

PLA Modernization

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In 2015, China's leadership directed the PLA to be capable of fighting and winning "informatized local wars" with an elevated emphasis on "maritime military struggle," adjusting its guidance on the type of war the PLA should be prepared to fight. China has endeavored to reduce personnel, simplify organizations, and modernize equipment. On the other hand, the United States Military established the concept of "Network Centric Operation"¹ in order to speed up decision making and improve the efficiency of military operation by communicating and sharing information through a higher-level C4I system. It has been introduced into all services.

China understands the importance of NCW and is introducing it, but with the recognition that modernization of equipment is not sufficient, China is simultaneously promoting mechanization and computerization. The 2010 White Paper on China's National Defense aims to achieve basic mechanization in 2020 and to make significant progress in informatization as it promotes the modernization of national defense and military.

¹ David S. Alberts, John J. Garstka, Frederick P. Stein, " Network centric warfare : developing and leveraging information superiority", CCRP publication series, 2nd Edition (Revised), August 1999

The white paper stated, “PLA deepens research into integrated operational theories under informatization, promoting the introduction of weapons equipment using the latest high technologies, developing new operational capabilities, and building a joint operation system under information-oriented conditions².”

（「推进国防和军队现代化。着眼2020年基本实现机械化并使信息化建设取得重大进展的目标，坚持以机械化为基础，以信息化为主导，广泛运用信息技术成果，推进机械化信息化复合发展和有机融合。拓展和深化军事斗争准备，牵引和带动现代化建设整体发展。深化信息化条件下联合作战理论研究，推进高新技术武器装备建设，发展新型作战力量，着力构建信息化条件下联合作战体系。」）

The basis for joint operations under informatized conditions is the C4I network. The satellite is an important sensor node and a communication node constituting the network. China is also developing space to realize NCW and has launched a number of satellites to build the network. China has already had a capability to put satellites into Low Earth Orbit (LEO), Sun-Synchronous Orbit (SSO), and Geosynchronous Transfer Orbit (GTO).

China Aerospace Science and Technology Corporation

² 《2010 年中国的国防》中华人民共和国国务院新闻办公室（2011 年 3 月）

(CASC) is responsible for the launch of these satellites³. CASC is a huge state-run company and its predecessor was the Fifth Academy of the Ministry of National Defense, established in 1956. China's space development is closely related to the PLA. Later, on July 1, 1997, the company became a state-run company called The China Aerospace Corporation in line with the strategy of reforming the defense science, technology and industry management system of the State Council. It became to CASC on July 1, 1999 at last.

The Long March (LM) launch vehicles developed by CASC have made over 290 flights, and are capable of sending spacecraft into LEO, SSO, GTO and Earth-Moon transfer trajectory. CASC has launched more than 200 satellites since 1970. In recent years, the new-generation launch vehicles, including LM-5, LM-6, LM-7 and LM-11, have made their flights successfully. LM-5 has a LEO payload capacity of 25000 kg and a GTO payload capacity of 14000 kg. It is enough payload to mount various sensors such as radar.

CASC also manufactures weapons equipment. Weapon equipments which was made by CASC includes Strategic Nuclear Missiles, Conventional Ground-to-Ground Missiles, Air and Missile Defense Equipment, unmanned aerial vehicles (UAV), artillery rocket and guided bombs etc.

³ 中国航天科技集团有限公司 China Aerospace Science and Technology Corporation 网站，<http://www.spacechina.com/n25/index.html>

CASC is the only manufacturer of the intercontinental strategic nuclear missiles in China. CASC has realized the development of the strategic nuclear missiles, from single-stage to multi-stage, from liquid to solid, from land-based to land/sea-based, from fixed-launch to mobile launch, and from medium and long-range to intercontinental. With the increasing improvement of the capabilities of strategic early-warning, missile penetration, rapid reaction and survivability and protection, China has initially formed a strategic nuclear deterrence system with both solid and liquid, long range coverage, land/sea-based, and significantly enhanced yield and effectiveness.

The missiles produced by CASC include DF-41, which was first unveiled on October 1, 2019 at the 70th Anniversary Review of the People's Republic of China. The Chinese PLA Airforce is in charge of space, but the rocket army operates ballistic missiles. The Rocket Army was upgraded from the 2nd Artillery on December 31, 2015, following a military reform that began in November 2015⁴.

When a promotional video of the Chinese rocket army flowed on February 15, 2017, the media in Hong Kong and Taiwan analyzed its meaning and said, “It is what will

⁴ <<陆军领导机构火箭军战略支援部队成立大会在京举行>>国防部网，2016年1月1日，
http://www.mod.gov.cn/photo/2016-01/01/content_4634906.htm

dominate President Trump.” However, the promotional video was not the topic in Japan.

Many Japanese respond sensitively to the “satellite launch” of North Korea, but not to China's satellite launch. China launches more than 20 satellites annually, even with just the announcements.

For one thing, there seems to be an idea that “satellite launch” has little military significance because China has already established technology for intercontinental ballistic missiles. But satellite launches are not only linked to ballistic missile technology, but also have other important military implications.

The fact that China's space development is integrated with the military operation is obvious from CASC's leading role in space development and the history of space development. China's space development was started by the organization in PLA. China launched its first space exploration rocket (T-7M) on February 19, 1960, and made the first test flight of Dongfeng 1 (DF-1) on November 5, the same year. Incidentally, DF-1 is a copy of the Soviet R-1 (SS-2) missile.

Looking at these launch tests, it can be seen that rocket and missile development are linked closely. Following the success of these tests, on August 20, 1961, the party center consisting of Chairman Mao Zedong and Prime Minister Zhou Enlai agreed to the development and production of “Double Shells”. “Double Shells” refers to nuclear weapons and

missiles that carry them. Chinese leaderships ordered to develop a ballistic missile with a nuclear warhead.

China at that time, like the current North Korea, was investing domestic resources in the development of nuclear weapons that could deter major powers as an “option of the weak”. China also uses “irrational rationality” to deceive other countries. “Irrational rationality” means deliberately frightening the other side by thinking that “China is not rational”.

It was essential for China to have a means to transport nuclear warheads to Washington, D.C. and Moscow, in order to make “irrational rationality” effective. On June 29, 1964, China successfully conducted a self-developed “Dongfeng 2 (DF-2)” launch test. At the same time, efforts were made to reduce the size of the nuclear warhead, and on October 27, 1966, a test of launching the DF-2 equipped with a nuclear warhead was conducted, which was called “Connected Double Shells”.

In response, on May 13, 1967, the National Planning Committee (now the National Development Planning Committee) launched a plan for an earth observation satellite system. All that was needed to get these satellites into orbit was a rocket with high thrust. On January 30, 1970, the Chinese first mid-range ballistic missile “Dongfeng 4 (DF-4)” was successfully launched. On April 24 of the same year, the “Long March 1” rocket was launched with the first satellite “Dong

Fang Feng 1".

Thus, China's space development has been carried out exactly in line with the development of ballistic missiles and nuclear warheads. And on September 18, 1999, the Communist Party Central, State Council, Central Military Commission, and National People's Congress all commended those who were successful in the R & D of "Double Shells and a Star". "One star" in "Both bullets" refers to satellites.

China's current space development is not just for the development of ballistic missile technology. It forms various networks using satellites, has a space station, and is looking into moon development.

China considers the possibility of the United States military attack on China. Therefore, GPS (Global Positioning System), which is very convenient in Japan, cannot be used militarily in China. China needs to build a similar positioning satellite navigation system in its own country.

The positioning satellite navigation system in China is the "Beidou" system. The "Beidou" system is being established in three stages. As the first stage, the No. 1 system for demonstration tests was built by the end of 2000, and as the second stage, the No. 2 system was completed by the end of 2012, and positioning errors in the Asia Pacific region and China were less than 10 meters. As the third stage, the No. 3 system will be completed with 30 satellites in 2020, and the "Beidou" system will be a global satellite positioning

navigation system.

2020 is also the time for the second phase of Chinese navy development. By 2020, the Chinese Navy is aiming to deploy carrier strike groups around the world and demonstrate military presence. In order for China to expand its military operations around the world, its own positioning navigation system is necessary.

By the way, 2020 is conscious of 2021 of “100 years anniversary of the birth of Chinese Communist Party”, which is one of the “two hundred years”. Mr. Deng Xiaoping ordered Chinese Communist Party to make Chinese people to be rich by 2021.

But China believes that the United States will intervene China's economic development. A2 / AD, a strategy that prevents the US Navy from attacking China, is now well known. The word A2 / AD itself was used by the Net Assessment Office of US Department of Defense, but there is no doubt that China wants to strike the US Navy fleet as far away from the mainland as possible.

The ASBM (Anti-Ship Ballistic Missile) attacks the US fleet in the waters farthest from mainland China. In order for ASBM to accurately hit US Navy vessels, accurate target position information in a water more than 3000 kilometers away from the mainland is necessary. This is because without the target information, you cannot enter the launch parameters.

China insists it has a detecting range for launching ASBM

that spans 5 million square kilometers in the Pacific Ocean using satellites. China has also worked hard to build a maritime reconnaissance and surveillance sensor network.

It has only been 10 years since the launch of the first remote sensing satellite "Yaogan 1" in 2006 and the launch of the "Yaogan 30" satellite in May 2016. Also, according to Chinese data, the ground resolution of another commercial remote sensing satellite "Gaofen" series is already less than 0.5 meters. The satellites of the "Gaofen" Series are major project of the National Science and Technology Critical Special Project High-resolution Earth Observations included in the National Medium to Long-Term Science and Technology Development Plan (2006-20). High-resolution optical satellites and synthetic aperture radar satellites have been launched in the project.

CASC plans to build a commercial remote sensing satellite network with a resolution of 0.5 meters in 2022. The military satellite network maintained by China boasts even higher resolution. China has established a marine reconnaissance and surveillance sensor network to support expand the scope of its naval and air force operations. CASC launched a very large platform satellite with a payload of 1.5 tons in 2018. It can be applied not only as a communication satellite and high-orbit remote sensing platform, but also in outer space exploration.

China sent a new communications technology experiment

satellite into planned orbit from the Xichang Satellite Launch Center in southwest China's Sichuan Province on October 17, 2019. The satellite, launched by a Long March-3B carrier rocket, will be mainly used for multi-band and high-speed communication technology experiments. The satellite and the carrier rocket were respectively developed by the China Academy of Space Technology and the China Academy of Launch Vehicle Technology under the China Aerospace Science and Technology Corporation⁵. China will provide high-speed and high-capacity communications to aircraft flying domestically and overseas, ships navigating the world, vehicles moving on land, etc. with high-speed broadband satellites, and will contribute to the “One Belt One Road” strategy and overseas development strategy.

China is taking control of 5G technology and trying to build a network that it dominates. Unlike the Internet, the network built by China will be difficult for the US to obtain information. If more countries use the Chinese network, the world's information and communications could be divided into two blocks. China is rushing to launch satellites, lay submarine cables, and then improve network infrastructure. The network

⁵ 《长三乙火箭成功发射通信技术试验卫星四号》中国航天科技集团有限公司, 2019 年 10 月 18 日, <http://www.spacechina.com/n25/n2014789/n2014804/c2751987/content.html>

is the basis for the battles deployed by the Chinese PLA.

The Chinese People's Liberation Army has established a new unit to support satellite operations. It is a “strategy support unit”. The main mission of the Strategy Support Unit is to “ensure superiority in space, outer space, networks, and cyberspace, and to advance the PLA's operations in an advantageous manner.” Specific missions include information, technical reconnaissance, electronic Special operations including war, cyber warfare, psychological warfare, maintenance and replenishment (including target search and tracking, transmission of target information), daily navigation assistance activities, management of "Beidou" and space information collection means, cyber attacks / Defense, network defense, etc⁶.

The Strategy Support Unit is a newly created unit that inherits the duties of the former General Staff Division 2 (Information, HUMINT, etc.) and 3 (Technical Reconnaissance), and the former General Equipment Division. It is an organization deeply involved in Chinese space development.

However, even with such large scale of sensor networks and communication networks in place, China's network-centric operations are far below the US. Even if the capabilities of

⁶ <<我军战略支援部队是一支什么样的军事力量？>>国防部、2016 年 1 月 6 日、http://news.mod.gov.cn/pla/2016-01/06/content_4635380.htm

individual satellites are improved and they can be physically connected, the know-how of “System of Systems” that integrates multiple systems to build a larger system cannot be easily obtained.

China, which thinks it can't win the United States, tries to have capability of asymmetrical warfare against the United States. One of them is an anti-satellite weapon. After the first actual satellite destruction in 2007, it is said that in 2013, it had already acquired the ability to destroy geostationary orbit satellites.

These are aimed at destroying satellites, one of the critical nodes of the US network, to reduce or disable US C4I capabilities. DN-2 targets high-orbit satellites for US GPS and reconnaissance. China claims that 24 satellite destruction missiles can neutralize US communications and information networks.

But this is also ironic for China. Now China is launching many satellites and trying to build a network. There is no other country cannot do the satellite destruction that China can do. This time, the satellite destruction technology that China has developed may turn the Chinese satellite into a target.

China's space development has made great strides. Manned space development is one of them. China's manned space development is also based on a three-stage development strategy. The manned space development “Three Steps” development strategy (921 project) decided on September 21,

1992 is based on the “863 Plan” directed by Mr. Deng Xiaoping in 1986.

The first step is a rudimentary and experimental stage in which a manned airship is launched and travels back and forth through the universe, from Shenzhou 1 (November 1999) to Shenzhou 6 (October 2005). The second step is the docking of the spacecraft and the space station and the short stay in the space laboratory, which is divided into the first stage and the second stage. The first stage is from Shenzhou 7 (September 2008) to Shenzhou 10 (June 2013) and includes the space laboratory Tiangong 1. The second stage is a 30-day stays by Shenzhou 11 (October 2016) and Tiangong 2.

The third step is the construction of a medium-term stay-type “Tiangong” space station, which China plans to complete by 2022. Instead of the ISS (International Space Station), which will be in operation in 2024, only China's sole space station will float in space. Even in this manned space development, the source is in the direction of Mr. Deng Xiaoping in the 1980s. Various current development strategies have not changed since the 1980s.

The lunar exploration in China, which was started in 2004, is called the “Chang-e project”, and is divided into three stages⁷: “lap”, “fall (landing)”, and “round (return)”. The first period (2007) is the exploration of the lunar topography,

⁷ 中国探月与深空探测网， <http://www.clep.org.cn/index.html>

geology, and environment by “Chang-e1”. In the second period (2007-2016), unmanned landing on the moon with "Chang-e 2" and "Chang-e No. 3", and lunar surface survey with lunar car "Yutu (December 2013-August 2016)" It is. The third period (2016-2020) is the lunar exploration by lunar vehicles sent from "Chang-e 5" scheduled to be launched in 2017 and the collection of rocks, etc. These are collected and returned to the earth.

In Japan, it was reported that "Yutu" was stopped in August 2016 as if it were a romantic event, but China's lunar development is also a battle for leadership in energy resource development with the United States. It also includes military meaning. “Helium 3”, which exists a lot on the moon, cannot be used immediately as an energy resource. Still, China says that all of the earth's energy resources are constrained by the United States, so the moon's energy resources must be controlled by China before the United States reach them. China's space development is also based on the sense of crisis that the US will hinder China's development. The place of conflict between the United States and China is spreading from space on the earth to cyberspace and space.