

## CIRCUMTERRESTRIAL COSMOS, THE NEW “BATTLEFIELD”

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**Abstract:** *History and previous military conflicts have shown that the main objective of every military power involved in an armed conflict is to win the war. But when several forces are involved and the achievement of this objective is dependent on various factors, it is mandatory to analyse, think of and take a decision regarding the course of action. This is the moment when the paradigms of swiftly adjusting to the situation in the field and to any potential changes, of decreasing the level of uncertainty and of estimating as accurately as possible the enemy’s course of action, take shape. All these approaches, given a space dimension and applied to the aerospace military actions, represent real challenges for military strategists and tacticians. The new structure and the highly dynamic and unpredictable operating mode of the military space technologies, coupled with the factors and characteristics of the space environment, require some special procedures and operational components adaptable to the constant evolution of the aerospace forces. The present paper underscores the need for the space dimension to be included as a new zone for conducting military operations, this dimension being defined as a new „battlefield” which requires strategies according to which space power is an indispensable and an extremely important component of the future armed conflicts allowing for endless possibilities and courses of action specific to a wide range of conflicts.*

**Keywords:** *space, satellite, power, rockets, security, orbits, space programs, missions, crew*

### 1. INTRODUCTION

The military aerospace actions are the prerogative of the space power, and the space power is the branch which either uses military systems with specific functions in exploring, controlling and monitoring the space and which can use its military component in producing a certain effect on the enemy, or, in case of an armed conflict, which can provide support and information to other armed forces branches in order to achieve supremacy on the battlefield.

Using as a reference point the examples and patterns suggested by history, the evolution of the space power can be anticipated.

In a similar manner to the air, navy and ground forces, space power may apply some of the common procedures, and may adapt some strategies and doctrines.

However, the action-related techniques and most of the combat methods are applicable only to space and only to the space power elements that act in this environment.

Thus, the circumterrestrial cosmos becomes a territory for military actions, a possible conflict zone, a new battlefield for the military powers that are endowed with space techniques and forces.

The modern techniques and technologies used and the terrestrial and space systems that are being used in military space actions grant this power a superior operational value, extremely complex and effective, including in the context of non-conventional or asymmetric war-like confrontations.

By thoroughly analyzing the possibilities of action of space power and the way in which this power interacts with other armed forces branches, it becomes obvious that space power is directly related to the technical capabilities and technological innovations, to the economic power and people’s intelligence, all of them building an invincible military power with highly accurate and efficient reconnaissance, monitoring, communications, guidance, navigation and combat capabilities.

### 2. AEROSPACE FORCE AND MILITARY ACTIONS IN CIRCUMTERRESTRIAL COSMOS

A basic strategy rule, empirically drawn based on the evidence of two and a half millennia of armed confrontations, is the one that highlights a strategically important objective for one of the parties involved in a conflict, if only because it is important to that party, is worth being attacked by the party involved in conflict and annihilated as soon as possible.

Defending and protecting that particular objective and identifying the threats/attacks which may be initiated against it, are a priority for the force involved in the conflict, the 'defender', and the achievement of these defensive requirements can easily be realised from space, with the help of the surveillance means, technicians and space technologies.

So, geopolitically speaking, space acquires the status of a very important zone, a true battlefield, a vital area not only for undertaking military actions, but also for carrying out daily activities.

The control the area above the Earth's atmosphere, ranging from 100 kilometers above the sea level, in all directions, to the infinite of the Universe, attaches a highly strategically importance to a state, entity or alliance, in achieving their own interests and purposes. In fact, the decisive nature of confrontations, the synchronising and integrating of combat actions, the accurate and decisive strike of the enemy's vital points are becoming more and more dependent not only on the cosmic means and components, but also on the space techniques and technologies which are increasingly being used in conducting and controlling the military actions.

The sum of the space means, components, systems, techniques and technologies and the way they interact from a military standpoint are specific to m.o. of an armed forces branch, for which reason the terms *aerospace force* and *space power* must be created and used. These new concepts, aerospace force and space power, result in extending the military actions on a vertical axis, fact which allows the military elements and systems to act when and where it is necessary, without geographical and physical limitations, as in the case of the other armed forces. Moreover, the armies that are not equipped with such a technology and do not own any space means, cannot speak about a real space power in the context of an armed conflict, even if during peace time, the space power '*manifests itself in a concrete manner if only to discourage a potential aggressor*' [1]. To illustrate this, we could analyze by means of the space observation-exploration actions, an extremely important indispensable military action of a power which, although it does not represent a threat to those affected by such actions, is still a discouraging or disheartening factor for the potential opponent, who finds himself in a position in which most of his actions, and troops maneuvers are known, thus revealing his intentions, and he cannot take action or come up with solutions to counter these actions.

The term of *space power* is used for the first time in 1964, when strategists and theorists analyzing air power, and facing an increasing rate of missions and flights into the outer space, tackle this issue, but they do not define it as an armed forces branch.

Later, in 1968, Lt.col. David Lupton, an officer in the United States Air Force, publishes the paper '*On Space Warfare, a Space Power Doctrine*' [2], a paper in which he exposes a first version of the space power definition, based on the similarities with the definitions for ground, navy, and air power offered by Mahan, Billy Mitchell, Hap Arnold and other authors. Thus, they believe that for an accurate definition of space power, three characteristics must be taken into account:

- it must be an element of national power;
- its purposes must be military and non-military;
- the space systems it uses may be military and/or civil.

In conclusion, Lupton states that space power represents '*a nation's ability to exploit extraterrestrial space for accomplishing national purposes and it includes the sum of a nation's astronautical capabilities. Only a nation that owns such capabilities and it is able to exploit them can be called a space power.*' [3]

In 1994, after analyzing the space systems, colonel Robert Larned, an officer member of the command team within the department of operations of the Air Force Space Command (ASFC) of U.S.A., expands Lupton's definition, stating that space power represents '*the ability to exploit the national, civil and military, security space systems and the strategic infrastructure of national security.*' [4]

His argument draws upon the division of space techniques, technologies and actions into least three systems of distinctive properties, such as:

- a system deployed in space (like those placed on the terrestrial or geostationary orbits);
- a single or multiple terrestrial or offshore system (such as detection radars, command and control centers, missiles and launching pads, infrastructures of firing ranges and training centers, weapons and ammunition factories, research and test centers etc.)
- a system designed to establish communications links.

Given these elements, as well as the importance and the need to develop these new branches, in the 90's American military analysts attempt to define space power by separately analyzing the two terms (power and space), and later on, they combine the definitions obtained in order to create the commonly used concept of *space power*.

Consequently, they defined space as being '*the area above Earth's atmosphere, infinitely spread and in all directions, starting from approximately 62 miles (100 Km) from the Earth's surface*' [5], and power '*the ability of a state or of a non-statal actor to fulfill its purposes in the near presence of other actors situated on the planet.*' [6].

The final result is the definition of space power, the accepted and most commonly used version, the one that states that „*space power represents the ability of a state or of a non-statal actor to fulfill its purposes and objectives in the near presence of other actors situated on the planet, through the control and exploiting cosmic space*” [7]. The growing importance attached to the use of space power, and the capabilities involved, considerably improve the security assurance levels, a fact also shown by the authors of United States Space Operations Doctrine, who in the document 'AFDD 2-2, Space Operations', attribute „*the capability of using the aerospace force for the support of the national security strategy and for the accomplishment of national security objectives*” to space power [8]. The dimension and the facilities available in the circumterrestrial space have transformed this area into one in which a lot of civil, governmental and military users perform their daily activities, users who are reliant on satellite communication services, the Global Positioning System (GPS), TV or radio transmissions or information about climate changes and weather conditions that might affect certain areas. For both these users and the space power, the constituents the elements comprising the infrastructure necessary to produce, use and exploit this area are defining, these elements relying on the modernisation and adaptation of the domains and branches to which they belong and which might be grouped into the next categories:

- hardware elements or facilities and equipment used for manufacturing and launching multiple space means of command and control;
- technology-related elements: laboratories, institutes, medical and technological research centers, special means of transportation, energy sources;
- industry-related elements: especially private industry because of the high costs and innovation needs in many branches;
- education-related elements, in order to allow for, among others, the access of a high number of universities, in order to educate engineers and specialists able to develop advanced space research programs;
- specific geographical elements, requiring a vast territory propitious for executing launches and other experimental activities;
- elements related to intellectual climate, traditions, and activities fostering public awareness, moral and intellectual support for space activities in order to promote confidence in space bodies and organisations.

Following analysis of the space power concept, including the levels onto which it is structured, it became necessary to include in the analysis other elements as well, some of them intrinsic to this power.

So, the elements that belong to the space systems used only for military purposes, along with those of the commercial ones, that belong to the civilian systems and with those that belong to the infrastructure and to the scientific and research field delineate the space activities.

By analyzing space activity from a military point of view and by using as a reference point the laws and principles that affect the organisation, planning and performing of military actions, it can be concluded that space power has a defining role in undertaking modern military actions, and the way in which it is used depends on the strategy, on the commanders' abilities to act at a tactical level, on the intelligence and data made available by the space systems. Consequently, we could state that the use of space power relies on military art, the one which „*just like any other arts has its own theory and principles, otherwise it would not be an art*” [9].

The action-related elements of space power include both offensive and defensive components. Therefore, satellite and anti-satellite weapons (ASATs) are operated both as intercontinental ballistic missiles (ICBMs) and anti-ballistic missiles (ABM), with launching rockets (boosters) and intercepting missiles, with both manned and unmanned space ships, as well as with an infrastructure developed on the ground, composed of radars and space surveillance sensors, command and control centers, communication networks and facilities destined to launch military operations in or through space.

All these rely on technologies and infrastructures which have required substantial investments on the part of the great powers and states with a vested interest in the air space, investments whose beneficiaries are agencies and departments that manage space activity.

The importance that the great powers attribute to space power has become even more evident in the last period, when U.S. and former- U.S.S.R. investments made between 1980-1990 have reached almost 80 billion dollars on each side, with the purpose of building military space means [10], and facilities for launching, conducting and coordinating these from the ground. Moreover, between 2013-2014, other important investments have been made, such as those made by the European Space Agency whose budget has reached 4.1 billion euros (Germany 22.9%, France 22.6%, Italy 10.5% and Great Britain with 8.1%) [11] or of the U.S.A., who is planning to invest 17.6 billion dollars in NASA.

Struggling to maintain Russia as an elite space power, in September 2014 the Russian president Vladimir Putin declares that "Russia will become a space superpower" [12] and, to be more convincing, he reveals the sums allotted to the construction of the new Vostochny space cosmodrome, near the Chinese border.

Thus, Russia has planned to spend approximately 100 billion rubles (almost 17 billion dollars) for the cosmodrome that will replace the one at Baikonur, in use since the U.S.S.R fell apart. By the end of 2015, this figure will be supplemented with another 50 billion rubles (8.5 billion dollars) [13].

The main reasons that justify these huge investments are:

-fame, pride and prestige, in connection with the race to conquer the space, arguments that highlight a nation's high level of development;

-the contribution to the development of technologies in the field of communications, and of the means of surveillance of ground targets and strategic points;

-the development of the space scientific and technological research;

-the designing and building of a military force in the field of security and defense;

-the overcoming of boundaries and finding of a solution to colonise other celestial bodies.

It can, therefore, be said that considerable efforts are being made in order to obtain and maintain the status of space power, a power compelled to protect its investments, a power that is increasingly plausible, discouraging and highly effective in new armed confrontations.

### 3. CONCLUSIONS

Nowadays space power is becoming the component that assures space supremacy, the kind of force that fully controls the circumterrestrial space and imposes domination on the new battlefield so that it prevents the enemy from undertaking action in this area, from placing on the orbits any system or device, so that the freedom of action belongs to the one who has space supremacy.

In conclusion, the space dimension of the military confrontations is similar to those on the ground, in the air or at sea. It defines the ability of the parties involved in a conflict to impose their will in the circumterrestrial space in the form of airspace operations and combat actions on all levels: strategic, operative and tactical. The growing importance, size and dynamics of the military actions in this field highlight the role and the position of the aerospace force in modern warfare.

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