

Bureau 1440 – Rassvet

Starlink of Russia

Treadstone 71



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Bureau 1440 is a Russian company under ICS Holding tasked with developing the Rassvet satellite system, a low-Earth orbit (LEO) satellite network designed to provide secure, high-speed internet across Russia. The project represents a strategic effort to reduce reliance on Western technology, mimic Starlink, and achieve technological sovereignty in satellite communications.

Treadstone 71 analyzes the broader implications of Bureau 1440's work, including its technological ambitions, challenges, and geopolitical significance. The goal is to understand how Rassvet positions Russia in the global satellite industry and what its development means for technological independence, security, and competition with established players like Starlink.

Analytic Brief

Bureau 1440 is leading Russia's Rassvet satellite project under ICS Holding, aiming to build a secure, domestically controlled low-Earth orbit satellite network. The initiative seeks to challenge Western dominance in satellite communications, address domestic connectivity needs, and strengthen Russia's technological independence. Significant challenges in production, funding, and global competition could undermine its ambitions.

Bureau 1440, a subsidiary of ICS Holding, is tasked with designing and deploying the Rassvet satellite constellation. Alexey Shelobkov drives the initiative alongside associated companies like Yadro Group and AO IKS. The project operates under strict government oversight through the State Commission for Radio Frequencies (SCRF), ensuring data sovereignty and national security.

Rassvet aims to deploy over 250 satellites by 2030, providing secure internet access across Russia. The system focuses on connecting remote regions, ensuring communications resilience, and supporting strategic military and civilian objectives. Unlike global systems like Starlink, Rassvet prioritizes regional connectivity under state-controlled infrastructure. Challenges in domestic component production, reliance on government funding, and slower deployment timelines threaten its success.

The project represents Russia's broader push for technological sovereignty in response to sanctions and reliance on Western infrastructure. Rassvet could become a strategic tool for military operations, national security, and regional influence. However, delays, high costs, and competition with faster, more advanced systems like Starlink risk leaving it uncompetitive or incomplete.

Geopolitical tensions and the widespread success of Starlink in Ukraine have pressured Russia to accelerate its domestic satellite communications projects. The need to secure

sensitive communications and expand connectivity to underserved areas has grown urgent, particularly under mounting economic and technological isolation.

Bureau 1440 has launched six experimental satellites, with limited progress toward the full constellation. Regulatory approvals by the SCRF have streamlined some processes, but production bottlenecks and reliance on limited domestic resources have stalled momentum. Competing systems like Starlink have already achieved global coverage, intensifying the technological gap.

Rassvet faces an uphill battle in achieving its stated objectives within the proposed timeframe. Scaling production, securing funding, and modernizing technology remain significant hurdles. While it holds potential as a regional system for secure communications, its global relevance is unlikely unless technological breakthroughs or strategic alliances accelerate development.

Bureau 1440's progress will shape the future of Russia's satellite ambitions. A successful Rassvet system would bolster national security, improve regional connectivity, and enhance Russia's geopolitical influence. Failure to meet technical and financial challenges risks relegating the project to a symbolic effort rather than a transformative communications system. Anticipated advancements in competing systems like Starlink could render Rassvet obsolete unless Russia accelerates its capabilities and ensures sustained support.

Introduction

Russia's push to develop its satellite communication systems, led by Bureau 1440 and supported by organizations like ICS Holding and Yadro Group, represents a calculated response to escalating geopolitical pressures and technological dependencies. Projects such as Rassvet have become emblematic of this effort, aiming to establish a secure, domestically controlled network that counters Western dominance in the satellite internet sector. The development of Rassvet is not merely a technical endeavor; it is a reflection of Russia's broader strategy to achieve autonomy in critical infrastructure and reduce vulnerabilities to foreign influence.

The success of Elon Musk's Starlink has fundamentally reshaped global perceptions of satellite internet's strategic importance. Its rapid deployment, operational effectiveness, and role in supporting Ukraine during the conflict provided a real-world demonstration of how such systems could redefine modern warfare and civilian communications. Russia's response has been to prioritize the creation of its systems, drawing both inspiration and competitive urgency from the global capabilities of Starlink. The SCRF's recent regulatory

approvals have further accelerated the momentum for Rassvet, granting Bureau 1440 the freedom to deploy terminals and connect them within tightly controlled parameters.

Unlike Starlink's global ambitions, Rassvet focuses on national connectivity and security. Ground stations and traffic routing remain exclusively within Russian territory, ensuring a level of sovereignty unattainable through reliance on foreign systems. However, ambitions alone cannot bridge the technological gap that separates Rassvet from its competitors. Russia's limited ability to produce advanced components domestically and the financial strain of ongoing sanctions create significant hurdles that challenge the feasibility of completing the project within its ambitious timeframe.

Despite these challenges, Rassvet holds immense strategic potential. The system could redefine Russia's connectivity infrastructure, ensuring secure communications for military and civilian applications alike. It also positions Russia to offer alternative satellite solutions to nations seeking to avoid dependence on Western providers. However, without breakthroughs in production efficiency and sustained investment, Rassvet risks becoming an aspirational project rather than a transformative one. The stakes are high, and the trajectory of Rassvet will not only shape Russia's satellite industry but will also influence its position in the global competition for technological dominance.

Analysis - Overview

According to the protocol of the State Commission on Radio Frequencies dated December 24, the low-Earth orbit satellite constellation project "Rassvet," developed by Bureau 1440 (part of ICS Holding), has received approval to operate under several key conditions. These conditions highlight Russia's strategic priority to create an independent satellite communication infrastructure but simultaneously impose significant technological and organizational challenges on the project.

Main Conditions of Operation

Use of Russian Radio Electronics

All devices involved in the project must prioritize the use of domestic radio components. This measure aims to reduce reliance on imports, especially under sanctions, but limited production capacity and insufficient localization of technologies may lead to significant delays in project implementation.

Routing Traffic Through Russian Gateways

All data transmitted by ground stations must pass exclusively through gateway stations located within Russian territory, ensuring control over transmitted traffic and reducing

the risk of external interference but imposing additional restrictions on infrastructure development.

Avoidance of Interference with Government Systems

The equipment must not interfere with the radio-electronic systems of government agencies, requiring careful coordination with other radio frequency users.

Distance from Airports

Ground communication stations cannot be located closer than 0.5–3.5 kilometers from airport boundaries, adding territorial constraints to infrastructure deployment.

Challenges and Issues of the Project

Technological Gap

While Russian companies have experience producing radiation-resistant components, the volumes required for the entire satellite constellation are insufficient. A full cycle of import substitution in electronics has not yet been realized, which could delay the project indefinitely.

Financial Costs

The project is estimated at 445 billion rubles, including both budgetary and non-budgetary funds. The high cost raises questions about the financial sustainability of the project, particularly in the context of economic constraints.

Implementation Deadlines

According to the plans, the constellation is expected to include 383 satellites by 2030, with 91 serving as replacements. To date, only six satellites have been launched, casting doubt on the feasibility of meeting the proposed timeline.

Competition with International Systems

While the "Rassvet" project is still in development, systems like Starlink and OneWeb have already deployed substantial constellations and are providing global services.

Strategic Significance

The "Rassvet" project is crucial for strengthening Russia's sovereignty in communication technologies. Successful implementation of the program will ensure:

- High-speed internet access for remote regions and transportation systems.
- Enhanced capabilities for military and civilian communications.
- Independence from Western technologies under sanction conditions.

"Rassvet" reflects Russia's ambition to establish its space infrastructure capable of ensuring independence in communication technologies. However, the project's ambitions face real obstacles, ranging from technological gaps to challenges in timelines and financing.

Without significant increases in production capacity, modernization of technologies, and cost optimization, the project risks remaining a long-term aspiration rather than a concrete achievement.



Starlink (SpaceX) and Rassvet (Bureau 1440, ICS Holding - <https://x-holding.ru/projects/buro-1440/>)

Table 1 Starlink (SpaceX) and Rassvet (Bureau 1440, ICS Holding - <https://x-holding.ru/projects/buro-1440/>)

Aspect	Starlink (SpaceX)	Rassvet (Bureau 1440, ICS Holding)
Launch Year	First satellites launched in 2019	First satellites launched in 2023
Planned Satellite Count	Over 42,000 satellites are planned by the mid-2030s	383 satellites planned by 2030
Current Deployment	Over 5,000 operational satellites as of 2025	6 satellites launched as of 2025
Launch Year	2019	First satellites launched in 2023
Deployment Scale	Over 5,000 satellites in orbit as of 2025	Six experimental satellites launched, aiming for 250 by 2030
Geographic Coverage	Global	Regional, focused on Russia and potential allies
Technological Sophistication	High-efficiency phased array antennas, inter-satellite laser links, and mass production expertise	Reliant on domestically sourced components, struggling to achieve production scale
Speed and Latency	Speeds up to 500 Mbps with latency as low as 20 ms	Projected lower speeds and higher latency due to domestic technology limitations
Target Audience	Global consumers, businesses, and governments	Domestic users, military, and infrastructure projects

Aspect	Starlink (SpaceX)	Rassvet (Bureau 1440, ICS Holding)
Cost	Competitive pricing supported by SpaceX's efficient Falcon 9 launches	Heavily reliant on government funding, with an estimated cost of 445 billion rubles (~\$4.8 billion)
Geographic Coverage	Global, with a focus on underserved and remote areas	Primarily Russia, with potential regional/global reach
Primary Goals	High-speed, low-latency global internet; commercial and government applications	Domestic internet coverage, ensuring independence from Western infrastructure
Ownership	Privately owned and operated by SpaceX (Elon Musk)	Bureau 1440 under ICS Holding (public-private partnership with Russian state involvement)
Funding	Largely private investment, including SpaceX revenue and partnerships with governments like the U.S. DoD	Estimated 445 billion rubles (~\$4.8 billion), split between public (100 billion rubles) and private funds
Satellite Technology	Advanced, mass-produced satellites with in-house proprietary design	Reliant on domestically produced components, with challenges in scaling production of radiation-resistant technology
Ground Infrastructure	Extensive network of ground stations globally, gateway-free direct-to-device communication in some areas	All data is routed through gateway stations on Russian territory.
Latency	~20–40 ms (low-latency ideal for gaming, video calls, and remote work)	Unknown; dependent on domestic tech, expected higher latency due to gateway routing
Speed	Speeds up to 500 Mbps (and higher in some use cases with Starlink Premium)	Anticipated speeds unknown; expected slower compared to Starlink due to tech limitations
Launch Capacity	Utilizes Falcon 9 and Falcon Heavy rockets for frequent, cost-efficient launches	Limited domestic launch capabilities; reliant on Soyuz or Angara rockets, with a slower cadence
Inter-Satellite Links	Equipped with advanced laser communication for inter-satellite networking	Technology under development; expected challenges in replicating laser link efficiency

Aspect	Starlink (SpaceX)	Rassvet (Bureau 1440, ICS Holding)
Cost of Service	~\$110/month for standard service; Starlink Premium available at higher costs	Pricing not disclosed; expected subsidized pricing for domestic users
Target Markets	Global consumers, governments, businesses, and military	Primarily domestic Russian market with potential expansion to allied or sanctioned states
Security	Uses advanced encryption; limited by Musk's control over use in conflict zones	Fully controlled by Russian authorities, with potential integration into military and intelligence systems
Challenges	Regulatory hurdles in various countries, competition with OneWeb and others, geopolitical limitations	Technological delays, insufficient production capacity, competition with established systems like Starlink and OneWeb
Regulatory Compliance	Works with international regulatory bodies like the ITU for spectrum and orbital slots	Regulated strictly by the Russian State Commission on Radio Frequencies
Launch Cost Efficiency	Extremely cost-efficient due to reusable Falcon rockets	Higher launch costs due to reliance on older, less efficient launch technology
Strategic Significance	Expands U.S. global influence in communications and military capabilities	Enhances Russian technological sovereignty and reduces dependence on Western systems
Expected Completion	Full deployment by mid-2030s	Planned deployment by 2030, though delays are likely

Alexey Shelobkov – CEO ICS Holding

Alexey Shelobkov's extensive involvement in Russia's technology and satellite projects is deeply intertwined with his leadership roles across multiple companies, all of which play significant parts in the development of advanced communication infrastructure, including the Rassvet project. His connections to Yadro Group, ICS Holding, Bureau 1440, and AO IKS reveal a cohesive strategy to consolidate technological innovation and production under centralized control. This analysis explores these entities, their interrelations, and their collective impact on Russian technological ambitions, particularly in the satellite communication domain.

In an interview with the Russia24 TV channel, Alexey Shelobkov, CEO of ICS Holding, spoke about the main achievements of the outgoing year.

- Creation of technological infrastructure, space developments and information security are the key areas of activity of ICS Holding. The Holding's flagships- YADRO and BYURO1440 made breakthroughs in their fields in the past year.
- The company expects that by the end of 2025, revenue will exceed 200 billion rubles.
- To solve the problem of personnel shortage, Holding's companies cooperate with 18 leading technological universities in the country.
- "An engineer today is a superhero of the new era."

Corporate Structure and Roles

Shelobkov's influence extends across four major organizations, each contributing unique capabilities to the broader objective of technological independence and advanced communications systems in Russia.

Table 2 Corporate Structure

Entity	Description	Core Functionality	Relevance to Rassvet
Yadro Group (GK Yadro)	A major player in IT infrastructure, data storage solutions, and high-performance computing.	Development of hardware and software solutions for secure and efficient data processing and storage.	Provides critical hardware and backend support for satellite communication systems.
ICS Holding	A conglomerate of IT and telecom companies known for advancing Russian IT sovereignty.	Oversight of multiple subsidiaries, including Bureau 1440, with a focus on developing secure, domestic technology solutions.	Acts as the umbrella organization driving the Rassvet project and similar initiatives.
Bureau 1440	The primary organization managing the Rassvet satellite project under ICS Holding.	Development and deployment of Russia's low-Earth orbit satellite constellation.	Leads the design, testing, and implementation of Rassvet satellites and related systems.
AO IKS	A subsidiary of ICS Holding focused on IT and communication technologies.	Research and development in telecommunications, software, and secure communications.	Supports Rassvet's communication technologies and ground station integration.

Strategic Interconnectivity

The interconnected nature of these companies demonstrates a deliberate effort to centralize innovation, production, and deployment within a tightly controlled framework. ICS Holding serves as the central hub, coordinating the activities of Yadro, Bureau 1440, and AO IKS to ensure seamless integration across hardware, software, and communication systems.

Yadro's expertise in IT infrastructure provides the technological foundation for data processing and storage, which is essential for the Rassvet satellite network. Bureau 1440 translates these capabilities into space-based applications, focusing on satellite design, testing, and deployment. AO IKS complements these efforts by developing the communication technologies required for ground stations, terminals, and inter-satellite links.

Technological and Economic Impact

Shelobkov's enterprises play a crucial role in advancing Russia's technological sovereignty. The synergy between these companies enables the development of secure, domestically controlled communication systems that reduce reliance on foreign technology. This focus aligns with Russia's broader geopolitical strategy of insulating its infrastructure from external influence, particularly in the face of Western sanctions.

From an economic perspective, these projects represent substantial investments, such as the estimated 445 billion rubles allocated for the Rassvet project alone. Shelobkov's companies stand to benefit significantly from government funding and contracts, reinforcing their position as key players in Russia's high-tech sector. However, the heavy reliance on state financing raises questions about the sustainability and scalability of these efforts, especially given the economic strain of sanctions and global competition.

Challenges and Risks

Despite their ambitious objectives, Shelobkov's companies face several challenges that threaten the viability of their projects-

- **Technological Gaps-** While Yadro and AO IKS have made strides in hardware and software development, Russia's domestic production capabilities remain limited in areas like radiation-hardened components and high-efficiency satellite technology.
- **Production Scalability-** Bureau 1440's plan to deploy over 250 Rassvet satellites depends on the ability to mass-produce satellites and terminals. Current domestic manufacturing capabilities fall short of the required scale.
- **Economic Constraints-** The reliance on government funding exposes these projects to economic volatility. Any disruptions to funding or prioritization shifts could stall progress.

- Global Competition- Entities like Starlink and OneWeb have already established significant leads in satellite internet services, making it challenging for Rassvet to compete on cost, coverage, or technological sophistication.

Strategic Implications for Rassvet

Shelobkov's leadership and the interconnected structure of his companies create a robust framework for advancing Russia's satellite communication capabilities. However, the success of Rassvet depends on overcoming technological and economic hurdles. If successful, the project will significantly enhance Russia's strategic autonomy in communications, providing secure connectivity for military, government, and civilian applications. The integrated approach of Shelobkov's companies positions Rassvet as a cornerstone of Russia's broader push for technological sovereignty.

Alexey Shelobkov's stewardship of Yadro Group, ICS Holding, Bureau 1440, and AO IKS underscores a calculated effort to consolidate Russia's technological development under centralized leadership. The collaborative framework of these entities highlights their potential to drive innovation in satellite communications while also exposing vulnerabilities in scalability, funding, and technological readiness.

The interconnected efforts of Shelobkov's companies reflect a broader strategic objective to insulate Russia from reliance on foreign technologies. However, the challenges they face underscore the complexity of achieving such autonomy in a highly competitive and technologically advanced sector. The success of the Rassvet project will not only determine the future of Russia's satellite communications but will also serve as a litmus test for the viability of its broader push for technological sovereignty.

The development of Russian satellite communication systems such as Rassvet, Skif, and Express-RV represents a significant strategic move toward technological independence and national security. Recent approvals by the State Commission for Radio Frequencies (SCRF) highlight Russia's ambition to build sovereign satellite networks comparable to Elon Musk's Starlink. However, significant gaps in technological capability, economic resources, and deployment timelines raise questions about whether these projects can effectively compete in the global satellite communication market or even meet domestic demands.

Technological and Strategic Foundations

Rassvet, the flagship satellite initiative led by Bureau 1440 under ICS Holding, exemplifies Russia's effort to replicate the operational success of Starlink while ensuring that infrastructure remains firmly under Russian control. The SCRF has laid the groundwork for this initiative by approving subscriber terminal requirements for mobile and stationary applications streamlining deployment processes. These decisions align with a broader

strategy to strengthen Russia's autonomy in communication systems, particularly in light of sanctions and strained relations with Western technology providers.

Unlike Starlink's global focus and rapid deployment capabilities, Rassvet emphasizes regional connectivity and national security. All traffic from subscriber terminals must route through interface stations located within Russian territory, ensuring that data remains under domestic jurisdiction. This regulatory requirement underscores the project's prioritization of sovereignty over efficiency, introducing additional layers of complexity in deployment and scalability.

Starlink vs. Rassvet: A Comparative Perspective

The differences between Starlink and Rassvet highlight the challenges faced by Russia in entering an already competitive market dominated by technologically advanced players.

Operational Challenges and Limitations

Rassvet and similar initiatives face significant hurdles, particularly in technological readiness and production scalability. Russia's limited capacity to manufacture radiation-resistant components at scale constrains the deployment of satellites. Bureau 1440 has yet to demonstrate the ability to produce high-quality subscriber terminals or satellites at the pace required to achieve its deployment targets.

Economic pressures further complicate progress. With an estimated cost of 445 billion rubles, Rassvet places a substantial burden on Russia's strained economy. Sanctions exacerbate this challenge by restricting access to foreign technology and funding, forcing reliance on domestic resources that are not yet capable of meeting the project's ambitious demands.

Competition with established players like Starlink adds another layer of difficulty. SpaceX's dominance in the global market, achieved through a combination of technological innovation and cost efficiency, sets a high bar for entrants like Rassvet. Starlink's inter-satellite laser communication and reusable rocket technology allow for rapid, cost-effective deployment, a capability that Rassvet is unlikely to match in the near term.

Strategic Implications

Despite its challenges, Rassvet holds strategic importance for Russia. Satellite communication systems are increasingly central to national security, economic development, and military operations. By developing its systems, Russia seeks to reduce reliance on Western technology and fortify its communications infrastructure against external threats.

The project also has broader geopolitical implications. Rassvet's success could position Russia as a provider of satellite communication services for allied or sanctioned states looking for alternatives to Western-dominated systems. This potential for global influence aligns with Russia's broader strategic goals of countering Western hegemony in critical technologies.

Balancing Act Between Ambition and Reality

The development of Rassvet and related systems demonstrates Russia's determination to achieve sovereignty in satellite communications, a field dominated by Western players like Starlink. However, the project's success depends on overcoming significant challenges, including technological gaps, economic constraints, and competition with more advanced systems.

While the SCRF's decisions provide regulatory clarity, they cannot substitute for the technological innovation and economic resources required to compete on the global stage. Rassvet's trajectory will depend on Russia's ability to scale production, modernize its technology, and secure sustainable funding. Failure to address these issues risks leaving Rassvet as an aspirational project rather than a functional system capable of meeting its ambitious objectives.

The stakes are high, not only for Russia's communications infrastructure but also for its broader strategic positioning in the global technology race. Rassvet's success or failure will serve as a litmus test for the viability of Russia's efforts to achieve technological independence in an increasingly interconnected world.

Developments

The State Commission for Radio Frequencies (SCRF) has advanced Russia's ambitions for sovereign satellite communication networks by approving subscriber terminal requirements for systems like Rassvet, Skif, and Express-RV. These approvals underscore the nation's drive to achieve technological independence and fortify control over its communication infrastructure, especially amid increasing geopolitical tensions and Western sanctions. However, the challenges inherent in this project reveal a complex landscape of technological, economic, and competitive pressures that threaten to derail its progress.

Subscriber Terminals- Expanding Potential and Control

The SCRF's decision to greenlight subscriber terminals for satellite internet opens doors for mobile and fixed-location connectivity applications. The approval permits terminals to function on aircraft, ships, and land vehicles while also supporting stationary installations. Streamlining the regulatory process, the commission has allowed operators to import and

deploy these devices without requiring individual frequency permissions, creating a pathway for quicker implementation.

However, this flexibility comes with strict conditions. All terminal traffic must pass through interface stations located within Russian territory. Data sovereignty introduces potential bottlenecks in scalability and efficiency. Additionally, operators must retain the capability to disable terminals causing harmful interference, reinforcing system stability but adding layers of operational complexity.

Promises of Connectivity for Underserved Regions

The potential applications of these systems stand to transform connectivity in Russia. Airlines such as Aeroflot and transportation operators like Russian Railways are positioning themselves to incorporate satellite internet into passenger services, providing in-transit connectivity for flights and long-distance train routes. Moreover, the prospect of extending high-speed internet to remote and underserved regions could address longstanding digital divides, enabling socio-economic growth in areas previously excluded from reliable online access.

Satellite Deployment and Current Status

Russia's satellite internet ambitions hinge on three primary systems—Rassvet, Express-RV, and Skif. Rassvet currently operates six experimental satellites, with plans to launch over 250 units by the project's completion. Express-RV, targeting geostationary operations, is scheduled to see its first satellite launch in 2025. Skif, though lagging with just one demo satellite launched out of the planned twelve, remains a component of the broader initiative. Despite these aspirations, the gap between these early efforts and the scale of established players such as Starlink remains stark.

Challenges in Implementation

The timeline for achieving a fully operational network stretches far into the future. While the SCRF's proactive regulatory framework lays the groundwork for future growth, the technological readiness of Russia's satellite production capabilities remains a significant barrier. Bureau 1440, responsible for Rassvet, faces challenges in scaling production due to limited domestic capacity for manufacturing radiation-resistant components.

Economic pressures further exacerbate these difficulties. The combined cost of the projects, exceeding 445 billion rubles (\$4.8 billion), represents a heavy financial burden in an already strained economy. Sanctions not only restrict access to critical foreign technologies but also hinder the ability to secure funding or partnerships that could accelerate progress. In contrast, competitors like Starlink, with over 5,000 satellites already

operational, continue to dominate the global market with high-speed, low-latency internet services.

Strategic Implications for Russia's Global Positioning

The approval and development of these systems reflect a broader Russian strategy to secure technological sovereignty. Routing all traffic through domestic infrastructure and controlling terminal functionality addresses security concerns, protecting against external influence or interference. This approach strengthens national defense and intelligence capabilities while ensuring greater resilience against geopolitical adversaries.

On the economic front, expanded internet coverage promises to unlock new opportunities in remote regions, potentially fostering growth and innovation. However, questions about the feasibility of scaling such infrastructure and delivering competitive services remain unresolved. Russia's satellite networks, while conceived as domestic alternatives to Starlink, face substantial hurdles in becoming viable options for international markets. Nonetheless, countries aligned with Russia or seeking alternatives to Western-dominated systems might find appeal in these platforms, offering an avenue for Moscow to exert influence abroad.

A Competitive Reality

Russia's efforts to replicate Starlink's success illuminate the dual-edged nature of technological exposure. Starlink's deployment in Ukraine showcased the system's capabilities in real-time, offering operational lessons to Russian engineers and inadvertently accelerating their satellite development efforts. This reverse engineering, while inevitable in such scenarios, underscores the risks of deploying advanced technologies in conflict zones without adequate protection against their exploitation.

The Cost of Catching Up

Russia's ambitious satellite communication projects stand at the intersection of national security imperatives, technological challenges, and economic constraints. While the SCRF's regulatory clarity has provided a foundation, significant gaps remain in the ability to match the scale, efficiency, and innovation of competitors like Starlink. The path forward depends on overcoming domestic production limitations, securing sustainable funding, and addressing the broader strategic implications of lagging in this critical sector.

The effort to achieve satellite independence showcases Russia's determination to escape reliance on Western infrastructure, yet the cost of catching up in a rapidly advancing field threatens to leave its ambitions mired in delays and inefficiencies. Without a cohesive strategy to close the technological gap, the promise of Rassvet and its counterpart's risks

remain unrealized, exposing the nation to greater vulnerabilities in a highly competitive and strategically significant domain.

Reverse Engineering?

The Russian efforts to develop domestic satellite internet systems like Rassvet, which are modeled after the functionality of SpaceX's Starlink, represent a significant instance of reverse engineering inspired by the exposure and use of Starlink technology during the ongoing conflict in Ukraine. This development raises concerns about the unintended consequences of deploying advanced commercial technologies in conflict zones, as well as the ethical and geopolitical implications of Elon Musk's decisions in this context.

The Russian efforts to reverse engineer Starlink's technology and adapt it for domestic satellite projects like Rassvet reveal the significant risks of deploying advanced commercial systems in active conflict zones. The exposure of Starlink terminals and their sophisticated technology in Ukraine provided Russian engineers with an unprecedented opportunity to analyze, study, and potentially replicate these systems. Elon Musk's decisions surrounding the deployment and management of Starlink in Ukraine have had unintended but far-reaching consequences, laying bare critical vulnerabilities in the handling of dual-use technologies and their intersection with geopolitics.

Starlink's Role in Russian Reverse Engineering

The deployment of Starlink terminals in Ukraine offered an invaluable opportunity for Russian engineers to access advanced satellite communication technologies. Starlink's terminals feature high-efficiency phased array antennas, low-latency inter-satellite laser links, and scalable satellite manufacturing processes that enable mass deployment. Each of these features represents cutting-edge advancements that have redefined the satellite internet industry.

Russia likely gained insights into these capabilities through various means, including the capture of hardware and interception of signals in the battlefield environment. This exposure has accelerated Russia's efforts to design systems modeled on Starlink, particularly Rassvet, which seeks to replicate Starlink's operational versatility and scalability while ensuring full domestic control. The battlefield utility of Starlink—demonstrated through its adaptability, resilience, and dual-use potential for both civilian and military applications—provided a clear blueprint for Russia to emulate in its satellite initiatives.

Operational Insights from Starlink's Deployment

Starlink's resilience and effectiveness in Ukraine showcased its value as a tool for modern warfare. Its use in providing secure communication, supporting drone operations, and

enabling situational awareness has made it indispensable for Ukrainian forces. However, these same characteristics underscored its strategic importance, compelling Russia to prioritize the development of a domestic equivalent. The combination of Starlink's battlefield performance and its adaptability to civilian applications has revealed its potential as both a technological advantage and a strategic vulnerability.

Russia's Geopolitical Response

Faced with Starlink's operational success and its implications for Western dominance in satellite communications, Russia responded by accelerating its satellite programs. Rassvet, along with other initiatives like Skif and Express-RV, reflects Moscow's strategic pivot to creating independent satellite communication networks. These projects aim to ensure that Russia's satellite systems remain under complete domestic jurisdiction, free from the influence or control of external powers. The decision to prioritize sovereignty underscores the broader geopolitical pressures driving technological competition between Russia and the West.

Musk's Actions and Their Consequences

Musk's decision to deploy Starlink terminals in Ukraine initially provided a strategic advantage for Ukrainian forces. However, the absence of safeguards to prevent reverse engineering or misuse in hostile environments was a glaring oversight. The exposure of Starlink's technology-enabled Russia to study and adapt its systems, raising questions about the security protocols surrounding dual-use technologies deployed in conflict zones.

Subsequent decisions by Musk to restrict Starlink's military applications, such as limiting its use for offensive operations like drone strikes, introduced operational constraints for Ukraine. These restrictions not only weakened its effectiveness but also created inconsistencies in Musk's commitment to Ukraine's defense efforts. Such inconsistencies emboldened Russian efforts to develop alternatives, further illustrating the risks of entrusting pivotal technologies to private entities operating without strategic oversight.

Implications of Rassvet and Related Projects

The development of Rassvet and similar systems marks a significant step toward Russia's technological self-reliance. By achieving sovereignty in satellite communications, Russia reduces its dependence on Western technology and infrastructure. This development has far-reaching implications for military coordination, propaganda dissemination, and control over information flows. The ability to replicate and potentially enhance Starlink-like systems also provides Russia with a platform for disinformation campaigns and the export of such technologies to allied authoritarian states.

The erosion of Western advantages in satellite communications poses a direct threat to strategic dominance. Starlink's success in Ukraine demonstrated its utility as a critical tool for modern warfare. Russia's efforts to neutralize this advantage through the development of Rassvet undermine the technological superiority that has long been a cornerstone of Western military and economic power.

Privatized Geopolitics and Musk's Role

Allowing a private individual to wield such disproportionate influence in geopolitical conflicts underscores a fundamental failure in governance. Musk's unilateral decisions on Starlink's deployment and restrictions reflect the dangers of concentrating critical technological control in the hands of one person. The absence of accountability or coordination with Western governments highlights the ethical and strategic risks posed by privatized geopolitics.

Musk's actions have not only facilitated Russia's reverse engineering efforts but also accelerated the proliferation of advanced satellite technologies to adversarial states. This development complicates global security dynamics, as other nations may follow Russia's lead in replicating satellite systems, further destabilizing the balance of power in space-based communications.

The exposure of Starlink's technology in Ukraine and its subsequent adaptation by Russia exemplifies the unintended consequences of deploying advanced commercial systems in conflict zones. Musk's decisions—whether motivated by altruism, profit, or personal interests—have revealed the dangers of privatized control over dual-use technologies. Russia's efforts to replicate Starlink through projects like Rassvet threaten to undermine Western dominance in satellite communications, eroding strategic advantages that have long defined modern military and economic power.

A global response is required to address the vulnerabilities exposed by this situation. Governments must establish oversight mechanisms to prevent the unregulated deployment of critical technologies in conflict zones. Without such safeguards, the risks of reverse engineering, technological proliferation, and geopolitical destabilization will only continue to grow. Musk's actions, while well-intentioned, have laid bare a systemic failure to anticipate the broader consequences of technological exposure, underscoring the need for accountability and coordinated policy in managing the intersection of technology and geopolitics.

Musk's Actions

Elon Musk's actions in the Starlink-Ukraine-Russia conflict highlight a profound failure of accountability and an alarming example of the dangers of privatized control over critical

technologies with global strategic implications. Musk's unilateral decision-making, driven by personal whims and seemingly detached from coordinated government policies, has not only compromised Western technological superiority but also provided adversarial states with the blueprint to replicate these advancements. This reckless autonomy exposes systemic flaws in the governance of dual-use technologies and raises urgent questions about the unchecked power of private actors in geopolitics.

Unchecked Decision-Making in High-Stakes Scenarios

Musk's control over Starlink and its deployment in Ukraine demonstrates how private interests can supersede state authority in matters of international conflict. By deploying Starlink terminals to Ukraine without adequate safeguards against their misuse or exposure, Musk showcased a dangerous blend of opportunism and short-sightedness. His later decision to restrict the use of Starlink for military purposes—reportedly preventing offensive operations such as drone strikes—only further undermined the Ukrainian effort. These actions highlight the perils of entrusting global security dynamics to the unregulated decisions of a single individual who answers to neither voters nor international bodies.

Technology as a Weapon of Influence

Starlink is more than just a communication tool—it is a dual-use technology with profound implications for modern warfare, intelligence, and civil infrastructure. Musk's failure to anticipate the strategic value of this system and the risks of exposing it in active conflict zones enabled Russian actors to study and reverse-engineer its components. By exposing the operational and technological strengths of Starlink, Musk handed adversaries the keys to replicating a system that had previously given the West a clear advantage in both military and civilian applications.

This negligence is particularly damning given Musk's apparent lack of accountability to Western governments, whose support indirectly enabled SpaceX's dominance in the space and satellite industries. While enjoying billions in government contracts and subsidies, Musk acted independently of these governments' strategic priorities, showcasing an alarming disregard for the broader consequences of his actions.

Undermining National Security and Global Stability

The exposure of Starlink in Ukraine allowed Russia to accelerate its satellite internet projects, such as Rassvet. These systems now pose a direct threat to Western interests, providing Russia with secure, independent communications for military and intelligence purposes. The proliferation of such systems could erode the West's technological edge, particularly as Russia may export these capabilities to allied authoritarian states or use them to bolster its disinformation campaigns and military operations.

Musk's lack of foresight in this scenario demonstrates a severe disconnect between his private ambitions and the geopolitical realities surrounding his technology. His ability to operate Starlink without oversight has not only undermined the West's technological superiority but also emboldened adversaries to close the gap more quickly than anticipated.

The Ethical Dilemma of Privatized Geopolitics

Musk's actions exemplify the dangers of allowing private individuals and corporations to wield disproportionate influence in geopolitical conflicts. His inconsistent stance—supporting Ukraine initially, only to impose restrictions on military applications later—underscores the inherent instability of relying on privately controlled systems in matters of national security. These decisions were made without transparency, public accountability, or coordination with Western governments, exposing the fragility of relying on privatized infrastructure in conflict zones.

Starlink's role in the Ukraine conflict has set a dangerous precedent, one in which the personal inclinations of a single individual can dictate critical decisions affecting global security. Starlink, in this role, erodes democratic processes and exposes a troubling imbalance of power where private corporations operate with near-sovereign authority in matters of international significance.

Accountability?

Musk's handling of Starlink in the Ukraine-Russia conflict represents a catastrophic failure of foresight, responsibility, and accountability. His decisions have enabled the proliferation of advanced technologies to adversarial states, undermined Western security, and exposed systemic vulnerabilities in the governance of dual-use technologies. Musk's unchecked autonomy in this context is a stark reminder of the dangers of privatizing geopolitical influence and allowing strategic technologies to fall into the hands of individuals who operate outside the bounds of international oversight. His actions demand scrutiny and serve as a call to action for governments to reclaim control over critical infrastructure to prevent future travesties of this magnitude.

Wrap Up

Russia's Rassvet project reflects the country's commitment to securing technological independence in satellite communications, a pursuit driven by geopolitical pressures, economic constraints, and the global dominance of competitors like Starlink. Bureau 1440, with support from ICS Holding and affiliated entities, leads this ambitious effort to establish a domestically controlled satellite network capable of supporting national security and regional connectivity.

The project emerges as a strategic necessity in light of the demonstrated power of Starlink during the Ukraine conflict, where its advanced satellite technology redefined military operations and civilian communication capabilities. Russia's decision to accelerate Rassvet underscores the perceived urgency to counter such systems with a sovereign alternative. However, the technological divide between Starlink's operational advancements and Rassvet's nascent capabilities presents a formidable challenge. Limited production capacity, reliance on outdated or insufficient domestic resources, and the absence of scalable satellite manufacturing hinder progress.

Economic factors compound these challenges. The 445 billion ruble price tag, alongside the restrictions imposed by international sanctions, forces the project to rely heavily on state support. While regulatory approvals from the SCRF simplify some logistical hurdles, the broader question of whether Rassvet can achieve operational efficiency and competitive relevance remains unanswered. The current pace of deployment—six experimental satellites—lags far behind Starlink's global network of over 5,000 operational units.

Despite these difficulties, Rassvet holds significant promise for reshaping Russia's satellite communication infrastructure. It has the potential to provide secure, state-controlled internet access to underserved regions, support military operations, and offer alternative systems to nations seeking to diversify away from Western satellite providers. Achieving these goals depends on overcoming production bottlenecks, modernizing technology, and securing sustained investment.

The stakes for Rassvet extend beyond national boundaries. Its success or failure will influence Russia's technological standing and its ability to compete in the rapidly evolving global satellite market. The effort encapsulates the tension between aspiration and practicality, where ambition meets the limitations of current resources. Russia's ability to bridge these gaps will determine whether Rassvet emerges as a transformative achievement or remains a symbol of unmet potential. The coming years will reveal whether Bureau 1440 and its partners can defy the odds and deliver a system capable of challenging the dominance of Starlink and its peers.

Appendix A – Corporate Registrations

Bureau 1440

Full legal name- OBSHESTVO S OGRANICHENNOJ OTVETSTVENNOSTYU "BYURO 1440"

Leader- SHelobkov Aleksej Anatolevich

Date of entry in the register- 08.12.2020

The authorized capital- 2616.28 ths rub.

Number of staff- 216

Number of founders- 5

Contact Information-

Legal address- RUSSIA, 123022, G.MOSCOW, MUNITCIPALNIJ OKRUG PRESNENSKIJ, PER STOLYARNIJ, D. 3, K. 14, POMESH. 1 N 

E-mail- info@1440.space

Site (www)-

Telephone(s)-

Requisites organization (the data from the register)-

TIN (INN)- 7707446530

KPP (tax registration reason code)- 770701001,770301001

OKPO (All-Russian Classifier of Enterprises and Organizations)- 46594387

OGRN (Primary state registration number)- 1207700466588

OKFS (National Classification of ownership)- 16 - Private property

OKOGU (National Classification of state power and control)- 4210014 - Organizations established by legal entities or citizens or legal entities and citizens together

OKOPF (National Classification of legal forms)- 12300 - Limited liability companies

OKTMO (National Classification of municipalities)- 45380000000

OKATO (National Classification of administrative and territorial division)- 45286585 - city Moscow , TCentralnij, Tverskoj

Types of activity-

Additional-

32.20	Manufacture of television and radio transmitting equipment, telecommunications equipment
35.30	Manufacture of aircraft, including space
35.30.4	Production of spacecraft, launch vehicles and other space objects
36.22.1	Production of technical use of precious metals
64.20	Activities in Telecommunications
72.20	Software development and consulting in this area
72.6	Other activities related to the use of computers and information technology
72.60	Other activities related to the use of computers and information technology

The founders of the company-

Name	Share	Amount
company	0%	0 ths rub.
company	0%	0 ths rub.
company	0%	0 ths rub.

Is or has been in the past founder of the following organization-

Date	Name	Share	Amount
20.02.2024	AO "LABS 1440"	0%	1000 ths rub.

29.05.2023	AO "FAB RASSVET"	0%	1000 ths rub.
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The results of the year 2022-

2022 2021 2020

Financial statements (accounting figures)-			
Code	Indicator	Value	Unit
F1.1100	Total for Section I - Non-current assets	3405160	ths rub.
F1.1200	Total for Section II - Current assets	2352260	ths rub.
F1.1600	BALANCE (asset)	5757420	ths rub.
F1.1300	Total for Section III - capital	4581320	ths rub.
F1.1400	Total for Section IV - Long-term liabilities	651474	ths rub.
F1.1500	Total for Section V - Short-term liabilities	524622	ths rub.
F1.1700	BALANCE (passive)	5757420	ths rub.
F2.2100	Gross profit (loss)	-194776	ths rub.
F2.2200	Profit (loss) from sales	-627417	ths rub.
F2.2300	Profit (loss) before tax	-665239	ths rub.
F2.2400	Net income (loss)	-544626	ths rub.
F2.2500	The total financial result of the period	-544626	ths rub.

Quick Reference-

Company OOO "BYURO 1440" registered December 08 2020 year at 123022, G.MOSCOW, MUNITCIPALNIJ OKRUPRESNENSKIJ, PER STOLYARNIJ, D. 3, K. 14, POMESH. 1 N. Company was assigned OGRN 1207700466588 and the TIN 7707446530. The company is headed SHelobkov Aleksey Anatolevich. For 2022 year company made a loss 544626 ths rub.

DESIGN AND TECHNOLOGY BUREAU 1440

Full legal name- OBSHESTVO S OGRANICHENNOJ OTVETSTVENNOSTYU
"KONSTRUKTORSKO-TEHNOLOGICHESKOE BYURO 1440"

Leader- CHelpachenko Stanislav Anatolevich

Date of entry in the register- 30.10.2024

The authorized capital- 10 ths rub.

Number of founders- 1

Contact Information-

Legal address- RUSSIA, 123112, G.MOSCOW, MUNITCIPALNIJ OKRUG PRESNENSKIJ, NAB
PRESNENSKAYA, D. 8,STR. 1, STR. 1, POMESH. 245M 

E-mail-

Site (www)-

Telephone(s)-

Requisites organization (the data from the register)-

TIN (INN)- 9703194998

KPP (tax registration reason code)- 770301001

OKPO (All-Russian Classifier of Enterprises and Organizations)-

OGRN (Primary state registration number)- 1247700716163

OKOPF (National Classification of legal forms)- 12300 - Limited liability companies

OKATO (National Classification of administrative and territorial division)- [45](#) - city Moscow

Types of activity-

Additional-

72.1	Hardware consultancy Computer Engineering
72.10	Advice on hardware computing
72.4	Creation and use of databases and information resources, including the resources of the Internet

72.40	Creation and use of databases and information resources, including the resources of the Internet
74.20.13	Design, associated with the construction of engineering structures, including hydraulic structures, design of traffic flow
74.20.12	Design of production facilities, including the placement of machines and equipment

The founders of the company-

Name	Share	Amount
CHELPACHENKO STANISLAV ANATOLEVICH	100%	10 ths rub.

Quick Reference-

Company OOO "KTB 1440" registered October 30 2024 year at 123112, G.MOSCOW, MUNTCIPALNIJ OKRUPRESNENSKIJ, NAB PRESNENSKAYA, D. 8,STR. 1, STR. 1, POMESH. 245M. Company was assigned OGRN 1247700716163 and the TIN 9703194998. The company is headed CHelpachenko Stanislav Anatolevich. For year company made a loss/

LABS 1440

Full legal name- AKTCIONERNOE OBSHESTVO "LABS 1440"

Leader- Upravlyayushaya Kompaniya Obshestvo S Ogranichennoj Otvetstvennostyu "Byuro 1440"

Date of entry in the register- 20.02.2024

The authorized capital- 1000 ths rub.

Number of founders- 1

Contact Information-

Legal address- RUSSIA, 109316, G.MOSCOW, MUNTCIPALNIJ OKRUG PECHATNIKI, PR-KT VOLGOGRADSKIJ, D. 42, K. 5, POMESH. 1N 🇷🇺

E-mail-

Site (www)-

Telephone(s)-

Requisites organization (the data from the register)-

TIN (INN)- 9723224746

KPP (tax registration reason code)- 772301001

OKPO (All-Russian Classifier of Enterprises and Organizations)- 94072891

OGRN (Primary state registration number)- 1247700177702

OKFS (National Classification of ownership)- 16 - Private property

OKOGU (National Classification of state power and control)- 4210014 - Organizations established by legal entities or citizens or legal entities and citizens together

OKOPF (National Classification of legal forms)- 12267 - Private companies limited

OKTMO (National Classification of municipalities)- 45393000000

OKATO (National Classification of administrative and territorial division)- 45290582 - city Moscow , YUgo-Vostochnij, Pechatniki

Types of activity-

Additional-

32.20	Manufacture of television and radio transmitting equipment, telecommunications equipment
35.30	Manufacture of aircraft, including space
35.30.4	Production of spacecraft, launch vehicles and other space objects
36.22.1	Production of technical use of precious metals
64.20	Activities in Telecommunications
72.20	Software development and consulting in this area
72.6	Other activities related to the use of computers and information technology
72.60	Other activities related to the use of computers and information technology

The founders of the company-

Name	Share	Amount
OOO "BYURO 1440"	0%	1000 ths rub.

Quick Reference-

Company AO "LABS 1440" registered February 20 2024 year at 109316, G.MOSCOW, MUNITCIPALNIJ OKRUPECHATNIKI, PR-KT VOLGOGRADSKIJ, D. 42, K. 5, POMESH. 1N. Company was assigned OGRN 1247700177702 and the TIN 9723224746. The company is headed Upravlyayushaya Kompaniya Obshestvo S Ogranichennoj Otvetstvennostyu "Byuro 1440". For year company made a loss

JOINT-STOCK COMPANY "FAB RASSVET"

Full legal name- AKTIONERNOE OBSHESTVO "FAB RASSVET"

Leader- Kanunnikov Boris Aleksandrovich

Date of entry in the register- 29.05.2023

The authorized capital- 1000 ths rub.

Number of founders- 1

Contact Information-

Legal address- RUSSIA, 141981, MOSKOVSKAYA AREA, DUBNA, G. DUBNA, G DUBNA, UL BOLSHEVOLZHSKAYA, D. 21 🇷🇺

E-mail-

Site (www)-

Telephone(s)-

Requisites organization (the data from the register)-

TIN (INN)- 5010061227

KPP (tax registration reason code)- 501001001

OKPO (All-Russian Classifier of Enterprises and Organizations)- 50046987

OGRN (Primary state registration number)- 1235000068346

OKFS (National Classification of ownership)- 16 - Private property

OKOGU (National Classification of state power and control)- 4210014 - Organizations established by legal entities or citizens or legal entities and citizens together

OKOPF (National Classification of legal forms)- 12267 - Private companies limited

OKTMO (National Classification of municipalities)- 46718000001

Types of activity-

Additional-

35.30	Manufacture of aircraft, including space
72.20	Software development and consulting in this area
72.6	Other activities related to the use of computers and information technology
72.60	Other activities related to the use of computers and information technology
74.20.14	Drafting industrial processes and production related to electrical engineering, electronic engineering, mining, chemical engineering, mechanical engineering, as well as in the field of industrial engineering, systems engineering and safety
73.10	Research and experimental development on natural sciences and engineering

The founders of the company-

Name	Share	Amount
company	0%	0 ths rub.

The results of the year 2023-

2023

Financial statements (accounting figures)-
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Code	Indicator	Value	Unit
F1.1100	Total for Section I - Non-current assets	61086	ths rub.
F1.1200	Total for Section II - Current assets	9821	ths rub.
F1.1600	BALANCE (asset)	70907	ths rub.
F1.1300	Total for Section III - capital	868	ths rub.
F1.1400	Total for Section IV - Long-term liabilities	2153	ths rub.
F1.1500	Total for Section V - Short-term liabilities	67886	ths rub.
F1.1700	BALANCE (passive)	70907	ths rub.
F2.2100	Gross profit (loss)	0	ths rub.
F2.2200	Profit (loss) from sales	-84	ths rub.
F2.2300	Profit (loss) before tax	-134	ths rub.
F2.2400	Net income (loss)	-132	ths rub.
F2.2500	The total financial result of the period	-132	ths rub.

Quick Reference-

Company AO "FAB RASSVET" registered May 29 2023 year at 141981, MOSKOVSKAYA AREA, DUBNA, G. DUBNA, DUBNA, STR. BOLSHEVOLZHSKAYA, D. 21. Company was assigned OGRN 1235000068346 and the TIN 5010061227. The company is headed Kanunnikov Boris Aleksandrovich. For 2023 year company made a loss 132 ths rub.

Alexey Shelobkov Companies

[OOO "GK YADRO"](#) (OBSHESTVO S OGRANICHENNOJ OTVETSTVENNOSTYU "GRUPPA KOMPANIJ YADRO", TIN- 7703399790, address- G MOSCOW, PR KRASNOVOROTSKIJ, D 3 B, STR 1)

[OOO "IKS HOLDING"](#) (OBSHESTVO S OGRANICHENNOJ OTVETSTVENNOSTYU "IKS HOLDING", TIN- 9701124836, address- 119607, G.MOSCOW, MUNITCIPALNIJ OKRUG RAMENKI, PR-KT MICHURINSKIJ, D. 27, K. 5, POMESH. 9)

[ООО "BYURO 1440"](#) (OBSHESTVO S OGRANICHENNOJ OTVETSTVENNOSTYU "BYURO 1440", TIN- 7707446530, address- 123022, G.MOSCOW, MUNITCIPALNIJ OKRUG PRESNENSKIJ, PER STOLYARNIJ, D. 3, K. 14, POMESH. 1 N)

[АО "IKS"](#) (AKCIONERNOE OBSHESTVO "IKS", TIN- 9729362975, address- 119607, G.MOSCOW, MUNITCIPALNIJ OKRUG RAMENKI, PR-KT MICHURINSKIJ, D. 27, K. 5)

