CENTRE FOR JOINT WARFARE STUDIES

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GUNS AND ROCKETS – CHINESE PHZ 11

New Chinese Army PHZ-11 122mm MLRS Multiple Launch Rocket System on Tracked Chassis.

1. Long-range multiple launch rocket systems (LRMLRS) attached to an artillery detachment with a regiment under the PLA Army fire rockets during a live-fire training exercise in early July, 2021. Photo:China Military.

2. One of the latest Chinese artillery weapons recently made its exercise debut in plateau regions organized by the People's Liberation Army (PLA) Xinjiang Military Command and Tibet Military Command, with analysts saying on 28 July 2021 that these weapons are particularly effective on plateaus.

3. The new rocket artillery looks similar to the PHL-11 self-propelled multiple rocket launcher system, as both use a wheeled chassis and fire 122-millimeter-caliber rockets. However, the new rocket artillery only runs on four wheels and has 20 rocket launch tubes, while the PHL-11 runs on six wheels and has 40 launch tubes.

4. Unlike many other weapons and types of equipment that could offer a lower performance due to the lack of oxygen on plateaus, artillery weapons could perform even better in such areas, since the air resistance is lesser, and that is why they are some of the most important weapons for plateau operations.

Salient Features

5. The design of the PHZ-11 looks like the American-made **M-270** with an armored cabin at the front of the vehicle and the launcher station located at the rear of chassis. The vehicle uses new modern technologies offering ***improved accuracy due to better tube-laying and precision-guidance of individual rockets:-***

(a) The PHZ-11 could be operated by a crew of three including a driver, gunner, and commander, all of whom are seated in the fully enclosed cab at the front of the vehicle.

(b) This is protected against the firing of small arms and artillery shell fragments by aluminum armor.

(c) All the firing operations can be performed from inside of the crew cabin.

(d) The vehicle could be equipped with a land navigation system (LNS) and a computerized Fire-Control System (FCS), which

allows for autonomous operation with target information being transmitted to the launcher from the battery command post.

(e) The PHZ-11 is fitted with two pods of 20 launchers for 122mm rockets arranged in four rows of five tubes each mounted on a power operated turntable.

(f) After the rockets are fired, a dedicated reloading vehicle with a crane unloads the empty modules and places new ones directly on the mount.

(g) It can fire different types of unguided solid propellant 122 mm rockets including mine laying, fuel-air explosive, HE High Explosive, steel ball HE, and steel ball HE incendiary with a range from 15 km to 30 km.

(h) The PHZ-11 needs only a few minutes to be ready to fire and carry out a fire mission and rapidly to come out of action.

(j) Once the 122 mm rockets have been fired the vehicle can rapidly move to another position to avoid counter-battery fire.

(k) The PZH-11 was developed based on a modular design offering the possibility to fire rockets of different calibers as the mounting points are common to rocket modules of different calibers including 220 mm and 300 mm.

6. **Current Status.** It is reportedly now in service with the 62nd Heavy Combined-Arms Brigade, LX14, 76th Group Army, Western Theater Command.

7. Images released on a Chinese Defense blog in December 2020 had shown PHZ-11 122mm Multiple Launch Rocket System (MLRS) on tracked chassis. But now during the live firing, the photo and report released by Global Times had shown it as a wheeled version.

https://www.globaltimes.cn/page/202107/1229911.shtml

https://www.armyrecognition.com/april_2020_news_defense_global_security_army_industry/new_chinese_army_phz-11_122mm_mlrs_multiple_launch_rocket_system_on_tracked_chassis.html

https://nationalinterest.org/blog/reboot/what-makes-china%E2%80%99s-new-phz-11-multiple-launch-rocket-system-big-deal-174380

SPACE TECHNOLOGY – CHINA'S SPACE STATION

8. **China Space Station's Giant Robotic Arm Sparks Concerns in US.**[1] A powerful robotic arm attached to the core module the Chinese Space Station has sparked concerns in the United States over its possible military applications. The 10-metre-long device, which is capable of lifting objects weighing up to 20 tonnes and can move around outside of the station. China has launched several scavenger satellites fitted with robotic arms to gather and steer space debris so it burns up in the Earth's atmosphere; could also be used in future for grappling other satellites" as per James Dickinson, commander of the US Space Command who was addressing the Congress hearing last month and is therefore, of a military concern to the US.

9. The Technology is not new as US Space shuttles in 90's used to have the robotic arm. The reason for the concern is that China in 2016 had launched a satellite Shijian-17, with a robotic arm. The stated object of the mission was to test "high-orbit space debris observation technologies" This satellite is known have made unusual manoeuvres with respect to other satellites in the geo stationary orbit. As per the commander of the US space command this satellite has a potential ability take down US probes hence, a challenge in the space domain.

10. **Comments**. Truly, the robotic arm can be used for grabbing or disabling the adversary's satellite but, this may not be a best offensive option especially as there are several other anti-space domain measures such as jamming and cyberspace, directed energy weapons, co-orbit capabilities, and ground-based anti-satellite missiles be could be used to block or damage adversary's satellites. Unlike the robotic arm, many such measures also avoid attributability.

11. Space debris is matter of concern especially in the lower earth orbit. This could be a genuine Chinese experiment for clearance of the space junk. Several methods like gathering up space junk with robotic arms to nets, to obliterating the junk with lasers etc have been considered and tested. Many space agencies like NASA, the European Space Agency and the Japan Aerospace Exploration Agency have also engaged in past in space debris removal projects.

12. **Chinese Satellite Yunhai 1-02 Collision**[2]**.** Chinese Yunhai 1-02 a weather observation satellite which was launched by China in September 2019, suddenly disintegrated. It was speculated that It was hit by the space debris caused by the US weather satellite NOAA-17, which had broken apart 10 days before this incident and had created

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[1]https://www.scmp.com/news/china/diplomacy/article/3134500/china-space-stations-giant-robotic-arm-sparks-concerns-us

[2]www. Space.com

debris. Now, it has come to light that Yunhai 1-02 was actually hit by debris from a Russian rocket that launched a military radio surveillance satellite, Tselina-2, in 1996.This is one of the first major confirmed orbital collision in a decade.

13. The assessment of collusion with the space debris from the Russian military satellite became possible from the orbital data of the US Combined Force Space Component Command. The debris which collided with the Chinese weather satellite has been labelled as “object 48078” by the space command. The object actually is a fragment of the Zenit-2 Russian rocket which used to launch surveillance satellites.

14. The incident indicates that China still did not have Space Situational Awareness (SSA). Presently US, Russia, European space Agency have the space situational ability. In China, is expected to be in the nascent development phase or else China would have manoeuvred its military space craft to avoid the collision. Space situational awareness is vital for offensive and defensive actions in the space and would become vital for space faring nation not from military angle but also for safety of own satellite from inadvertent collision with the space junk. This is a matter of concern as the Lower Earth Orbit (LEO) is already very crowded would become worse in the coming years.

15. **Chinese Astronauts Complete Second Spacewalk at New Space Station.**[3]

16. Above photo was released on 20 the Aug, 2021 by China Manned Space Engineering Office shows a Chinese astronaut leaving the Tianhe core module for a spacewalk.

[3] ***https://edition.cnn.com/2021/08/20/china/china-tiangong-second-spacewalk-intl-hnk-scli-scn/index.html***

17. Actually, two Chinese astronauts came out of the core module on 20 Aug to install a range of equipment including a backup air conditioning unit. This was the second spacewalk. Earlier on 4 July, one of the astronauts had come out to install first extravehicular activity on the robotic arm which then helped them to transport other equipment around the station.

18. Tianhe is the largest spacecraft China has ever built. China launched the space station's core module, called Tianhe on April 28. It is 16.6meters long, and 4.2 m wide with of 22.5 tons. Presently, there are three astronauts on board since 17 June when their space craft Shenzhou12 docked with Tianhe. They will remain in the space for three months.

19. By end of 2022, two more modules will be launched which will complete the assembly phase of the space station. Besides, three additional crew missions and three cargo missions will be launched to the space station. Thus in all eight missions will be launched to Tianhe.

20. China has planned to maintain presence in the space. China started space exploration nearly a decade and half before India in 1970 and has established itself as space power. It has already announced that it will an exploration base on the moon together with Russia and has also landed a rover on Mars earlier this year. Seen in comparison, India is not lagging. Our budgets are much smaller but, the achievements are comparable to other space powers if seen in the time horizon.

CHINESE AIRBORNE C4ISR – KJ 2000

21. **Chinese Airborne C4ISR Capability Updates.** In March 2001, China faced a major hurdle for development of its airborne C4ISR capability when Israel cancelled AEW&C aircraft sale to China due to pressure from Clinton Administration. Development of its indigenous KJ-200 aircraft began the following year 2002 and it entered service in 2007.

22. China's aerospace forces, which include: the People’s Liberation Army Air Force (PLAAF), PLA Naval (PLAN Aviation), PLA Rocket Force (PLARF), PLA Army Aviation (PLAA), and the PLA Strategic Support Force (PLASSF) all make use of the C4ISR infrastructure. China Aerospace Studies Institute (CASI) published a detailed report on this subject covering wide range of airborne sensors and command and

control aircraft along with constellations of satellites[4]. These include early warning aircraft, specialized electronic intelligence (ELINT) aircraft, and maritime patrol aircraft, both manned and unmanned, as well as communications, radar, optical, and signals-collecting satellites. These platforms are essential enablers of the new combat aircraft and precision weapons that China's aerospace forces have been acquiring and are vital to China's ability to conduct long-range precision missions as well as pre-strike reconnaissance and post-strike damage assessment. The report brings out that the PLA's known inventory of fighter aircraft between 2015-2019 indicates that China is phasing out older fighters (J-7s, J-8s, J-10s) in favour of long-range fighters equipped with advanced sensors and long-range weaponry (J-10C, J-15, J-16, J-20). When paired with larger numbers of early warning aircraft, particularly the more capable KJ-2000s (and its future Y-20-based version), China will have a much more robust air defence and be capable of more effectively intercepting enemy aircraft, particularly low-flying aircraft and cruise missiles[5].

23. Four future developments may be particularly significant: the acquisition of AEW&C capabilities that extend well beyond China's borders, the deployment of robust space-based C4ISR capabilities, the creation of redundant command and control networks, and the employment of artificial intelligence to process the data collected by China's new C4ISR capabilities.

24. China appears to be poised to field larger numbers of AEW&C aircraft. With the apparent success of the KJ-200, KJ-500 and KJ-2000, more are being built, and upgraded variants of the KJ-200 appear to be in development. Additionally, test models of a carrier-based early warning aircraft, the KJ-600, appear to indicate that China's growing carrier force, currently at two carriers but projected to grow to a total of six, will also field AEW&C aircraft, further pushing the airborne detection range away from China's shores.

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[4]Dr. Brendan S. Mulvaney, China Aerospace Studies Institute, Chinese Airborne C4ISR, November 2020. https://www.airuniversity.af.edu/Portals/10/CASI/documents/Research/Infrastructure/2020-12-17%20PRC%20Airborne%20C4ISR_eBook.pdf?ver=pRjVmXMh1zcNZ5mhNwEdLA%3d%3d. 18 August 2021.

[5] ibid

(Source:https://www.airforce-technology.com/projects/kj-2000-aewc-aircraft/)

25. Greater numbers of satellites will improve the PLA's ability to carry out a full range of optical, radar and signals intelligence collection, more accurately monitor troop movements, and prepare for precision strikes or defensive operations. An area that may see growth in the coming years is "responsive space reconnaissance" in urgent situations, rapid assembly and launch of space reconnaissance platforms or use of an existing platform after a change of orbit. Rocket systems such as the Kuaizhou provide a "space rapid-reaction" capability by offering the ability to quickly replace destroyed satellites. The Kuaizhou system was first tested in 2017, and subsequent launches have been used to put small satellites in LEO. The Kuaizhou uses an adapted transporter erector launcher (TEL) similar to that used by ballistic missiles. These systems could give the PLA the ability to either conduct contingency reconnaissance ahead of conflict or replace satellite ISR and communication assets lost in conflict. Furthermore, the development of reusable rocket launch vehicle technology, in which China is also investing, could drive down the cost of space launches. These vehicles, combined with shrinking satellite sizes and development of effective sensors for small satellites, could allow China to field capable and redundant constellations of satellites for a variety of missions. China's apparent development and testing of early warning satellites indicates the possibility of a deployment of a space-based network of infrared-sensing early warning satellites which, combined with its existing network of ground-based large phased array radars (LPARs), could provide China with a robust nuclear early warning capability. Similarly, space-based ELINT satellites, combined with China's ground-based over-the-horizon (OTH) radars, can be used to detect aircraft or ships

operating outside of the coverage area of China's airborne AEW&C capabilities[6].

26. The PLA has made significant investments in underground fiber optic communication links, meant to make command and control nodes more resilient. Airborne networks combining manned aircraft, UAVs, and aerostats could offer another layer of redundancy and are clearly an area of research and development. CETC has displayed such a tactical datalink system, called the DT-03, which is depicted as connecting KJ-500s to fighters, UAVs, and ground stations.KJ-500 was officially shown for the first time at military parade in 2019, commemorating 70th anniversary of founding of PRC. China has also developed a Joint Integrated Datalink System similar to the U.S. Link-16 system. China claimed that this system was rolled out across the PLA's fleets and was capable of connecting to airborne early warning aircraft like the KJ-2000.

27. As China's aerospace industry produces increasing numbers of C4ISR platforms, the PLA will seek to enhance its capability to exploit the vast amount of data they collect through use of artificial intelligence. Chinese government departments have even sponsored public competitions to improve satellite sensor identification and tracking. The deployments of the platforms indicate that China has made significant progress in developing and fielding real C4ISR capabilities. These ongoing developments point toward a much more capable PLA, able to carry out modern informationized campaigns.

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[6] ibid