a particular skin color. They fit in a single shipping container and can be deployed remotely. Once launched, they will fly and kill autonomously without any further human action.

Science fiction? Not really. It could happen tomorrow. The technology already exists.

In fact, lethal autonomous weapons systems (LAWS) have a long history. During the spring of 1972, I spent a few days occupying the physics building at Columbia University in New York City. With a hundred other students, I slept on the floor, ate donated takeout food, and listened to Alan Ginsberg when he showed up to honor us with some of his extemporaneous poetry. I wrote leaflets then, commandeering a Xerox machine to print them out.

And why, of all campus buildings, did we choose the one housing the Physics department? The answer: to convince five Columbia faculty physicists to sever their connections with the Pentagon's Jason Defense Advisory Group, a program offering money and lab space to support basic scientific research that might prove useful for U.S. war-making efforts. Our specific objection: to the involvement of Jason's scientists in designing parts of what was then known as the "*automated battlefield*" for deployment in Vietnam. That system would indeed prove a forerunner of the lethal autonomous weapons systems that are poised to become a potentially significant part of this country's – and the world's – armory.

Early (Semi-)Autonomous Weapons

Washington faced quite a few strategic problems in prosecuting its war in Indochina, including the general corruption and unpopularity of the South Vietnamese regime it was propping up. Its biggest military challenge, however, was probably North Vietnam's continual infiltration of personnel and supplies on what was called the Ho Chi Minh Trail, which ran

from north to south along the Cambodian and Laotian borders. The Trail was, in fact, a network of easily repaired dirt roads and footpaths, streams and rivers, lying under a thick jungle canopy that made it almost impossible to detect movement from the air.

The U.S. response, developed by Jason in 1966 and deployed the following year, was an attempt to interdict that infiltration by creating an automated battlefield composed of four parts, analogous to a human body's eyes, nerves, brain, and limbs. The eyes were a broad variety of sensors – acoustic, seismic, even chemical (for sensing human urine) – most dropped by air into the jungle. The nerve equivalents transmitted signals to the "*brain*." However, since the sensors had a maximum transmission range of only about 20 miles, the U.S. military had to constantly fly aircraft above the foliage to catch any signal that might be tripped by passing North Vietnamese troops or transports. The planes would then relay the news to the brain. (Originally intended to be remote controlled, those aircraft performed so poorly that human pilots were usually necessary.)

And that brain, a magnificent military installation secretly built in Thailand's Nakhon Phanom, housed two state-of-the-art IBM mainframe computers. A small army of programmers wrote and rewrote the code to keep them ticking, as they attempted to make sense of the stream of data transmitted by those planes. The target coordinates they came up with were then transmitted to attack aircraft, which were the limb equivalents. The group running that automated battlefield was designated Task Force Alpha and the whole project went under the code name Igloo White.

As it turned out, Igloo White was largely an expensive failure, costing about a billion dollars a year for five years (almost $40 billion total in today's dollars). The time lag between a sensor tripping and munitions dropping made the system ineffective. As a result, at times Task Force Alpha

simply carpet-bombed areas where a single sensor might have gone off. The North Vietnamese quickly realized how those sensors worked and developed methods of fooling them, from playing truck-ignition recordings to planting buckets of urine.

Given the history of semi-automated weapons systems like drones and "*smart bombs*" in the intervening years, you probably won't be surprised to learn that this first automated battlefield couldn't discriminate between soldiers and civilians. In this, they merely continued a trend that's existed since at least the eighteenth century in which wars routinely kill more civilians than combatants.

None of these shortcomings kept Defense Department officials from regarding the automated battlefield with awe. Andrew Cockburn described this worshipful posture in his book *Kill Chain: The Rise of the High-Tech Assassins*, quoting Leonard Sullivan, a high-ranking Pentagon official who visited Vietnam in 1968:

> *"Just as it is almost impossible to be an agnostic in the Cathedral of Notre Dame, so it is difficult to keep from being swept up in the beauty and majesty of the Task Force Alpha temple."*

Who or what, you well might wonder, was to be worshipped in such a temple?

Most aspects of that Vietnam-era "*automated*" battlefield actually required human intervention. Human beings were planting the sensors, programming the computers, piloting the airplanes, and releasing the bombs. In what sense, then, was that battlefield "*automated*"? As a harbinger of what was to come, the system had eliminated human intervention at a single crucial point in the process: the decision to kill. On that automated battlefield, the computers decided where and when to drop the bombs.

In 1969, Army Chief of Staff William Westmoreland expressed his enthusiasm for this removal of the messy human element from war-making. Addressing a luncheon for the Association of the U.S. Army, a lobbying group, he declared:

> *"On the battlefield of the future enemy forces will be located, tracked, and targeted almost instantaneously through the use of data links, computer-assisted intelligence evaluation, and automated fire control. With first round kill probabilities approaching certainty, and with surveillance devices that can continually track the enemy, the need for large forces to fix the opposition will be less important."*

What Westmoreland meant by "*fix the opposition*" was kill the enemy. Another military euphemism in the twenty-first century is "*engage*." In either case, the meaning is the same: the role of lethal autonomous weapons systems is to automatically find and kill human beings, without human intervention.

New LAWS for a New Age – Lethal Autonomous Weapons Systems

Every autumn, the British Broadcasting Corporation sponsors a series of four lectures given by an expert in some important field of study. In 2021, the BBC invited Stuart Russell, professor of computer science and founder of the Center for Human-Compatible Artificial Intelligence at the University of California, Berkeley, to deliver those "*Reith Lectures*." His general subject was the future of artificial intelligence (AI), and the second lecture was entitled "*The Future Role of AI in Warfare*." In it, he addressed the issue of lethal autonomous weapons systems, or LAWS, which the United Nations defines as "weapons that locate, select, and engage human targets without human supervision."

Russell's main point, eloquently made, was that, although many people believe lethal autonomous weapons are a potential future nightmare, residing in the realm of science fiction, "*They are not. You can buy them today. They are advertised on*

the web."

I've never seen any of the movies in the *Terminator* franchise, but apparently military planners and their PR flacks assume most people derive their understanding of such LAWS from this fictional dystopian world. Pentagon officials are frequently at pains to explain why the weapons they are developing are not, in fact, real-life equivalents of SkyNet – the worldwide communications network that, in those films, becomes self-conscious and decides to eliminate humankind. Not to worry, as a deputy secretary of defense told Russell, "*We have listened carefully to these arguments and my experts have assured me that there is no risk of accidentally creating SkyNet*."

Russell's point, however, was that a weapons system doesn't need self-awareness to act autonomously or to present a threat to innocent human beings. What it does need is:

- A mobile platform (anything that can move, from a tiny quadcopter to a fixed-wing aircraft)
- Sensory capacity (the ability to detect visual or sound information)
- The ability to make tactical decisions (the same kind of capacity already found in computer programs that play chess)
- The ability to "engage," i.e. kill (which can be as complicated as firing a missile or dropping a bomb, or as rudimentary as committing robot suicide by slamming into a target and exploding)

The reality is that such systems already exist. Indeed, a government-owned weapons company in Turkey recently advertised its Kargu drone – a quadcopter "*the size of a dinner plate*," as Russell described it, which can carry a kilogram of explosives and is capable of making "anti-personnel autonomous hits" with "*targets selected on images and face recognition.*" The company's site has since been altered to emphasize its adherence to a supposed "man-in-the-loop" principle. However,

the U.N. has reported that a fully-autonomous Kargu-2 was, in fact, deployed in Libya in 2020.

You can buy your own quadcopter right now on Amazon, although you'll still have to apply some DIY computer skills if you want to get it to operate autonomously.

The truth is that lethal autonomous weapons systems are less likely to look like something from the ***Terminator*** movies than like swarms of tiny killer bots. Computer miniaturization means that the technology already exists to create effective LAWS. If your smart phone could fly, it could be an autonomous weapon. Newer phones use facial recognition software to "*decide*" whether to allow access. It's not a leap to create flying weapons the size of phones, programmed to "*decide*" to attack specific individuals, or individuals with specific features. Indeed, it's likely such weapons already exist.

Can We Outlaw LAWS?

So, what's wrong with LAWS, and is there any point in trying to outlaw them? Some opponents argue that the problem is they eliminate human responsibility for making lethal decisions. Such critics suggest that, unlike a human being aiming and pulling the trigger of a rifle, a LAWS can choose and fire at its own targets. Therein, they argue, lies the special danger of these systems, which will inevitably make mistakes, as anyone whose iPhone has refused to recognize his or her face will acknowledge.

In my view, the issue isn't that autonomous systems remove human beings from lethal decisions. To the extent that weapons of this sort make mistakes, human beings will still bear moral responsibility for deploying such imperfect lethal systems. LAWS are designed and deployed by human beings, who therefore remain responsible for their effects. Like the semi-autonomous drones of the present moment (often piloted from half a world away), lethal autonomous weapons systems don't remove human

moral responsibility. They just increase the distance between killer and target.

Furthermore, like already outlawed arms, including chemical and biological weapons, these systems have the capacity to kill indiscriminately. While they may not obviate human responsibility, once activated, they will certainly elude human control, just like poison gas or a weaponized virus.

And as with chemical, biological, and nuclear weapons, their use could effectively be prevented by international law and treaties. True, rogue actors, like the Assad regime in Syria or the U.S. military in the Iraqi city of Fallujah, may occasionally violate such strictures, but for the most part, prohibitions on the use of certain kinds of potentially devastating weaponry have held, in some cases for over a century.

Some American defense experts argue that, since adversaries will inevitably develop LAWS, common sense requires this country to do the same, implying that the best defense against a given weapons system is an identical one. That makes as much sense as fighting fire with fire when, in most cases, using water is much the better option.

The Convention on Certain Conventional Weapons

The area of international law that governs the treatment of human beings in war is, for historical reasons, called international humanitarian law (IHL). In 1995, the United States ratified an addition to IHL: the 1980 U.N. Convention on Certain Conventional Weapons. (Its full title is much longer, but its name is generally abbreviated as CCW.) It governs the use, for example, of incendiary weapons like napalm, as well as biological and chemical agents.

The signatories to CCW meet periodically to discuss what other weaponry might fall under its jurisdiction and prohibitions, including LAWS. The most recent conference took place in

December 2021. Although transcripts of the proceedings exist, only a draft final document – produced before the conference opened – has been issued. This may be because no consensus was even reached on how to define such systems, let alone on whether they should be prohibited. The European Union, the U.N., at least 50 signatory nations, and (according to polls), most of the world population believe that autonomous weapons systems should be outlawed. The U.S., Israel, the United Kingdom, and Russia disagree, along with a few other outliers.

Prior to such CCW meetings, a Group of Government Experts (GGE) convenes, ostensibly to provide technical guidance for the decisions to be made by the Convention's "*high contracting parties*." In 2021, the GGE was unable to reach a consensus about whether such weaponry should be outlawed. The United States held that even defining a lethal autonomous weapon was unnecessary (perhaps because if they could be defined, they could be outlawed). The U.S. delegation put it this way:

> *"The United States has explained our perspective that a working definition should not be drafted with a view toward describing weapons that should be banned. This would be – as some colleagues have already noted – very difficult to reach consensus on, and counterproductive. Because there is nothing intrinsic in autonomous capabilities that would make a weapon prohibited under IHL, we are not convinced that prohibiting weapons based on degrees of autonomy, as our French colleagues have suggested, is a useful approach."*

The U.S. delegation was similarly keen to eliminate any language that might require "*human control*" of such weapons systems:

> *"[In] our view IHL does not establish a requirement for 'human control' as such… Introducing new and vague requirements like that of human control could, we believe, confuse, rather than clarify, especially if these proposals*

> *are inconsistent with long-standing, accepted practice in using many common weapons systems with autonomous functions.”*

In the same meeting, that delegation repeatedly insisted that lethal autonomous weapons would actually be good for us, because they would surely prove better than human beings at distinguishing between civilians and combatants.

Oh, and if you believe that protecting civilians is the reason the arms industry is investing billions of dollars in developing autonomous weapons, I’ve got a patch of land to sell you on Mars that’s going cheap.

The Campaign to Stop Killer Robots

The Governmental Group of Experts also has about 35 non-state members, including non-governmental organizations and universities. The Campaign to Stop Killer Robots, a coalition of 180 organizations, among them Amnesty International, Human Rights Watch, and the World Council of Churches, is one of these. Launched in 2013, this vibrant group provides important commentary on the technical, legal, and ethical issues presented by LAWS and offers other organizations and individuals a way to become involved in the fight to outlaw such potentially devastating weapons systems.

The continued construction and deployment of killer robots is not inevitable. Indeed, a majority of the world would like to see them prohibited, including U.N. Secretary General Antonio Guterres. Let’s give him the last word:

> *“Machines with the power and discretion to take human lives without human involvement are politically unacceptable, morally repugnant, and should be prohibited by international law.”*

I couldn’t agree more.

Featured image: *Killer Robots by Global Panorama is licensed under CC BY-SA 2.0 / Flickr*

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U.S. Drastically Undercounted Civilian Deaths Due To Airstrike, Finds Investigation

*by **Countercurrents Collective**, published on **Countercurrents**, December 20, 2021*

> *Nice quick summary of what is in the report. We should all read it. [jb]*

The U.S. military drastically undercounted civilian deaths caused by airstrikes in the Middle East since 2014, according to a New York Times investigation published Saturday.

The New York Times reviewed a hidden Pentagon archive comprised of the military's confidential assessments of over

1,300 reports of civilian casualties in airstrikes, and found, "since 2014, the American air war has been plagued by deeply flawed intelligence, rushed and imprecise targeting and the deaths of thousands of civilians, many of them children. There was and a lack of accountability for wrongdoing.

While the official military count says 1,417 civilians have been killed in Iraq and Syria, the investigation found many more civilian deaths, citing multiple examples, though it did not provide an exact count.

The New York Times found examples of the U.S. forces not disclosing the mistaken killing of civilians during airstrikes. In 2017, a family of four in a car that were fleeing West Mosul, Iraq, and three other civilians were killed after the vehicle was mistaken as a car bomb.

Last month, The Times revealed that military leaders hid a 2019 airstrike in Syria where as many as 64 civilians were killed.

Earlier this year, a report compiled by an independent monitoring group found that the U.S. airstrikes have killed as many as 48,000 civilians since the 9/11 terrorist attacks.

The New York Times report (What to Know About the Civilian Casualty Files, by Michael Levenson) said:

> *"In the years since American boots on the ground gave way to a war of airstrikes in Iraq, Syria and Afghanistan, the U.S. military has made a central promise: that precision bombs and drones would kill enemies while minimizing the risks to civilians.*
>
> *"Recent investigations by The New York Times have undercut that promise. In September, The Times reported that a drone strike in Kabul, Afghanistan, which U.S. officials said had destroyed a vehicle laden with bombs, had instead killed 10*

> *members of a family. Last month, The Times reported that dozens of civilians had been killed in a 2019 bombing in Syria that the military had hidden from public view.*
>
> *"Now, a Times investigation has found that these were not outliers but rather the regular casualties of a transformed way of war gone wrong."*

It said:

> *"In addition to reviewing the military's assessments of reports of civilian casualties – obtained through Freedom of Information requests and lawsuits against the Defense Department and U.S. Central Command – The Times visited nearly 100 casualty sites in Iraq, Syria and Afghanistan and interviewed scores of surviving residents and current and former U.S. officials."*

Following are key takeaways from Part 1 of the investigation:

Civilian Deaths Have Been Drastically Undercounted

According to the military's count, 1,417 civilians have died in airstrikes in the campaign against ISIS in Iraq and Syria; since 2018 in Afghanistan, U.S. air operations have killed at least 188 civilians. But The New York Times found that the civilian death toll was significantly higher. Discrepancies arose in case after case – none more stark than a 2016 bombing in the Syrian hamlet of Tokhar.

U.S. Special Operations forces hit what they believed were three ISIS "*staging areas,*" confident they were killing scores of ISIS fighters. A military investigation concluded that seven to 24 civilians "*intermixed with the fighters*" might have died. But, The Times found, the targeted buildings were houses where families had sought refuge. More than 120 civilians were killed.

In 1,311 Reports, One ‘Possible Violation’

The Pentagon has also failed to uphold pledges of transparency and accountability.

Until now, only a handful of the assessments have been made public. None included a finding of wrongdoing or disciplinary action. Only one cited a “*possible violation*” of the rules of engagement — a breach in the procedure for identifying a target. Fewer than a dozen condolence payments were made, even though injured survivors often required costly medical care. The records show little effort by the military to identify patterns of failure or lessons learned.

In many instances, the command that had approved a strike was responsible for examining it, often using incorrect or incomplete evidence. In only one case did investigators visit the site of a strike. In only two did they interview survivors or witnesses.

Taken together, the 5,400 pages of records point to an institutional acceptance of civilian casualties. In the logic of the military, a strike was justifiable as long as the expected risk to civilians had been properly weighed against the military gain, and it had been approved up the chain of command.

Over 50,000 Airstrikes, Most Not Planned in Advance

America’s new way of war took shape after the 2009 surge of U.S. forces into Afghanistan. By the end of 2014, President Barack Obama declared America’s ground war essentially done, shifting the military’s mission to mostly air support and advice for Afghan forces battling the Taliban. At roughly the same time, he authorized a campaign of airstrikes against ISIS targets and in support of allied forces in Iraq and Syria.

At an ever-quickening pace over the next five years, and as the administration of Obama gave way to that of Donald Trump,

U.S. forces executed more than 50,000 airstrikes in Iraq, Syria and Afghanistan.

When the wars intensified, the authority to approve strikes was pushed further down the chain of command, even as an overwhelming majority of strikes were carried out in the heat of war, and not planned far in advance.

Biases and Blind Spots Created Danger

The records suggest that civilian deaths were often the result of "*confirmation bias*," or the tendency to find and interpret information in a way that confirms preexisting beliefs. People rushing to a bombing site were assumed to be ISIS fighters, not civilian rescuers. Men on motorcycles, thought to be moving "*in formation*," displaying the "*signature*" of an imminent attack, were just men on motorcycles.

Cultural blind spots also left innocent civilians vulnerable to attack. The military judged, for example, that there was "*no civilian presence*" in a house where families were napping during the days of the Ramadan fast or sheltering from the heat or intense fighting.

Breakdowns In Technology And Surveillance

For all their promise of pinpoint accuracy, at times U.S. weapons simply missed. In 2016, the military reported that it had killed Neil Prakash, a notorious Australian ISIS recruiter, in a strike on a house in East Mosul. Four civilians died in the strike, according to the Pentagon. Months later, Prakash was arrested crossing from Syria into Turkey.

Poor or insufficient surveillance footage often contributed to deadly targeting failures. Afterward, it also hamstrung efforts to examine strikes. Of the 1,311 reports examined by The Times, the military had deemed 216 allegations "*credible*." Reports of civilian casualties were often dismissed because

video showed no bodies in the rubble, yet the footage was often too brief to make a reliable determination.

Sometimes, only seconds' worth of footage was taken before a strike, hardly enough for investigators to assess civilians' presence. In some other cases, there was no footage at all for review, which became the basis for rejecting the allegation. That was often because of "*equipment error*," because no aircraft had "*observed or recorded the strike*," or because the unit could not or would not find the footage or had not preserved it as required.

Failure To Account For Secondary Explosions

A target such as a weapons cache or power station came with the potential for secondary explosions, which often reached far beyond the expected blast radius. These accounted for nearly one-third of all civilian casualties acknowledged by the military and half of all civilian deaths and injuries at the sites visited by The Times.

A June 2015 strike on a car-bomb factory in Hawija, Iraq, is among the deadliest examples. In plans for the nighttime attack, the nearest "*collateral concern*" was assessed to be a "*shed*." But apartment buildings ringed the site, and dozens of displaced families, unable to afford rent, had also been squatting in abandoned buildings close by. According to the military investigation, as many as 70 civilians were killed that night.

In response to questions from The Times, Capt. Bill Urban, the spokesperson for the U.S. Central Command, said that "*even with the best technology in the world, mistakes do happen, whether based on incomplete information or misinterpretation of the information available. And we try to learn from those mistakes*." He added, "*We work diligently to avoid such harm. We investigate each credible instance. And we regret each loss of innocent life*."

Countercurrents Collective are a group of writers in India who support and manage the Countercurrents.org blog which has been doing a great job for more than a decade.

New York Times Reporting on Airstrikes Should Give Daniel Hale More Credit

*by **Sam Carliner**, published on **Common Dreams**, December 20, 2021*

The New York Times recently came through with a display of reporting that should be commended. On December 18, the paper announced its release of hundreds of the Pentagon's confidential reports of civilian casualties caused by U.S. airstrikes in the Middle East. This follows its high profile investigations into the U.S. drone murder of the Ahmadi family during the Afghanistan withdrawal, and an American strike cell in Syria that killed dozens of civilians with airstrikes.

Many journalists will, rightfully, praise the New York Times for its reporting on U.S. airstrikes and the civilian cost. Far fewer will point out how the inhumanity of U.S. airstrikes were first revealed in 2013 by whistleblower Daniel Hale.

Hale used his first hand experience identifying targets for the drone program to highlight how it relies on faulty criteria, and as a result, kills civilians. Later, Hale worked for the National Geospatial-Intelligence Agency, where he had access to documents on how the drone program operates. Hale provided those documents to the Intercept which published them

as The Drone Papers in 2015. While Hale's documents were not as comprehensive as the trove recently published by the New York Times, they did provide much of the same core revelations, particularly the faulty nature of how intelligence is gathered and the high civilian-toll of air campaigns. Most notably, Hale's documents revealed that 90% of the drone program's victims were not the intended targets. Up until the recent reporting by the New York Times, Hale's revelations were the most comprehensive proof of how U.S. air warfare functions.

To be fair, the Times' reporting on the brutal nature and high civilian cost of U.S. airstrikes is not insignificant. Americans could have easily ignored the Pentagon's violence now that the "boots on the ground" approach to intervention has largely ended with Biden's Afghanistan withdrawal. In fact, the use of airstrikes was championed by Obama so as to avoid anti-war sentiments from Americans. The Times actually highlights this, writing:

> *"The air campaign represents a fundamental transformation of warfare that took shape in the final years of the Obama administration, amid the deepening unpopularity of the forever wars that had claimed more than 6,000 American service members. The United States traded many of its boots on the ground for an arsenal of aircraft directed by controllers sitting at computers, often thousands of miles away."*

Still, as much as the Times' reporting already seems to be provoking conversation around U.S. air warfare, it is concerning that this conversation comes with the risk of Hale's own heroic actions being disregarded. The Times makes no mention of Hale's actions, even as they receive accolades for supposedly breaking to the world the violence of U.S. airstrikes. More damning is how little the Times has commented on the fact that Hale was sentenced to nearly four years in

prison earlier this year for exposing the drone program. Aside from a standard article about his sentencing published in July, Daniel Hale is absent from the New York Times' pages. Azmat Khan, the reporter behind the "*Civilian Casualty Files*" has not mentioned Daniel Hale once on Twitter.

It's not like there have not been updates in Hale's story since he was sentenced. After his sentencing, Hale was kept languishing in a jail for over two months even though he was supposed to be transferred in a matter of weeks. Once finally transferred, Hale's situation was made worse. He was supposed to be sent to a prison that would provide care for his Post Traumatic Stress Disorder diagnosis, but instead he is now being held in a communication management unit (CMU). CMU's are designed for terrorists and "*high-risk inmates*" and detainees have highly restricted contact with the outside world. The American Civil Liberties Union has called on the U.S. government to end its use of CMUs, arguing that these "*secretive housing units inside federal prisons in which prisoners are condemned to live in stark isolation from the outside world are unconstitutional, violate the religious rights of prisoners and are at odds with U.S. treaty obligations*."

Daniel Hale deserves freedom for revealing proof of the very crimes the New York Times is now being praised for exposing. His support team and anti-war activists have been working hard to grow concern and action for his cause, but that is a daunting task considering Hale is a person who the U.S. government, and U.S. military in particular, want silenced. But as the Times has shown with its own reporting of U.S. airstrikes, they have a platform that can cut through Pentagon-imposed silence. A single editorial calling for Hale's release would do wonders for his cause.

Presumably, the Times reporters who have been investigating the violence of U.S. airstrikes are doing so because they believe the victims of U.S. air campaigns deserve justice. The

Pentagon’s refusal to hold anyone accountable for their deadly Kabul airstrike in August signals that it will be an uphill battle holding anyone accountable for the newly-exposed airstrikes. Daniel Hale joined the fight to hold the Pentagon seriously accountable. He joined years before the New York Times did, and was treated like a criminal for it. The New York Times should give Daniel Hale proper credit and call for Biden to immediately pardon him. As long as he’s in prison, there is no justice.

***Featured Image:** Drone whistleblower Daniel Hale (R) stands next to CodePink co-founder Medea Benjamin outside the White House in Washington, D.C. in this undated photo. (Photo: Democracy Now!)*

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Next Generation Warfare: Combat Drones Become Fastest-growing Weaponry in Global Military Arsenal

*by **Prakash Nanda**, published on **Eurasia Times**, November 28, 2021*

Around this time last year (2020), Azerbaijan had conquered

almost the entire Armenian exclave of Nagorno-Karabakh. If the war had attracted global attention, it was mainly because of one feature.

And that was the widespread use of armed drones of Turkish production, which decimated and demoralized the unprepared Armenians from the air.

In fact, the importance of armed drones nowadays is such that almost all the major countries are acquiring more and more armed drone systems. A side effect of this proliferation is an increase in their exports, a fact that was conclusively proved last week with the release of two reports.

On November 25, Reportlinker.com announced the release of '*Aircraft Insulation Market by Platform, Type, Material, Application and Region – Forecast to 2026*'. According to the report, the global aircraft insulation market size is projected to grow from $5.5 billion in 2021 to $8.2 billion by 2026, at a CAGR of 8.3% from 2021 to 2026.

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Based on this, the report says that the UAV platforms happen to be the fastest segment of the aircraft insulation market. It is not much affected by the COVID-19 outbreak. And major players of this market are DuPont (US), Triumph Group, Inc. (US), Transdigm Group, Inc. (US), Zotefoams (UK), BASF SE (Germany), Rogers Corporation (US), Safran Group (France), and Evonik Industries (Germany).

The other report coming on November 23, estimates that the Global Defense Drone Market will generate $16,902.0 million and exhibit a CAGR of 7.9% from 2021 to 2028, owing to increasing defense expenditure in many countries around the world.

The Asia-Pacific region is anticipated to observe the fastest growth by 2028, the report, which, incidentally, is prepared

by “*Research Dive*”, a market research firm based in Pune, India, says.

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Based on payload, the small drones sub-segment is estimated to generate a revenue of $7,901.2 million by 2028 and hold dominating market share over the forecast period. This is majorly owing to the effectiveness of small drones to lift a payload up to 25 kg, and perform computerized command, communication, control, and information functions.

Based on application, the combat operations sub-segment is expected to generate a revenue of $6,556.2 million by 2028 and is predicted to witness the fastest growth during the analysis period. This is mainly due to the rising need for upgrading the existing unmanned aerial attack systems for threat elimination missions and target identification in military aviation.

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Based on region, the Asia-Pacific market for defense drones is expected to surpass $4,071.7 million by 2028 and witness the fastest growth in the global industry over the forecast period. The increasing military expenditure of major countries in the region, such as China, India, Japan, Australia, and others is the major factor predicted to boost the regional market growth by 2028.

…Turkish Bayraktar TB2 is now export-hit and Ankara has ensured that the development and production of the drone can run as autonomously as possible. Among TB2’s customers are now Ukraine and Poland.

The US, of course, is the leader in the market as it has used drones in conflicts for long, particularly in asymmetric conflicts with low intensity – both to cover ground groups from the air and to target suspected terrorist targets. In

Afghanistan, Pakistan, Iraq, and Yemen, the US MQ-1 Predator and MQ-9 Reaper systems have been used extensively.

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Proliferation Of Military Drones

All told, if military drones are becoming increasingly indispensable for the armed forces all over the world, there are essentially four reasons behind this trend.

One, they are less costly but pretty effective as operational intelligence platforms for proper data flow and they provide real-time surveillance to detect ballistic missile threats.

Two, they can be used in remote locations where the communication systems are poor. They are thus able to provide vital data, irrespective of location. As a result, the control center of the user is able to plan and prepare for uncertain attacks. They, thus, help in making well-informed decisions.

Three, and this is a corollary of the above, in heavy fighting zones, drones help in providing information to the command center to identify the targets better, improve safety, and protect infrastructures from any kind of external threats or risks. In this sense, they greatly reduce putting military personnel in harm's way or in combat….

Four, drones are proving also lethal to enemy combats as regular airplanes. This means that it is easier to neutralize enemy power using a drone with minimal human casualties.

However, the biggest criticism against military drones is that they often cause collateral damages to civilian lives and property…..No wonder why US MQ-1 Predator and MQ-9 Reaper are such dirty words in Pakistan, Afghanistan, Iraq, and Syria.

But then, modern warfare is increasingly becoming insensitive to civilian opinions. National interests weigh over notions of rights and wrong in fighting wars, particularly when the

enemies happen to be those who have the scantiest respect for these very notions of rights and wrongs.

And that explains why the armed drone market is growing and will grow further.

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*Author and veteran journalist **Prakash Nanda** has been commenting on politics, foreign policy on strategic affairs for nearly three decades. A former National Fellow of the Indian Council for Historical Research and recipient of the Seoul Peace Prize Scholarship, he is also a Distinguished Fellow at the Institute of Peace and Conflict Studies.

The drone defense dilemma: How unmanned aircraft are redrawing battle lines

*by **Tom Kington**, published on **Defense News**, February 14, 2021*

ROME — First there was the video from Libya of a Turkish drone destroying a Russian Pantsir missile defense system.

Next came the veteran S-300 air defense system — also Russian — being taken out in Nagorno-Karabakh by an Israeli-built Harop loitering munition.

In the conflicts in Libya and Nagorno-Karabakh last year, unmanned platforms often made short work of the ground-based systems designed to neutralize them, paving the way for easy attacks on vulnerable troops.

What is more, experts say, is that the balance of power between drones and air defense systems is shaping up to be a key to global wars in the near future.

> *“Libya, Nagorno-Karabakh and also Syria have just showed us that if a fielded force cannot protect its airspace, then the large scale use of UAVs can make life extremely dangerous,”*

said Justin Bronk, an air force research fellow at the Royal United Services Institute in England.

Turkey’s Bayraktar TB2 armed drone grabbed the headlines during the Libya conflict last year, which saw Turkey deploy the platform to defend the U.N.-backed Tripoli government against strongman Khalifa Hifter, who relied on Russian Pantsir systems.

Able to fire their Roketsan munitions from outside the range of the Russian systems, the TB2s scored hits, helping stop Hifter’s advance.

> *“Turkey also sent in engineers who improved the software of the drones on the fly, while there was no similar learning curve with the Chinese UAVs operated by the UAE to assist Hifter,”*

said Jalel Harchaoui at the Switzerland-based Global Initiative Against Transnational Organized Crime.

> *“The bold and effective use of TB2s in Nagorno-Karabakh in October was made possible by the previous success in Libya,” he added.*

An enclave belonging to Azerbaijan but governed by breakaway ethnic Armenians, Nagorno-Karabakh has been a flashpoint between Azerbaijan and Armenia for years. It exploded in a brief and bloody war between September and November.

Turkey, which backed Azerbaijan, reportedly sent in UAV trainers ahead of the conflict. TB2s alongside Israeli loitering munitions were soon racking up successes, with Dutch warfare research group Oryx reporting 134 Armenian tanks destroyed compared to 22 lost by Azerbaijan.

> *"Turkey built up its UAV expertise after leasing Israeli UAVs, then put that expertise to use building its own after frustrations over the limits placed on its use of the Israeli systems," Bronk said. "The TB2 has a similar aerodynamic profile to the Heron, while the Turkish Anka UAV is similar to the Hermes 450."*

Manufacturer Bayraktar has sold the TB2 to Qatar and Ukraine, while Serbia is eyeing a purchase, raising the TB2′s profile as a competitor to the Chinese Wing Loong II, 50 of which have been exported.

> *"China and Turkey are vying for sales, which begs the question: Why doesn't Russia have the equivalent of a TB2 to sell? I am very surprised they are almost absent in this market," Harchaoui said.*

The drone's contribution to the hostilities in Nagorno-Karabakh came with a price, as Canada suspended arms exports to Turkey amid claims the TB2 contained Canadian parts, while a U.K. firm supplying parts to the drone also canceled its contract.

A number of nations, including the U.K., are meanwhile beefing up their defenses for ground forces, said Bronk.

> *"In light of this threat, the British Army has recently ordered a short/medium-range [surface-to-air missile] system called Sky Sabre. If deployed forward in significant numbers, it should dramatically reduce the Army's vulnerability to*

both surveillance and attack by hostile UAVs in situations where friendly air cover is unavailable," he said.

Drones are not, however, invulnerable, he added.

"U.S. and British Reapers and Predators in Syria had lots of problems with Russian electronic warfare. Since the Reaper can be targeted, you can imagine that less sophisticated platforms can be more easily affected," he said.

Bronk expects that more militaries will spend more money on air defense to balance out the drone threat – "*particularly countries which don't have strong air forces*."

"One option is the Russian SA-17 system, which has a 75-kilometer range compared to the 10 kilometers of TB2 missiles, or the cheaper and more contained SA-15 with a 10-kilometer range. Western products include the [National Advanced Surface-to-Air Missile System] NASAMS, which already helps to defend Washington, D.C., with a roughly 15-kilometer range and the NASAMS 2 with a 30- to 40-kilometer range," he said.

Peter Roberts, the director of military sciences at the Royal United Services Institute, said the world is waking up to the reality of modern warfare.

"For a while there was the romantic view that either drones or tanks or missiles would win wars on their own," he said. "There is no silver bullet on the battlefield, and this is an era which is rediscovering that."

Roberts added that urban warfare is also undergoing a revival, as is the art of deception in war.

"Whether it's the Russians in Ukraine or the Iranians, the use of decoys is back – something we once knew about, then

> *forgot in the 1990s."*

The world is also returning to an era of proxy wars, he said, from Libya to Nagorno-Karabakh to Yemen.

> *"That means wars fought on the edge of great powers using mercenaries and sponsored guerilla groups and insurgents," he said. "It also means more sophisticated weapons in the hands of smaller, nonstate groups like the Houthis in Yemen using cruise and ballistic missiles and drones. It is potentially very nasty."*

***Featured Image:** An Israeli Heron-TP unmanned aircraft sits on the tarmac during the April 2018 Berlin Air Show. (Sebastian Sprenger/Staff)*

Russia's Real-World Experience is Driving Counter-Drone Innovations

by **Samuel Bendett**, published on **Defense News**, May 23, 2021

The Russian military is actively working to develop concepts, tactics, techniques and procedures against aerial drones. The Russian Ministry of Defence has invested heavily to defend its forces against the growing threat and proliferations of UAVs large and small, from those manufactured by foreign states to those used by a growing slate of nonstate actors and terrorist organizations.

This investment comprises the development of technologies,

incorporating the lessons learned from its own military and from other forces' combat, and continuing to refine its electronic warfare capabilities as a key element of counter-unmanned aerial system tactics, techniques and procedures.

Learning from experience

Russia's own involvement in the Syrian conflict started in 2015 when it brought its military in direct conflict with forces and coalitions fighting the government of President Bashar Assad. While Russia considers Syria its own "*sandbox*" for testing multiple weapons systems, the unpredictable Syrian military battlespace also resulted in nonstate actors experimenting with commercial off-the shelf drone technologies by launching multiple mass UAV attacks against the Russian base at Hmeimim.

At the same time, the Russian military was a keen observer of combat drone use against its allies in Syria and in Libya.

The ongoing drone use by the anti-Assad Syrian forces against Russian targets, along with Yemen's Houthi forces against Saudi Arabian targets, and the recently concluded war in Nagorno-Karabakh confirmed the MoD's conclusion: A robust electronic warfare defense, together with early warning radars and anti-aircraft systems, can provide adequate protection against the growing use of UAVs by global belligerents.

In Syria, the MoD dubbed this triple c-UAS layer as the "*echeloned defense*" that was effective against do-it-yourself-type drones, but that is still unproven against more sophisticated military drones currently in service with multiple combatants around the world.

Following the conclusion of the 2020 Nagorno-Karabakh War, Russian military experts remain committed that the above-mentioned "*echeloned*" combination would have worked well against Azerbaijani drone attacks, especially given that some form of this echelon comprising EW and anti-aircraft systems

in service with the Armenian forces was able to blunt certain Azeri UAV operations. As Turkish combat drones in Libya and Syria attacked Moscow's allies, the older Soviet and Russian-made anti-aircraft systems had limited success against adversarial UAVs, but could not be more effective without other "*echeloned*" elements described above.

The continuous Houthi drone strikes against Saudi targets also expose the limits of modern Western-made anti-aircraft systems like the Patriot; such systems may not be adequate against small UAVs with very low radar signatures. The cost of deploying such anti-aircraft systems against small drones may be prohibitively expensive, necessitating a different approach to dealing with this new and evolving threat.

Finally, Russian support for the separatist forces in eastern Ukraine confirmed the importance of drones as a key intelligence, surveillance and reconnaissance element in today's combat, and the importance of robust EW defenses should the Ukrainian military start fielding more sophisticated UAVs against pro-Russian forces.

Concepts and Technology

According to Lt. Gen. Alexander Leonov, chief of the Russian air defense forces, the ongoing efforts by nonstate actors and terrorist organizations to improve their UAVs and their usage methods indicate that in the near future, the threats associated with the use of drones may increase not only in Syria but also in other countries.

He points out that Russia gained valuable experience in countering such drone attacks, and that these skills and knowledge are now reflected in air defense combat manuals and are part of tactical, select and reconnaissance training. In fact, the Russian Ministry of Defence notes that today, all military districts across the country have units to counter adversarial drones.

The Russian experience defending its Khmeimim base from UAV strikes has become the foundation of its military's c-UAS training program. Starting in 2019, all major military exercises and drills include the defense against an adversary's massed drone attacks. The electronic warfare systems and technologies emerged as a key concept in this training. Across the Russian military services, in numerous drills, exercises and maneuvers, EW training is regularly conducted against adversarial drones, and practically all c-UAS drills feature EW systems as a key element.

Such symbiotic pairing typically unfolds in drills where the "*adversary*" forces use UAVs as key ISR elements against Russian troops, vehicles and systems.

Typically, the Russian military uses a combination of portable and wheeled EW systems. The Borisoglebsk and Zhitel systems are often tested in such drills; the EW specialists conduct electronic reconnaissance, then collect and analyze intelligence data, followed by conducting radio interference to "drown" adversarial UAV control channels along with drones' communication channels with GPS navigation satellites.

In another typical c-UAS exercise that was conducted this year, the "adversary" force used several UAVs to conduct reconnaissance and coordinate artillery strikes against Russian positions. The Southern Military District's mobile EW groups used an R-934BMV automated jamming station, the Silok-01 electronic warfare system and the Pole-21 advanced radio suppression system to discover enemy UAVs in order to interfere with their communications and suppress their control channels, rendering them useless for further operations.

In Syria, the MoD confirms that a combination of hand-held and stationary systems are used to suppress and jam drones that continue to harass and attack Russian positions. Using such systems allows the Russian military to directly influence UAVs' control and navigation channel receivers. The EW troops

intercept control channels, and the operator monitors the position of the UAV and proceeds to take control of the drone, giving the UAVs a command to land.

In Russia, military forces started using Stilet and Stupor portable c-UAS rifles, along with the newest Krasukha-C4 EW complex designed to identify adversarial strike aircraft and to suppress their communications and navigation. In a recent Black Sea drill, the EW detachments used the Krasukha system to target and disable multiple drones flying at low and medium altitudes.

Looking Ahead

Today, the Russian military is making c-UAS training mandatory across its services. In July 2018, the MoD announced that all ground forces, marines and airborne troops will have to learn how to shoot down drones with assault rifles, machine guns, sniper rifles and automatic weapons. This c-UAS concept of operations was developed taking into account the Russian military experience in Syria.

There is also evidence that the Russian MoD is eager to expand its c-UAS training and field activity beyond countering small, low-flying drones. In 2018, Russian EW systems jammed American drones operating in Syria, providing the MoD with valuable data and experience in countering more advanced adversarial UAVs.

The Russian military is also making sure its c-UAS systems and concept of operations involve the latest technologies, such as artificial intelligence, for the greatest advantage against the growing sophistication of the global drone force. New counter-drone radars and UAVs capable of targeting other drones are in development by the Russian military-industrial enterprises.

As the UAV threat will continue to persist, Russian MoD efforts will be directed at the continuing refinement of its

c-UAS practices, while seeking to introduce technology capable of offering protection against adversaries' drone developments.

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