

## MILITARY ACTIONS IN THE CIRCUMTERESTRIAL SPACE AND THEIR INFLUENCE AT STRATEGIC, OPERATIVE AND TACTICAL LEVEL

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**Abstract:** *The theatre of cosmic warfare around the Earth is one of the newest battlefields, where the need to implement new types of operations at a strategic, operative, and tactical level is extremely evident. Therefore, most developed countries are already taking actions not only in order to gain certain technical and tactical advantages on the new battlefield, but also in order to develop weapons systems, as well as reconnaissance, observation, alert and tracking systems specific to military actions, which are instrumental in gaining influence and acquiring supremacy in space.*

**Keywords:** *Cosmic warfare, space, weapons, satellite, missile*

### 1. INTRODUCTION

Whether we are talking about war as in and out of space, star wars or “future” wars, the physiognomy of these wars, the defining elements of “tomorrow’s” confrontations or the zone where “the front line” will be established, all these have become realities that cannot be ignored and for which the leading military parties of the world are already taking preventive measures with the purpose of acquiring knowledge, anticipating and preparing to impose domination and gain supremacy in the field of war.

We are at the dawn of a new era for the exploration of the extraterrestrial space. We have not reached other planets, but we have reached the moon and established a permanent orbital station- The International Space Station and filled the Earth’s orbit with satellites that make communications, surveillance, and navigation possible. We can now also study the evolution of our planet especially, the development of military operations in and out of space.

In the new millennium, the space zone is understood as a vertical extension of the airspace, a place where military operations can be deployed.

Achieving domination in this new area implies the use of power in space which benefits from a variety of high tech materials and technologies.

The concept of power in space or aerospace power focuses more on the vertical dimension of

the military operations based on a dimensional perspective (space-time-fight) which will allow armed forces to act wherever necessary without any geographical and physical limits as in the case of other military forces.

Thus, the outer space around the Earth has become a dimension of real interest and the exploration and research that are undertaken in this new dimension already shape a different projection for military operations. The expanded analysis and research of the space dimension are: hyper-altitude, immensity, hostility, geocentricity, emptiness along with the relationship between them, thus creating numerous and important aspects for military operations that are not isolated, but in a tight inter-dependency.

To have a chance to respond to these challenges in such a dimension, the new force, that is the space force, must adapt perfectly to the demands resulting from the action domain, have the capability to explore the space dimension, act permanently in engagement zone, continue or develop actions together with the air force, navy and the army.

The hegemonic aspirations of the great military powers will ensure a strategic importance to the space land circumstance, in the future the space operations being essential in determining the successful outcome of a confrontation, regardless of the place or the dimension of the battlefield.

## 2. THE ECONOMY AND MANAGEMENT OF THE SPACE LAND CIRCUMSTANCES

While the world financial system is still fighting against a profound economical and mortgage crisis, the international space industry has been evolving and developing based on an independent scenario. According to the Space Foundation organization, in 2007 the space land circumstance economy was approximately 251 billion dollars<sup>1</sup> worth.

Ever since, space economy has increased in size for the sixth consecutive year, growing at a faster rate than in the previous years, most likely due to improving conditions in some sectors of the broader global economy. The total for the global space economy in 2011 was \$289.77 billion in government budgets and commercial revenue, an increase of 12.2 percent from the 2010 total of \$258.21 billion and an increase of 41 percent from 2006<sup>2</sup>.

As in past years, the majority of this growth resulted from commercial success rather than increases in government spending.

The governments of Brazil, India and Russia all increased their space budgets by more than 20 percent. Some space agencies experienced more modest growth, as was the case for the European Space Agency (ESA), whose budget increased by 7 percent in spite of the ongoing fiscal problems in some of its member states. Space agencies in other nations, such as the United State of America and Japan, operated under flat or diminished budgets. Spending in the U.S. on government space projects was 47,25 billion in 2011, a decline of less than 1 percent from the amount spent in 2012.

Orbital launch activity increased by 14% in 2011, and is rising up to 84 launches from a total of 74 in 2010. Russia conducted the most of launches with a total of 31. China followed with a total of 19 launches, outpacing for the first time in history. While the U.S. a total of 18 successful launches was not the highest, it contained the greatest launch vehicle diversity, with eight different types of orbital rockets.

At the end of 2011, there were estimated 994 active satellites in orbit around the Earth.

The broadcasting industry is a huge driver of demand for communications satellites, largely due to global growth in the number of high-definition television channels, which require more bandwidth than their standard definition counterparts.

Development of observatories and robotic exploration systems continued in 2011, with plans for several observatories with capabilities that will exceed those of existing telescopes. In July 2011, Russia launched a radio telescope called Spektr-R, marking the return of the Russian space program to scientific missions after a hiatus of several years. As with many scientific missions, other countries will participate in the research, in this instance by providing ground-based observations that can be combined with those from Spektr-R to produce images with ever greater detail and clarity. The year 2012 was an active one from the space activity point of view. Thus, on 19 January it started with the launch from Cape Canaveral, Florida of a Delta 4 rocket with the purpose to transport the military satellite Wideband Global SATCOM 4 in Earth's orbit.

Wideband Global SATCOM (WGS-4) was built by the Boeing company and is, as its name suggests, the fourth tactical communication satellite from a constellation of satellites that offer communication capabilities that are ten times greater than its predecessor SATCOM 3.

On the other hand, on 28 July Russia launched into the orbit two satellites: Gonets-M a science and research satellite and the military satellite from the Kosmos series, built as its predecessor on the Yantar 4KM2 platform, a "spy" satellite equipped with a powerful optic camera; practically, it is a telescope with high resolution used by the Russian army with the purpose of gathering information from other countries and competitors. Also, it is an alert post in case of national defense against nuclear bombs launched from the other parts of the world. Europeans also wished to possess their own GPS system, a more advanced and especially more independent system compared to the American military one. Financed by the European Commission and implemented by the European Space Agency, the Galileo satellites can offer a better coverage and precision due to a tighter constellation and a higher orbit.

Thus, the ESA launched the first two from a series of four satellites on 21 October 2011 and 13 October 2012, the other two being destined to validate the functionality of the system on the orbit and providing the first operational services of the Galileo micro constellation that would include the alignment of 30 satellites at 23.222 km distance from the Earth's surface.

1 <http://incomemagazine.ro/articles/exista-o-economie-a-spatiului-circumterestru>, accessed at 23.02.2013

2 The Space Report 2012 – Executive Summary, <http://www.spacefoundation.org/programs/research-and-analysis/space-report>, accessed at 23.02.2013

China is another key player with regards to space activity, making an unexpected launch on 30 April 2012 of two navigation satellites on a rocket called "The long march-3B" from the satellite launch centre in Xichang, the Sichuan province. This is the first time when one rocket has carried two satellites destined to stay at medium and high orbit. These are the 12th, and the 13<sup>th</sup> satellites in the "Beidou" navigation network, a structure that has been functional since 2012. The satellite network provides a large amount of data from various domains, such as: telecommunications, transports, meteorology, etc.

Japan, India and France are countries with a vast and quite recent activity in the field of space, countries that in 2012 and at the beginning of 2013 launched into the orbit civilian and military satellites destined to naval surveillance and communication or, as in the case of Japan, launched spy satellites to supervise its neighbour, North Korea.

The last launch took place on 15 January 2013 when a Russian Rockot Breeze KM rocket placed into the orbit three military satellites for the Russian army. The separation of the three satellites, dubbed Cosmos 2482, Cosmos 2483 and Cosmos 2484, was confirmed by the Russian Space Agency Roskosmos. The satellites are destined for military communication and have the Strela 3M platform, the newest version of the Strela standard<sup>3</sup>.

Space activity, as perceived from the point of view of the number of satellites, be it military or civilian, and launched into the orbit over the last years, has revealed a permanent interest for space domination on the part of the great actors on the international military stage.

Thus, the U.S. has so far launched 429 satellites into the orbit, Russia over 100 satellites, China approximately 70, Japan 40 and India 26. Their destination varies and it can be adapted based on the course of actions in the space land circumstance.

Depending on the organization and destination, there are approximately 1000 satellites that orbit around the Earth and most of them can be grouped, as follows:

- Communication Satellites – 562;
- Satellites for studying Earth – 86;
- Early Warning Satellites – 8;
- Amateur radio satellites – 3;
- Astrophysics satellites – 15;
- Meteorological Satellites – 10;
- Satellite Navigation / GPS – 79;

- Research Satellite (espionage), surveillance and remote sensing – 89;
- Scientific research satellites – 96;
- Satellites for other purposes – 27<sup>4</sup>

The high rate of satellites, their characteristics, role and their organization into constellations prove the fact that there is a genuine interest in developing this new domain, in which major investments are made, especially state-of-the-art technology, which will undoubtedly trigger major changes not only in the field of space, but also in the air, naval, and army domains.

### **3. THE INFLUENCE OF SPACE ACTIVITY ON THE AIR, NAVAL AND ARMY FORCES AND ITS ROLE IN THE OPERATING MODE AT A STRATEGIC, OPERATIVE AND TACTICAL LEVEL**

The new global security threats will require appropriate evaluations and answers from the technology sphere and the space land circumstance, which would subsequently form the basis for an aerospace power capable to be used at a maximum efficiency at a strategic, operative and tactical level.

The implemented aerospace technologies in the new aerospace power perimeter are giving birth to a new generation of airships, smart weapons, C4I high tech systems, electronic surveillance systems, search and hit systems etc. that will ensure superior airspace control, complete visibility, both night and day, thus reducing the time to make a decision and allowing for action integration of high intensity and complexity regardless of the time factor or the type of force.

The new power can only act together with all the other military forces and can increase the decisive nature of the confrontation by concentrating on the effects and operating with minimal losses.

The new technologies are aimed at creating space surveillance sensors and advanced telescopes, space ship fighters with no pilot and systems that are specific to Electronic Warfare, communication and process for gathering information, and combat capabilities with a high precision (missiles and rockets launched from satellites and guided by them and other controlled weapons), etc.

3 [http://romanian.ruvr.ru/2013\\_01\\_15/Primalansare-in-spatiu-din-anul-2013-a-decurs-cu-succes/](http://romanian.ruvr.ru/2013_01_15/Primalansare-in-spatiu-din-anul-2013-a-decurs-cu-succes/), accessed at 23.02.2013

4 [http://ro.wikipedia.org/wiki/Satelit\\_artificial](http://ro.wikipedia.org/wiki/Satelit_artificial), accessed at 23.02.2013

For the American aerospace technology, which transfers the war to the extra atmosphere, the aerospace technologies of the future envisage rockets, satellites and radars but with special qualities (communications, laser, infrared), anti-missile capabilities and space interceptors to destroy the kinetic energy, aerospace lasers, etc. Space Centric Radar (SCR) will be included in networks of systems to be used launching attacks from space and will generate a wealth of information, as well as real time images of the aerospace activity from the ground or naval level<sup>5</sup>.

The development of anti-satellite technology offers more protection to the aerospace power, which consequently becomes capable to protect itself and dominates the battlefield through superiority, speed, position and control of information. Thus, the space systems will create that instant presence from the above anywhere on the planet.

The introduction of advanced technologies in the aerospace sphere will continue. Therefore, through the extension of space power, an important dimension of warfare will be achieved, the integration of space defense systems with the modern air defense systems ultimately being possible.

Space power together with air, ground and naval power will contribute to the total domination of the adversary in all military operations. Such a thing will be possible due to the military cooperation from the industrial, technical and technological standpoints, especially given the impossibility of producing in an isolated manner weapons and technologies necessary for a modern war.

Nevertheless, in the foreseeable future, impossible as it may sound, the aerospace power will make us dependent to new vulnerabilities deriving from the myriad of space equipment, satellites and orbital platforms.

The fundamental condition for the existence of a new space power is represented by the necessity to have space supremacy and the quick evolution of the other military categories that will need a precise remote coordination in order to be as effective as possible.

The configuration of future space power will be built based on the requirements of the modern military confrontations and will be defined as:  
-high performance command and control systems for space operations;  
-control and surveillance systems to offer supremacy on this new battlefield with important influence at operational and tactical level for air, naval and ground operation;

-the capability to hit and destroy objectives in space with maximum precision and minimal collateral damages, from distance, through missile and weapons systems of very high precision, regardless of the time factor;  
-specialized personnel adapted to space war conditions;  
-an adequate space platform equipped with modern telecommunications;  
-performant space fighting techniques with stealth capabilities and safe counter-measures systems, which will also ensure protection against jamming and impact from any environment.

All the aforementioned aspects will lead to a conclusion that will sooner or later be confirmed. A strategic confrontation in space will be difficult to avoid. According to Wu Tianfu's <sup>6</sup>, a representative of the second artillery division which controls the nuclear arsenal in China, "the development of forces in space is a clear sign that a military competition for space domination will emerge."

We can say that acquiring space combat equipment is already inevitable, and that „in the not so distant future space will definitely turn into a battlefield”, as Xu Nengwu, a representative of the University of Science and Technology for National Defense in China<sup>7</sup>, stated.

Thus, in the future he who controls the space will hold the power!

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<sup>6</sup> <http://www.mediafax.ro/externe/expertii-chinezi-considera-inevitabila-o-confruntare-in-spatiu-2679544>, accessed at 23.02.2013

<sup>7</sup> <http://www.gandul.info/news/incepe-lupta-pentru-dominatia-spatiala-2679711>, accessed at 23.02.2013

<sup>5</sup> Andrew KOCH, More troubles for space radar, Jane's defence weekly, vol. 41, 13 october 2004, p. 5.