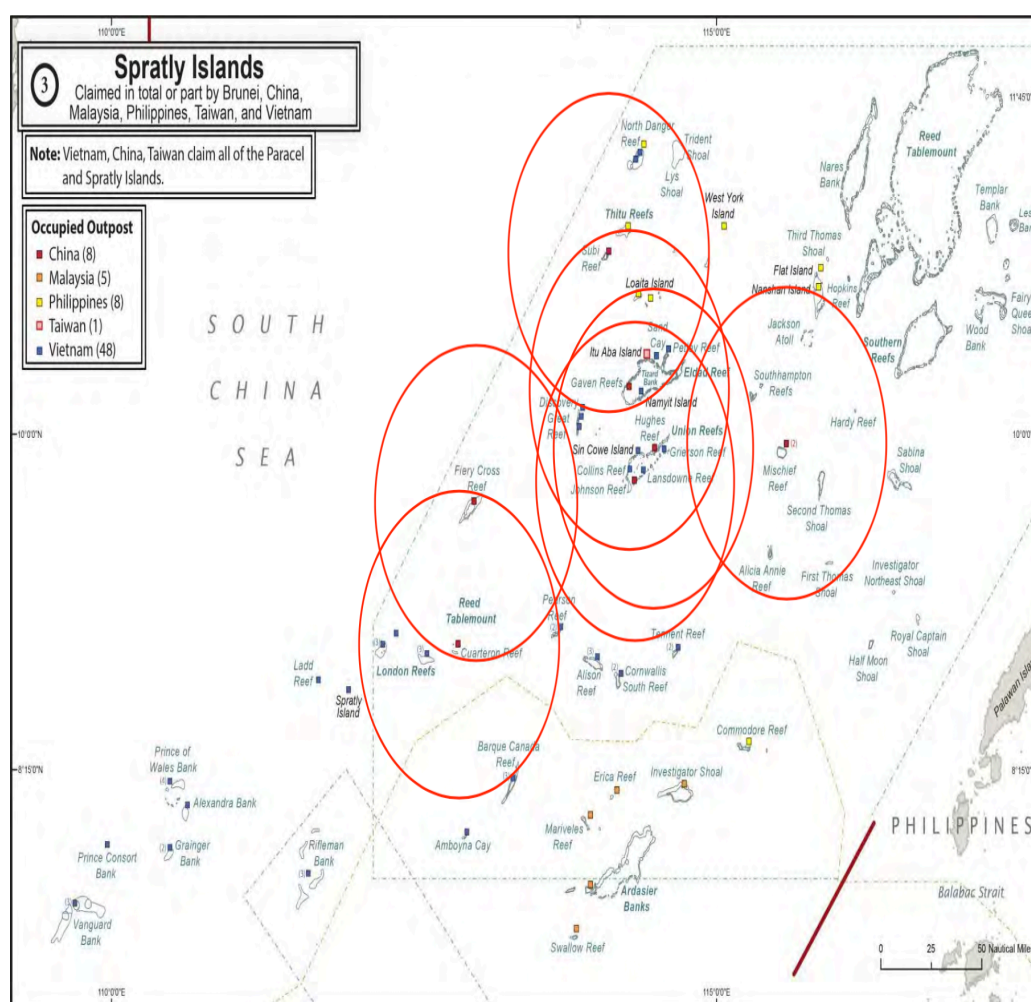


Red Drones Over Disputed Seas

A Field Guide to Chinese UAVs/UCAVs Operating in the Disputed East and South China Seas

BY IAN BURNS MCCASLIN



(Cover Image: Flight Radii of S-100 If Deployed from Physical Features China Controls in the Spratlys, Source: *The Asia-Pacific Maritime Security Strategy*.¹ Author added flight radii over original map.)

Why A “Field Guide”?

Driven by heavy investment in its own drone industry and acquisition (often illegally) of drone technology from abroad, the People’s Republic of China (PRC or China) has experienced a “drone boom.”² A quick glance at the Wikipedia page for “List of unmanned aerial vehicles of China” shows an astoundingly large number of drone models, even if many will never be mass produced.³ Chinese-made drones are not just proliferating at home, as models, such as the Wing Loong I, are selling more frequently and in larger numbers abroad.⁴ However, more importantly, China is increasingly deploying drones under the control of its military and maritime law enforcement agencies in areas whose sovereignty China is disputing.⁵ Specifically, Chinese drones have already been spotted in both the East China Sea, where it has sovereignty disputes with both Japan and the Republic of China (ROC or Taiwan), and the South China Sea, where it has sovereignty disputes with Taiwan, the Philippines, Malaysia, Brunei, and Vietnam.

International law and norms, as well as the legal systems in countries around the world, are still struggling to catch up to the new realities and challenges of drone proliferation.⁶ Currently there are no “rules of the road” for most countries to operate drones nationally, let alone internationally. How close foreign drones are allowed to operate near drones of other countries or near manned aircraft or surface vessels need to be answered to avoid misunderstandings and accidents between different militaries and law enforcement agencies. However, the use of drones by China in areas it claims abroad will not pause while claimants negotiate over sovereignty or legal norms catch-up to the reality of a drone proliferation. The Chinese government’s theft of an American unmanned underwater vehicle (UUV), which the U.S. government claimed had sovereign immunity, is one of the more high profile examples of this issue.⁷ The buzzing and “overhead passes” of Philippine Navy ships by suspected Chinese drones over the years is another.⁸

Members of the coast guards, navies, and air forces operating in the East and South China Seas need to be prepared for future drone interactions, not just at the higher-levels of their leaderships’, but at the lower operational levels as well. Encountering a foreign drone flying near your craft can catch any sailor or pilot by surprise, and crews operating aircraft and surface craft in the East and South China Seas need to be properly prepared for such an encounter.⁹ Considering the level of resources China has put into drone development and enabling power projection farther from its shores, its drones are the ones members of the relevant coast guards, navies, and air forces will most likely encounter.¹⁰ Estimates cited by the U.S. Department of Defense in its 2015 China report, indicate that China plans to produce tens of thousands of unmanned systems potentially worth over \$10 billion between 2014 and 2023.¹¹ Add to this the aggressive, and sometimes lethal, nature of some of China’s manned air intercepts, operators from other countries in the East and South China Seas should be prepared for even more dangerous flying from Chinese unmanned aerial platforms.¹²

East Asian Maritime Claims

The Pacific Rim has numerous overlapping maritime claims. As China moves to secure access to transit routes, it has pressed its longstanding claim to a "nine-dash line" encompassing territory claimed by Vietnam, the Philippines, Indonesia, Malaysia, Brunei, Taiwan and Japan.



(Competing Claims in the East and South China Sea. Source: *Stratfor*.¹³)

Clarification

While the Chinese military (People's Liberation Army or PLA) is reported to have quite a few drone models, this guide will restrict itself to launch points and drones that have open-source evidence confirming their existence.¹⁴ A few potential launch points will be included for the sake of encouraging readers to think about the full-range of the PLA's capabilities, especially should the PLA one day choose to utilize them.

What Red Drones To Look Out For

While there are many Chinese aerial drone models, few are actually deployed and are relevant for this field guide. This field guide will focus on **four models: S-100, ASN-209, BZK-005, and GJ-1** (also more commonly known by its export name, Wing Loong I).¹⁵ These four models were chosen because they have been the most consistently observed military-grade aerial drones being operated by Chinese forces (namely the PLA Navy or PLAN, and the PLA Air Force or PLAAF). Each section will examine one drone model with an overview, tips on how to identify it, and where it could be seen operating in the East and South China Seas. This field guide will finish with a series of recommendations to improve the responses of other military and law enforcement agencies when facing a Chinese drone in the East and South China Seas.

S-100*Overview of S-100*

In 2010, the PLA purchased 18 rotary Schiebel S-100 drones.¹⁶ This vertical take-off and landing (VTOL) drone is produced in Schiebel's factory south of Vienna, Austria. The S-100 is the only aerial drone the company – which also manufactures products in mine detection and composite technology – currently sells.¹⁷ In May 2012, the Japanese Maritime Self Defense Force (JMSDF) released photographs of what appeared to be three S-100s on a PLA Navy Type 054 frigate.¹⁸ In a 2015 report, the U.S. Office of Naval Intelligence (ONI) stated that multiple S-100s had been seen operating from PLA Navy surface combatants.¹⁹



(A Likely S-300 Operating Near A Type 054A. Source: *Far-Eastern Sweet Potato*.²⁰)

ジャンカイⅡ級フリゲート(529)甲板上の無人航空機(UAV)



(Three Likely S-100s Aboard A Type 054A. Source: *Far-Eastern Sweet Potato*.²¹)

While the PLA will likely replace it with a domestic model in the future, the S-100 remains one of the more ubiquitous drones that has been deployed by China abroad.²²

The model has an operations ceiling of 18,000 feet in International Standard Atmospheric (ISA) conditions. When carrying a 75 pound (34 kilogram) or lighter payload, the S-100 has an operational endurance of more than six hours. If the external fuel tank is attached under

the same conditions, it has an operational endurance of more than 10 hours.²³ Depending on the configuration, it has a range between 60-125 miles (100-200 kilometers or km).²⁴

Schiebel's brochure for this drone praises it as "ideally suited for use in maritime operations."²⁵ It is likely to be used by China for intelligence, surveillance, and reconnaissance (ISR). The Schiebel brochure specifically lists Synthetic Aperture Radar (SAR), Maritime Radar, Signal Intelligence (SIGNIT), and Communication Intelligence (COMINT) as optional payloads for the S-100.²⁶

While the S-100 is not sold by Schiebel with weapons - and there are no indications that China has modified them to carry weapons - the S-100 has been modified in the past to carry weapons, such as the Lightweight Multirole Missile (LMM) by the defense firm Thales.²⁷ Therefore, the possibility exists that the PLA may modify this ISR drone to carry similar weapons.

How to Identify the S-100



(Front View of S-100. Source: Air Recognition.²⁸)



(Side View of S-100. Source: Air Recognition.²⁹)

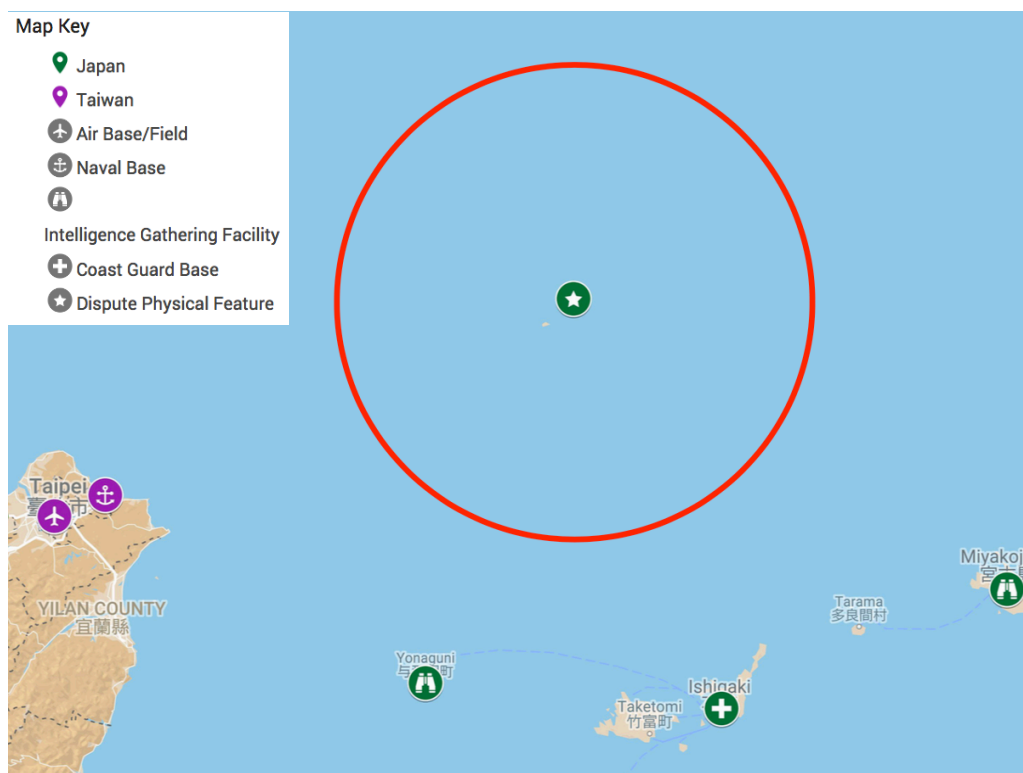
The maximum dimensions of the S-100 is a length of 10.2 feet (3.11 meters), a height of 3.6 feet (1.11 meters), and a width of 4.06 feet (1.24 meters).³⁰ While it has been used by other countries in several colors, to date, the S-100 has only been seen painted white when used by the PLAN.

Where Could You See the S-100?

Where these unmanned aerial vehicles (UAVs) could be seen depends, not only on the ranges and altitudes they can operate in, but where they can be deployed from. This model can operate from any land mass or vessel that has enough space for its frame to rest on. However, based on past precedent, and given the limited range of this model, China will likely be operating them from the PLAN Type 054/054A frigate.

Both the PLAN and China Coast Guard (CCG) have Type 054/054A frigates.³¹ The PLAN alone has commissioned at least 23 Type 054A frigates for its fleets.³² Currently nine of them

are a part of the East Sea Fleet, whose primary responsibility is the East China Sea. The Type 054As in the East Sea Fleet are joined by two Type 054 frigates.³³

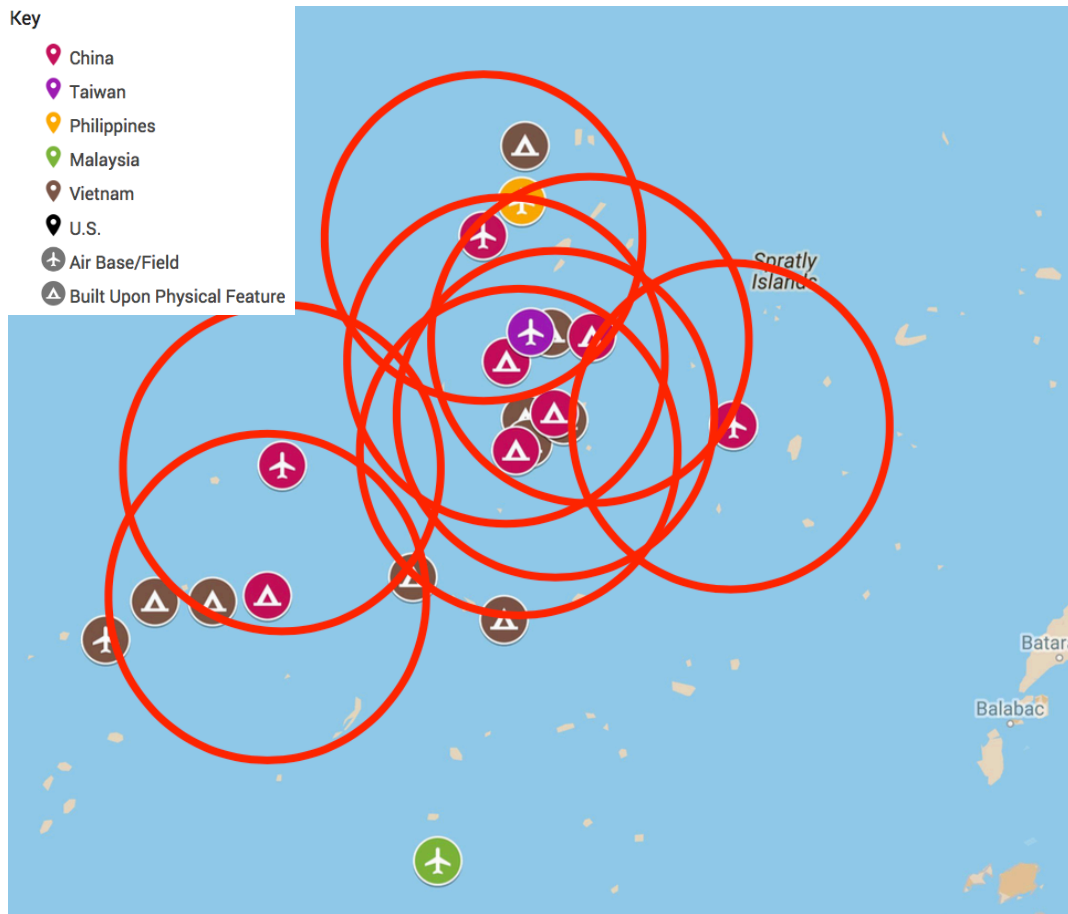


(The 62.5 mile [100.58 km] flight radii of the S-100 if operating within the Senkakus. Map By Ian Burns McCaslin.³⁴)

The bulk of these vessels are a part of the 8th Frigate *Dadui* (大队) based out of Shanghai.³⁵ The Type 054A has a navigational range of 4,600 miles (7,400 km) at 18 knots.³⁶ This range means the PLAN can deploy the S-100 from a Type 054/054A anywhere in the East China Sea. Given the frequency of Chinese vessels (private, maritime law enforcement agencies, and navy) entering into the territorial sea and contiguous zone of the Senkakus, drones launched from Chinese vessels are a concern for Japan.³⁷

The PLAN only has eight Type 054A frigates in the South Sea Fleet, whose primary responsibility is the South China Sea.³⁸ Given the range of these Type 054A frigates, China can deploy the S-100 from those vessels anywhere in the South China Sea. However, it is important to note that once launched from the vessel, the S-100 only has an operational range of 60-125 miles (100-200 km) depending on the configuration used and payload.³⁹

Even so, the physical features China controls that could support a drone, like the S-100, are a latent factor that must be kept in mind. If such features are taken as the only possible launch points (ignoring the Type 054/054A frigates as launch points), then the coverage afforded to China is still quite extensive. As shown in the map below.



(The 62.5 mile [100.58 km] flight radii of the S-100 utilizing any of the Chinese-controlled reclaimed physical features in the Spratlys. *Map by Ian Burns McCaslin.*)

Despite the S-100 having a shorter range and lower operational ceiling than other Chinese drones profiled in this field guide, it can still outperform the National Chung-Shan Institute of Science and Technology (NCSIST) Cardinal II drone used by Taiwan’s Marines and its Army’s Airborne Operation Special Force. The S-100 has nearly twelve times the range and nearly double the average cruise speed than that of the Cardina II.⁴⁰ Depending on the S-100’s payload, it can also outrange the NCSIST Albatross and NCSIST Sharp Kite used by Taiwan’s Army, by more than 30 miles (50 km) each.⁴¹ These performance capabilities mean that Taiwanese drone pilots must be aware that even if they see a S-100 near one of their outer islands, such as Itu Aba, the S-100 will be able to fly beyond the range of a Cardinal II, Albatross, or Sharp Kite. In such a situation, Taiwanese drone pilots may need to start thinking less like a drone pilot and more like a dogfighter.⁴² Factors such as speed, rate of climb, and turning radius, would need to be given greater consideration even when dealing with an unarmed, but potentially hostile foreign drone.⁴³ While range is important, it is not everything.

ASN-209

Overview of the ASN-209

The ASN-209 was designed by the Northwestern Polytechnics' UAV Institute, also known as "ASN Technology Corporation".⁴⁴ Units used by the PLA are manufactured by Xian Aisheng Technology Group Company Ltd.⁴⁵ This Chinese model is a medium-altitude, medium-endurance (MAME) UAV.⁴⁶ It has an operational ceiling of 16,404 feet (5,000 meters), an operational range of 124.3 miles (200 km), and an endurance of 10 hours.⁴⁷

The model is deployed with a rocket booster from the back of a truck and lands via parachute.⁴⁸ These capabilities enable the model to take off from anywhere with enough space for the launcher, which is about the same size as the model itself, and to land essentially anywhere. Unlike the S-100, the Aisheng (ASN)-209 is not limited by the consideration of a return trip to its original launch point.



(View of ASN-209 Launch. Source: Chinese Military Review.⁴⁹)

The ASN-209, deployed with the PLA, has not yet been seen equipped with weapons; however, in a brochure by the China National Aero-Technology Import & Export Corporation (CATIC) for the 2016 Singapore Airshow, the ASN-209 was depicted firing a Tian Long (TL)-2 missile.⁵⁰ The TL-2 has heat and fragmentation warheads and is described as "mainly employed for border surveillance, counter-terrorism, and maintaining stability to the target of light armored vehicle, skiff and armed personnel."⁵¹

How to Identify the ASN-209



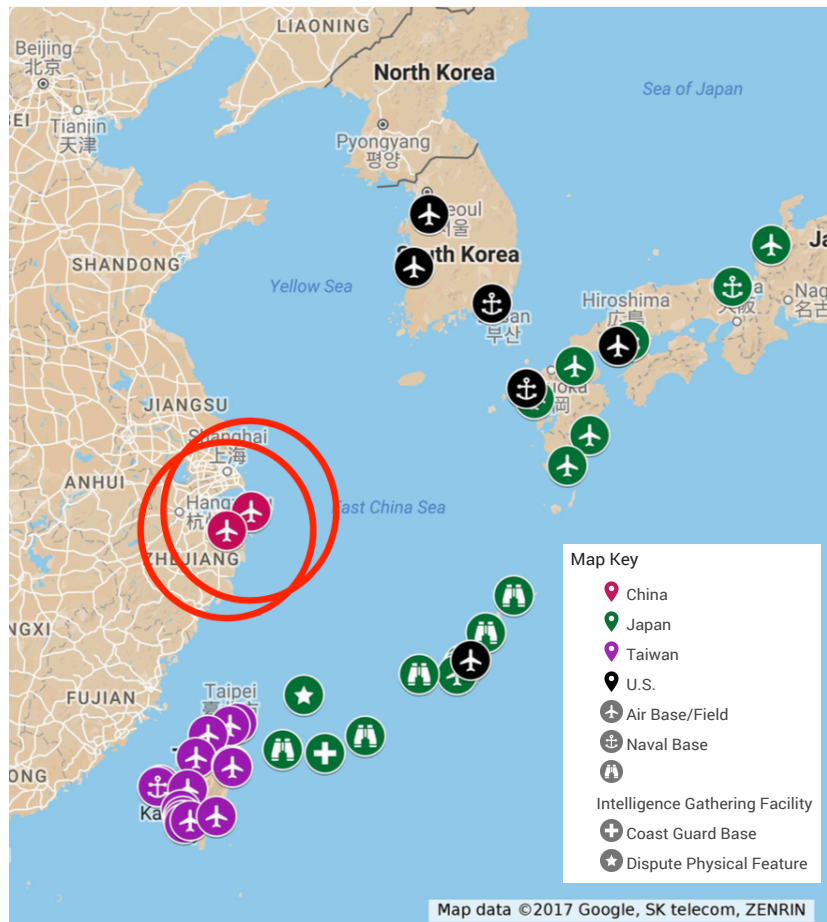
(Front View of ASN-209. Source: Avia.Pro.⁵²)



(Left: Side View of the Silver Eagle derivative of the ASN-209 with the telltale additional antenna.⁵³ Source: Chinese Military Review.⁵⁴ Right: Under View of ASN-209. Source: Asian Defence News.⁵⁵)

To date, the ASN-209 has been seen with a variety of paint schemes with the PLA and PLAN.⁵⁶ The most common is a white body with its underbody painted either dark grey or red. The ASN-209 has a length of 14 feet (4.3 meters), a width of 24.6 feet (7.5 meters), and a height of 5 feet (1.5 meters).⁵⁷

Where Could You See the ASN-209?

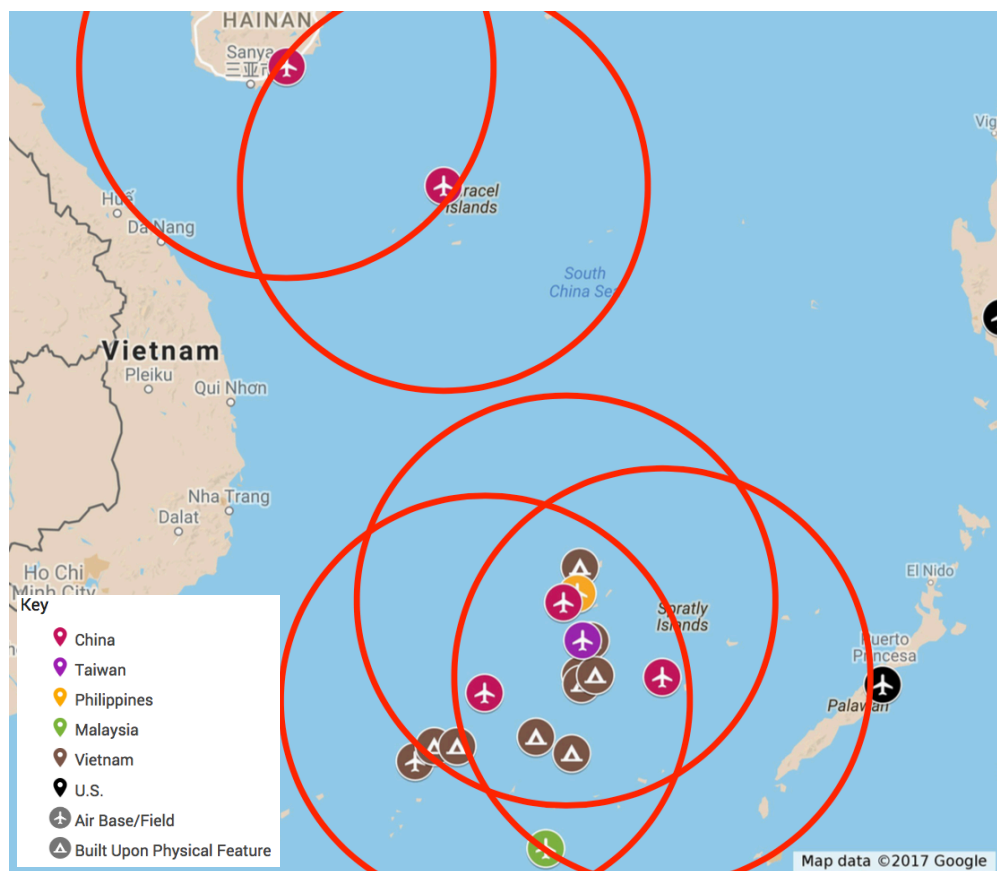


(The 124.3 mile [200 km] full range of the ASN-209, without a return trip, if launched from Daishan and Ningbo. Map by Ian Burns McCaslin.)

As previously mentioned, where these models could be seen depends, not only on the ranges and altitudes they can operate in, but where they can be deployed from. Since this model does not have to make a full return trip to its original launch point, it can fly to the full extent of its range of 124.3 miles (200 km).⁵⁸ So far its capabilities have only been confirmed to have been used in the East China Sea from near runways, as seen in the map above.

The ASN-209 has not yet been seen operating in or around the South China Sea. If it, or another model with similar capabilities, was to operate in the area, it would have the capability to operate more than 1.2 miles (more than 2,000 meters) higher than the only other drone that has been publically known to have been operated by another claimant in the South China Sea, Malaysia's Thales Fulmar UAV. However, it would actually be outranged by the Malaysia's Fulmar by more than 370 miles (600 km).⁵⁹

The map below is an illustration of the kind of coverage the ASN-209, or a similar model, could provide if China were to only deploy it from near runways in the South China Sea, as it has with the model near the East China Sea.



(The 124.3 mile [200 km] full range of the ASN-209, without a return trip, if launched from Chinese-controlled physical features with airfields in and around the South China Sea. Map by Ian Burns McCaslin.)

BZK-005

Overview BZK-005

This model is a medium-altitude, long-endurance (MALE) drone designed by the Beihang University's UAV Institute and the Harbin Aircraft Industry Group (HAIG), and manufactured by HAIG.⁶⁰ HAIG is a subsidiary of the Aviation Industry Corporation of China (AVIC).⁶¹ The BZK-005 has been one of the drones most commonly captured on Chinese runways via satellite imagery. As it is not a VTOL and China has not yet begun to deploy runway launched drones from its aircraft carrier, the range of this drone is limited by the location of ground-based runways that China can construct near or in the disputed areas of the East and South China Seas.

It has an operational ceiling of 26,247 feet (8,000 meters), with a maximum range of 1,491 miles (2,400 km) and an endurance of 40 hours.⁶²

So far the BZK-005 functions as an ISR asset for the PLA.⁶³ According to research by the U.S.-China Economic and Security Review Commission – though currently unverified – given its structural appearance, the BZK-005 “probably has electro-optical, infrared, synthetic aperture, and signals intelligence sensors and is equipped with satellite communications systems, allowing for real-time data transmission capability.”⁶⁴ To date, there is no sign the BZK-005 has been modified to carry weapons; however, given its size and carrying capacity, it could be modified to do so, just as the U.S. did with the Predator drone.⁶⁵

How to Identify the BZK-005



(Front View of BZK-005. Source: Sino Defence Forum.⁶⁶)



(Side View of BZK-005. Source: Sino Defence Forum.⁶⁷)



(Under View of BZK-005. Source: 新闻频道.⁶⁸)



(Behind View of BZK-005. Source: 新闻频道.⁶⁹)



(Far Away Side View of BZK-005. Source: 新闻频道.⁷⁰)

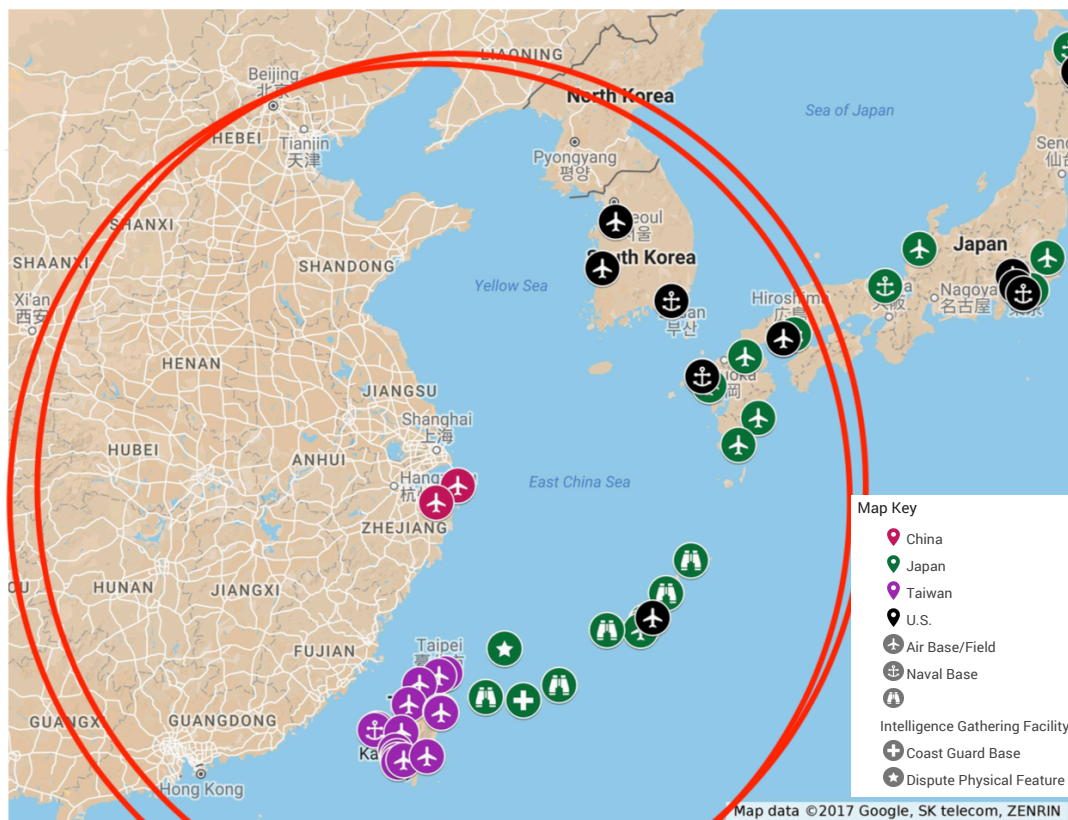
To date, the BZK-005 has been seen in use by the PLAAF and PLAN. The primary color scheme that the BZK-005 has been photographed with has been a blue-gray body with a “hump” on its head and lower spine painted white. However, it has also been photographed with a white and gray paint scheme. Based on which branch controls the bases where each color scheme was spotted, it appears the PLAN utilizes the white and gray paint scheme, while the PLAAF utilizes the blue-gray with white hump paint scheme.

It is estimated that the length of the BZK-005 is 30 feet (9.14 meters), with a width of 55 feet (16.76 meters).⁷¹

Where Could Your See the BZK-005

Due to its size and launch system, the BZK-005 requires a proper runway to take off and land. This characteristic means that the model cannot be deployed from mobile platforms, such as warships or from the backs of trucks. However, its range is significantly larger than models like the S-100 or ASN-209. The BZK-005’s range is about 1,490 miles (2,400 km) with an endurance of 40 hours. Its ceiling of operation is also higher at about 26,240 feet (8,000 meters).⁷²

As shown in the map below, a BZK-005 launched from Daishan Island or Ningbo in Zhejiang Province has the range to easily fly to the Senkakus, as well as Japan's Southwest Islands, the southern part of the Japanese home islands, and all of the Republic of Korea (ROK or South Korea) and Taiwan. Given its range, the BZK-005 would have ample fuel to loiter around most of the East China Sea.



(The 745 mile [1,200 km] flight radii of the BZK-005 when launched from Daishan and Ningbo for the East China Sea. *Map by Ian Burns McCaslin.*)

Japan's southern most military, intelligence, and coast guard facilities, such as those on Yonaguni, Ishigaki, Miyako, Kume, Okinawa, Okinoerabu, and Amamioshima – which are the Japanese islands closest to the Senkakus – are notably in range of a BZK-005.

As can be seen from the map below, if a BZK-005 were to be launched from the four main Chinese-controlled islands (artificial and natural): Woody Island, Subi Reef, Mischief Reef, and Fiery Cross Reef, it could range over the entire South China Sea. Even if it was launched from Lingshui Air Base on Hainan Island, it could still reach all of the major artificial islands China has created thus far. To date, the BZK-005 has been captured with satellite imagery using an airstrip in Lingshui Air Base and on Woody Island, the two northern most of the five airstrips shown in the map below.⁷³ However, as of now, there are no BZK-005s permanently based on any of islands (artificial or natural) controlled by China in the South China Sea.



(The 745 mile [1,200 km] flight radii of the BZK-005 if launched from Lingshui, Hainan, Woody Island, Subi Reef, Mischief Reef, and Fiery Cross Reef. Map by Ian Burns McCaslin.)

While the BZK-005 has been seen on the runways of Lingshui and Woody Island in the past, they have not yet been seen on Subi Reef, Mischief Reef, or Fiery Cross Reef. Their inclusion is merely to give readers an idea of the utility of these Chinese-controlled, artificially constructed islands for drone use.

The high operational ceiling of the BZK-005 means it can operate at higher altitudes than a number of other aircraft, particularly those used by the coast guards of states China is in disputes with in the East and South China Sea. In the case of the Japanese Coast Guard (JCG), the BZK-005 can fly higher than the Bombardier Dash 8 (which Japan uses for maritime surveillance) and the AgustaWestland AW139, Eurocopter AS332 Super Puma, Eurocopter EC225 Super Puma, and Sikorsky S-76D (which Japan uses for search-and-rescue).⁷⁴

In the case of Taiwan's Coast Guard Administration (CGA), the BZK-005 can fly above all of the CGA's helicopters (MBB/Kawasaki BK 117B-2, Eurocopter AS365 Dauphin, Sikorsky S-76B, Boeing B-234MLR [under National Forest Agency], and the Bell UH-1H).⁷⁵

In the case of the Philippine Coast Guard (PCG), the BZK-005 can fly above all of the aircraft they currently operate (Britten-Norman BN-2 Islander, MBB Bo 105, and the Short C-23 Sherpa).⁷⁶

In the case of the Malaysian Maritime Enforcement Agency (MMEA), also known as the Malaysian Coast Guard, the BZK-005 can fly above both the helicopters it uses for search-and-rescue (AgustaWestland AW139 and Eurocopter AS365 Dauphin).⁷⁷ The BZK-005 can also fly about 5,000 meters above the operational ceiling of the Thales Fulmar X, operated by the MMEA.⁷⁸

In the case of the Vietnam Coast Guard (VCG), the VCG's CASA C-212 Aviocar series 400 can still fly above the BZK-005 by more than 1,000 meters.⁷⁹

GJ-1

Overview of GJ-1

This is a medium-altitude, long-distance (MALE) UAV, which was designed to be converted to an unmanned combat aerial vehicle (UCAV).⁸⁰ The *Gongji* (GJ)-1 was designed by the Chengdu Aircraft Design and Research Institute, which works with the manufacturer, the Chengdu Aircraft Industry Group, a subsidiary of AVIC.⁸¹ Unlike many of the other drones designed for ISR, the GJ-1 has been almost exclusively photographed equipped with, firing, or next to missiles and bombs. This has been one of the more notable drone models exported abroad by China. The model's first export version, the Wing Loong I, was exported to Kazakhstan, Saudi Arabia, and the United Arab Emirates. The largest drone export order yet for China is for the second export version, the Wing Loong II.⁸²

The GJ-1 can carry a total payload of 441 pounds (200 kilograms). It has optional SAR and electro-optical loadouts.⁸³ It has been seen equipped with eight different weapon types in one test alone.⁸⁴ Primarily, the weapons it has been seen with have been air-to-surface missiles and small diameter bombs.⁸⁵ These include the AKD-10, BRMI-90, FT-7/130, FT-9/50, FT-10/25, GB-7/50, and GB-4/100.⁸⁶

How to Identify the GJ-1:



(Front view of the GJ-1. Source: airforce-technology.com.⁸⁷)



(Side View of GJ-1. Source: airforce-technology.com.⁸⁸)

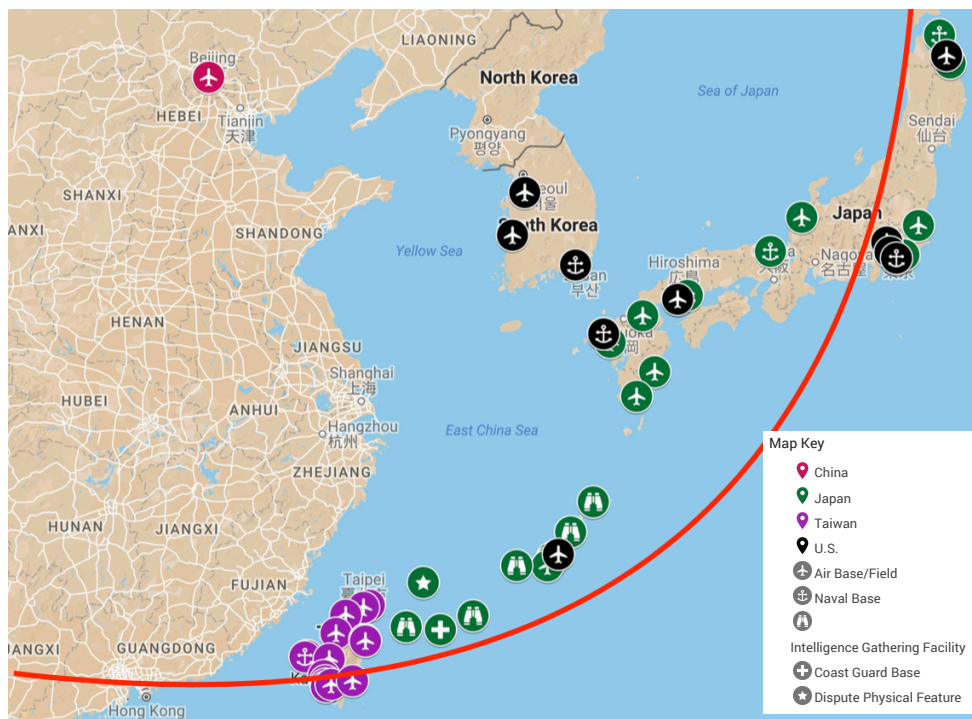


(Lower and Behind View of Two GJ-1s in formation. Source: 中国军网.⁸⁹)

The GJ-1 has so far only been photographed since its deployment with PLAAF with a gray paint scheme. The model strongly resembles the U.S. Predator, so much so that some have labeled it a “Predator Clone.”⁹⁰

The model has a length of 28 feet (9 meters), a width of 46 feet (14 meters), and a height of 9.1 feet (2.8 meters).⁹¹

Where Could You See the GJ-1



(The 1,242.5 mile [2,000 km] flight radius of the GJ-1 Launched From Near Beijing. Map by Ian Burns McCaslin.)

This model has by far the greatest operational capabilities of the models listed in this field guide. Its range of 2,485 miles (4,000 km) allows it to cover the East China Sea from any drone base in the provinces of the Eastern Theater Command.⁹² Even from one of the PLAAF's airstrips in Shahe, north of Beijing, a GJ-1 still has the capability to reach all of the East China Sea.

That same range also allows it to cover all of the South China Sea from any drone base in the Southern Theater Command.⁹³ As shown below, even if only launched from the airstrip at Lingshui on Hainan, the GJ-1 provides the PLA with significant coverage of the South China Sea.



(The 1,242.5 mile [2,000 km] flight radius of the GJ-1 if launched from airstrip at Lingshui on Hainan. Map by Ian Burns McCaslin.)

Like the BZK-005, the GJ-1 can either fly farther or higher than many of the unmanned and manned platforms operated by countries around both the East and South China Seas.

Conclusion

Education and discussion of drones can no longer be the exclusive domain of theorists or high-level officers. Though drones largely remain in the popular conscious of many countries as untouchable platforms striking targets far below with impunity, the increasing clip of drone models being shot down shows that such advanced technology can still be brought down by a simple bullet. One of the drone models profiled in this field guide is alleged to have been shot down by Al Shabaab militants while being operated by the United States.⁹⁴ Even aerial drones with more advanced capabilities have been brought down, such as the downing of multiple Iranian Shahed-129's by U.S. fighter jets.⁹⁵ The Shahed-129 is a MALE drone, just

like the BZK-005 and GJ-1, showcasing that unmanned platforms are still no match for manned ones.⁹⁶

Aerial drones are in the fray of armed conflict just as much as manned aerial platforms now; however, the proliferation of drones is still being adjusted to by law enforcement agencies and militaries. Therefore, any member of a military service or law enforcement agency operating in the East and South China Sea must be mentally prepared to encounter a drone. As was seen with the EP-3 incident in 2001, an aerial asset does not have to fire weapons to damage the asset of another country. While armed Chinese drones operating in the East and South China Seas may still be a little ways off, Chinese drones flying dangerously close to aerial or naval assets could happen much sooner.

Thinking further into the future, the militaries and law enforcement agencies of the region need to seriously consider if their personnel operating in the East and South China Seas are sufficiently prepared to deal with Chinese drones, even if they lose contact with their superiors and have to react based only on their training and instincts.⁹⁷ This field guide aims to jumpstart a conversation on how militaries and law enforcement agencies should prepare their personnel to deal with potentially hostile aerial drones, armed or otherwise, operating in disputed areas in their maritime neighborhood. If these organizations properly prepare themselves, they can better react to deal with a potential threat and prevent the encounter from escalating beyond their control.

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Endnotes

¹ *The Asia-Pacific Maritime Security Strategy: Achieving U.S. National Security Objectives in a Changing Environment*, U.S. Department of Defense, 2015, p.7.

² Note: This field manual will use the term “drone” to refer to both UAVs and UCAVs. While China almost exclusively uses the term “无人机” (UAV), some of its drones that are nominally UAVs have been reconfigured to have offensive combat capabilities. Drone is a catch-all term that is more widely known by the publics of multiple countries. For more on China’s investment in its own drone industry, see Hugh Harsono, “Drones: Putting China’s economy on autopilot,” *Tech Crunch*, June 3, 2016,

<https://techcrunch.com/2016/06/03/drones-putting-chinas-economy-on-autopilot/>. For more on China’s actions to illegally acquire drone technology from abroad, see Edward Wong, “Hacking U.S. Secrets, China Pushes for Drones,” *The New York Times*, September 20, 2013,

<http://www.nytimes.com/2013/09/21/world/asia/hacking-us-secrets-china-pushes-for-drones.html>.

³ “List of unmanned aerial vehicles of China,” *Wikipedia*, June 8, 2017,

https://en.wikipedia.org/wiki/List_of_unmanned_aerial_vehicles_of_China. For more on why some drones are designed and tested but never manufactured, see Ian M. Easton and L. C. Russell Hsaio, *The Chinese People’s Liberation Army’s Unmanned Aerial Vehicle Project: Organizational Capacities and Operational Capacity*, Project 2049 Institute, March 11, 2013, p.4.

⁴ “China Exclusive: China’s domestic Wing-Loong II UAS conducts maiden flight,” *Xinhua*, February 28, 2017, http://news.xinhuanet.com/english/2017-02/28/c_136089591.htm.

⁵ Xinhua, “China to deploy drones for marine surveillance,” *China Daily*, August 29, 2012,

http://www.chinadaily.com.cn/china/2012-08/29/content_15716266.htm.

⁶ John Kaag and Sarah Kreps, *Drone Warfare*, Polity Press, 2014, p.78-104.

⁷ Phil Stewart, “UPDATE 6-China seizes U.S. underwater drone in South China Sea,” *Reuters*, December 16, 2016, <http://www.reuters.com/article/usa-china-drone-idUSL1N1EB1PK>.

⁸ For more on the “overhead passes” of a suspected Chinese drone of the BRP Sierra Madre, see James Laude, “Chinese drones fly over Phl ship in Ayungin,” *The Philippine Star*, August 21, 2014,

<http://www.philstar.com/headlines/2014/08/21/1359978/chinese-drones-fly-over-phl-ship-ayungin>. For more on the buzzing of the *BRP Ramon Alcaraz*, see Jamie Laude, “Unidentified drone buzzes Philippine Navy ship in Benham Rise,” *The Philippine Star*, March 26, 2017,

<http://www.philstar.com/headlines/2017/03/26/1684645/unidentified-drone-buzzes-philippines-navy-ship-benham-rise>.

⁹ Two such encounters include the May 2017 encounter between Chinese Coast Guard ships and drone and Japanese fighter jets and the March 2017 encounter between a suspected Chinese drone and a Philippine Navy ship. For more on the former encounter, see “Japan scrambles jets over China drone flight near disputed islets,” *Reuters*, May 19, 2017, <http://www.reuters.com/article/us-japan-china-drone-idUSKCN18E1Q9>. Jamie Laude, “Unidentified drone buzzes Philippine Navy ship in Benham Rise,” *The Philippine Star*, March 26, 2017, <http://www.philstar.com/headlines/2017/03/26/1684645/unidentified-drone-buzzes-philippines-navy-ship-benham-rise>.

¹⁰ For more on the funding, research, design, and manufacturing of Chinese drones, see Ian M. Easton and L. C. Russell Hsaio, *The Chinese People’s Liberation Army’s Unmanned Aerial Vehicle Project: Organizational Capacities and Operational Capacity*, Project 2049 Institute, March 11, 2013, p.5-10.

¹¹ *Annual Report to Congress: Military and Security Developments Involving the People’s Republic of China 2015*, Office of the Secretary of Defense, 2015, p.36.

¹² One of the more recent examples of dangerous flying by PLA fighter jets was in May 2017; however, the most well known incident was the EP-3 incident in 2001. For more on the former example, see Barbara Starr and Zachary Cohen, “Chinese fighter jets conduct unsafe maneuver near US aircraft,” *CNN*, May 28, 2017,

<http://www.cnn.com/2017/05/26/politics/chinese-fighter-jets-unsafe-maneuver-us-aircraft/index.html>. For more on the EP-3 incident, see Kim Zetter, “Burn After Reading,” *The Intercept*, April 10, 2017,

<https://theintercept.com/2017/04/10/snowden-documents-reveal-scope-of-secrets-exposed-to-china-in-2001-spy-plane-incident/>.

¹³ “Great Power Politics in the South China Sea,” *Stratfor*, 2017, <https://www.stratfor.com/article/great-power-politics-south-china-sea>.

- ¹⁴ The launch points covered in this field guide are not meant to be exhaustive, but representative. For a good graph of potential drone/UAV units in China and whose general jurisdiction they may be under, see: https://jamestown.org/wp-content/uploads/2016/05/PLA_Organizational_Structure_for_UAVs.pdf.
- ¹⁵ Jeffrey Lin and P.W. Singer, “China Shows Off Its Growing Drone Fleet,” *Popular Science*, November 14, 2014, <http://www.popsci.com/china-shows-its-growing-drone-fleet>.
- ¹⁶ Greg Waldron, “PICTURES: Schiebel Camcopter S-100 operated from Chinese Frigate,” *Flight Global*, May 18, 2012, <https://www.flightglobal.com/news/articles/pictures-schiebel-camcopter-s-100-operated-from-chinese-frigate-372045/>.
- ¹⁷ “About Schiebel,” *Schiebel*, June 28, 2017, <https://schiebel.net/>.
- ¹⁸ “Schiebel Camcopter S-100 operated from Chinese frigate,” *Pakistan Defence*, May 21, 2012, <https://defence.pk/pdf/threads/schiebel-camcopter-s-100-operated-from-chinese-frigate.181351/>.
- ¹⁹ “The PLA Navy: New Capabilities and Missions for the 21st Century,” *Office of Naval Intelligence*, 2017, p.22-23.
- ²⁰ J. Michael Cole, “‘Mystery’ UAVs seen on Type 054A vessel; ‘Varyag’ completes sixth sea trial,” *Far-Eastern Sweet Potato*, May 16, 2012, <http://fareasternpotato.blogspot.com/2012/05/mystery-uavs-seen-on-type-054a-vessel.html>.
- ²¹ J. Michael Cole, “‘Mystery’ UAVs seen on Type 054A vessel; ‘Varyag’ completes sixth sea trial,” *Far-Eastern Sweet Potato*, May 16, 2012, <http://fareasternpotato.blogspot.com/2012/05/mystery-uavs-seen-on-type-054a-vessel.html>.
- ²² “The PLA Navy: New Capabilities and Missions for the 21st Century,” *Office of Naval Intelligence*, 2015, p.22-23.
- ²³ Camcopter S-100: Unmanned Air System (English Brochure), *Schiebel*, p.6.
- ²⁴ Camcopter S-100: Unmanned Air System (English Brochure), *Schiebel*, p.9.
- ²⁵ Camcopter S-100: Unmanned Air System (English Brochure), *Schiebel*, p.6.
- ²⁶ Camcopter S-100: Unmanned Air System (English Brochure), *Schiebel*, p.5.
- ²⁷ “Lightweight Multirole Missile – Martlet, April 19, 2017, <http://www.thinkdefence.co.uk/uk-complex-weapons/lightweight-multirole-missile-martlet/>.
- ²⁸ “Camcopter S-100 Unmanned Aerial System,” January 23, 2015, <http://www.airrecognition.com/index.php/world-air-force-military-equipment-aircraft-/west-europe-air-force-military-aircraft-planes-equipment-/austria/uav/1455-camcopter-s-100-unmanned-aerial-vehicle-technical-data-sheet-specifications-intelligence-description-information-identification-pictures-photos-images-video-schiebel-austria-defence-aviation-aerospace-industry-technology.html>.
- ²⁹ “Camcopter S-100 Unmanned Aerial System,” January 23, 2015, <http://www.airrecognition.com/index.php/world-air-force-military-equipment-aircraft-/west-europe-air-force-military-aircraft-planes-equipment-/austria/uav/1455-camcopter-s-100-unmanned-aerial-vehicle-technical-data-sheet-specifications-intelligence-description-information-identification-pictures-photos-images-video-schiebel-austria-defence-aviation-aerospace-industry-technology.html>.
- ³⁰ Camcopter S-100: Unmanned Air System (English Brochure), *Schiebel*, p.6.
- ³¹ On the CCG utilizing the Type 054A frigate, see: Ridzwan Rahmat, “Chinese Coast Guard bolsters fleet with Type 054A missile frigate-type ship,” *Jane’s 360*, June 2, 2016, <http://www.janes.com/article/60904/chinese-coast-guard-bolsters-fleet-with-type-054a-missile-frigate-type-ship>.
- ³² Ridzwan Rahmat, “China commissions 23rd Type 054A frigate into East Sea Fleet,” *Jane’s 360*, December 30, 2016, <http://www.janes.com/article/66605/china-commissions-23rd-type-054a-frigate-into-east-sea-fleet>.
- ³³ “East Sea Fleet,” *Wikipedia*, May 30, 2017, https://en.wikipedia.org/wiki/East_Sea_Fleet.
- ³⁴ Flight radius is the distance an aerial vehicle can cover before it needs to turn around for its return trip to its original launch point.
- ³⁵ Peter Wood, “Snapshot: China’s Eastern Theater Command,” *China Brief*, Vol. 17, Is. 4, p.3.
- ³⁶ Conversion from nautical miles to miles and kilometers based on the figures given in this article: Gabe Collins and Andrew Erickson, “The Type 054/054A Frigate Series: China’s Most Produced and Deployed Large Modern Surface Combatant,” *China SignPost*, August 2, 2015, <http://www.chinasignpost.com/2015/08/02/the-type-054054a-frigate-series-chinas-most-produced-and-deployed-large-modern-surface-combatant/>.
- ³⁷ What will be called the Senkakus in this piece, are called the Senkaku Islands by Japan, Diaoyu Islands by China, and Diaoyutai Islands by Taiwan. This widely spread out cluster of eight physical features is administered by the Japanese government. Given the 2016 arbitration that ruled physical features that were claimed as islands in the South China Sea were, in fact, not legally islands, this work will only refer to them as the Senkakus.

- ³⁸ “South Sea Fleet,” *Wikipedia*, May 30, 2017, https://en.wikipedia.org/wiki/South_Sea_Fleet.
- ³⁹ Camcopter S-100: Unmanned Air System (English Brochure), *Schiebel*, p.9.
- ⁴⁰ However, the Cardinal II may be more maneuverable than the S-100. For more on the Cardinal II, see “Cardinal II Unmanned Aircraft System, Taiwan,” *airforce-technology.com*, June 7, 2017, <http://www.airforce-technology.com/projects/cardinal-ii-unmanned-aircraft-system/>. For its users, see Judy Lin, “Taiwan’s heavy drones for surveillance still in pilot project phase,” *Taiwan News*, May 29, 2017, <http://www.taiwannews.com.tw/en/news/3175094>.
- ⁴¹ For information on the Albatross, see Rita Cheng, Elaine Hou, and Kuo Chung-han, “New U.S. drone sale policy could be good for Taiwan,” *Focus Taiwan*, February 18, 2015, <http://focustaiwan.tw/news/aip/201502180005.aspx>. For information on the Sharp Kite, see “Military Drone Missing in Chiayi County,” *Taiwan English News*, October 28, 2016, <http://news.thewildeast.net/military-drone-missing-in-chiayi-county/>.
- ⁴² For more on the drone pilots versus pilots of manned aerial platforms, see Lee Ferran, “Drone ‘Stigma’ Means Less Skilled’ Pilots at the Controls of Deadly Robots,” *ABC News*, April 29, 2014, <http://abcnews.go.com/Blotter/drone-stigma-means-skilled-pilots-controls-deadly-robots/story?id=23475968>.
- ⁴³ Collisions between small drones and much larger manned airplanes in tests have been found to be devastating. Therefore, it stands to reason that a collision between two drones would be even more devastating. For more on collision tests between drone and airplanes, see David Hambling, “What Really Happens When a Drone Strikes an Airplane,” *Popular Mechanics*, December 22, 2016, <http://www.popularmechanics.com/flight/drones/a24467/drone-plane-collision/>.
- ⁴⁴ Ian M. Easton and L.C. Russell Hsiao, *The Chinese People’s Liberation Army’s Unmanned Aerial Vehicle Project: Organizational Capacities and Operational Capacity*, Project 2049 Institute, March 11, 2013, p.6.
- ⁴⁵ “Aisheng ASN-209 (Silver Eagle) Medium Altitude, Medium Endurance (MAME) Unmanned Aerial Vehicle (UAV),” *Military Factory*, seen on August 1, 2017, at https://www.militaryfactory.com/aircraft/detail.asp?aircraft_id=1285.
- ⁴⁶ This drone appears to be indigenously designed; however, given China history of illegally acquiring or outright copying foreign military and dual-use technology, it can be difficult to determine how much any one model is actually indigenously designed. For more on Chinese theft and copying of foreign military technology see Robert Farley, “5 Lethal Chinese Weapons of War (Stolen or Copied from Russia or America),” *The National Interest*, August 7, 2016, <http://nationalinterest.org/blog/the-buzz/5-lethal-china-weapons-war-stolen-or-copied-russia-america-17275>.
- ⁴⁷ Wendell Minnick, *Chinese Fixed-Wing Unmanned Aerial Vehicles*, “ASN Technology,” p.34.
- ⁴⁸ Wendell Minnick, *Chinese Fixed-Wing Unmanned Aerial Vehicles*, “ASN Technology,” p.34.
- ⁴⁹ “Chinese ASN-209 Tactical MALE UAVs,” *Chinese Military Review*, May 5, 2017, <http://chinesemilitaryreview.blogspot.com/2013/06/chinese-asn-209-tactical-male-uavs.html>.
- ⁵⁰ Wendell Minnick, *Chinese Fixed-Wing Unmanned Aerial Vehicles*, “ASN Technology,” p.37.
- ⁵¹ Wendell Minnick, *Chinese Fixed-Wing Unmanned Aerial Vehicles*, “ASN Technology,” p.38.
- ⁵² “Aisheng ASN-209. Specifications. A photo.,” *Avia.Pro*, August 10, 2016, <http://en.avia.pro/blog/aisheng-asn-209-tehnicheskie-harakteristiki-foto>.
- ⁵³ For on the Silver Eagle variant, see 中国海军列装银鹰无人机 可用于远程通信(图), *新华网*, July 18, 2011, <http://ent.xinmin.cn/2011/07/18/11434710.html>.
- ⁵⁴ “Chinese ASN-209 Unmanned Aerial Vehicle (UAV),” *Chinese Military Review*, May 5, 2017, http://chinesemilitaryreview.blogspot.com/2011/10/chinese-asn-209-tactical-unmanned_20.html.
- ⁵⁵ “Egypt starts the production of ASN-209 UAVs,” *Asian Defence News*, June 7, 2012, <http://asian-defence-news.blogspot.com/2012/06/egypt-starts-production-of-asn-209-uavs.html>.
- ⁵⁶ Elsa B. Kania, “Testimony before the U.S.-China Economic and Security Review Commission: Chinese Advances in Unmanned Systems and the Military Applications of Artificial Intelligence—the PLA’s Trajectory towards Unmanned, “Intelligentized” Warfare,” *U.S.-China Economic and Security Review Commission*, p.2-3.
- ⁵⁷ Wendell Minnick, *Chinese Fixed-Wing Unmanned Aerial Vehicles*, “ASN Technology,” p.34-35.
- ⁵⁸ Wendell Minnick, *Chinese Fixed-Wing Unmanned Aerial Vehicles*, “ASN Technology,” p.34.
- ⁵⁹ “Fulmar X,” *Thales Group*, May 30, 2017, <https://www.thalesgroup.com/en/fulmar-x>.
- ⁶⁰ On the model being a MAME, see Kimberly Hsu, Craig Murray, Jeremy Cook, and Amalia Feld, “China’s Military Unmanned Aerial Vehicle Industry,” *U.S.-China Economic and Security Review Commission*, June 13, 2013, p.8. For the BZK-005’s designers and manufacturer, see Elsa B. Kania, “Testimony before the U.S.-China Economic and Security Review Commission: Chinese Advances in Unmanned Systems and the Military

Applications of Artificial Intelligence—the PLA’s Trajectory towards Unmanned, “Intelligentized” Warfare,” *U.S.-China Economic and Security Review Commission*, p.3

⁶¹ “Company Overview of Harbin Aircraft Industry (Group) Co., Ltd,” *Bloomberg*, seen on August 3, 2017, at <http://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapid=5886369>.

⁶² Chris Biggers, “Satellite Imagery Reveals China’s New Drone Base,” *bellingcat*, June 29, 2015, <https://www.bellingcat.com/news/rest-of-world/2015/06/29/satellite-imagery-reveals-chinas-new-drone-base/>.

⁶³ “The PLA Navy: New Capabilities and Missions for the 21st Century,” *Office of Naval Intelligence*, 2015, p.22.

⁶⁴ Kimberly Hsu, Craig Murray, Jeremy Cook, and Amalia Feld, “China’s Military Unmanned Aerial Vehicle Industry,” *U.S.-China Economic and Security Review Commission*, June 13, 2013, p.6.

⁶⁵ For the potential of the BZK-005 to be modified, see Kimberly Hsu, Craig Murray, Jeremy Cook, and Amalia Feld, “China’s Military Unmanned Aerial Vehicle Industry,” *U.S.-China Economic and Security Review Commission*, June 13, 2013, p.6. For the history of the Predator and its modification, see Kyle Mizokami, “The Predator Drone Is Going Into Retirement,” *Popular Mechanics*, March 1, 2017, <http://www.popularmechanics.com/military/news/a25439/predator-drone-retirement/>.

⁶⁶ “Chinese UAV & UCAV development,” *Sino Defence Forum*, September 3, 2015, <https://www.sinodefenceforum.com/chinese-uav-ucav-development.t3526/page-166>.

⁶⁷ “Chinese UAV & UCAV development,” *Sino Defence Forum*, September 2, 2015, <https://www.sinodefenceforum.com/chinese-uav-ucav-development.t3526/page-166>.

⁶⁸ “中国巡钓鱼岛无人机为 BZK-005 续航 40 小时,” 新闻频道, November 18, 2010, <http://www.zg1929.com/a/shequluntan/hongsejunshi/2013/0918/62563.html>.

⁶⁹ “中国巡钓鱼岛无人机为 BZK-005 续航 40 小时,” 新闻频道, November 18, 2010, <http://www.zg1929.com/a/shequluntan/hongsejunshi/2013/0918/62563.html>.

⁷⁰ “中国巡钓鱼岛无人机为 BZK-005 续航 40 小时,” 新闻频道, November 18, 2010, <http://www.zg1929.com/a/shequluntan/hongsejunshi/2013/0918/62563.html>.

⁷¹ “Aircraft and Building Guide,” *Center for the Study of the Drone*, May 5, 2017, <http://dronecenter.bard.edu/aircraft-and-building-guide/>.

⁷² Chris Biggers, “Satellite Imagery Reveals China’s New Drone Base,” *bellingcat*, June 29, 2015, <https://www.bellingcat.com/news/rest-of-world/2015/06/29/satellite-imagery-reveals-chinas-new-drone-base/>.

⁷³ For the latest sighting of BZK-005s using Lingshui Air Base on Hainan Island, see Mike Yeo, “China deploys new anti-submarine aircraft to fringes of South China Sea,” *Defense News*, June 22, 2017, <http://www.defensenews.com/articles/china-deploys-new-anti-submarine-aircraft-to-fringes-of-south-china-sea>.

⁷⁴ For specifications on the Bombardier Q-200 a more powerful version of the Bombardier Dash 8 or Q-100, which still has a lower operational ceiling than the BZK-005, see “Bombardier Q-200,” *Bombardier*, June 2006, p.2. For specifications of the “AgustaWestland AW139,” *aerospace-technology.com*, July 7, 2017, <http://www.aerospace-technology.com/projects/ab139/>. For specifications of *Operational Evaluation Board Report: Eurocopter Super Puma Fleet, Revision 1*, European Aviation Safety Agency, February 15, 2013, p.18. For specifications of Eurocopter EC225 Super Puma, see “Eurocopter EC225 Super Puma MkII,” *aerospace-technology.com*, July 7, 2017, http://www.aerospace-technology.com/projects/eurocopter_ec225/. For specifications on the Sikorsky S-76D, see “Sikorsky S-76D Executive Helicopter,” *Sikorsky: A Lockheed Martin Company*, 2017, p.19.

⁷⁵ For specifications for the MBB/Kawasaki BK 117-B-2, see “MBB/Kawasaki/Eurocopter BK117,” *Flugzeuginfo.net*, seen July 7, 2017, http://www.flugzeuginfo.net/acdata_php/acdata_bk117_en.php. For specifications for the Eurocopter AS365 Dauphin, see *Operational Evaluation Board Report: Eurocopter Dauphin/Twin Engine Family, Version 2*, European Aviation Safety Agency, August 2, 2012, p.21. For specifications of S-76 B, see “Sikorsky Aircraft S-76B,” *Flugzeuginfo.net*, seen July 10, 2017, http://www.flugzeuginfo.net/acdata_php/acdata_s76b_en.php. For specifications for the Boeing B-234MLR, see Boeing-Vertol Model 234,” *Aviastar*, seen July 10, 2017, http://www.aviastar.org/helicopters_eng/bvertol_234.php. For specifications for the Bell UH-1H, see “Bell Helicopter Bell205 (UH-1),” *Flugzeuginfo.net*, seen July 10, 2017, http://www.flugzeuginfo.net/acdata_php/acdata_205_en.php.

⁷⁶ For specifications of Britten-Norman BN-2 Islander, see “Britten-Norman BN-2 Islander,” *Flugzeuginfo.net*, seen July 10, 2017, http://www.flugzeuginfo.net/acdata_php/acdata_bn2_en.php. For specifications for the

- MBB Bo 105, see “MBB, Messerschmitt-Bölkow-Blohm Bo 105,” Flugzeuginfo.net, seen July 10, 2017, http://www.flugzeuginfo.net/acdata_php/acdata_bo105_en.php. For specifications for the Short C-23 Sherpa, see Short Brothers (Shorts) Short 330,” Flugzeuginfo.net, seen July 10, 2017, http://www.flugzeuginfo.net/acdata_php/acdata_330_en.php.
- ⁷⁷ For specifications of the “AgustaWestland AW139,” *aerospace-technology.com*, July 7, 2017, <http://www.aerospace-technology.com/projects/ab139/>. For specifications for the Eurocopter AS365 Dauphin, see *Operational Evaluation Board Report: Eurocopter Dauphin/Twin Engine Family, Version 2*, European Aviation Safety Agency, August 2, 2012, p.21.
- ⁷⁸ For specifications on the Thales Fulmar X, see “Fulmar X,” *Thales Group*, seen July 10, 2017, <https://www.thalesgroup.com/en/fulmar-x>.
- ⁷⁹ For specifications of the CASA C-212 Aviocar series 400, “C-212 400 Maritime Patrol Aircraft, Spain,” *airforce-technology.com*, May 30, 2017, <http://www.airforce-technology.com/projects/c212/>.
- ⁸⁰ “Chengdu (AVIC) Wing-Long (Pterodactyl) Medium-Altitude, Long-Endurance (MALE) Unmanned Aerial Vehicle (UAV),” *Military Factory*, August 1, 2017, https://www.militaryfactory.com/aircraft/detail.asp?aircraft_id=1030.
- ⁸¹ Robert Wall, “China’s Armed Predator,” *Free Republic*, November 17, 2010, <http://www.freerepublic.com/focus/news/2628440/posts>.
- ⁸² Jon Grevatt, “China secures its ‘biggest’ military export order for new UAV system,” *Jane’s 360*, February 28, 2017, <http://www.janes.com/article/68308/china-secures-its-biggest-military-export-order-for-new-uav-system>.
- ⁸³ Wendell Minnick, *Chinese Fixed-Wing Unmanned Aerial Vehicles*, “Wing Loong,” p.69.
- ⁸⁴ Beth Stevenson, “VIDEO: Chinese Wing Loong UAV carries out weapon drops,” *Flight Global*, August 24, 2015, <https://www.flightglobal.com/news/articles/video-chinese-wing-loong-uav-carries-out-weapon-drops-415998/>.
- ⁸⁵ Wendell Minnick, *Chinese Fixed-Wing Unmanned Aerial Vehicles*, “Wing Loong,” p.71.
- ⁸⁶ “Wing Loong Unmanned Aerial Vehicle (UAV), China,” *airforce-technology.com*, May 5, 2017, <http://www.airforce-technology.com/projects/wing-loong-unmanned-aerial-vehicle-uav/>.
- ⁸⁷ “Wing Loong Unmanned Aerial Vehicle (UAV), China,” *airforce-technology.com*, May 5, 2017, <http://www.airforce-technology.com/projects/wing-loong-unmanned-aerial-vehicle-uav/wing-loong-unmanned-aerial-vehicle-uav5.html>.
- ⁸⁸ “Wing Loong Unmanned Aerial Vehicle (UAV), China,” *airforce-technology.com*, May 5, 2017, <http://www.airforce-technology.com/projects/wing-loong-unmanned-aerial-vehicle-uav/wing-loong-unmanned-aerial-vehicle-uav1.html>.
- ⁸⁹ “国产翼龙无人机首次编队试飞 今年将批量交付,” 中国军网, January 4, 2015, http://www.81.cn/syjd/2015-01/04/content_6293661_9.htm.
- ⁹⁰ Robert Johnson, “China’s Mysterious Predator Clone Is Finally Out In the Open,” *Business Insider*, November 8, 2012, <http://www.businessinsider.com/chinas-mysterious-predator-clone-is-finally-out-in-the-open-2012-11>.
- ⁹¹ Wendell Minnick, *Chinese Fixed-Wing Unmanned Aerial Vehicles*, “Wing Loong,” p.71. “Wing Loong Unmanned Aerial Vehicle (UAV), China,” *airforce-technology.com*, May 5, 2017, <http://www.airforce-technology.com/projects/wing-loong-unmanned-aerial-vehicle-uav/>.
- ⁹² Peter Wood, “Snapshot: China’s Eastern Theater Command,” *China Brief*, Vol. 17, Is. 4, March 4, 2017, p.1-6.
- ⁹³ Peter Wood, “Snapshot: China’s Southern Theater Command,” *China Brief*, Vol. 16, Is. 12, August 1, 2016, p.1-4.
- ⁹⁴ Matt Blake, “‘This one won’t spy on Muslims again’: Somali militants publish pictures of US drone they ‘shot down,’” *Daily Mail*, May 31, 2013, <http://www.dailymail.co.uk/news/article-2333983/This-wont-spy-Muslims-Somali-militants-publish-pictures-US-drone-shot-down.html>.
- ⁹⁵ W.J. Hennigan, “U.S. forces shoot down Iranian drone over Syria as fighting escalates,” *Los Angeles Times*, June 20, 2017, <http://www.latimes.com/politics/washington/la-na-essential-washington-updates-us-forces-shoot-down-iranian-drone-over-1497972506-htmlstory.html>.
- ⁹⁶ “HESA Shahed 129 (Eye-Witness) Medium-Altitude, Long-Endurance (MALE) Reconnaissance / Light Attack Drone,” *Military Factory*, June 20, 2017, http://www.militaryfactory.com/aircraft/detail.asp?aircraft_id=1330.
- ⁹⁷ For more on at least one incidence of apparent Chinese interference with the communications of countries, see Scott Bentley, “The Next South China Sea Crisis: China vs. Indonesia?,” *The National Interest*, September 24, 2014, <http://nationalinterest.org/blog/the-buzz/the-next-south-china-sea-crisis-china-vs-indonesia-11342>.