



## CHINA TO DEVELOP SPACE MILITARY CAPABILITIES

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Militaries all over the world increasingly depend on space systems for various force enhancements and application functions. Space force plays an increasingly critical role in enhancing information superiority, situational awareness and targeting to military forces. Space power is therefore, a vital element which provides the ability to be persuasive in peace, decisive in conflict and pre-eminent in any form of combat. Since space systems are extremely important to military operations it is un-realistic to imagine that they will never become targets. The trend towards increased dependency creates both opportunities and vulnerabilities in future crises and conflicts. Just as land dominance, sea control and air superiority have become critical elements, space superiority is emerging as an essential element of battlefield success and future warfare. As space systems become lucrative targets, there will be a critical need to develop robust capability to ensure space superiority – just as there has been for land, sea and air dimensions. Historically military forces have evolved to protect national interests and assets.

During this early part of the 21<sup>st</sup> century space power has all the makings of evolving into another and equivalent (to land, sea and air) medium of warfare. China dramatically demonstrated this with the shooting down of its old satellite in 980 Km orbit on 11 January 2007 with a ground launch interceptor. Likewise, space forces will emerge to protect these commercial and military assets. Therefore, it comes as little surprise that the People's Liberation Army (PLA) Air Force commander Xu Qiliang, in a wide-ranging interview to the People's Liberation Army (PLA) Daily, stated, that militarisation of space, was a "historical inevitability" and "China will develop an air force with integrated capabilities for both offensive and defensive operations in space

as well as in the air". The Chinese air force commander added that it was not only major air force powers in the world which were eyeing outer space for weaponisation, but, some developing countries were also changing their military strategies to gain access to putting weapons in outer space. Asserting that it was imperative for PLA Air Force to develop capabilities in outer space, the Chinese Commander said, "The PLA must, in a time frame, develop weapons of space security and space dominance".

The PLAAF Chief also mentioned that the PLA Air Force was also working to improve its detection and early warning, air strike and anti-missile air defence capabilities. "Superiority in space and in the air would mean, to a certain extent, superiority over the land and the oceans," he said<sup>1</sup>. ..... "Regardless of its extent of development, the People's Liberation Army Air Force will never pose a military threat to any country". It is however difficult to believe that the Chinese are accruing this power for the sake of peace; more likely it is for "peace" at their terms.

This proclamation by the Chinese Air Force chief is in all probability likely to lead to space weaponisation and formation of new equations in the world order. The US, in particular, has invested heavily in space based capabilities both for commercial and military requirements, and derives disproportionate efficiency from these. This high dependence on space assets presents the 'soft ribs of the US', to a potential adversary making the US extremely wary of a virtual "Space Pearl Harbour"<sup>2</sup>. This will drive the US to step up its efforts to secure and defend its space assets leading to a space weaponisation race.

The sphere of action in space is not limited to anti-satellite operations but also has tremendous potential applications in

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1. Detection, tracking and destruction of ballistic missiles
2. Disrupting communication links between satellites and ground stations by 'drowning out' the signal with a more powerful 'fake' signal or by targeting ground stations via physical attacks or computer hacking.
3. Misdirecting or hijacking UAVs especially those linked via satellites.
4. Taking over enemy computers.
5. Disruption of Global Positioning Systems.

### Militarisation-Weaponisation Conundrum

Though no weapons have been used against hostile elements in space the same may no longer be true because of the increasing use of satellites in the battlespace. A prospective opponent will understandably view any space capability as part of forces arrayed against it in a theatre. Therefore, the natural consequence of space integration into military activity is a more hostile environment in space.

The situation is getting even more muddled up with US stating that it considers space including ground, space segments and supporting links vital to its national interests. In consonance with this line of thought the US space policy document released on October 06, 2006 states, that the United States will: "preserve its rights, capabilities, and freedom of action in space; dissuade or deter others from either impeding those rights or developing capabilities intended to do so; take those actions necessary to protect its space capabilities; respond to interference; and deny, if necessary, adversaries the use of space capabilities hostile to U.S. national interests".<sup>3</sup> This clearly indicates US' leaning towards weaponisation.

There is however no clear definition of what space weaponisation is; whether it should be based on the position of the weapon or the intended target. This gives rise to a range of possibilities for the weapons like space to space, space to earth, land to land (via space), air to space etc. These possibilities only serve to add to the prevailing confusion. The advent of micro/nano/pico satellites as bodyguard satellites further complicates matters.

For the world at large the common understanding has been that weaponisation is a subset of militarization and there is, but, a subtle difference between the two. If one envisions a continuum running from space systems being used for civil purposes to weaponisation, weaponisation occurs when the upper range of the continuum is reached.

At its most extreme, space weaponisation would include the deployment in quantity of a full range of space weapons, including satellite-based systems for ballistic missile defence (BMD), space-based anti-satellite weapons (ASATs), and a variety of space-to-earth weapons, and would play a central role in any type of military operation.

While the RAND study restricts itself to weapons based in space<sup>4</sup>, the Chinese and Russian definition on the other hand, includes weapons like earth based ASATs or Lasers, which means the stalemate still continues. Experts like Michael Krepon have suggested, that in order to make further progress 'a code of conduct for responsible space faring nations' may be adopted rather than getting embroiled in definitions or creating new legal regimes for preventing an arms race in outer space.

### China's Foray into Space

China has a comprehensive, integrated and focused space program. Its space program spans the entire spectrum of activities, ranging from manufacture and launch of satellites, manned missions, space research, space applications and deep space missions. Unlike US and India, where clear demarcation can be made between the military and civil organisational structures, the Chinese space program has a strong military bias which permeates even the scientific, domestic, and commercial elements of the space effort. China is in the process of enhancing its space capability.

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Owing to its strategic significance, Chinese aerospace experts state that, disrupting, sabotaging and destroying satellites – has become the most important way to gain information dominance in future wars. Chinese experts note that the counter-jamming capabilities of radar systems have been continuously advancing. The air-space battlefield is said to be the quintessential battlefield for information counter-attack. Satellites travelling in geostationary orbits or 300-1,000 kilometre orbits can conduct electronic reconnaissance and disrupt operations over wide areas.

According to Chinese military scientists, high-powered microwave weapons have triggered "a new revolution". Not only are they compatible for creating integrated systems with radar for low-power detection, target tracking and jamming, but their power can also be rapidly increased for destruction of targets and for inflicting damage on the electronic equipment of enemy targets. These weapons portend extremely wide applications

extending to aeronautic, astronautic, warship and battlefield weaponry. According to China, rapid advances are being made in U.S. HPM and High Energy Laser weapons with some of them already entering applications

stages. China's laser weapons and application programs are massive and sophisticated by any international standards and some estimates suggest that there are approximately 10,000 personnel including 3000 engineers involved with China's laser program alone (40% of these are for defence applications alone)<sup>5</sup>. China may already possess the capability to damage, under specific conditions, optical sensors on satellites that are very vulnerable to damage by lasers. However, given China's current level of progress in laser technology, it is reasonable to assume that Beijing would develop a weapon that could destroy satellites in the future.

Reports suggest that China has considerable and growing capabilities for developing information technology and networks. Chinese officials state that China plans to focus on developing "new-concept" weapons, such as electromagnetic pulse (EMP) systems for disrupting adversary networks and new satellites for establishing a unique GPS network for the Chinese military in the future.<sup>6</sup> It had always been speculated that China was keen on exercising some degree of space control. The clear indications were their attempts at dazzling an American satellite by a ground based laser in 2006, and the infamous ASAT test in January 2007. The recent comments by their PLAAF commander Xu Qiliang has put all the speculations to rest. Though China's military thinkers believe that the first wave will develop from fire power attack and electromagnetic attack to satellite paralysis<sup>7</sup>, the sequence in the next fifteen to twenty years may just be the opposite.

In future complete plans will be laid out to achieve space superiority, throughout the range of military operations to beat these space based military assets. Satellites are the main focus of military space activities. Over 800 satellites orbit the earth, many of which have military uses, from reconnaissance to guiding weapons. They are increasingly used to provide direct support for military operations for instance during the 2003 Iraq war, 68% of munitions were satellite guided (up from 10% in the 1991 Iraq War).

While Chinese military experts applaud the "brilliant" performance of the U.S. Global Positioning System (GPS), in the Gulf and Kosovo conflicts, they continue to clarify its inevitable "Achilles' Heel" because the low altitudes of the

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GPS satellites and low power requirements of their receiver sets make them susceptible to interference, jamming or spoofing<sup>8</sup>. Chinese ASAT test and dazzling of the US satellite signalled that

satellites in space are no longer safe. In response, the US shot down their uncontrolled spy satellite before it entered the earth's atmosphere under the garb of an 'extraordinary measure' heating up the race for weaponisation of space.

Space assets have become a key feature in the digitalisation of the battlefield where some of the fog and friction of war is removed for the side dominating space. It is emerging, as a distinct warfare area of its own. The effect may be to dominate an adversary before conflict starts so as to make the conflict unnecessary, something Sun Tzu advocated nearly 2,500 years ago. Owing to the strategic importance of satellites sabotaging and destroying them to gain information dominance in future conflicts will gain prominence. Therefore, limiting the adversary's use of space and precluding him from influencing friendly space systems has become essential to maintaining situational awareness because of the critical advantages it provides.

#### Implications for India

The increasing exploitation of space by China under all weather conditions will improve intelligence gathering and targeting capability across the vast expanse of the Indian landscape. There is a risk that space-based communications of our nuclear arsenal could be neutralised by Chinese ASAT capabilities. This would have an adverse effect on our nuclear deterrent if redundancy is not adequately maintained. By virtue of having good battlefield awareness and transparency, China will be able to prioritise target selection and enhance the destructive potential of their arsenal while prosecuting air, land and sea campaigns. China's counter-space capabilities are a threat to India's limited yet valuable ISR, communication and navigation satellites, through hard and soft kill options, degrading and denying India the much needed overall battle space awareness. While China continues to improvise on its capabilities, indirectly it also makes Pakistan a 'proxy space power' given its penchant for proliferation of technology and capabilities. Exploitation of China's capabilities for use by Pakistan against India cannot be ruled out in any future conflict.

India has taken small steps by its successful demonstration of exo-atmospheric and endo-atmospheric tests towards validating a Ballistic Missile Defence; it is still miles away

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from operationalising even a theatre specific system. The most pressing requirement for India is to institutionalise an organisation for overseeing the entire gamut of militarisation of space with a national perspective. India is already on the way to develop her own navigation system GAGAN (GPS and Geo Augmented Navigation) for civil aviation and Indian Regional Navigation system (IRNSS), and has also signed the GLONASS (Global Navigational Satellite System) agreement with Russia which is an alternative to the US Global Positioning System. Keeping the trends towards weaponisation in mind, it could be a good move to enter into collaboration with other countries to share satellite systems for a variety of purposes. This would, in some measure restrain an adversary from disrupting satellite services since it would affect others as well or have dual purpose satellites. In operation 'Iraqi Freedom', commercial satellites provided 80% of US data, compared with only 45% in 'Desert Storm' in the early 1990s.

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Disruption of any one of these by hard kill or soft kill will have far reaching effects on the outcome of operations. Moreover, the fantastic rates of increase in the ability to collect, process, classify and disseminate information to an ever-

growing number of targets within an increasingly wide geographical radius at speeds that are hard to imagine implies that these information systems will be the targets of attack. Therefore, there is a perpetual risk that the "weak signals" (those that count) could disappear in a "growing background noise". Adequate precautions against these are best taken during design and implementation stages. The war front, in the conventional sense, may no longer exist. It will be fluid and scattered. Therefore, the essential factor for success in the future will increasingly dwell on the ability to provide secure links between the soldiers and commanders and the ability to increase the information gap between allies and adversaries for which the control of space assets will be vital.

### Conclusion

The need to provide balanced wideband, narrowband and protected communication systems to a broad range of users across diverse mission areas can be effectively met by a satellite based network. Satellite communication and navigation services will form the backbone of this desired ability to conduct operations both in peace and war over the coming years.

The proliferation of new sensor and communication technologies in recent years has been so profound that warfare has now transcended from being terrestrial to the outer space. Satellites are playing an increasingly important role in achieving information dominance. In future, space power will play a very major role in deciding the outcome of conflicts. Security of space based assets will therefore have to be accorded the highest priority.

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### Notes

<sup>1</sup> State Media, "China Chief says space arms inevitable", <http://www.google.com/hostednews/afp/article/ALeqM5gDrce4fjESD3cLHgo-KPFYvINfpA>, Nov 1, 2009

<sup>2</sup> Charles V. Pena and Edward I. Hudgins, "Should the United States "Weaponise" Space? Military and Commercial Implications". *Policy Analysis No. 427*, Mar 18 2002

<sup>3</sup> US Space Policy 2006 < [http://www.au.af.mil/au/awc/awcgate/whitehouse/ostp\\_space\\_policy06.pdf](http://www.au.af.mil/au/awc/awcgate/whitehouse/ostp_space_policy06.pdf) >, on Sep 22, 2007

<sup>4</sup> Robert Preston, Dana J. Johnson, Sean J. A. Edwards, Michael D. Miller, Calvin Shipbaugh, "Space Weapons Earth Wars", [http://www.rand.org/pubs/monograph\\_reports/MR1209/](http://www.rand.org/pubs/monograph_reports/MR1209/)

<sup>5</sup> Jane's Information Group, "China's Aerospace and Defence Industry: Directed Energy Weapons and Sensors," [http://www.aeronautics.ru/archive/research\\_literature/aviation\\_articles/Janes/topics/plasma\\_stealth/Directed%20Energy%20Weapons%20and%20Sensors.pdf](http://www.aeronautics.ru/archive/research_literature/aviation_articles/Janes/topics/plasma_stealth/Directed%20Energy%20Weapons%20and%20Sensors.pdf)

<sup>6</sup> Mary Fitzgerald, "China plans to control space and win the coming information war," *Armed Forces Journal*, November 2005, p.40

<sup>7</sup> Mary C. Fitzgerald, "China's Military Modernisation and its Impact on the United States and the Asia-Pacific," [http://www.hudson.org/files/publications/07\\_03\\_29itzgerald\\_statement.pdf](http://www.hudson.org/files/publications/07_03_29itzgerald_statement.pdf)

<sup>8</sup> Mary C. Fitzgerald, "China's Military Modernisation and its Impact on the United States and the Asia-Pacific," [http://www.hudson.org/files/publications/07\\_03\\_29\\_30\\_fitzgerald\\_statement.pdf](http://www.hudson.org/files/publications/07_03_29_30_fitzgerald_statement.pdf)



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