[CONFIDENTIAL]

THREAT ANALYSIS

China's Anti-Aircraft-Carrier Capability, 2016 – 2020

(Prepared for Trump Campaign National HQ, Rev. 5/22/2016, ATTN: Lt. Gen. Joseph "Keith" Kellogg, Mr. Carter Page and Mr. Joseph E. Schmitz)

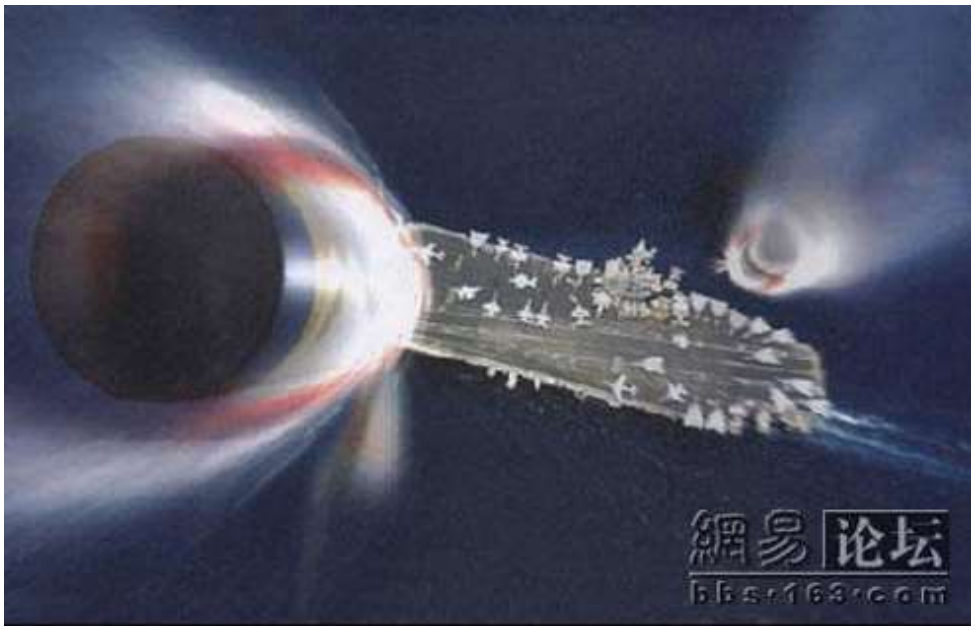


Table of Contents

Executive Summary

(Since the author travels to mainland China from time to time for business, PLEASE keep this document strictly confidential and remove the "About the Author" section if and when distribution beyond core campaign staff is necessary.)

This paper discusses potential threats to the US Navy's Carrier Strike Groups. It considers potential armed conflicts in the Taiwan Strait or South China Sea where the adversary would be armed forces of the People's Republic of China. It includes several **new developments** since **September of 2015** and **as recent as 5/20/2016**. This paper should be viewed as an addendum to the Department of Defense's April, 2016 report to Congress [1] and RAND Corp's September, 2015 report on China's military. [2] While this report focuses on technical details, additional reports and analyses dealing with strategy, force posture and tactical employment of specific weapons systems can be prepared upon request.

While a direct war with China in the near future is highly unlikely, a **Commander-in-Chief** needs to be prepared for contingencies. Policy options to prevent such a war while maximizing American interests are provided toward the end of this paper.

Carrier Strike Groups (CSGs) are the primary tools of US power projection overseas. When there is a crisis, the first question a US President asks is: "Where are our carriers?" Since the 1996 Taiwan Strait Missile Crisis, the People's Republic of China has been pursuing a multi-pronged, multi-faceted approach to countering the overwhelming firepower of USN CSGs. 20 years later, in 2016, China has succeeded in developing a potent threat to any USN CSGs seeking to operate within and around the Taiwan Strait and South China Sea at war time. This threat includes components at the surface, in the air, underwater, in space and in the electronic/cyberspace. In military parlance, China has developed a comprehensive Anti-Access / Area Denial (A2/AD) capability. [3]

On the policy front, it is the author's belief that the US can act as the mediator and reiterate a fair but firm stance towards both China and China's rivals in various disputes (including but not limited to: Taiwan, the Philippines, Vietnam, Malaysia and Indonesia). **Doing so at the earliest opportunity would be beneficial in stabilizing the region.** After November, special envoys can be sent by President Trump even before he takes the oath of office. Said envoys need to get both sides to sit down and agree to a set of ground rules with clear red lines that cannot be crossed. The settings must be relatively private to avoid either side "losing face", which is important in East Asian culture.

Taiwan should be a very high priority in any such negotiations, as the Island has recently elected a pro-independence president, Tsai Ing-wen, who has assumed office on 5/20/2016, local time.

Hope to see you in the White House.

About the Author

[Removed for the public version]

Abbreviations

A2/AD – Anti-Access / Area Denial

AAM – Air-to-Air Missile

AMRAAM – Advanced Medium-Range Air-to-Air Missile, the standard medium-range air-to-air missile carried by all US fighter aircraft

ARH – Active-Radar Homing (missile)

ASAT – Anti-SATellite (weapons / capability)

ASBM – Anti-Ship Ballistic Missile

ASCM – Anti-Ship Cruise Missile

AShW – Anti-Ship Warfare

ASW – Anti-Submarine Warfare

AWACS – Airborne Warning and Control System (aircraft)

BDS – BeiDou Navigation Satellite System

CWIS – Close-In Weapons System, gun-based point defense system onboard most USN ships

CSG – Carrier Strike Group

DoD – The Department of Defense

DPP – Democratic Progressive Party, Taiwan's pro-independence party

FAC – Fast Attack Craft

GPS – Global Positioning System

ICBM – Intercontinental Ballistic Missile

IOC – Initial Operating Capability

IRBM – Intermediate-Range Ballistic Missile

KMT – Kuomintang (Nationalist) Party, Taiwan's centrist political party

LACM – Land-Attack Cruise Missile

LoDSats – Launch-on-Demand Satellites

PLA – The People's Liberation Army, China's army

PLAN – The People's Liberation Army Navy, China's navy

PLAAF – The People's Liberation Army Air Force, China's air force

PLARF – The People's Liberation Army Rocket Force, China's ballistic missile force

PLASSF – The People's Liberation Army Strategic Support Force, China's equivalent of the US Space Command AND Cyber Command

PRC – The People's Republic of China\

RAM – Rolling Airframe Missile, short-range point defense missile carried by newer USN ships

ROC – The Republic of China (Taiwan)

SAM – Surface-to-Air Missile

SARH – Semi-Active Radar Homing (missile)

SRBM – Short-Range Ballistic Missile

SSK – Conventionally-powered attack submarine

SSN – Nuclear-powered attack submarine

SSO – Sun Synchronous Orbit

USAF – The United States Air Force

USN – The United States Navy

(The Overview section continues on the following page.)

Overview

As stated in the Executive Summary, Carrier Strike Groups (CSGs) are the primary tools of US power projection overseas. As such, they are considered strategic targets by any potential adversary, both in terms of sheer firepower and the large number of American lives at stake. After all, there are over 5,000 USN personnel onboard each aircraft carrier.

Since the 1996 Taiwan Strait Missile Crisis, the People's Republic of China has been pursuing a multi-pronged, multi-faceted approach to countering the overwhelming firepower of USN CSGs. 20 years later, in 2016, China has succeeded in developing a potent threat to any USN CSGs seeking to operate within and around the Taiwan Strait and South China Sea at wartime. This threat includes components at the surface, in the air, underwater and in space. In military parlance, China has developed a credible and robust Anti-Access / Area Denial (A2/AD) capability against US CSGs. [3]

For readers familiar with China's military power up to the year 2015, reading the **Recent Developments** section, which follows this section immediately, should be sufficient.

For a more comprehensive view, the **Threat Components** section is divided into **3 subsections: Space / Cyber; Air / Land / Surface / Sub platforms carrying ASBMs or ASCMs; and finally, Electronic Warfare (EW)**.

In military doctrines, the process of destroying a target can be defined as a kill chain, consisting of the following steps:

- Target acquisition, identification and tracking
- Force dispatch to target
- Decision and order to attack
- Destruction of the target

In targeting a USN CSG, any Space/Cyber assets deployed by China will be primarily concerned with the very first step of the kill chain – finding the target. Indeed, in the past year or so, China has significantly stepped up its efforts to develop a Launch-on-Demand Satellites (LoDSats) capability, which would be crucial in a shooting war with the US, where satellites and other surveillance capabilities will be high-priority targets. The **Platforms** subsection describes vehicles that carry hard-kill weapons to positions where attacks can be launched, corresponding with the second and last step of the kill chain. The ASBMs and ASCMs are the actual hard-kill tools designed to physically destroy ships or their components. Finally, EW assets are designed to blind the adversary.

The **Recommended Policy Options** section is at the very end and also serves as the conclusion to this report.

Recent Developments

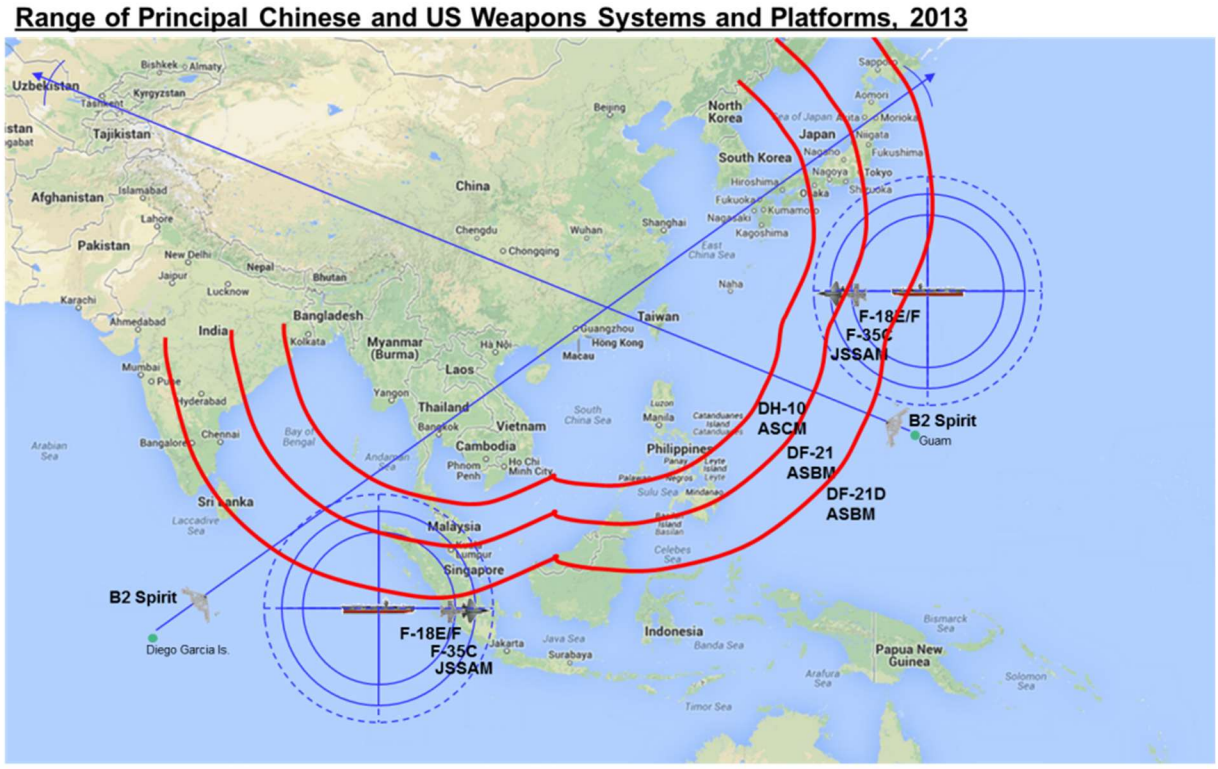
This section is arranged in chronological order, starting with China's V-J Day Parade on **9/3/2015** and ending with the inauguration of Taiwanese president Tsai Ing-wen on **5/20/2016**.

I. China's Potential ASBMs: DF-15B, DF-21D and DF-26 during the 9/3/2015 V-J Day Parade.

The **DF-26** is a newer missile with a reported range of 3,000 to 5,000 kilometers, allowing it to hit the island of Guam, an important US base in the western Pacific. Thus, it has been dubbed the "Guam-killer". Little is known publicly about this missile and it was **NOT** included in the aforementioned RAND report, although it was speculated that the Pentagon knew about the missile as early as 2007. [9] Wikipedia has an excellent overview page on the DongFeng family of missiles. [10]

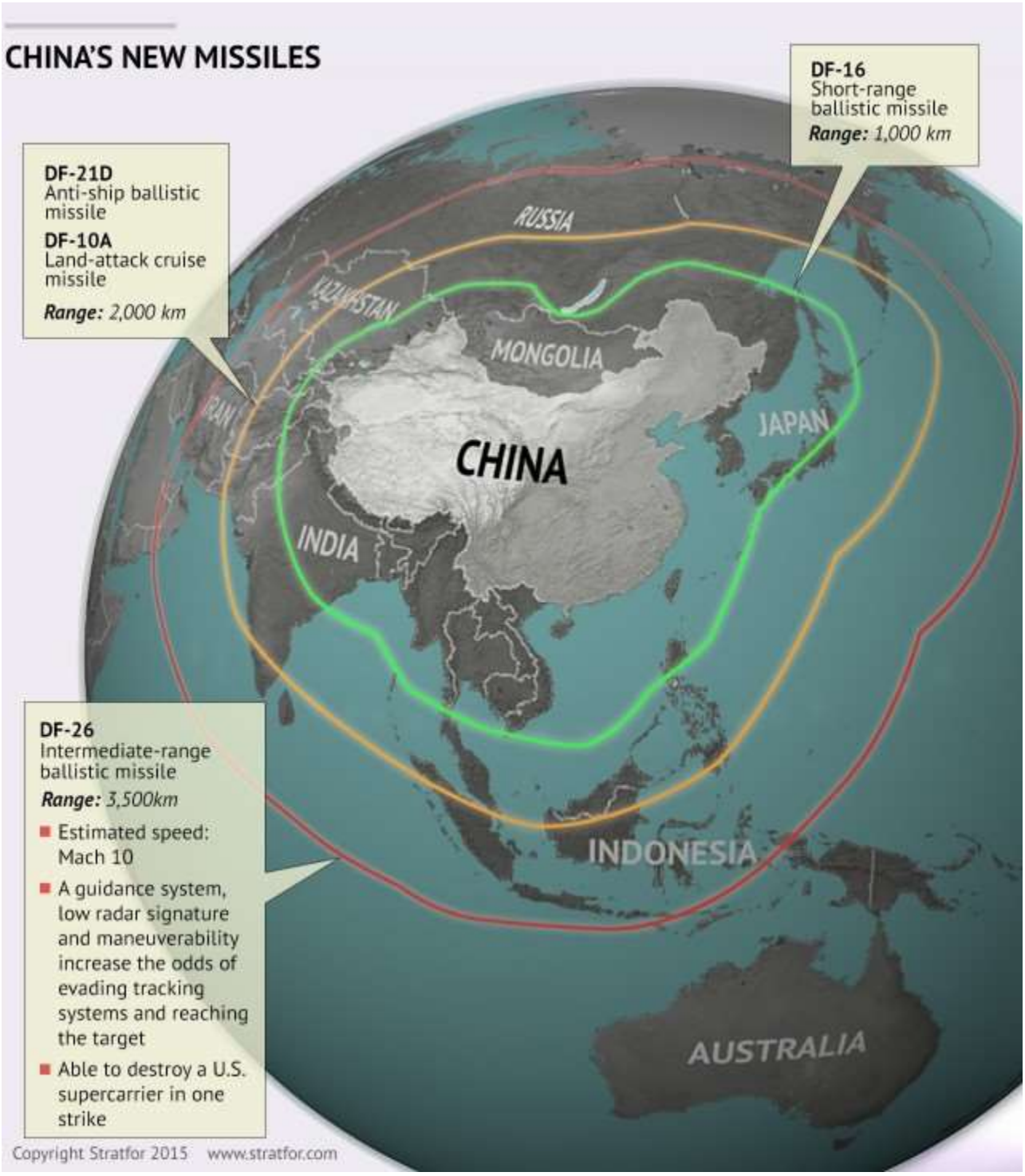
All three operational ASBM-capable missiles: **DF-15B, DF-21D and DF-26** are currently fitted with a maneuvering re-entry vehicle (warhead) and their Transporter-Erector-Launcher vehicles (TELs) have some cross-country capability. Both design features make them more survivable. The maneuvering warhead also means that, in theory, all three types can become ASBMs, though in practice, only the DF-21D is considered a dedicated carrier-killer. A 4th potential ASBM is the **DF-16**, with a 1,000km range, though it has not yet been seen in public with a maneuvering warhead. [11] The unveiling of the DF-26 "Guam-killer" is important in the sense that it threatens a crucial staging area, which provides support to any USN CSGs operating closer to the Chinese coast.

Fig. 1, ranges of the DF-21D vs US assets. The DF-26 (not included in this picture) will be able to reach the island of Guam (Picture credit: GlobalSecurity.org)



Sources: GlobalSecurity.org, U.S. DoD

Fig. 2, ranges of DF-16, DF-21D, DF-10A and DF-26 (Picture credit: Stratfor.com)



II. China's Launch-on-Demand Satellites Capability, 9/19/2015 and 9/25/2015

Two new types of rockets – the **CZ-6** and the **CZ-11** – made their maiden flights soon after China's big V-J Day Parade on 9/3/2015. Both have potentials to provide a Launch-on-Demand Satellites (LoDSats) capability to China.

In a shooting war between the US and China, surveillance satellites capable of identifying and tracking enemy forces will be high-priority targets for both sides. Therefore, the ability to quickly launch satellites to replace friendly ones that have been destroyed is important. Otherwise, military commanders and decision-makers will be essentially blind.

CZ-6

The first type, the CZ-6 (or Long March 6), is a 3-stage, liquid-fueled design capable of putting 1.08 metric tons of payload into a Sun Synchronous Orbit (SSO) 700 kilometers high, which is an ideal orbit for surveillance of a specific geographic area.

There are 2 points about the 9/19 launch that are interesting:

1. The rocket was launched from a road-mobile Transporter-Erector-Launcher vehicle.

2. The 9/19/2015 launch demonstrated the ability to put multiple microsatellites into a different orbit from a heavier main payload. This means that it would be capable of putting a heavier satellite with high-powered optical / infrared equipment and a batch of cheaper, lighter ones in orbit with one launch and search a large patch of the ocean simultaneously. (See Fig. 5)

Although the liquid-fueled nature of the rocket means that it will take as much as 24 hours to prepare for a launch, the choice of a TEL and the ability to put multiple satellites in orbit with one launch means that this rocket would be still be suited for launches from the relative safety of China's interior, like Xichang or Jiuquan, or even a hastily-prepared military launch site.

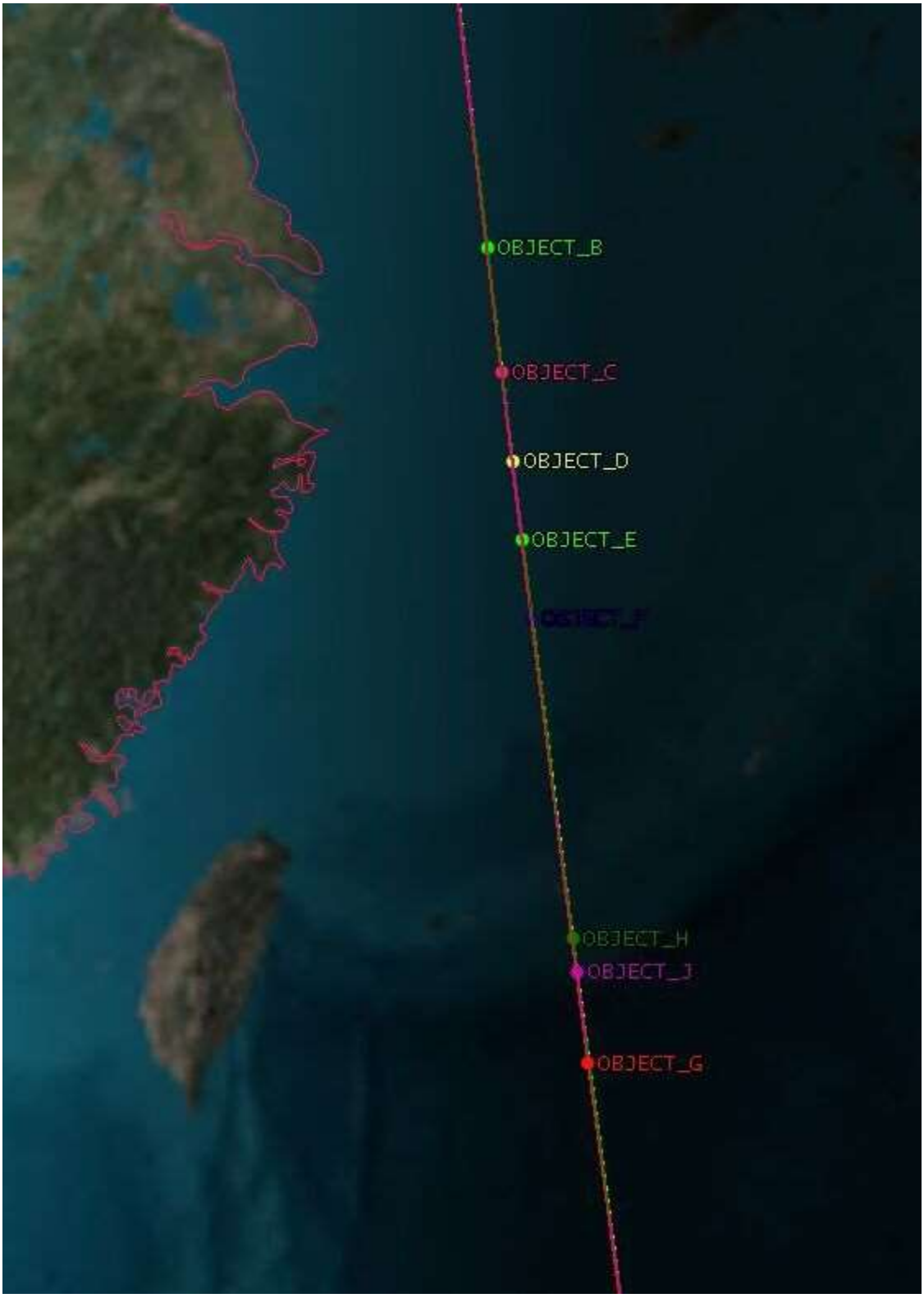
(Figures and photos continue on the following page.)

Fig. 3, the CZ-6 rocket on a camouflaged TEL. (Photo credit: watermarked WeChat user)

Fig. 4, orbital data of 9/19/2015 CZ-6 launch payloads (Picture credit: Chinese internet)

NORAD CAT ID	SATNAME	INTLDES	TYPE	COUNTRY	LAUNCH	SITE	DECAY	PERIOD	INCL	APOGEE	PERIGEE	RCS	TLE
40899	OBJECT A	2015-049A	TBA	PRC	2015-09-19	TSC		93.74	97.41	522	392		TLE | OMM
40900	OBJECT B	2015-049B	TBA	PRC	2015-09-19	TSC		95.15	97.45	536	516		TLE | OMM
40901	OBJECT C	2015-049C	TBA	PRC	2015-09-19	TSC		95.17	97.46	536	517		TLE | OMM
40902	OBJECT D	2015-049D	TBA	PRC	2015-09-19	TSC		95.18	97.45	536	518		TLE | OMM
40903	OBJECT E	2015-049E	TBA	PRC	2015-09-19	TSC		95.19	97.46	536	519		TLE | OMM
40904	OBJECT F	2015-049F	TBA	PRC	2015-09-19	TSC		95.19	97.46	537	518		TLE | OMM
40905	OBJECT G	2015-049G	TBA	PRC	2015-09-19	TSC		95.24	97.46	541	520		TLE | OMM
40906	OBJECT H	2015-049H	TBA	PRC	2015-09-19	TSC		95.23	97.45	540	519		TLE | OMM
40907	OBJECT J	2015-049J	TBA	PRC	2015-09-19	TSC		95.23	97.45	539	520		TLE | OMM

Fig. 5, orbital dispersion of secondary payloads super-positioned near Taiwan. (Picture credit: Chinese internet)



CZ-11

Compared with the CZ-6, the CZ-11 is more secretive and received much less state media attention. It can be, however, even more suitable for the role of LoDSats launches. Since it is solid-fueled, launch preparation takes only minutes. It is launched from a tube similar to ballistic missiles and the entire system can most likely be turned into a true road-mobile design with a multi-axel TEL. The 4-stage rocket has a Low Earth Orbit (LEO) payload capacity of 700kg and an SSO capacity of 350kg. The launch on 9/25/2015 put 4 satellites into orbit.

Fig. 6, one of a handful of available photos of the rocket (Photo credit: Weibo.com)

Fig. 7, the launch tube being transported (Photo credit: Chinese internet)

III. Restructuring of the PLA, Dec. 31, 2015 to Feb. 2016

The PLA Second Artillery was renamed the PLA Rocket Force (PLARF) on Dec. 31, 2015. While largely symbolic, it cements the PLARF's status as an independent service. More importantly, a new branch of service of the PLA was established on the same day – the Strategic Support Force (PLASSF). [13]

These two events, coupled with the reorganization of the PLA's old structure of 7 military regions into 5 theatre commands in February of 2016, can be seen as a shift towards a joint force command structure more suitable for wartime operations.

Anecdotal evidence has it that traditionally, inter-service rivalry existed within China's military. The Chinese leadership might have feared that a hastily organized command structure in a time of war would be ineffective in commanding units from different military services, e.g. PLAAF pilots might be reluctant to follow orders from a PLAN commander and vice versa. With standing theatres of operation and command, it might be hoped that inter-service exercises and operations would become the norm during peacetime and thus, make a transition to wartime operations smoother.

The PLASSF has been reported by some English media as an equivalent to the US Space Command. However, the author believes its scope covers not only space assets, but also cyber, and in the future, some soft-kill EW. This idea is supported by an article written by the PLASSF's commander Gao Jin on the newspaper PLA Daily, where he stated "the PLA must be ready to fight in a joint operational environment that combines land, sea, air, space, cyber and electronic." [14] Additionally, a Jan. 25, 2016 newspaper article stated that the first unit of the PLASSF is a dedicated cyber warfare unit led by a PhD who likes to use words like "big data" and "cloud-computing". [15]

Fig. 8, China's new Theatre Commands (Picture credit: Wikipedia.org)

IV. Surveillance Satellite Launches, Aug. 27, 2015 to 5/15/2016

Generally speaking, China's surveillance satellites, or spy satellites, fall into either the **Yaoguan** (remote sensing) or **Gaofen** (high resolution) families. While some of these satellites are dual-use, meaning they can be utilized for both civilian and military purposes, many are dedicated spy satellites controlled directly by the PLA.

Wikipedia has an excellent list of the Yaogan family of satellites launched prior to Jan.1, 2015. (Up to Yaogan 26) [16]

Yaogan launches in 2015 and onward are as follows:

Yaogan 27, **8/27/2015** [17]

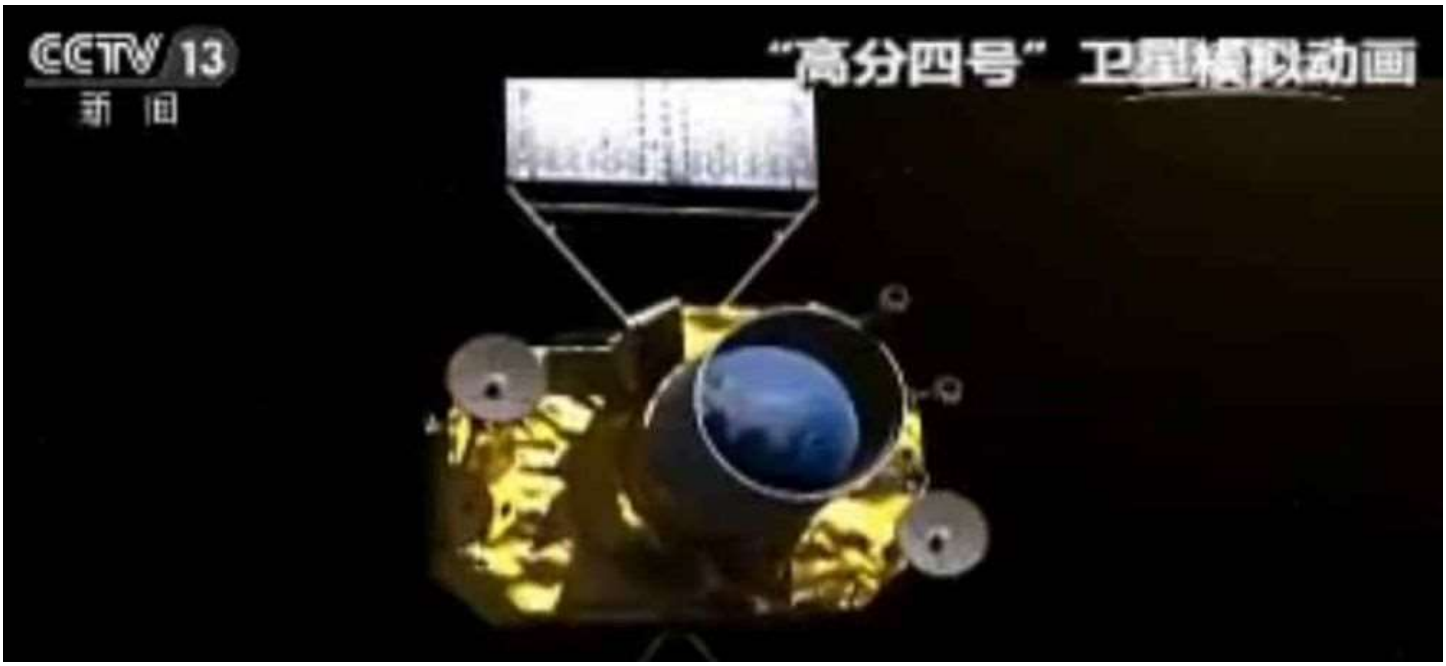
Yaogan 28, **11/9/2015** [18]

Yaogan 29, **11/27/2015** [19]

Yaogan 30, **5/15/2016** [20]

The **Gaofen 4** satellite launched on 12/28/2015 will be placed in a Geosynchronous Orbit (GEO) some 36,000km above the equator. It will essentially hang statically over China. This position allows it to continuously keep an eye on an area 7,000km by 7,000km (4,375 by 4,375 miles) surrounding China, 24/7. It carries powerful optics with a resolution of 50m, which allows it to identify the long wake of a USN CSG as the ships sail across the ocean. This means that if a USN CSG gets within 2,000 miles of China's east coast, it will most likely be spotted by this satellite. [21] [22]

Fig. 9, artist's depiction of the Gaofen 4 satellite (Picture credit: CCTV / Popsci.com)



V. Type 022 Fast Attack Craft (FAC) in the South China Sea, 5/17/2016

The Type 022 FAC [23] is a fast, nimble and stealthy missile boat carrying 8 ASCMs similar to the USN's AGM-84 Harpoon. The recent spotting of these FACs at Woody (Yongxing) Island confirms long-held suspicions that PLAN FACs will likely operate in wolf packs in and around the South China Sea.

Generally speaking, FACs are not suitable for long-range missions as their living quarters and fuel capacity are limited. But as more port facilities on islands controlled by China in the region are completed, these FACs will be able to operate further from the Chinese mainland and pose a credible threat to any USN CSGs that venture too close.

Fig. 10, a Type 022 FAC near the lighthouse on Woody Island (Picture credit: watermarked Weibo user)

Fig. 11, two Type 022 FACs docked at Woody Island along with a Chinese Coast Guard vessel and a resupply ship (Picture credit: watermarked Weibo user)

(Next subsection continues on the following page.)

VI. Inauguration of Taiwan's New President Tsai Ing-wen, 5/20/2016 [24]

Ever since the end of the Chinese Civil War in 1949, a separate government – the Republic of China, or ROC – has existed on the island of Taiwan (and a few surrounding islands). Led by strongman Chiang Kai-shek and later his son until their respective deaths, the Kuomintang (KMT) or Nationalist Party has ruled Taiwan from 1945 to 2000. (With the KMT's Lee Teng-Hui winning a democratic election in 1996.) The KMT has been consistently against formal Taiwan independence from mainland China. Thus, in recent years, KMT rule usually means periods of quiet in the Strait.

However, as Taiwan transitioned into democracy in the 1990s, the largest opposition party at the time – the pro-independence Democratic Progressive Party (DPP) – gained popularity and power. Chen Shui-bian, [25] a DPP leader became Taiwan's president in 2000. The next 8 years have seen some of the tensest moments in the Taiwan Strait since the 1996 Missile Crisis. Chen's later years as Taiwanese president were marred with corruption and scandals. After leaving office, he was convicted on multiple counts of corruption, with overseas assets confiscated by US, Singaporean, Swiss and EU authorities.

In 2008, Ma Ying-jeou [26] of the KMT won the election and became president. He is now seen domestically as an honest and clean academic who was ineffective as president. Although he succeeded in maintaining the peace in the Taiwan Strait and negotiating the Trans-Pacific Partnership (TPP) with the US, domestic pressure from mainly young, pro-independence activists resulted in two large-scale weeks-long street protests during his second term, in March of 2014 and May of 2015. The end result is the KMT's landslide defeat in legislative elections in 2015 and the DPP's Tsai Ing-wen [27] winning the recent 2016 Taiwanese presidential election.

China, for its part, has always maintained that it has sovereignty over the island of Taiwan and has codified the use of force against Taiwan independence in its 2005 Anti-Secession Law. It has always been suspicious of the DPP and would have scrutinized Ms. Tsai's inauguration speech closely. [24] Most notably, Beijing would be looking for references to the "Consensus of 1992" [28] as a gauge of Tsai's tendencies to act on Taiwan independence during her tenure.

In her speech, Tsai mentioned "the meeting of 1992" without using the word "consensus", to toe a line between China and hardliners within the DPP. So far, Beijing has responded with a cool and solemn (but not harsh) message, as is evident in a statement from the Office for Taiwan Affairs of the PRC's State Council just hours after Tsai's speech. [29] The author believes that Beijing has back channels to Taipei, was aware of the substance of Tsai's speech ahead of time and has taken a "wait and see" approach. However, any future move by the Tsai administration to gain more international recognition or "stir up trouble" in Beijing's eyes will likely be met with swift and severe rhetoric, followed by a diplomatic offensive. Most likely, Beijing will take away another one of the two dozen or so countries that still have formal diplomatic ties with the ROC.

Further escalation by both sides when a diplomatic / political fight is already underway can lead to an armed conflict. Therefore, when those signs become apparent, the US President must act quickly to quell both sides, de-escalate the situation and thus, preserve the peace.

Threat Components

In the Threat Components section of the report, the author will discuss the PRC's assets that are directly involved in a kill chain targeting a USN CSG, or more specifically, a USN carrier. The focus will be on the technical capability of each asset or weapons system, with some attention given to deployed numbers, but minimal discussion on actual tactical employment in a realistic conflict scenario.

However, analyses focusing on tactical employment or actual war scenarios can be done upon request.

I. Space / Cyber

As mentioned before, the PLASSF is a brand new service branch of China's military with a focus on space and cyber warfare. The promotion of China's space and cyber forces into their own independent service branch, theoretically on an equal footing with the Army, Navy, Air Force and strategic Rocket Force, should be seen as a demonstration of the Chinese leadership's emphasis on asymmetric and information warfare in future conflicts.

On the space front, the BeiDou Navigation Satellite System (BDS), China's equivalent to the US Global Positioning System (GPS), has been capable of covering the Asia-Pacific region effectively since 2012. The third-general BeiDou satellite constellation, with **global coverage**, will be **fully operational by the end of 2020**. As the US GPS system can be used for targeting by US missiles and bombs, the BDS can also provide the Chinese military with a precision strike capability.

As previously stated, China has been launching its Yaogan and Gaofen families of spy satellites at a steady pace. Overall, in terms of numbers and capability, China still lag behind the US in space-based surveillance technology. However, at this point, China's spy satellites do provide its military with an adequate **target acquisition, identification and tracking capability in the western Pacific**. Additionally, in the next few years, that capability will likely improve over time both in quality and quantity. Finally, China's demonstrated LoDSats capability means that it will be able to initiate Anti-Satellite (ASAT) warfare in the future as it now has the ability to replace its own downed satellites.

On the cyber front, there are already numerous reports on how China's hackers penetrated various US government agencies' and corporations' computer networks. The US military has grown to rely heavily on information technology and data sharing networks. Cyber espionage by the PLASSF in the weeks leading up to an armed conflict can provide PLA commanders with precise locations of USN CSGs initially, making satellite acquisition of these vital US assets easier.

As a full-time IT expert and part-time aerospace engineer who speaks the language, the author is ideal for the role of a PLASSF commander in any war game involving that force, in case the Foreign Policy Team would like to conduct one prior to November.

II. Air / Land / Surface / Sub Platforms

The second step in the kill chain is to position platforms carrying hard-kill weapons where they can launch an attack on the targeted CSG. In the 20 years since 1996, China has developed or acquired a wide variety of such platforms.

Aircraft (PLAAF and PLAN Fighters, Fighter-Bombers and Bombers)

About 70~80% of the ground strike capability and 90% of long-range air superiority of a CSG are provided by the fixed-wing aircraft of the group. At present, F/A-18 C/D Hornets and F/A-18 E/F Super Hornets are the main jet fighter aircraft aboard all USN carriers. (For ease of writing, both the Hornet and the Super Hornet will be referred to as the **Hornet Family** subsequently, though the author is fully aware that the Super Hornet is a much more capable aircraft.) A typical USN carrier air wing consists of 48 aircraft in the Hornet Family.

This also means that if an adversary managed to take out all those aircraft or somehow prevent them from operating, the CSG would have lost its fangs. Thus, threats to a USN CSG's aircraft should be considered threats to its warfighting ability as well. As such, USN aircraft operating around China will not only face PLAN fighters, but most likely PLAAF fighters as well.

China has around a thousand modern fighters capable of firing medium-range Active-Radar Homing (ARH) missiles similar to the US AMRAAM, which makes them rough equivalents of the Hornet Family. In terms of lethality, currently, they come in the form of the Su-27/30/33 Flanker family, the indigenous J-10 and the older J-8II.

One potential game changer is the Chengdu J-20 stealth aircraft. [32] Its capability will likely approach that of the USAF's F-22 Raptor and slightly better than the F-35C Lightning II that will be carried by USN carriers. The F-35C will enter service around 2018. **The J-20 will likely do so around 2020. When it does, it will pose a serious threat to high-value US assets like AWACS and tanker aircraft operating in the airspace around China.**

It should also be noted that the Shenyang Aircraft Corporation, rival of Chengdu and manufacturer of all Chinese Flankers, has been developing its own stealth fighter, the J-31. [33] This makes China the only other country in the world with 2 stealth fighters in development / deployment. Although the J-31 has received little interest from the PLAAF, Shenyang is trying hard to sell the project to the PLAN and export markets. It is the author's opinion that short of major engine and fuel capacity upgrades, this aircraft will likely not have a real customer and **NOT** enter production.

On the anti-ship front, traditionally, only PLAN aircraft were trained in the anti-ship role. However, that has changed in the past few years. PLAAF JH-7 fighter-bomber units are now capable of carrying out anti-ship missions. [31] Therefore, realistically, US military planners must take both PLAN and PLAAF Su-30MKK, JH-7, H-6 and other aircraft in similar classes into account, when considering threats to the ships in a CSG.

On the key support aircraft front, China does have a handful of KJ-series of AWACS aircraft and a number of maritime patrol and surveillance aircraft based on the Y-8 airframe. In addition, China has

a dozen or so tanker aircraft based on the Il-76 and H-6 airframes. As mentioned before, AWACS and tanker aircraft are high-value targets in wartime. China has demonstrated a desire to shore up these capabilities. Most recently, since 2011, China has been pushing hard to acquire Il-78 tankers from both Ukraine and Russia, with mixed results.

Wikipedia has detailed inventories of PLAN and PLAAF. The numbers are from public sources and mostly accurate to the best of the author's knowledge. [30]

Long-Range Air-to-Air Platforms (2016): ~ 973 total (PLAAF: 809; PLAN: 164)

(Not counting the J-7, which is a family of short-range fighter based on the Vietnam-era MiG-21.)

Long-Range Air-to-Surface Platforms (2016): ~ 515 total (PLAAF: 313; PLAN: 202)

(Including Su-30MKKs and JH-7s of both the PLAAF and PLAN; also including PLAN J-15 carrier-borne fighters.)

NOTE: Su-30s are multirole fighter-bombers and are counted in both categories. **The number of modern jets in the PLA's inventory will no doubt increase by 2020.**

Fig. 12, the Chengdu J-20 Stealth Fighter, a potential game changer (Photo credit: Chinese internet)

Land-based Platforms

All of China's ASBMs are launched from land-based TELs. The PLA also possesses a significant numbers of land-based ASCMs with PLAN coastal defense units and PLARF LACM unis that can be converted to an anti-ship role if necessary.

Fig. 13, PLARF DF-21D "carrier-killer" ASBM during China's 2015 V-J Day parade (Photo credit: Chinese internet)

(Photos and texts continues on the following page)

Fig. 14, PLAN YJ-62 ASCM launching from a TEL (Photo credit: Chinese internet)

Fig. 15, PLARF CJ-10 LACM TELs during V-J Day parade (Photo credit: Chinese internet)

PLAN Carrier Liaoning (CV-16)

The PLAN has long sought to acquire an aircraft carrier. The effort finally succeeded in 2012 with the commission of the Liaoning.

The Liaoning was originally laid down as the Soviet Navy's ***Riga***, a Kuznetsov class carrier, and later renamed to ***Varyag***. With the fall of the Soviet Union, construction was suspended. China purchased the stripped hulk in the late 1990s and towed it to Dalian, where more than a decade later, it was finally fully fitted and ready for sea.

An aircraft carrier is only as good as the air wing it carries. At present, in 2016, the Liaoning's air wing is not ready for combat operations. The most recent footage of the carrier's operation in 2015 shows only around six (6) J-15 fighters operating onboard the carrier, while most analysts expect the ship to carry 24 J-15s (similar to the Russian Su-33) when fully operational. It is the author's belief that the Liaoning will be able to operate 12 J-15s by the end of 2017. **By the year 2020, the Liaoning's air wing should be fully operational, with 24 fixed-wing aircraft during normal operations and a maximum capacity of 32~36 fixed-wing aircraft embarked.** It should also be noted that China is currently constructing its first indigenously-built carrier in the same class as the Liaoning. However, this second PLAN carrier will likely **NOT** become fully operational by 2020.

In terms of capability, planners can consider the Liaoning's future surface battlegroup as equal to roughly half a USN CSG. A USN delegation with a dozen or so officers visited the Liaoning in 2015. The visit was mentioned in the Pentagon's 2016 report on China. These USN officers will no doubt have more information on the ship and its crew's level of readiness.

Fig. 16, J-15s on the deck of the Liaoning (Photo credit: Chinese internet)

Destroyers, Frigates and Lighter ASCM-Carrying Vessels

Since the mid-2000s, the PLAN has acquired about **3 dozen major surface combatants – destroyers and frigates –** capable of operating thousands of miles from China's coast. These include ships with capabilities approaching or roughly on par with the USN's Arleigh Burke class destroyers. With the ASCMs, SAMs and helicopters they carry, they can pose a potent threat to a USN CSG on the high seas.

These ship classes and numbers are as follows (with units under construction and planned in parenthesis):

Type 051C Destroyer: **2**

Type 052B Destroyer: **2**

Type 052C Destroyer: **6**

Type 052D Destroyer: **3 (4 under construction, with 5 more planned)**

Type 054 Frigate: **2**

Type 054A Frigate: **22**

The PLAN also has four **(4) Russian-built Sovremennyy-class destroyers**, armed with the deadly supersonic P-270 Moskit (NATO designation SS-N-22 Sunburn) ASCM. In addition, about 30 older PLAN destroyers and frigates are still in service. Although these have very limited air defense capabilities and are generally slower than the newer ships, they are capable of carrying modern ASCMs.

A new class of destroyers – the Type 055, with a displacement of 10,000 tons, has been designed. At least one is reportedly under construction in the Jiangnan Shipyard near Shanghai. **It will most likely be operational by 2020**.

As stated in the **Recent Developments** section, if a USN CSG gets too close to the Chinese coastline, or PLAN bases in the South China Sea, the **83 Type 022 FACs** and **25 Type 056 corvettes** will become threats as well.

(Photos and texts continues on the following page.)

Fig. 17, the 4th Type 052D destroyer being fitted (Photo credit: QQ News)

Fig. 18, a squadron of the PLAN South Sea Fleet underway (Photo credit: Guangzhou Daily)

Attack Submarines

Submarines are the most asymmetric threats to a CSG. They are called “silent hunters” for a good reason. On the one hand, even modern homing torpedoes have a rather limited range. Thus, sub commanders typically have to launch a torpedo attack from within 10 nautical miles of the target, putting the sub itself at great risk. On the other hand, submarines can be the most stealthy option available to a naval commander facing a USN CSG. As demonstrated in previous exercises with friendly forces, even conventionally-powered submarines are capable of sneaking through a carrier’s ASW net. Practically, subs would be slower than a CSG and would usually employ ambush tactics when attempting a torpedo attack on a carrier.

In addition to torpedoes, modern subs generally also carry another tool of the deadly trade – sub-launched ASCMs. As an ASCM launch platform, the sub itself would be much safer, with satellite and/or other surveillance platforms providing mid-course updates and the ASCM itself taking care of terminal guidance.

In terms of propulsion technology, nuclear-powered subs (SSNs) are capable of higher speeds and longer-duration missions than conventionally-powered subs (SSKs). However, since most existing SSNs use a pressurized-water nuclear reactor design that requires continuous pump operation, they tend to be less quiet than the best SSKs when lying in ambush.

The PLAN currently has the following modern submarines (again, from Wikipedia [33]):

Type 095 SSN (NATO: N/A): **0 (1, under sea trial)**

Type 093 SSN (NATO: Shang): **2 (4)**

Type 091 SSN (NATO: Han): **3**

Type 039A SSK (NATO: Yuan): **15 (5)**

Type 039 SSK (NATO: Song): **13**

Kilo-class SSK (Russian-built): **12**

Additionally, the PLAN still has 17 older Type 035 (Ming-class) SSKs in service.

(Photos and texts continues on the following page.)

Fig. 19, the Type 093 SSN (Photo credit: Chinese internet, watermarked site)

Fig. 20, the Type 039A SSK (Photo credit: Chinese internet, watermarked site)

III. Electronic Warfare (EW)

Little is known about China's EW capabilities, as is expected. EW capability is one of the most closely-guarded areas for all countries around the world.

From what little is available publically, the PLA has been consciously developing its EW capabilities since the 1990 Persian Gulf War. The effort accelerated after the 1996 Missile Crisis and 2001 EP-3 Incident near Hainan Island.

In addition to Electronic Intelligence (ELINT) gathering aircraft based on the Y-8 airframe mentioned previously. There are recent efforts to develop both dedicated airborne EW platforms based on and EW pods designed for both the JH-7 and J-16 airframes. [34] [35]

Fig. 21, JH-7 with EW pods (Photo credit: CCTV / Chinese internet)

Recommended Policy Options

As Americans and citizens of a global village, the author is sure that readers of this report have been and will continue to strive to keep the peace in our village. As Caul von Clausewitz wrote, “War is merely the continuation of policy by other means.” In many previous cases, wars could have been averted had the parties involved acted in a more cooperative manner more promptly.

The final section of this report provides policy options aimed at stabilizing both the Taiwan Strait and the South China Sea, two regions where the potential for direct armed conflict with China exist. As is evident from the previous pages of this report, such a conflict will be costly for both sides.

These policy options can be carried out immediately after the November election and do not have to wait until the President takes his oath of office in January.

Taiwan

As stated before, Taiwan should be a high priority. Maintaining the status quo in the Taiwan Strait is crucial to American interest in the region. A special envoy from the President (or President-Elect) can sit down with representatives from both China and Taiwan in a private setting to discuss specific scenarios, for example:

1. Taiwan tries to get its supporters in the UN to start an initiative for a formal seat at the UN for the Island again;
2. China steals away another country currently with formal diplomatic ties with Taiwan without diplomatic provocation from the Island.

We must make it crystal clear how we will react in each case and how we will punish the side that starts a fight. Basically, the US has to play the adult in the room.

Obviously, we cannot account for every single possible scenario, but we **CAN** make it clear that we will be firm but fair to both sides.

The South China Sea

The South China Sea is more messy, but less urgent (to a certain extent) mainly because the US has more pull over the Philippines than we do with Taiwan. The same idea and setup can work here, with the first main policy goal being trying to get China to publicly announce what it means with the nine- (or ten-) dash line.

Traditional fishing ground? Exclusive economic zone? Or, territorial water?

Once that ambiguity is gone, any negotiation that follows will be much easier. After all, you cannot negotiate with someone without knowing what they want.

Have a good weekend and see you in the White House.

References

1. Department of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2016* http://www.defense.gov/Portals/1/Documents/pubs/2016%20China%20Military%20Power%20Report.pdf

2. Michael Nixon, Forrest E. Morgan, Jacob L. Heim, Jeff Hagen, Sheng Li, etc., RAND Corporation, http://www.rand.org/content/dam/rand/pubs/research_reports/RR300/RR392/RAND_RR392.pdf

3. Maj. Christopher J. McCarthy, USAF, "Anti-Access/Area Denial: The Evolution of Modern Warfare" https://www.usnwc.edu/Lucent/OpenPdf.aspx?id=95

4. The Bullis School, http://www.bullis.org/

5. Nelson Hernandez, the Washington Post, "Solider from Potomac, MD, Killed in Afghanistan" http://www.washingtonpost.com/wp-dyn/content/article/2009/02/27/AR2009022701925.html

6. NASA Mars Balance Mass Challenge, https://www.nasa.gov/solve/marsbalancechallenge

7. The Good Judgment Project, https://en.wikipedia.org/wiki/The_Good_Judgment_Project

8. IARPA, Intelligence Advanced Research Projects Activity, https://www.iarpa.gov/

9. DF-26 missile, https://en.wikipedia.org/wiki/DF-26

10. DongFeng (DF) family of missiles, https://en.wikipedia.org/wiki/Dongfeng_%28missile%29

11. DF-16 missile, https://en.wikipedia.org/wiki/Dongfeng_%28missile%29#Dongfeng_16

12. PLASSF, https://en.wikipedia.org/wiki/People's_Liberation_Army_Strategic_Support_Force

13. Ministry of Defense, PRC, "President Xi Jinping at Establishment Ceremony of a New Army Command and Two New Services", reported by Phoenix Media, http://news.ifeng.com/a/20160101/46916476_0.shtml

14. ZHENG Wenhao, Phoenix Media, "Exclusive Look at the PLASSF", http://news.ifeng.com/a/20160103/46924745_0.shtml

15. Xi'an Evening News, reprinted by Phoenix Media, "Unmasking the First Unit of the Strategic Support Force", http://news.ifeng.com/a/20160125/47221255_0.shtml

16. Yaogan launches (up to Yaogan 26), https://en.wikipedia.org/wiki/Yaogan

17. Yaogan 27 launch, https://spaceflightnow.com/2015/08/27/chinese-spy-payload-fired-into-orbit/

18. Yaogan 28 launch, https://spaceflightnow.com/2015/11/09/intelligence-gathering-satellite-launched-by-china/

19. Yaogan 29 launch, https://spaceflightnow.com/2015/11/27/radar-spy-satellite-launched-by-china/

20. Yaogan 30 launch, https://spaceflightnow.com/2016/05/15/chinese-rocket-lofts-government-surveillance-satellite/

21. Stephen Clark, "China launches eagle-eyed satellite to stare down at Earth", Spaceflight Now, https://spaceflightnow.com/2015/12/29/china-launches-eagle-eyed-satellite-to-stare-down-at-earth/

22. Jeffrey Lin and P.W. Singer, "Gaofen 4, The World's Most Powerful GEO Spy Satellite, Continues China's Great Leap Forward Into Space", Popular Science, http://www.popsci.com/gaofen-4-worlds-most-powerful-geo-spy-satellite-continues-chinas-great-leap-forward-into-space

23. The Type 022 Fast Attack Craft, https://en.wikipedia.org/wiki/Type_022_missile_boat

24. "Complete Transcript of Tsai Ing-wen's Inauguration Speech, 5/20/2016", Lianhe Zaobao (largest Singaporean Chinese-language newspaper), http://www.zaobao.com.sg/realtime/china/story20160520-619360

25. Chen Shui-bian, https://en.wikipedia.org/wiki/Chen_Shui-bian

26. Ma Ying-jeou, https://en.wikipedia.org/wiki/Ma_Ying-jeou

27. Tsai Ing-wen, https://en.wikipedia.org/wiki/Tsai_Ing-wen

28. The Consensus of 1992, https://en.wikipedia.org/wiki/1992_Consensus

29. Statement from the PRC's Office for Taiwan Affairs, Phoenix Media, http://news.ifeng.com/a/20160520/48812135_0.shtml

30. PLA aircraft inventory, https://en.wikipedia.org/wiki/List_of_active_People's_Liberation_Army_aircraft

31. "PLAAF JH-7As Conducts ASCM Drills", QQ News, http://news.qq.com/a/20131121/003857.htm

32. Chengdu J-20 Stealth Fighter, https://en.wikipedia.org/wiki/Chengdu_J-20

33. PLAN Submarine Force, https://en.wikipedia.org/wiki/People's_Liberation_Army_Navy_Submarine_Force

34. The JH-7 EW aircraft, QQ News, http://news.qq.com/a/20160401/018816.htm

35. J-16 EW aircraft vs F-35, 163 News, http://war.163.com/15/1228/09/BBTMPS6Q00014OVF.html