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Operational Art/Operational Maneuver Groups in Space

Conceptualizing a Potential Russian Approach

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Abstract

This article considers Russia's potential use of operational art in space for three reasons. First, Russian Defense Minister Shoygu has called aerospace the new center of gravity for future conflicts. Second, Russia's military is testing how to maneuver satellites to conduct space operations, since destroying the enemy's group of satellites and depriving him of communications, navigation, and reconnaissance capabilities determines victory today in the military's opinion. Finally, Russian analysts expect the emergence of new forms of military operations in near space to defeat orbital alignments of forces, suppress radio communication systems in space, and block orbital alignments of forces and means in specific areas of space.

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Executive Summary

While it is not known for certain whether Russia utilizes operational art in space, there is growing circumstantial evidence supporting that contention. First, Russia considers space as a theater of military operations (TVD), within the boundaries of which operations of a strategic force can be organized and conducted. This TVD hosts Russian satellites of various types that gather and pass information, conduct reconnaissance and communication functions, and maneuver alone or in groups, among other functions. Second, in a 2009 article in Russia's *Air-Space Defense*, one author was identified as a teacher of the "spacecraft launch and command and control forces operational art and tactics department of the Military-Space Academy." Third, Russian Defense Minister Sergey Shoygu has called aerospace operations, of which space is an important element in Russian theory, the center of gravity of future conflicts. Fourth, in a 2018 article in the journal *Military Thought* on modern methods of aerospace and air defense practices, the author stated such forces must (not may, must!) use the theory and practice of operational art and its methods and techniques. Finally, satellites and other equipment are capable of employing the principles of operational art, which include the conduct of deep operations, envelopment, and maneuver; and attacking weak flanks in an integrated and planned fashion, in space. These principles could be carried out in the following way:

- Deep operations could involve Russian strikes against satellites in space or against underwater cables or the use of special operations to destroy critical infrastructure targets (SODCIT) criteria. Satellites perform maneuver operations often to inspect other satellites or to perform other missions.
- Space is underdeveloped at the moment, which indicates it could remain for some time as a place for maneuver.
- Moving satellites to more favorable positions enable either strikes against adversary equipment or the achievement of a strategic position in a specific orbit, such as to conduct inspections of other satellites.
- The use of satellites as an operational maneuver group would be an unconventional form of using such assets and would consist of both ground and space-based weapons that can influence the TVD.
- Russian analysts write that practically every US weapon is hooked to satellite communications, GPS navigation, and the mobile Internet. Russian EW operators claim to be able to shut these space channels down with ease.
- Space may now be considered a flank for planetary operations.
- Space assets that maneuver in the form of groups can operate in deep space to envelop an opponent.

The majority of these operations are present in the planning of Russian aerospace operations today.

The actual equipment employed in space or on the ground (and aimed at space objects) at the moment includes the following items that are capable of conducting maneuver and deep/planetary operations in near or deep space:

- Inspector satellites, such as the Kosmos 2521
- Killer satellites
- Tirada-2s, to thwart communications
- Rudolf, anti-satellite strike system
- Nudol, anti-satellite and missile system
- Peresvet combat laser
- Ground stations that can jam objects in space
- MiG-31 armed with anti-satellite missiles
- Space junk that comes alive
- Reconnaissance-strike complexes or information-strike systems

Also, ground based hackers should be included, since they have attempted to take control of satellites, such as theoretically occurred in 1998.

Russian authors contend that satellites can guide weaponry to distant shores or be the focal point from which an operation unfolds. In a global conflict the destruction of the enemy's group of satellites is vital to success, since it deprives him of communications, navigation, and the capability to conduct reconnaissance. The following citation indicates what distant targets might include:

It is possible to use various space systems in support of each of these operations. Thus, supporting a **strategic operation to destroy critically important enemy targets** necessitates the use of space-based means of reconnoitering these targets; electronic intelligence assets; meteorological reconnaissance assets in the interests of a proper selection of attack weapons and their combat employment methods; and space-based navigation, communications, relay, and strike evaluation systems.¹

Therefore, the emergence of new forms of military operations in near space can be expected that would aim to block and defeat orbital alignments of forces while suppressing radio communication systems in specific areas of space. Satellites, due to their ability to maneuver and move singularly or in swarms, could be capable of acting as an operational maneuver groups (OMG) in space. A contemporary space OMG potentially would consist of reconnaissance-strike units, satellites of various types, counter communication units, and other assets combined into a single organism. These assets are available but it is unclear if the Operational Art Department at the General Staff Academy has plans for using space assets in a space TVD.

¹ Vasily Y. Dolgov, and Yuriy D. Podgornykh, "Space As a Theater of Military Operations: On Possible Forms and Methods of Combat Employment of Space Command Forces and Assets," *Vozdushno-Kosmicheskaya Oborona Online*, 10 April 2013.

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1 Introduction

Today, circling high above Earth, are over 2,000 satellites. Some are of commercial origin and some military. In the latter's case, they are responsible for watching military equipment and troop movements in other nations, coordinating command and control activities, and helping weapons and forces navigate their way across the globe, among other issues. Their importance to the way nations plan to deter or conduct modern warfare is hard to overestimate.

Russia's military is and has been deeply embedded in the study and use of such space activities, from the launch of Sputnik in 1957 to today's US reliance on Russian rockets to send astronauts to the International Space Station. In addition, Russian military thinkers are probing deeper into finding ways to use space for military advantage. This domain continues to escalate in importance. In 2015, Russian Defense Minister Sergey Shoygu conceded that aerospace is now the center of gravity (COG) of future wars,² a reference made even earlier in 2011 by Makhmut Gareyev, a long-time prominent military theorist who is a General of the Army and President of the Academy of Military Science.³ In 2018 Shoygu added that "precision-guided munitions and reconnaissance and electronic warfare systems are exerting ever greater influence on the development of operational art."⁴ Another 2018 article on modern methods of aerospace and air defense practices noted that these forces must (not may, must!) use the theory and practice of operational art and its methods and techniques.⁵

The thoughts of such Russian experts and leaders make it appear imperative for the West to study and conceptualize how operational art might be applied to the aerospace domain where many of these new capabilities or their control mechanisms are found. Questions abound as a result. Would the use of such a domain be considered separately or, more likely, in conjunction with other operations such as ground-based maneuver brigades? What would joint domain operations look like and how would they be implemented? What would be the configuration of an operational maneuver group (OMG) in space?

Russian authors have noted in the past that operational art, which includes the preparation and planning of missions for large-strategic formations, should not stand still or degrade⁶ and many authors support this contention. In 2012, for example, Gareyev noted that OMGs, a popular Soviet operational term of the 1980s, were liquidated with the fall of the Soviet Union but that OMGs will "obviously be used in some form or another" in the future.⁷ Such observations most likely have created a mandate for the Operations Department of the General Staff or professors at the General Staff Academy's Department of Operational Art to continue to work on this theory. Now, as opposed to past developments, theorists must take into consideration the impact of a

² *Interfax* (in English), 3 August 2015.

³ M. A. Gareyev, "On the Organization of the Russian Federation's Aerospace Defense," *Journal of the Academy of Military Science*, No. 2 2011, p. 40.

⁴ No author provided, "Russian Federation Defense Minister Sergey Shoygu Opened Russian Federation Armed Forces Operational-Mobilization Leadership Conference," *Ministry of Defense of the Russian Federation*, 12 February 2019.

⁵ A. P. Korabelnikov, "Modern Methods of Aerospace and Air Defense of Facilities and Prospective Development Trends," *Military Thought* (in English), Volume 1 2019.

⁶ V. K. Kopytko, "The Evolution of Military Art," *Military Thought* (in English), Volume 1 2008.

⁷ M. A. Gareyev, "The Living Embodiment of the Brain of the Army," *Arsenal Otechestva*, No. 2 2012, published 17 June 2013 at <http://arsenal-otechestva.ru/article/111-mozg-armii>.

series of technological advancements that not only affect the theory's content but also its reach, which can extend to the heavens (satellites) or under the oceans (cables, submarines, etc.).

Maneuver, deep operations, and breakthroughs are traits that have long characterized operational art's ground operations. They work in space as well. Satellites maneuver and conduct operations such as extended reconnaissance, inspection, navigation, and other activities. Since operational art planners are not standing still, they may well be working on coordinated and integrated methods to align capabilities with operations in this or in other domains. An operational group, it must be remembered, is a temporary large strategic formation that consists of front forces operating on a separate operational direction or sector of the front,⁸ which in this proposed case would be a space axis. Thus, while the focus is often on Russian maneuver brigades creating an optimal fighting force on the ground, Russian planners may simultaneously be creating an optimal fighting force in space.

Before developing operational art theory, Russian planners look to the future through the prism of trends and forecasting. Operational art theory is then adjusted based on the results of the inquiry to ensure it remains ahead of the present strong technological curve that is driving advances in capabilities. Russia's host of new technological achievements in weaponry that President Vladimir Putin touted in March 2018 offer proposed guarantees of strategic stability and parity with other nations for the Kremlin. These new achievements also affect the preparation and planning of operational art for specific new domains, such as space.

This article will attempt to refocus attention on how operational art might be applied to the space domain in Russia's planning process. Thinking in such terms opens up other vectors for planners to consider beyond just ground operations. These variants can add input to contested environment operations as well, such as when examining Russia's potential operations in the Baltic and Central Europeans areas or even beyond to global operations.

A brief discussion of Russia's concept of an operation in general and operational art in particular is offered, along with the added concepts of an operational plan and a concept of operations, the components of operational art. That initial discussion of definitions is followed with some limited comments on operational art by the noted Soviet theoreticians Aleksandr A. Svechin and Georgiy Isserson. The views of other prominent Soviet military theorists' views on operational art can be found elsewhere.⁹ Svechin and Isserson's discussion is followed by more recent discussions on operational art since 1999, which have been few in number. These Russian sources are followed by the work of two US experts, David Glantz and Jacob Kipp, both of whom have written many articles, and even books, on the concept. Their analysis is important, even though truncated here, for it looks at Russian military literature on the topic of operational art from 1914 to more recent times. The article then concludes with a look at Russian satellite and space operations, to include how that nation has tested maneuvering satellites and preparations and plans for operations in space.

⁸ S. F. Akromeev, main editor, *Military Encyclopedic Dictionary*, Second Edition, Moscow: Military Publishing House, 1986, p. 513.

⁹ See, for example, Wilson C. Blythe's interesting discussion of other prominent Russian officers' views on operational art in World War II and earlier time periods (includes the views of Mikhail Tukhachevsky, N. E. Varfolomeev, Vladimir Triandafillov, etc.) in his work "A History of Operational Art," *Military Review*, November-December 2018, pp. 37-49. The discussion covers US and other nations views on operational art in addition to Russian views.

1.1 Definitions of Operational Terms

There are a few examples of what might be termed “official” definitions of Russian terms, and they can be found in Russia’s *Military Encyclopedic Dictionary* and its *Military Encyclopedia*. There are only a few differences in the two sources used here, the 1986 *Military Encyclopedic Dictionary* and the eight volumes written between 1995-2003 that compose the most recent *Military Encyclopedia*. In the latter case only small snapshots of the definition are offered. The point of the comparison of the two sets of definitions is simply to demonstrate consistency, and therefore should be skimmed.

Operational art is defined in the Soviet Union’s 1986 *Military Encyclopedic Dictionary* as “Encompassing the theory and practice of preparing for and conducting combined-arms, joint, and independent operations (combat actions) by large strategic formations of the armed forces by various branches.”¹⁰ Its tasks include the following:

- An investigation of the mechanisms, content, and nature of modern operations and other forms of the operational employment of large strategic formations;
- An elaboration of the means of preparing for and conducting operations, the means and methods of organizing and maintaining coordination, the comprehensive support of troops taking part in operations, and the command and control of them;
- An elaboration of the operational requirements for organizing and arming large strategic formations;
- The development of recommendations for the operational equipping of theaters of military operations;
- The study of the views of potential adversaries for the conduct of military actions on an operational-scale.¹¹

The term operational art was first used in 1922. The division of military art into strategy, operational art, and tactics did not take place until 1926. During World War II, operational art evolved further in the preparation for and conduct of operations.¹² In the post-war period, new areas developed in connection with the following:

- Equipping the Armed Forces with new weaponry and military equipment;
- Increasing the combat capabilities of troops;
- The increased scale and intensity of warfare and the mutual penetration and interlacing of the various types of operations;
- And the need to conduct principal operations with the joint efforts of the various branches of the Armed Forces.¹³

¹⁰ S. F. Akromeev, main editor, *Military Encyclopedic Dictionary*, Second Edition, Moscow: Military Publishing House, 1986, p. 513.

¹¹ Ibid.

¹² Ibid.

¹³ Ibid., p. 514.

Operational art was defined in 2002 in Russia's *Military Encyclopedia* as "Encompassing the theory and practice of preparing for and conducting military operations on an operational scale (operations, battles, combat operations, strikes) by large formations of various branches of the armed forces. Operational art occupies an intermediate position between strategy and tactics..."¹⁴

An **operation** was defined in the 1986 *Military Encyclopedic Dictionary* as

An aggregate of battles, engagements, strikes, and maneuvers, coordinated and interlinked in objective, task, place, and time by various force organizations, conducted simultaneously and sequentially according to a common concept and plan, to accomplish missions in a theater (theaters) of military actions, a strategic or operational direction (in a specific area or zone) within a specified period of time; a form of military action.¹⁵

Designations include strategic, front, and army, which can be further differentiated as offensive and defensive or initial and subsequent according to time and sequence of execution. Principal indicators include the number of troops taking part, the width of a zone of action, and the depth or rate of advance. Influence on the content of operations is exerted by war aims and the nature of operational missions performed, military-economic capabilities of the state, and the combat capabilities of both sides.¹⁶

An **operation** was defined in the 2002 *Military Encyclopedia* as

An aggregate of battles, engagements, strikes, and maneuvers, coordinated and interlinked in objective, task, place, and time by various force organizations, conducted simultaneously and sequentially according to a common concept and plan to accomplish strategic, operational-strategic, operational, or operational-tactical missions in a theater of military operations, a strategic or operational direction, or in a specific vast area (zone) within a specified period of time; a form of military operation.¹⁷

An **operational plan** was defined in the 1986 *Military Encyclopedic Dictionary* as

the manner, procedure, order and methods of accomplishing military missions as determined by a commander. It includes the concept of operation (s) (commander's concept), missions of the troops, fundamentals of coordination, support, and the organization of command and control. The operation plan (battle) is the basis of the command and control of troops. It is made as a result of sizing up military missions and an estimate of the situation. Data for decision-making is prepared by the staff, chiefs of combat arms, special troops, and services. Operational planning is usually done with a map and refined on the terrain at the first opportunity. In ground force subunits all work connected with decision-making is as a rule performed on the

¹⁴ S. B. Ivanov, Main Editor, *Military Encyclopedia*, Moscow: Military Publishing House, Vol. 6 2002, p. 63. The entire discussion of operational art was on pages 63-67.

¹⁵ Akromeev, pp. 514-515.

¹⁶ Ibid., p. 515.

¹⁷ S. B. Ivanov, Main Editor, *Military Encyclopedia*, Moscow: Military Publishing House, Vol. 6 2002, p. 77.

terrain. The operation plan (battle) is detailed in the operational planning process; it is formally articulated on a map, with an explanatory note appended.¹⁸

In 2003 the *Military Encyclopedia* defined an operational plan as

the manner, procedure, order, and methods of accomplishing military missions as determined by a commander. It includes the concept of operation (s) (commander's concept), missions of the troops, basic questions for coordination, and the basic organization of command and control.¹⁹

A **concept of operations** was defined in the 1986 *Military Encyclopedic Dictionary* as

basic decisions about forthcoming combat operations. It determines: the direction or axis of the main attack and other thrusts (areas of concentration of main efforts); the sequence and methods of defeating an adversary; the order for delivering fire for effect and, in a nuclear war, nuclear weapons of destruction; group and operational orders of battle (battle disposition).²⁰

The 1995 *Military Encyclopedia* defined a **concept of operations** more explicitly as follows:

The basis for a decision to conduct an operation (battle); the main idea for the method by which a force grouping conducts an assigned strategic, operational, or tactical combat mission in a military theater, along a strategic (or operational) axis, or in an area of terrain. In the zone of operation (battle) the following are defined: the areas where the main efforts are concentrated (the axes of the primary and other strikes); the methods for defeating the enemy (which force groupings, where, in what sequence, and how the defeat will be accomplished; the kind of fire or nuclear strike, and measures to deceive the enemy); the force grouping and their operational composition (order of battle).²¹

1.2 Operational Art: Summaries of a Few Important Discussions

If Russia ever did decide to intervene in Europe, whether it be in the Baltics or by attacking Central European countries, or if it decided to conduct operations on a global scale in conjunction with an ally, it is reasonable to assume that the planning of operations and operational art would be a focal point. Operational art is of special interest for its use of front and army operations on a large-scale. The latter has been evident in Russia's yearly exercises in specific military districts (south in 2016, west in 2017, east in 2018, central upcoming in September 2019) or their special operational pairing with China's military. And not to be forgotten is whether, on a mass scale that includes space, Russia would consider the use of operational art on a planetary scale.

The analysis that follows will initially look at two short summaries from the works of General Aleksander Svechin and General Georgiy Isserson, two of the most prominent Soviet authors on operational art in the pre-World War II period. Their short summaries are followed by several

¹⁸ Ibid., p. 634.

¹⁹ S. B. Ivanov, Main Editor, *Military Encyclopedia*, Moscow: Military Publishing House, Vol. 7 2003, p. 229.

²⁰ Akromeev, p. 264.

²¹ P. S. Grachev, main editor, *Military Encyclopedia*, Moscow: Military Publishing House, Vol. 3 1995, p. 238.

works on operational art in Russia over the past 18 years. Surprisingly, very little has been written on the issue recently. Still, the articles that did appear offer several elements of operational art to consider when theorizing what a larger Russian campaign may look like.

General Aleksander Svechin

In the 1927 work *Strategy* by Aleksandr A. Svechin, the noted Russian theorist, there was a section on operational art. Svechin noted that tactical creativity is governed by operational art, and that operational art sets forth a series of tactical missions and logistical requirements based on the goal of an operation. Operational art depends on the manner in which an operation is conducted, material available, time allotted for tactical missions, forces deployed for battle on a certain front, and the nature of the operation itself. Operational art must take into account the possibilities presented by the immediate rear (front logistics). Only on occasion is an ultimate goal achieved in a single battle with combat operations. Rather, it requires a series of operations separated by pauses in different areas of a theater, due to the immediate goals of forces in these areas. An operation consists of drawing up a plan; logistical preparations; the concentration of forces at the starting position; the building of defensive fortifications; marching; fighting battles that encircle or destroy a portion of an adversary's force and force the withdrawal of other forces due to an envelopment, breakthrough, or holding of a line in a geographical area. An operation can become an act of war "if the efforts of troops are directed toward the achievement of a certain intermediate goal in a certain theater of military operations without any interruptions."²² Svechin's comments provided much of the initial impetus behind the concept of operational art and strongly influenced the years of work on the concept that followed.

General Georgiy Isserson

Isserson is well known for his seminal work entitled *The Evolution of Operational Art*. In his preface to the second edition of the work, in May 1936, he wrote the following:

The very essence of operational art presupposes freedom of methods and forms which should be carefully chosen each time to fit a concrete situation. All the propositions we advance in the field of modern operational art should be treated as orienting ideas, which find this or that concrete expression only in a given genuine situation.

Therefore, the present work would be of negative value if the ideas it advocates were treated as ready-made schemes. There can be no such schemes in operational art. We aim to show essential distinctions between the conditions of our era with its new forms of the deep operation and the operational art of the past. This is the only significance ascribed to the propositions advanced in the present work.²³

²² A. A. Svechin, *Strategy*, Military Bulletin 1927, as translated and published by East View Publications, Minneapolis Minnesota, 1992, Kent Lee editor, pp. 68-69. The work is preceded with introductory essays on Svechin written by Russian Major-General (retired, now deceased) V. V. Larionov; former Russian Security Council Chief and Deputy Minister of Defense A. A. Kokoshin; former Soviet Chief of the General Staff V. N. Lobov, and noted US historian of Russia's military, Jacob W. Kipp.

²³ For a translation of this work, see <https://www.armyupress.army.mil/Portals/7/combats-studies-institute/csi-books/OperationalArt.pdf>.

Isserson's comments accord with the well-established Russian view that there should be no stereotyping in the development of military affairs, a view reiterated by a host of contemporary military theorists.

Major-General E. G. Korotchenko, retired

In 1999, writing in *Voennaya Mysl (Military Thought)*, Korotchenko described where operational art was heading. He noted that the revolution in military art has launched “a radical revision of ideas of the place and role, forms and methods of armed, information, and psychological confrontation.”²⁴ An important trend is that warfare is switching to a functional-structural and selective impact type of operation. This represents a departure from a principle of using force on force to one using the principle of asymmetrical threats. Assets designed to disorganize command and control of an enemy task force are now important, where a key trend is the evolution of operational forms and means of warfare and the emergence of new ones.²⁵ The “growing potentials of air and space warfare are increasingly influencing the theory and practice of operational art.”²⁶ The prevention of an enemy's domination in space is now important and commanders must “employ the potentials of our space-based systems to the utmost when preparing operations and waging hostilities.”²⁷ This is because the course and outcome of operations are dominated by space and missile forces.

Maneuver, a typical trend of operational art, has a more important role to play under the current advanced technological situation. Commanders will have to adopt ways to ensure freedom of maneuver. This requires the constant interaction among all services during an operation and an increased reliance on timely logistics. Warfare may be constantly waged along the entire depth of a large strategic formation's operational deployment. Finally, there is a trend toward greater complexity in operational planning due to the shorter time for preparations. An adversary can prepare the ground for an operation with information and other techniques long before a military conflict begins. Thus, it is important to study how all of these factors affect operational art and to identify the direction in which it is heading.²⁸

Colonel-General V. Zherebtsov of the Operational Art Department

On 11 April 2001 the Department of Operational Art at the Military Academy of the Russian Federation Armed Forces General Staff celebrated its 65th anniversary. In recognition of that event, the chief of the department, Colonel-General Vyacheslav Zherebtsov, penned an article on operational art for the paper *Krasnaya Zvezda (Red Star)*. He wrote that discussing operational art was now an obligation, since the large battles of World War II had been replaced with different armed conflicts (internal, border, etc.) due to separatism and the escalation of such conflicts, such as in Chechnya, “on the soil of interethnic, territorial, religious, and other differences.”²⁹ This has required securing victory through skill and ability instead of just by

²⁴ E. G. Korotchenko, “Operational Art Today: Where It Goes,” *Voennaya Mysl (Military Thought)*, No. 1, 1999 (in English), p. 13.

²⁵ *Ibid.*, p. 14.

²⁶ *Ibid.*, p. 15.

²⁷ *Ibid.*

²⁸ *Ibid.*, pp. 15-18.

²⁹ Vyacheslav Zherebtsov, “Military School: Ensuring That the Thinking Is Ahead of the Times,” *Krasnaya Zvezda (Red Star)*, 7 April 2001, p. 2.

numbers, and required a reassessment of how to implement operational art. Peacekeeping, for example, has become a new direction for operational art. A pressing issue has become the “adaptation of the theory and practice of operational art to the radical changes in the military-political situation at the turn of the century, and the need to learn lessons and draw conclusions from the experience of local wars and armed conflicts of recent decades...”³⁰

The direction of military art in the next 10-15 years, Zherebtsov predicted, would take the following directions:

- Armed struggle will transform into an information-focused armed confrontation;
- There will be a new perception of operational art’s content, to include its principles, forms, and methods of conducting operations under conditions of an information-focused confrontation and the massive use of precision weapons;
- New ways and means of resolving tasks will be unveiled to confront modern interstate and intrastate opposition;
- Reliable nuclear deterrence must be ensured and there must be an increase in the combat capability and combat readiness of force groupings;
- Problems associated with repulsing strikes by superior enemy forces must be resolved;
- The quality of command and control must be enhanced along with support for combat operations and for the mental and psychological preparation of personnel.³¹

All of his predictions have proven to be correct.

Lieutenant-General A. N. Stolyarov of the Operational Art Department

In 2006 Lieutenant-General A. N. Stolyarov was appointed as the head of the Operational Art Department at the General Staff Military Academy. In 2007 he wrote an article for the journal *Voennaya Mysl (Military Thought)* on the history of the department since its founding in the 1930s. Near the beginning of World War II there were a few significant studies produced on operational art. They were:

- G. S. Isserson’s three works, *The Evolution of Operational Art*, *Fundamental Principles of an In-Depth Operation*; and *The Initial War Period*;
- E. A. Shilovsky’s three works, *The Operation*, *Breakthrough and Exploitation*, and *Fundamental Principles of an Offensive Army Operation*; and
- A. V. Kirpichnikov’s *Operations by Modern Mobile Armies*³²

The Operational Art Department contributed to military theory’s development during WWII. Professors closely followed wartime experience, identifying new trends and patterns in military art’s evolution, and developing recommendations for the conduct of operations, battles, and engagements. In 1948, experiences from the war were included in an in-depth study of new

³⁰ Ibid.

³¹ Ibid.

³² A. An. Stolyarov, “The Evolution and Development of the Theory and Practice of Operational Art at the General Staff Military Academy,” *Military Thought* (in English), Volume 3 2007. It is likely that this was an East View publication.

socio-political factors, modern warfare, changes in combat configurations of large strategic formations, and how the organizational structure of military units would affect operational art. These results were used to examine major aspects of the organization and conduct of operations for the initial period of war.³³

At the end of the first post-war period, 1945-1953, *A Comprehensive Course in the Operational Art* was produced. From 1954-1961 the department studied problems of operational art with respect to nuclear warfare. It also produced a theoretical work titled *A Course in the Operational Art* in four volumes, published between 1957-1959. From 1962-1971, work was performed on developing forms and methods of training and indoctrination for military personnel. Further, new texts were produced on front and army operations dealing with matters concerning the preparation and conduct of operations with the use of nuclear and other types of new weapons, to include future ones.³⁴

During the period 1972-1990, attention was given to breakthroughs in the development of conventional weaponry and to new forms and methods of operations using them. In particular this pertained to precision weaponry and its impact on future operations. From 1988-1996 the Operational Art Department developed 16 concepts (not specified further) that were “enshrined in legally enforceable documents of the General Staff.”³⁵ However, it was noted that changes in that period did include those associated with meeting engagements and counter assault and counter insurgency operations, as well as operational concealment, deception, and camouflage. In 1993, it was noted that research regarding local wars and armed conflicts and peacekeeping operations was expanded along with the interaction of branches and arms of service and a priority focus provided to the preparation and conduct of front and army operations in a large-scale war with reduced-strength formations.³⁶

At the start of the 21st century, a new evolution of operational art took place, Stolyarov added. This was due to “the growing evidence of the threat not only of armed conflicts and large-scale terrorist attacks, but also local and regional wars affecting the Russian Federation.”³⁷ A significant landmark in 2002 was the publication of the work *Operational Art: The Present and the Future*. Developed by a team of writers, to include Lieutenant-General A. N. Zakharov and Major-General E. G. Korotchenko, the work identified trends and problems with improving the concept. A few years later, new textbooks were produced on the fundamentals of operational art. Defensive and offensive operations were praised, as was a chapter on the basic principles of operational art. Combined-arms operations, forms of military action, effective engagements of enemy forces, and a substantiation of combat strength levels of force in strategic sectors were also addressed.³⁸

Stolyarov noted that operational art faces new tasks, such as containing an aggressor at an early stage of a crisis situation, and conducting large-scale operations simultaneously in several regions amid a wide use of new weaponry. This may also include the employment of

³³ Ibid.

³⁴ Ibid.

³⁵ Ibid.

³⁶ Ibid.

³⁷ Ibid.

³⁸ Ibid.

unconventional forms and methods of combat action, he noted. There exists a pressing need for conducting air and defensive operations by operational-strategic groupings in strategic sectors, and information warfare operations must also be countered. The countering of weaponry includes precision guided weapons, automated command and control, and reconnaissance systems. The operational art department is “concentrating its efforts on developing new, unconventional forms and methods of employing large strategic formations and groupings of forces in both large-scale and local wars, as well as in armed conflicts.”³⁹ The department is analyzing and forecasting the consequences of expected trends in military developments as a whole and operational art in particular. The author ended this article in 2007 noting that “in the very near future, substantial changes will occur in the theory and practice of operational art.”⁴⁰

Major-General V. K. Kopytko of the Operational Art Department

Major-General V. K. Kopytko became a professor at the Operational Art Department of the General Staff in 2000. He wrote in 2008 on the “Evolution of Operational Art” for the journal *Military Thought* and defined operational art as a “system of theoretical knowledge and practical recommendations on how to prepare and conduct different forms of military operations at the operational-strategic, operational, and operational-tactical levels.”⁴¹ His article was broken down into specific sections addressing the issue of military art; a history of the development of operational art (from WW I to 2008); a definition of operational art; a breakdown of the theory and practice of operational art and the tasks that accompanied them; the structure of operational art at the current stage; and the impact of objective and subjective causes and conditions that assist in the modern development of operational art. This section will only address the last two elements of Kopytko’s article, since many of the historical aspects were covered in Stolyarov’s presentation.

Kopytko wrote that operational art is composed of the following: combined arms operational art (combined arms of large strategic formations), operational art of the services and the centrally controlled arms (Strategic Missile Troops, Airborne Troops, and Space Troops), and operational art of the operational rear services. The structure is not constant but develops in line with the evolution of both weaponry and new combat arms and forces. The impact of subjective factors on operational art is considerable but only if analysts fully and comprehensively estimate the objective factors before them.⁴²

The influence of objective factors on operational art include a host of issues, such as:

- The military-political situation in the world;
- Qualitative and quantitative improvements in weaponry and equipment;
- The state’s internal economic, political, demographic, and social condition;
- The state of the Armed Forces;

³⁹ Ibid.

⁴⁰ Ibid.

⁴¹ V. K. Kopytko, “The Evolution of Military Art,” *Military Thought* (in English), Volume 1 2008.

⁴² Ibid.

- The composition and state of the Armed Forces of potential adversaries (and shifts in their methods of preparation and conduct of operations);
- The evolution of strategy and forms and methods of its employment;
- And the historical experiences (lessons learned) of wars and armed conflicts.⁴³

The newest objective factor in 2008, naturally, was the all-round informatization of military affairs.⁴⁴ Information confrontation in general, Kopytko noted, is emerging as a major component of all types of future warfare. Information-related advances in capabilities and other changes offer the possibility to automate the collection and processing of data on an opponent; the ability to react practically in real-time to changes in the situation; and the ability to assign missions to troops quickly and to supervise the efficiency of fire strikes.⁴⁵

Subjective factors influencing the development of operational art were the activities of top political and military personnel that influence the development of the military organization and doctrine of the state; the level of ideas associated with the development of operational art and its implementation; training of troops; and the state of military science and the educational component of its leaders.⁴⁶

Other Sources

Other than these longer discussions of operational art, there has hardly been any mention of the topic of operational art except for only a few scant references. A 2006 *Military Thought* article noted that the content of an operational method would include troop distribution, regions where the mission is to be accomplished (plus various modes of doing so and in what time); task force development and their operational formations; and troop maneuver means and material.⁴⁷ A 2015 *Novaya Gazeta* article stated that Russian operational art has traditionally been built “on the rapid pace of offensive operations supported by the constant buildup of troops’ efforts by means of rear echelons and the reserve, and the expenditure of ammunition in accordance with established destruction norms and densities.”⁴⁸ A 2018 article on modern methods of aerospace and air defense practices was the most useful. It noted that aerospace and air defense forces must use the theory and practice of operational art and its methods and techniques. This is a new premise for operational art, the issues of aerospace and air defense tactics. Operational art remains the issue of changing the situation in aerospace in one’s favor. It is further enriched with tactical methods and techniques.⁴⁹

⁴³ Ibid.

⁴⁴ Ibid.

⁴⁵ Ibid.

⁴⁶ Ibid.

⁴⁷ V. V. Barvinenko and V. R. Lyapin, “On the Correlation of Operational Concepts and Methods,” *Military Thought* (in English), Volume 4 2006.

⁴⁸ Vladimir Denisov, “We Have Given Our Adversary a 15-year Advantage and We Cannot Win It Back,” *Novaya Gazeta Online*, 2 December 2018.

⁴⁹ A. P. Korabelnikov, “Modern Methods of Aerospace and Air Defense of Facilities and Prospective Development Trends,” *Military Thought* (in English), Volume 1 2019.

2 The Writings of General of the Army Makhmut Gareyev

Russian General of the Army Makhmut Gareyev is the author of numerous works on topics ranging from strategic deterrence to training to future warfare. He served at the Battle of Kursk in World War II and celebrated his 96th birthday on 23 July 2019. Don't be fooled by his age. He is still the President of the Academy of Military Science and often advises members of the General Staff. At major parades in Red Square he can usually be found sitting next to President Putin. Two of his works are chosen here (his work on aerospace issues is included later) for their references to operations and operational art.

On Frunze and Operational Art

In a 1985 book titled *M. V. Frunze: Military Theorist*,⁵⁰ Gareyev outlined the military thoughts of Mikhail Vasilyevich Frunze on the latter's centennial birthday. He believes that Frunze was able to correctly analyze historical processes and their impact on the development of military affairs. He credits Frunze for his continued use of historical examples and their application to contemporary thought. For example, Frunze pointed to the importance of intuition and scientific prediction as well as the need to grasp the inner logic of complex events. Conforming to the situational context is a major law of military art.⁵¹ Frunze did not favor a strategy of starvation or destruction, but rather, depending on the situation, the use of either strategy. He agreed with Marx that the offensive, with other conditions being equal, was better than the defense.⁵²

Frunze considered the most effective method of countering enemy counterstrikes to be "the use of preemptive active operations to thwart the concentration of enemy counterstrike groupings and the destruction of these piecemeal."⁵³ Gareyev writes that one of the most difficult tasks is to foresee the possible nature of an enemy's plans at a war's outset (the initial period of war) and work out methods to increase both combat readiness and the strategic deployment of the Armed Forces.⁵⁴ This focus on the initial period of war appeared elsewhere in the book and indicates the importance that this "lesson learned" had for the Soviet Union when Gareyev authored this volume. At one point he stated that "the role of the initial period of war will increase further and this may be the main and decisive period which largely predetermines the outcome of the entire war."⁵⁵ Further, he added that the importance of past lessons "act as particles of insipient new methods of conducting armed combat."⁵⁶ The advent of the information and digital age has most likely only reinforced this belief in the mind of Gareyev and other Russia military planners.

Gareyev wrote that operational art's theory arose when an operation began to be viewed as an aggregate of battles and engagements unified in a single overall plan broken in space and time. Developments in both operational and tactical maneuver made it possible to more thoroughly elaborate the methods for preparing and conducting operations.⁵⁷ The basis of both operational and tactical maneuver, according to Frunze, was attacks against the weakest points (the enemy

⁵⁰ M. A. Gareyev, *M. V. Frunze: Military Theorist*, Moscow: Military Publishing House, 1985.

⁵¹ *Ibid.*, pp. 146, 148.

⁵² *Ibid.*, pp. 172-173.

⁵³ *Ibid.*, p. 177.

⁵⁴ *Ibid.*, p. 229.

⁵⁵ *Ibid.*, p. 237.

⁵⁶ *Ibid.*, p. 238.

⁵⁷ *Ibid.*, pp. 200, 202.

flanks and rear) and the envelopment and outflanking of enemy groupings combined with attacks from the front.⁵⁸ He focused attention on encircling and destroying the enemy. Decisive actions would be possible with bold maneuvers. This meant carrying out operations without operational pauses, thereby preventing an enemy to get their bearings or to bring up reserves, and to organize the defense. Breakthroughs, Marshall of the Soviet Union G. K. Zhukov noted, offer opportunities for freedom of maneuver and the opportunity to hit the enemy from the worst sector (from the enemy's perspective).⁵⁹

Gareyev writes that "In comparison with previous experience, this was a completely new phenomenon in operational art. For this reason, it was considered advisable to prepare ahead of time new troop groupings, to plan the maneuvering of resources, and increase the effort by committing reserves to battle."⁶⁰ The focus on a "new phenomenon" could indicate Gareyev is implying interest in the concept of the OMG, but this was not specifically stated.

On Marshall of the Soviet Union Nikolai Ogarkov

Writing in *Arsenal Otechestva* in 2012, Gareyev discussed the career of General Staff Chief and Marshall of the Soviet Union Nikolai Ogarkov, who was Gareyev's boss in the 1980s. He writes that Ogarkov was inquisitive, innovative, and creative, and in possession of the ability to perceive new problems of military art. It was thus no surprise to Gareyev that Ogarkov served as General Staff Chief for seven years, dedicating much time on improving the organizational structure and work of commanders and staffs at both the operational-strategic and operational levels.⁶¹

Ogarkov's development of the forms and methods of operational preparation were most important. New problems in strategy and operational art were verified and developed, often through the use of exercises. He also worked to improve the relationship with political leaders but this did not end well. Gareyev writes that in 1979 Ogarkov told the Politburo that the introduction of Soviet troops into Afghanistan may have serious international consequences. He was interrupted by I. V. Andropov, head of the KGB at the time, who told him "We have people who take care of politics; you solve the military task assigned to you."⁶²

Ogarkov continued to examine operational issues. He helped create the Center for Operational-Strategic research in the General Staff, a center later headed by General-Colonel V. V. Korobushin. Under Ogarkov's leadership, a five-volume *Principles of the Preparation and Conduct of Operations* was developed, volumes that contained important tenets of military art and operational-strategic principles of military doctrine. Gareyev added that the maneuvers conducted in 1981 were a creative effort on Ogarkov's part to introduce new operational-strategic ideas for the Armed Forces leadership. These maneuvers proposed an aggressive advancement in the direction of the flanks as well as into the depths of the opposing force. To

⁵⁸ Ibid., p. 204.

⁵⁹ Ibid., p. 234.

⁶⁰ Ibid., p. 209.

⁶¹ M. A. Gareyev, "The Living Embodiment of the Brain of the Army," *Arsenal Otechestva*, No. 2 2012, published 17 June 2013 at <http://arsenal-otechestva.ru/article/111-mozg-armii>.

⁶² Ibid.

accomplish such tasks, formations and units were required to have high maneuverability, independence, and initiative in resolving combat assignments.⁶³

Most important of all, however, was the decision to create OMGs that could fulfill Ogarkov's developments, and Gareyev specifically mentioned the concept and its contents as follows:

The main difference between former mobile groups and them [OMGs] was that not only tank armies and divisions were used, but also separate army corps with special organizations, specially created to act as operational maneuver groups, where tank, motorized rifle, artillery, and other units outfitted with the latest equipment, amphibious combat infantry vehicles and armored transports, and self-propelled artillery were combined into a single organism. For the first time, an airborne-assault regiment and army aviation were included in the make-up of these corps.⁶⁴

Gareyev added that OMGs were liquidated with the fall of the Soviet Union but that operational maneuver groups will "obviously be used in some form or another" in the future. The main priority in the entire system of military development remains the operational-strategic vector.⁶⁵ Again, it is important for a Western analyst to know what Gareyev meant by a "form," for without this understanding, the potential realization of the concept is not clear.⁶⁶ Thus, it is possible that OMGs could even be developed for space operations in "some form or another."

3 US Experts Jacob Kipp and David Glantz on Russian Operational Art

Dr. Jacob Kipp was an analyst and then the director of the Foreign Military Studies Office at Fort Leavenworth, Kansas in past years. He is the author of numerous papers on Russian strategy and operational art and has served as a long-time consultant on Russian military affairs for numerous Pentagon offices. Kipp defined operational art as the conduct of war at echelons above corps and on the scale of theater-strategic campaigns.⁶⁷ The term came into use, he notes, due to the development of new weaponry that not only extended the breadth and depth of the battlefield, but fire's increased lethality. These weapons caused havoc in the development and application of combined arms, and offered new opportunities for maneuver. This forced more dependence on a commander's intellect (instead of just eyeballing a situation), which reduced "chance" to a question of "probability." Calculations became based on an assessment of the mission, theater terrain, the enemy's force, one's own forces, and time. All of these circumstances had to be taken into account as operations became more complex.⁶⁸

Kipp added that operational art was defined by Aleksandr A. Svechin in a series of lectures on strategy in 1923-1924. These lectures described operational art as the bridge between tactics and

⁶³ Ibid.

⁶⁴ Ibid.

⁶⁵ Ibid.

⁶⁶ For an explanation of a "form," see Timothy Thomas, "Russia's Forms and Methods of Military Operations," *Military Review*, May/June 2018, pp. 30-37.

⁶⁷ Jacob W. Kipp, "The Origins of Soviet Operational Art: 1917-1936," in *Historical Perspectives of the Operational Art*, Michael D. Krause and R. Cody Phillips, General Editors, Center of Military History, Washington DC, 2005, p. 213.

⁶⁸ Ibid., pp. 219-220.

strategy. N. Varfolomeev, a deputy head of the Department of Strategy during Svechin's time, noted that the operation, which had become the base for understanding operational art, was the totality of maneuvers and battles in a given sector of a theater of military action to achieve a common objective.⁶⁹ It was this concept of maneuver that appeared to take center stage in many discussions. It seemed that the less developed a theater of war, the greater were the opportunities of employing maneuver forms of combat. Maneuver was meant to disorganize and demoralize an opponent.⁷⁰

Svechin's era, Kipp notes, was the time that "the study of past campaigns, current trends in weapons development, and force structure requirements coalesced around the concept of operational art."⁷¹ Svechin, for example, had formulated two competing postures—annihilation and attrition—as issues regarding the relationship between operational art and future war paradigms. Thoughts focused on combining breakthrough and deep pursuit operations in the conduct of annihilation operations. In such operations logistics became of critical importance in the accomplishment of operational art.⁷²

Noted Soviet General V. K. Triandafillov became an important advocate of operational art as well. He laid out in theoretical detail the military context for successive deep operations. Success in such operations, in accordance with the imprint of operational art, required an effective command and control system that would coordinate the operations of several fronts and the establishment of realistic logistical norms. Another Soviet General of renown, M. N. Tukhachevsky, was another advocate of operational art, arguing that it required the complete militarization of the national economy.⁷³

David Glantz, author of the popular work *Soviet Military Operational Art: In Pursuit of Deep Battle*, noted that between 1932 and 1936 the Red Army's theoretical and practical work on operational art created a model of offensive combat that has endured to the present.⁷⁴ This thought was supplemented with a focus on maneuvering due to the mechanization and motorization of ground forces. Operational maneuver was noted to be "the organized shifting of distinct groups of forces during an operation to achieve a more favorable position with regards to an enemy in order to strike a blow against him or repel an enemy attack."⁷⁵ Glantz went on to describe how the Soviet Union then incorporated the development of nuclear weapons into the maneuver concept. He quotes Colonel F. D. Sverdlov, a leading maneuver specialist in Russia, as the author behind the defining of the concept known as antinuclear maneuver, which is the withdrawing of subunits from under the possible blows of an enemy nuclear strike.⁷⁶

The Soviet Union's perilous political and economic situation in the early 1990s caused the military to switch to a concept dubbed defense sufficiency. This was a military strategy based on

⁶⁹ Ibid., pp. 214-215.

⁷⁰ Ibid., p. 224.

⁷¹ Ibid., p. 229.

⁷² Ibid., pp. 230-231.

⁷³ Ibid., pp. 233-234.

⁷⁴ David M. Glantz, "Soviet Operational Art since 1936: The Triumph of Maneuver War," in *Historical Perspectives of the Operational Art*, Michael D. Krause and R. Cody Phillips, General Editors, Center of Military History, Washington DC, 2005, p. 249.

⁷⁵ Ibid., p. 269.

⁷⁶ Ibid., p. 271.

premeditated defense. But as the nation gradually improved and moved into the 21st century, the military began to discuss vertical maneuver and envelopment by air assault and the conduct of operational and tactical maneuver again.⁷⁷ This has apparently led to the works in *Military Thought* discussed above in relation to operational art.

4 Russian Use of Operational Art and Maneuver in Space

Based on the discussion above of operational art, several points stand out. Operational art is defined as the preparation and conduct of combined-arms, joint, and independent operations for large-strategic formations. The discussion indicated in several places that a principal element of the concept was the preparation of such operations in peacetime in order to be prepared for the initial period of war, a period now marked by increased speed due to the impact of advanced technology in the information age and its impact on the development of weaponry, reconnaissance assets, and frequency interference capabilities. Being in a superior position during the initial period of war clears the way for the use of operational art in space and helps ensure success.

Other important points are listed below. The initial sentence in each bullet is from the discussion above. It is followed by another sentence (from this author, in brackets) which is a conceptualization indicating how satellites and space would fit each concept:

- Maneuver, deep operations, breakthroughs, and integrated operations were listed several times each. [Deep operations could involve Russian strikes against satellites in space or against underwater cables or the use of SODCIT criteria. Satellites perform maneuver operations often to inspect other satellites or to perform other missions.]
- It was noted that the less developed a theater of war, the greater were the opportunities of employing maneuver forms of combat. [Space is underdeveloped at the moment, which indicates it could remain for some time as a place for maneuver.]
- It was argued that an effective command and control system was needed for operational art. [Russia has established such a system with its National Defense Management Center in Moscow.]
- David Glantz wrote that operational maneuver was “the organized shifting of distinct groups of forces during an operation to achieve a more favorable position with regards to an enemy in order to strike a blow against him or repel an enemy attack.”⁷⁸ [Moving satellites against other satellites to either strike a blow against them or to simply achieve a strategic position in a specific orbit, such as to conduct inspections of other satellites, relate to Glantz’s thought.]
- The operational art department is “concentrating its efforts on developing new, unconventional forms and methods of employing large strategic formations and groupings of forces in both large-scale and local wars, as well as in armed conflicts.”⁷⁹ [The use of

⁷⁷ Ibid., p. 278.

⁷⁸ Glantz, p. 269.

⁷⁹ Stolyarov.

satellites as an operational maneuver group would be an unconventional form of using such assets.]

- The basis of both operational and tactical maneuver, according to Frunze, was attacks against the weakest points (the enemy flanks and rear) and the envelopment and outflanking of enemy groupings combined with attacks from the front.⁸⁰ [Russian leaders state that they consider the weakest links in Western systems to be their links to space systems, which can be considered a flank.]
- Ground maneuvers proposed an aggressive advancement in the direction of the flanks as well as into the depths of the opposing force.⁸¹ [Space may now be considered a flank for planetary operations.]
- Operational maneuver groups will “obviously be used in some form or another” in the future.⁸² [Space assets that maneuver in the form of groups can involve the movement of space assets to assist in enveloping an opponent.]

The majority of these operations are present in the planning of aerospace operations today. It was noted earlier that two important military leaders (Gareyev in 2011 and Shoygu in 2015) have stated that aerospace is the new center of gravity. A short summary of how Russia’s military is discussing concepts related to operational art in space, from a few sources, is summarized below.

In 2009 a report noted that in the future a space strike echelon will accomplish combat missions and carry out combat support of land-based operations. The information-strike operation and a space operation are the result of the change in the nature of armed combat. They will precede air, naval, and land offensive operations. The information-strike operation was defined as

an automated weapons system, which is designed for the highly effective destruction of one, several, or many facilities (targets) using precision-guided strike weapons at great distances in accordance with the operations (combat operations, battle, strike, or engagement) plan or its concept of operations.⁸³

Targets of an information-strike operation include the command and control posts and communication centers of combined formations and formations, aircraft, the missile troops and artillery, reconnaissance-strike (weapon) complexes, reconnaissance, air defense and electronic warfare.⁸⁴ The reconnaissance-strike complex was defined as an automated weapon complex designed for the destruction of ground-based facilities using missiles, aircraft, and other forces immediately upon detection.⁸⁵

In 2011, Gareyev, writing in the *Journal of the Academy of Military Science*, noted that the center of gravity of armed struggle is shifting to the aerospace domain, elements of which are

⁸⁰ *M. V. Frunze*, p. 204.

⁸¹ “The Living Embodiment...”

⁸² “The Living Embodiment...”

⁸³ Igor Vitalevich Morozov, Sergey Valentinovich Baushev, and Oleg Eduardovich Kaminskiy, “Space and the Nature of Contemporary Operations: Gaining and Maintaining Supremacy in the Information and Space Sphere Has a Decisive Impact on the Course and Outcome of a Contemporary High-Tech Armed Confrontation,” *Vozdushino-Kosmicheskaya Oborona (Air-Space Defense)*, 14 July 2009, pages unknown.

⁸⁴ *Ibid.*

⁸⁵ *Ibid.*

increasingly more interconnected. An aerospace defense (VKO) campaign, Gareyev writes, would consist of a series of air operations. They would include bomb, rocket, radio-electronic and other strikes against an adversary's aviation, rocket and naval forces, air defense systems, command posts, industrial, energy, and other important infrastructure objectives and, finally, against the main ground force groupings. This is planned at the very beginning of a war.⁸⁶

Thwarting an opponent's aerospace attack is of primary significance, since the course and outcome of a war depend on this. Such defensive conditions extend into the space domain. VKO missions include reconnaissance of the aerospace domain (an aerospace theater of military operations can be under consideration) to identify enemy attacks; the implementation of an antisatellite struggle; control over the space domain; and defense against strikes from space as well as an anti-rocket and air defense plan that confronts both strategic and nonstrategic attacks. These are dynamic operations that are acquiring greater importance.⁸⁷

Gareyev noted that a probable adversary's command and control system, to include aerospace attack means, is usually located in space. It thus becomes a primary target, where it is necessary

To direct the main scientific and technological efforts towards seeking out the resources and methods aimed at bringing down the entire space communications and command and control system. This will not only create favorable conditions to successfully resolve VKO tasks, but also violate the principal base on which the opposing side structures its entire network-centric system of command and control.⁸⁸

Such a system requires the creation of an operational group of specialists from the Main Air Force Staff, the Space Force Command, and other command and control organs in the General Staff Military Academy for the assessment of the actual conditions of forces and means.⁸⁹

In October 2013 Russia published its latest, at the time of this writing, military doctrine. It was noted that two principal tasks of the Armed Forces were to provide air and space defense of important structure of the Russian Federation while being ready to repel strikes from aerospace attacks; and to deploy and maintain in the strategic space zone "orbital spacecraft groupings that support Armed Forces activities."⁹⁰ Whether these "groupings" were OMGs is not known, but again the possibility remains.

In November 2017 Russia announced it was developing two advanced anti-satellite weapons: Rudolf, a mobile anti-satellite strike system and the Tirada-2S, a mobile anti-communication satellite electronic warfare system.⁹¹ The Tirada-2S conducts the radio-electronic suppression of satellite communications, even from Earth.⁹²

⁸⁶ M. A. Gareyev, "On the Organization of the Russian Federation's Aerospace Defense," *Journal of the Academy of Military Science*, No. 2 2011, p. 40.

⁸⁷ Ibid.

⁸⁸ Ibid., p. 42.

⁸⁹ Ibid.

⁹⁰ B. D. Kazakhov and G. K. Isaev, "Recommendations to Clarify the Conceptual Apparatus Used to Describe the Subject Area 'Tactics' as a Component of Military Science," *Vestnik Akademii Voennykh nauk (Journal of the Academy of Military Science)*, No. 3 2018, pp. 30-35

⁹¹ No author or title provided, *Interfax*, 30 November 2017.

⁹² No author or title provided, *Interfax* (in English), 9 January 2019.

In 2017, journalists reported on the use of Russia's Space troops to test a "maneuvering" military inspection satellite. The satellite undocked from a Kosmos-2519 space platform and it began an autonomous flight. It first changed its orbit, then returned to the Kosmos platform and inspected it. Such a capability can allow for determining the functional purpose of a foreign satellite and, when required, turn into a space interceptor than can deploy missiles. Independent military expert Valeriy Mukhin stated that such a system can become a deterrence factor for potential enemies, as it can check whether a satellite's stated function "corresponds to reality."⁹³

In 2018 a *Wired* magazine article discussed the threat of a war high above the earth among satellites. The article stated that in 2014 the US military noted that a piece of Russian space junk, Object 2014-28E, began to act strangely. It performed complicated maneuvers and came alive. It sided up to American commercial communication satellites. The Object has been joined in years since by "similar space objects of Russian provenance."⁹⁴ The same year a MiG-31 appeared on the Internet with a mockup of a new type (not identified further) of an anti-satellite missile under the fuselage. It would be guided to its target by the Krona space object recognition station at Kazakhstan's Saryshagan range.⁹⁵ Further, the Peresvet combat laser system was advertised as capable of fighting satellites in orbit according to the Russian Defense Ministry, and it has been supplied to the Space Forces.⁹⁶

Another 2018 report noted that a Soyuz-2 launch vehicle fitted with a Fregat upper stage can put into orbit up to 15 inspector satellites. Foreign media, it noted, had dubbed these inspector satellites to be "killer satellites." Russian media reported that a Kosmos-2521 inspector satellite had shifted position after some months in orbit to draw close to and photograph various foreign satellites, American ones included. The article then noted that "preparations to repulse a possible attack utilizing the capabilities of an orbital satellite grouping are under way in all the world's leading states both in space and on Earth."⁹⁷ These vehicles can spend years in space and, on command, instantly mount an attack due to an adversary's aggression. On Earth, techniques are under investigation to suppress satellite signals and create interference.⁹⁸

A final 2018 report listed the "essence and content of the employment of tactical formations that are organizationally part of the space forces." The authors note that space force formations in peacetime are designed to carry out the following missions: implementing continuous control of axes in the space domain that are in danger of operations of ground radar stations of the missile - attack warning system; conducting continuous reconnaissance of regions for the launch of ballistic missiles; detecting space objects and cataloging them; controlling space ships in orbital flight and safeguarding the deployment of orbital space ship groupings while maintaining them in a combat-ready condition; and other tasks. Scientific studies should be aimed at the following: taking into account the opposing sides being equipped with new means of armed struggle and the influence of other operational (tactical) factors; and developing operational-tactical requirements

⁹³ S. Valchenko, N. Surov, and A. Ramm, "Russia Sends Inspector into Orbit: Military Test Operations of Maneuvering Identification and Intercept Satellite," *Izvestiya Online*, 26 October 2017.

⁹⁴ Garrett M. Graff, "The Outer Limits of War," *Wired Magazine*, July 2018, pp. 48-49.

⁹⁵ Anton Valagin, "Photos: MiG-31 Tests 'Satellite Killer,'" *Rossiyskaya Gazeta Online*, 30 September 2018.

⁹⁶ No author or title provided, *Interfax* (in English), 5 December 2018.

⁹⁷ Irina Dronina, "The Militarization of Space Threatens Undesirable Consequences for Everyone. A Single Medium-Class Launch Vehicle Can Put 15 Special-Purpose Satellites into Space," *Nezavisimaya Gazeta Online*, 19 June 2018.

⁹⁸ *Ibid.*

for new and modernized complexes and systems.⁹⁹ Thus operational issues are under continuous reevaluation.

In 2019, Russian analysts offered a brief description of the Nudol missile defense system. It is designed to repulse a nuclear strike at distant approaches to Russia, and it is being deployed on the ground and in space. There it can strike at satellites and missiles.¹⁰⁰ Nudol is said to be a two-stage missile, with solid-fuel engines for both stages and a warhead equipped with maneuver engines. Equipped with both a conventional and nuclear warhead, the missile can strike targets at a distance of up to 1500 kilometers and with a speed of intercept of Mach 10. By operating against both missiles and satellites, Nudol can eliminate both reconnaissance and target designation satellites of an opponent, which eliminates them from seeing anything. Moscow's layered ballistic missile defense system would thus include satellite groupings, a network of ground-based, long-range radar detections stations, and Nudol, thus becoming an aerospace defense system covering air and space.¹⁰¹

Finally, also in 2019, President Putin stated that nearly 80 percent of Russia's military and dual-use satellites had been replaced.¹⁰² Defense Minister Shoygu stated that the throughput of communication channels for Russia's military satellite grouping will increase 2.5 times by 2025 and will raise their jamming resistance.¹⁰³ Thus, the improvement in space systems is a clear indication of its growing importance.

With these concepts as background, a truncated potential lineup of equipment that Russian theorists might consider as components of a space OMG that can maneuver and conduct deep/planetary operations in near or deep space include the following, based on the articles used above:

- Inspector satellites, such as the Kosmos 2521
- Killer satellites
- Tirada-2s, to thwart communications
- Rudolf, anti-satellite strike system
- Nudol, anti-satellite and missile system
- Peresvet combat laser
- Ground stations that can jam objects in space
- MiG-31 armed with anti-satellite missiles
- Space junk that comes alive

⁹⁹ Kasakhov and Isaev, pp. 30-35.

¹⁰⁰ Viktor Sokirko, "Intelligence Late to Report: US 'Pinpoints' Killer of its Satellites Three Years after the Event. Bad News for the Pentagon: Russia Successfully Testing Nudol System," *Svobodnaya Pressa*, 20 January 2019.

¹⁰¹ Dmitriy Popov, "The Killer Satellite with a Nice Name: The United States Has Nothing to Counter the Latest Nudol System," *Armeyskiy Standart*, 25 January 2019.

¹⁰² No author or title provided, *Interfax*, 16 May 2019.

¹⁰³ No author or title provided, *Interfax* (in English), 3 June 2019.

- Reconnaissance-strike complexes and information-strike system
- Ground based hackers who attempt to take control of satellites, such as theoretically occurred in 1998¹⁰⁴

5 Conclusions

Western analysts should consider whether the deep operations of operational art normally associated with ground forces are now finding new life in a deep space dimension of Russian planning; and whether the theory is further buttressed by Russia's SODCIT (special operations for the destruction of critical infrastructure targets) concept that aims to take out another nation's economic base or links to space operations in the initial period of war (IPW). Perhaps Russia has even developed a space OMG, the potential components of which were listed for consideration. What is apparent from just these three points (SODCIT, IPW, OMG) is that Russia's military has different focal points of thought than does the West, and they must be considered when developing Western responses to Russian threat indicators in space.

Recent Russian military literature has focused primarily on weapons based on new physical principals (NPP), electronic warfare, artificial intelligence, and other weapon-related interests. Yet ever since the 1920s, Soviet and now Russian military theorists have adjusted operational art to new discoveries in weaponry. Operational art's past characteristics of maneuver, breakthroughs, and deep operations are all applicable to space. These developments are taking place at a time and place (space) that has an unfolding environmental context. There are no rules of space warfare that would be equivalent to the rules of land warfare (although many believe space in the interim should abide by land warfare rules until space rules are developed). To date there is only the Outer Space Treaty of 1967 and not a rule of law. The treaty appears to leave much room for interpretation and was, naturally, unable to envision two things: the current space environment that includes commercial and private spacecraft in addition to government developed ones; and its high-technology equipment (lasers, antisatellite missiles, etc.) that is able to do things (inspect other equipment in space, for example) never before considered.

The four officers who wrote longer articles on operational art made references to both operational art and its characteristics, and also discussed the aerospace domain. Korotchenko stated that the "growing potentials of air and space warfare are increasingly influencing the theory and practice of operational art."¹⁰⁵ The prevention of an enemy's domination in space is now important and commanders must "employ the potentials of our space-based systems to the utmost when preparing operations and waging hostilities"¹⁰⁶ since the course and outcome of operations are dominated by space and missile forces. Maneuver, he noted, is a typical trend of operational art and has a more important role to play under the current advanced technological situation.¹⁰⁷ Zherebtsov stated that there will be a new perception of operational art's content, to include its principles, forms, and methods of conducting operations under conditions of an information-focused confrontation and the massive use of precision weapons; and that new ways

¹⁰⁴ No author provided, "Using the Force," *The Economist*, 20 July 2019, p. 19.

¹⁰⁵ Korotchenko, p. 15.

¹⁰⁶ *Ibid.*

¹⁰⁷ *Ibid.*

and means of resolving tasks will be unveiled to confront modern interstate and intrastate opposition.¹⁰⁸ Stolyarov noted that the operational art department is “concentrating its efforts on developing new, unconventional forms and methods of employing large strategic formations and groupings of forces in both large-scale and local wars, as well as in armed conflicts.”¹⁰⁹ He noted that “in the very near future, substantial changes will occur in the theory and practice of operational art.”¹¹⁰ Kopytko stated that operational art includes combined arms operational art (combined arms of large strategic formations); operational art of the services and the centrally controlled arms (Strategic Missile Troops, Airborne Troops, and Space Troops); and operational art of the operational rear services. The structure is not constant but develops in line with the evolution of both weaponry and new combat arms and forces.¹¹¹

The last section of the article, on the use of operational art in space, noted that being in a superior position during the initial period of war is the primary element that clears the way for the use of operational art in space and helps ensure success. Putting the proper equipment in space during peacetime prepares Russia’s military for the initial period of war. Large-strategic formations would be composed of equipment that includes lasers, satellites, anti-satellite missiles, counter communication, and other pieces of equipment instead of tanks, artillery, and aviation units. Numerous similarities in the characteristics surrounding the use of operational art in ground operations (weaknesses on flanks, etc.) are present in space, which provide further rationale for Russia conceptualizing the use of operational art or even perhaps OMGs in that domain.

Today, equipment orbits above us and cables wrap the globe together under the seas. Space objects, suspended in orbit, are equipped with capabilities that offer the opportunity to form OMGs in space in a suspended status, awaiting further orders for their activation or integration much like a computer virus. As was noted above by one Russian author, modern methods of aerospace and air defense practices contain forces that must (not maybe, but must) use the theory and practice of operational art and its methods and techniques.¹¹²

A recent US report suggested how the nation might incentivize Russia to fall in line with an international space traffic management (STM) scheme. These recommendations were:

1. Establish red lines in space surrounding critical satellites to quickly and clearly assign liability, when an undesirable space conjunction occurs.
2. With the best data and skills, DoD should take the initiative to develop specific space traffic standards and best practices pertaining to military security in STM. Otherwise, economic agencies and commercial operators could favor economic prosperity over military security.
3. The United States should submit an amendment to the Liability Convention to change the current fault-based liability for damage in space by a space object to absolute liability, just the same as liability for damage on Earth by a space object. The change would also

¹⁰⁸ Zherebtsov.

¹⁰⁹ Stolyarov.

¹¹⁰ Ibid.

¹¹¹ Kopytko.

¹¹² A. P. Korabelnikov, “Modern Methods of Aerospace and Air Defense of Facilities and Prospective Development Trends,” *Military Thought* (in English), Volume 1 2019.

facilitate the rules pertaining to the red lines in 1. to become customary international laws, regulations, and enforcement in STM.

4. The United States should deploy bodyguard spacecraft to get ready in time to protect satellites against the rapidly emerging and growing robotic ASATs.
5. For fairness, the United States should take the lead to make all spacefaring nations have the same indemnification and other provisions in their third-party liability insurance.¹¹³

These are all solid recommendations.

Before incentivizing Russia, however, it is mandatory to understand how their space theory differs from ours. That is required for without it, how do we know just what it is the West is trying to incentivize? Another set of recommendations is thus required based on the analysis above. First, the implications of Russia's understanding of emerging space trends and the follow-on forecasting of how to use maneuvering satellites and a SODCIT or space OMG should be studied. Russian leaders state that they consider the weakest links in Western systems to be the ones to space systems. How do you incentivize an opponent who believes they have found your weakest link? Further, an understanding of how Russia is developing the proper correlation of forces in space should be developed. If Russia considers space a flank to its more traditional terrestrial focus, then it would also be a place for operational art to unfold and influence events. All of these issues indicate how Russia is preparing to establish superiority in space with equipment to win the IPW and how it is developing its version of the rules of space conflict. Russia will demand "equal security" in space as they do on the ground.

Second, Western Red Team scenarios depicting Russia's space contingent must take these points into consideration. Western discussions should focus on Russia's negotiation techniques about space deployments, on the structure they envision to put in place, and on the operational art it plans to implement along with how Russia considers the impact of new trends leading to space conflicts.

Third, analysts have to stop shortchanging themselves with mirror-imaging their space priorities with those of Russia. Too few Western analysts apply Russian thought to space, instead relying on their own understanding and noting only that Russia is conducting hybrid warfare against them. While it appears that Russia is seriously considering the use of operational art in space, have Western analysts considered such use? In the exercises available to date in unclassified form, that does not seem to be the case. The West would be wise to deeply consider how Russia's military thinks and applies its traditional concepts to the new era, especially how new aspects of military art might be applied in space.

¹¹³ Brian G. Chow, "Commercial Space: Space Controls and the Invisible Hand," provided by Henry Sokolski, e-mail on 5 August 2019.