COVER STORY

The Drone Dealer

China is now the world's largest armed drone exporter. And when it comes to the future of war, that might present a problem for the United States.

BY ELI BINDER — MAY 16, 2021

A Chinese soldier salutes in front of a drone during a parade on October 1, 2019 in Beijing, China.
Credit: Kevin Frayer/Getty Images

The video was likely meant to promote morale. It was 2015, and the Iraqi city of Ramadi had just fallen to the Islamic State (ISIS). Determined to take it back, the Iraqi military was working closely with its United States partners, and the Ministry of Defense released a video clip to show themselves focused on the task at hand.[1]

Only, the advisor in the video diligently looking over the shoulders of senior Iraqi officers wasn't American. He appeared to be Chinese. And the sinister looking drone shown taxiing proudly on runways after destroying an ISIS position wasn't one of the familiar American drones that had, since 2002, flown the Iraqi skies. It was the Chinese-made Caihong-4.

Though the footage was supposed to show off the Iraqi military, the Caihong-4 stole the show. The Ramadi strike was the first time a Chinese-made armed drone was successfully used in combat, and the world took notice.

"I was shocked," says Heather Penney, a former fighter pilot and a senior fellow at the Mitchell Institute for Aerospace Studies, in Arlington, Virginia. "It probably wasn't a surprise to the entire U.S. leadership — someone must have known Iraq was buying Chinese drones — but it was not widely known."

A still from the Ministry of Defense's 2015 video, which showed the first time a Chinese-made armed drone was successfully used in combat.
Credit: Ministry of Defense YouTube video, since deleted

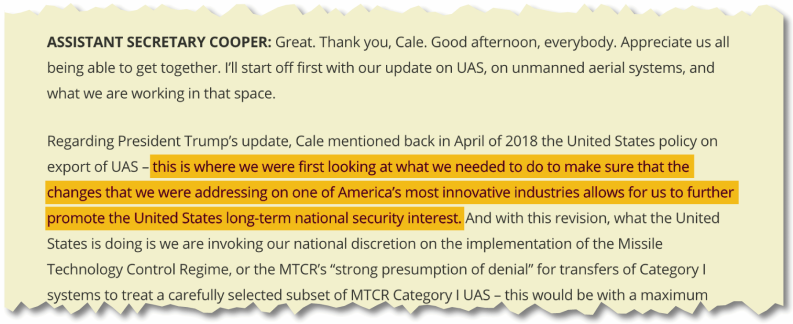
If the Ramadi strike marked the starting line for Chinese drones, the six years since have been their sprint to pole position. China is now the world's largest armed drone exporter, with Chinese state-owned defense contractors selling

armed drones to more countries than anyone else. Perhaps more surprisingly, their customers include everyone from pariah states like Turkmenistan to close U.S. defense partners like Iraq, Egypt and Saudi Arabia.

China has tapped into this market so successfully for one simple reason: the U.S. decided not to export its armed drones to anyone but its closest allies because of the Missile Technology Control Regime, an informal agreement aimed at reducing missile and drone proliferation.[2]

"Countries that wanted armed drones only had one choice: China," says Justin Bronk, a researcher who studies airpower and technology at the Royal United Services Institute, a defense think tank in London. Since drone technology is relatively simple compared to, say, a fighter jet, Bronk says it was an ideal market for China to take on: "It wasn't too difficult to get into, and the primary barrier in the market was that the U.S. refused to export them."

The U.S. has recently softened on this position, but only slightly. Last July, the Trump administration announced that it was open to selling armed drones to more countries, a decision the Biden administration has since upheld. Liberalizing drone sales in one of "America's most innovative industries allows for us to further promote the United States' long-term national security interest," R. Clarke Cooper, the State Department's assistant secretary for political-military affairs, announced at the time. Shortly thereafter, the State Department, for the first time, approved the export of armed, American-made Reaper[3] drones to the United Arab Emirates.



ASSISTANT SECRETARY COOPER: Great. Thank you, Cale. Good afternoon, everybody. Appreciate us all being able to get together. I'll start off first with our update on UAS, on unmanned aerial systems, and what we are working in that space.

Regarding President Trump's update, Cale mentioned back in April of 2018 the United States policy on export of UAS – this is where we were first looking at what we needed to do to make sure that the changes that we were addressing on one of America's most innovative industries allows for us to further promote the United States long-term national security interest. And with this revision, what the United States is doing is we are invoking our national discretion on the implementation of the Missile Technology Control Regime, or the MTCR's "strong presumption of denial" for transfers of Category I systems to treat a carefully selected subset of MTCR Category I UAS – this would be with a maximum

Credit: U.S. Department of State

But experts say this will do little to stop China's momentum. Being the world's drone salesman serves Beijing's interests for a number of reasons. First, the market is a lucrative one: this decade, countries (excluding the U.S. and its close allies) are expected to spend $56 billion on military drones, according to Janes, a defense intelligence firm. And second, unlike the market for high-end military equipment, the drone market is a global one: rich and poor countries alike have a use for them. This allows China to signal its arrival on the arms trade stage while also cultivating important connections to other militaries.

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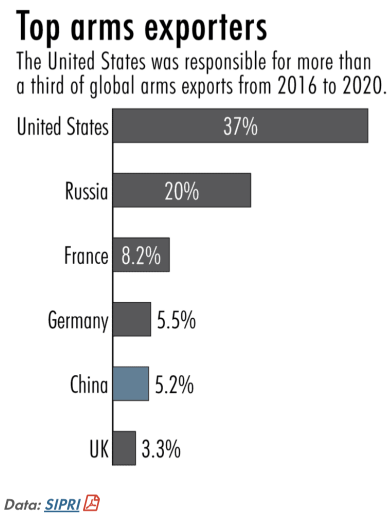
>
> *— Justin Bronk, a researcher who studies airpower and technology at the Royal United Services Institute*

"Historically, China has been a supplier of inexpensive weapons systems, which are basically Soviet-era weapons systems," says Philip Finnegan, the director of corporate analysis at Teal Group, an aerospace and defense consultancy in Fairfax, Virginia. "But drones are often thought of as the technology of the future, providing China an important entry into cooperation with militaries around the world. This is a way of strengthening political and military ties with countries that may be strategically important to China."

Indeed, although China is still the world's fifth largest arms exporter — behind the U.S., Russia, France and Germany — its drone products have opened doors to new customers in at least four countries: Serbia, Turkmenistan, the U.A.E. and Uzbekistan, according to data from the Stockholm International Peace Research Institute.



What does this mean for the U.S., the world's largest arms exporter and progenitor of armed drone combat? Experts say not much today, but potentially a lot in a few years time. Drones are still very much a technology of the future: today's armed systems — both U.S. and China made — are relatively slow and about as stealthy as a flying lawnmower, making them useful in battles against poorly-equipped opponents, but ineffective in a conflict between bigger powers.

Both China and the U.S., however, are racing to build a new generation of drones — ones equipped not only with deadly missiles, but also with artificial intelligence (AI) capabilities that, experts say, could change the very nature of war. And while the U.S. still enjoys a sizable lead in its hardware capabilities, the AI drone revolution will depend on software and data — areas in which China may already be ahead.

"This kind of technology is an area in which the U.S. used to enjoy a vast lead," says Sam Roggeveen, the director of the international security program and expert on China's military at the Lowy Institute, a think tank in Sydney. "But those days are clearly over."

'GOOD ENOUGH'

Unmanned flying vehicles have been a pet project of military engineers since the early 1900s. By World War I, the U.S. military was testing radio-controlled unmanned bombers. Drones made their first major combat appearance during the Vietnam War in the form of the U.S. "lightning bug" reconnaissance drones, which the Air Force flew over North Vietnam — and even China — to capture images.

But it wasn't until the twenty-first century that drones armed with missiles became a feature of war. In the days after the September 11 attacks, the Central Intelligence Agency decided to put Hellfire missiles on a surveillance drone, called the Predator, made by General Atomics, in its effort to kill Mullah Mohammed Omar, the Taliban's founder. Although the mission failed, the first drone strike sent a clear signal to the world: combat, in the future, was going to be different.

After taxiing in an MQ-9 Reaper, Airman 1st Class Jon Mann walks under a Reaper's wing to place wheel chocks to prevent accidental movement April 24, 2013 at Holloman Air Force Base, N.M.
Credit: U.S. Air Force photo/Senior Airman Andrew Lee

Just across Afghanistan's eastern border, China Aerospace Science and Technology Corporation (CASC) — a state-owned enterprise focused on China's space program — was watching closely. CASC traditionally sells rockets to the PLA, but at the time of the Predator's first strike, it had been working on a large, unarmed drone. Two months later, in December 2001, CASC put the Caihong (or Rainbow) through its first test flight, and four years later, the drone came equipped with AR-1 laser guided missiles that were notably similar to the Hellfire missiles used on the Predator.

By 2009, the Aviation Industry Corporation of China, the state-owned defense contractor that makes fighter jets for the PLA, had also developed a Predator lookalike: the Wing Loong (or Pterodactyl).[4] And by 2011, Pakistan and the U.A.E — both countries with long histories of arms purchases from the U.S. — signed deals for the Caihong-3 and Wing Loong-1, respectively.

Experts say that Caihong and Wing Loong drones are not as good as the Predator or its successor, the Reaper. They are a bit slower, cannot fly as high and can spend less time in the air than their U.S. counterparts. China's defense industry is also lagging in other relevant technologies, like the gyroscopics necessary to stabilize sensors and create smooth images. According to RUSI's Bronk, Saudi Arabia even saw one of its Caihong-4 drones shot out of the sky in Yemen because it had to fly low in order to get a picture of Houthi forces that wasn't blurry.

But most buyers don't mind that Chinese armed drones aren't cutting edge. Experts estimate the Chinese technology is sold for 10 or 20 percent of the cost of U.S. drones.

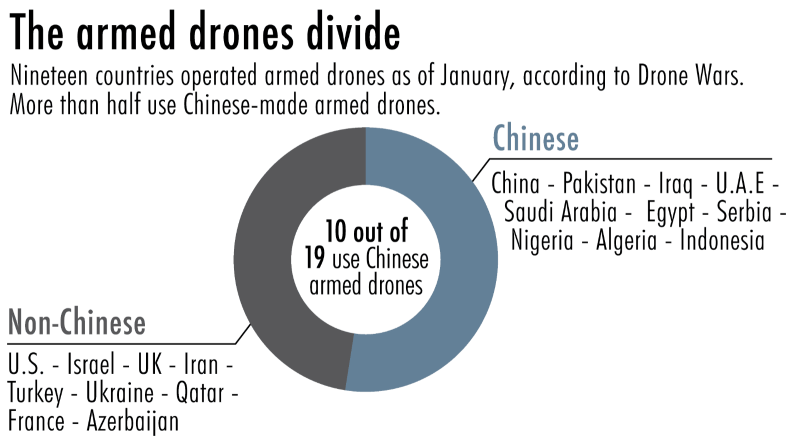
AVIC's Wing Loong at a 2019 showcase in Dubai.
Credit: AVIC

"There is not much value in comparing platform performance [with the U.S.] because most countries are not seeking best-in-class performance, but rather something that is affordable and 'good enough' for their specific requirements," says Kelvin Wong, a Singapore-based analyst at Janes who is an expert in China's military drone programs.

With the U.S. not exporting to most countries, many of China's clients are just happy to get their hands on *any* armed drone. Iraq, for instance, had few other options in its fight against ISIS. And, similarly, Nigeria has bought Caihong drones to fight Boko Haram.

China's customers also appreciate the lack of preconditions or strings attached to their purchases. After being rebuffed by the United States, for example, the U.A.E. bought Wing Loong-2 drones and sent some to Libya, where it carried out over 800 strikes against the U.S. and United Nations-backed government. Saudi Arabia, along with the U.A.E., has operated Chinese drones in Yemen in a war against the Iran-backed Houthis that has seen civilians widely targeted. And after Myanmar's army overthrew the democratically-elected government in February, it began flying Caihong-3 drones over protests, possibly for surveillance or to demonstrate force.

"For the Chinese, the most important thing is that the price is being paid," says Vuk Vuksanovic, a former Serbian diplomat who is now a researcher at the London School of Economics. "They don't interfere in the governance of the customer state or how they are going to be used in combat."



China does care, however, about how its drones perform in combat, and its booming export business has allowed it to test its fleet in real world scenarios. For China, which has not seen a hot war since its brief invasion of Vietnam in 1979, this is a crucial opportunity.

"The People's Liberation Army is a force that does not have recent operational experience," says Elsa Kania, an adjunct senior fellow at the Center for a New American Security and specialist on China's drone program. "The PLA has to learn without fighting, while exploring the potential of new capabilities and concepts of operations. Among the collateral benefits of drone sales, beyond the profits, may be a chance to see how well these weapons systems perform under operational conditions."

In other words, as in the Iraq video, providing drones allows China to look over other militaries' shoulders. According to Brendan Mulvaney, director of the China Aerospace Studies Institute at the U.S. Air Force's Air University, "The vast majority of [China's] agreements include the provision that the technical data will go back to China."

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— Peter Singer, a senior fellow at New America

That means as Chinese drones are deployed around the world, the drone manufacturers and PLA see what works and what does not. And these insights could help prepare China for the future of drone warfare — whatever that might be.

"The question about drones isn't just about the technology," says Peter Singer, a senior fellow at New America, a think tank in Washington, who researches the future of war. "It's how you use it. And militaries are still learning how to use drones."

AN ARMY OF FLYING ROBOTS

For military observers, a short war last September in the Caucasus, the region between the Caspian Sea and the Black Sea, served as something of a wake up call.

Armenia and Azerbaijan have fought over a long-contested region the two countries have called Nagorno-Karabakh since the end of the Soviet era. Armenia won the region in a ceasefire agreement in 1994, and until last year, the conflict was frozen. Then, Azerbaijan bought armed drones from Turkey and Israel.

"Drones lower the threshold for the use of force," says Chris Cole, the director of Drone Wars, an anti-armed drone organization based in Oxford. "It's very dangerous for global peace and security. Our worry is the greater proliferation of these systems will heat up these frozen conflicts like Nagorno-Karabakh globally, and we will see more war."

Indeed, with drone footage streaming on massive screens across Baku, the Azerbaijani capital, residents saw how their military's new artillery matched up to Armenia's minimal Soviet air defenses.

"Azerbaijan used drones to devastating effect, reportedly destroying 140-plus tanks, 35 infantry fighting vehicles, 19 armored personnel carriers and 310 trucks — plus dozens of artillery pieces and air defense systems," says Zachary Kallenborn, a researcher at the Unconventional Weapons and Technology divison of the National Consortium for the Study of Terrorism. "Drones effectively gave Azerbaijan a robust air force, and Armenia had limited capability to stop them."

In just six weeks, Armenia signed a ceasefire and accepted defeat.

"Ten years ago the debate was: are drones useful in war? Coming out of the Armenian-Azerbaijani conflict, the debate is not about if drones are useful, but what is the future of tanks," says Singer.

The Nagorno-Karabakh war marked the first time in history that drones decisively changed the course of an interstate conflict. Despite that distinction, however, the war used drones in familiar ways: Azerbaijan fired missiles at Armenian forces, who were helpless with few air defenses.

CCTV released footage of AVIC's Wing Loong-2 in flight in September 2020.

Yet, the battle showed how quickly a country can be overwhelmed by a fleet of robots. And experts say that over the next decade, both the U.S. and China are expected to launch a very different kind of drone. This next generation will be faster, stealthier and equipped with new kinds of missiles, lasers and electromagnetic jammers. More importantly, they will also have artificial intelligence software that allows them to make decisions autonomously. In the future, armed drones will decide what to target, if they should attack and how they should do so — all much faster than humans ever could. Artificial intelligence will also allow drones to communicate with one another as an army of flying robots, developing complex strategies and implementing them in the blink of an eye.

Companies in the U.S. and China are already working to develop autonomous software that lets drones work together in "swarms." A state-owned defense contractor in China,[5] for instance, released a video last September showing a test swarm of 48 "suicide drones." Experts say that if a swarm of 1,000 drones armed with missiles or bombs were to attack a target in sync, a country would need to have air defenses that were 100 percent successful to ensure an attack wouldn't be catastrophic. No country boasts such a technology.

"A swarm of drones is a scary idea when you're thinking of defending aircraft or bases, especially from the autonomy perspective," says Dan Gettinger, founder of the Center for the Study of the Drone at Bard College. "One of the main ways we intercept drones today is by jamming the connection between the operator and the aircraft. If the aircraft is autonomous, that link doesn't exist."

In April, a group of drones assembled in the shape of QR code in the promotional stunt for Bilibili.
Credit: Bilibili

So far, experts believe that the U.S. has an edge in drone hardware. Aviation has, historically, been a problem area for China. Even with significant help from the biggest U.S. aviation conglomerates, like Boeing and General Electric, the country has struggled to build jumbo jets. Engines have become a sticking point, and in recent years, the U.S. has made an effort to stop China from acquiring technology that could help. U.S. regulators, for example, unanimously voted to block the sale of a bankrupt Wisconsin drone engine company to a Chinese businessman this spring, its former employees told *The Wire*.

But hardware is where the good news ends for the Pentagon. And software, it turns out, is more likely to be the center of gravity in future drone competition.

"The [unmanned aircraft] is just a physical platform. Ultimately, it's all about the control systems, the computing systems, and how it autonomously navigates and feeds data to the user. All of this is essentially software and processor power. And this is where the Chinese are very strong," says Wong, the Janes analyst.

Indeed, when it comes to drone software, China's military developers have a wealth of experience to draw on. China's consumer drone industry is by far the world's most advanced. One Chinese company, DJI, makes up three-quarters of the world's consumer drone sales and has invested heavily in developing autonomous technology so its drones can do everything from inspect construction sites to move packages through traffic.

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> — *Chris Cole, the director of Drone Wars*

"It is very likely that there will be AI crossover between civil and military drones," says David Benowitz, a drone industry analyst in Shenzhen who previously worked at DJI.

The U.S., for its part, is investing in defenses against autonomous drones. Lockheed Martin, for example, markets a drone that uses high powered microwaves to disable incoming swarms. But, so far, these defenses offer little comfort. Experts say autonomous drones and swarming technology is potentially so deadly that averting conflict is far more preferable than developing technology to counter drones.

"The history of modern drone use started with counter-terrorism in the mountains of Afghanistan, and chapter two starts in Nagorno-Kharabakh," says Kallenborn, at the National Consortium for the Study of Terrorism. "Chapter three — what happens when great powers fight with them — has yet to be written. But I would die happy if that chapter were never written."

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COVER STORY

Pole Position

BY EYCK FREYMANN

In public, Chinese diplomats and climate negotiators deny that they see any link between climate change and geopolitics. But there is a deeply cynical consensus within China's academic and policy communities that climate change creates geopolitical opportunities that China can exploit — and must exploit before its rivals do. Greenland was the proof of concept for this strategy. And it caught the U.S. flat-footed.

THE BIG PICTURE

Transsion's Triumph

BY GARRETT O'BRIEN

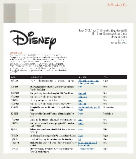
A look at Transsion's monumental growth, unique marketing strategies and future growth potential.

Q & A

Jörg Wuttke on China's Self-Destruction

BY ANDREW PEAPLE

The EU Chamber of Commerce in China president talks about China's self-inflicted problems; how he gets away with being so outspoken; and why he believes in China's comeback gene.



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