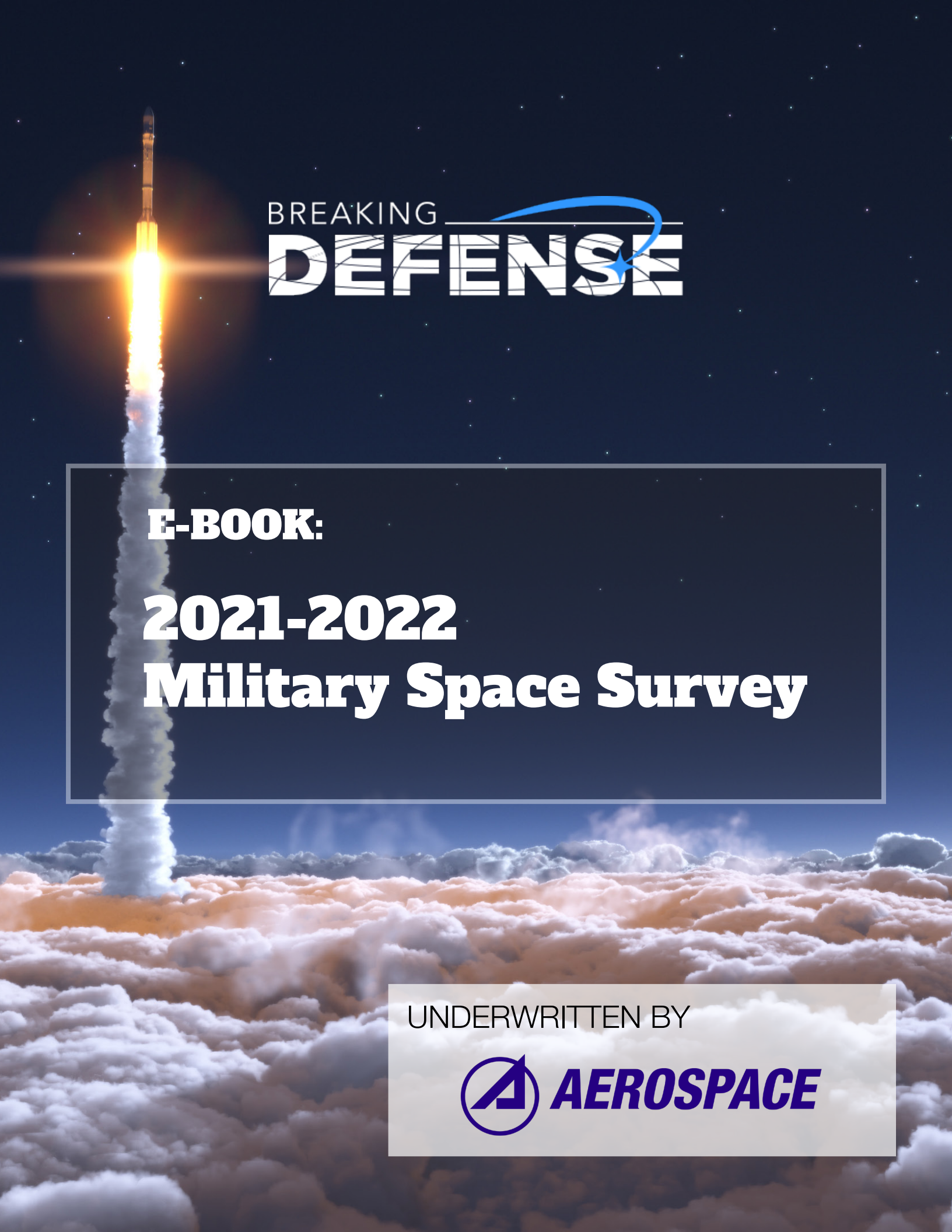

BREAKING DEFENSE

E-BOOK:

2021-2022 Military Space Survey

UNDERWRITTEN BY

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Editor's Letter

BREAKING DEFENSE

For years, the military space community was something of an outcast within its own house. While the services would pay lip service to how important space was, those involved directly in the community felt they were sidelined within the Air Force and elsewhere. That changed suddenly when then-President Trump declared the creation of a US Space Force, and a sudden wave of attention — from both the public and the defense industry — came along.

Roughly 20 months after the creation of the Space Force, Breaking Defense launched a first-of-its-kind attempt to take the temperature of America's military space community, with the aptly named Breaking Defense Military Space Survey. The online survey, which ran from mid-August to mid-September, polled almost 500 space professionals on a variety of topics, including the greatest threats to America's space ambitions, the growing role of the Space Force, and what space capabilities need the most investment going forward.

Roughly a third of the respondents identified themselves as being in military or government, while two-thirds identified themselves as defense/space industry or government contractors. Thirty-five percent identified themselves as an "Executive, Senior Management, Director, or equivalent," with another 27% identifying themselves as "Manager, Program Manager, Technical Manager or equivalent."

Inside this collection, you'll find a series of stories and infographics hitting the most interesting results from the survey. We'd also encourage you to take time and watch the Space Survey Roundtable, in which four experts debate the results and what they mean for America.

Fascinatingly, after the survey was completed, the military space picture only became more complicated. The last three months of 2021 saw the reveal of a Chinese fractional orbital bombardment system that was deployed on a hypersonic glide vehicle, a shocking Russian anti-satellite test that sent debris spinning through orbit, and the advent of megaconstellations in the commercial sector. It will be fascinating to see how that is all reflected in the 2022 edition of the survey – coming later this year.

Thanks for your readership,

Aaron Mehta
Editor in Chief

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BREAKING DEFENSE

Cyber Concerns, Classification Disagreements Lead Space Survey Results

The first-ever Breaking Defense Space Survey gathered information from national security space professionals in government, the military, and industry.

Managing digital operations in space is a major concern for experts. (Joshua J. Seybert / Air Force)

By AARON MEHTA on October 27, 2021 at 4:45 AM

WASHINGTON: More than any other threat, cyber attacks are the greatest concern for the US national security enterprise in the next five years, according to the results of the first ever Breaking Defense Space Survey.

The online survey, which ran from mid-August to mid-September, polled almost 500 space professionals on a variety of topics, including the greatest threats to America's space ambitions, the growing role of the Space Force, and what space capabilities need the most investment going forward.

Roughly a third of the respondents identified themselves as being in military or government, while two-thirds identified themselves as defense/space industry or government contractors. Thirty-five percent identified themselves as an "Executive, Senior Management, Director, or equivalent," with another 27% identifying themselves as "Manager, Program Manager, Technical Manager or equivalent."

While the idea of space-based kinetic warfare captures the public imagination, the professionals polled for this survey highlighted cyberattacks as the "greatest challenge" to for US security in orbit and beyond.

Overall, 35% of respondents listed cyber as the greatest concern, easily outpacing the next closest response, domestic politics, at 22%. That concern jumps to 47% when looking just at members of the Defense Department — those who are actively involved in day-to-day operations and may have a better sense of the kind of cyber activities other nations are playing with.

Given those concerns, it's not surprising that 75% of overall respondents listed cyber security as "extremely important" for space systems — and not a single respondent said it wasn't important at all.

Brian Weeden, head of program planning at the Secure World Foundation, told Breaking Defense that satellites are "increasingly becoming complex computer systems controlled by networks of computers on the ground and communicating with computer systems held by end users." As a result, "any point in that system can be attacked, and in most cases more cheaply and easier than developing an anti-satellite weapon."

It's certainly a threat DoD is aware of, said Justin Johnson, who held a number of Pentagon space roles in the Trump administration, concluding as the acting assistant secretary of defense for space policy.

"In both daily competition and in conflict, cyber security has to be a top priority, for DoD writ large and for space systems specifically," said Johnson, who stressed he was speaking solely as a former official and not in his current industry role. "In many ways, degrading, disrupting, or disabling a space capability via cyber is much more attractive to a potential adversary. It may be deniable or reversible, and it does not damage the space ecosystem in the same way that an ASAT missile would create a space debris cloud."

To Classify Or Not To Classify

Relatedly, there seems to be a split in the space community about greater transparency when it comes to space-based threats and capabilities.

Just under 50% of respondents reported that threat information to space systems should be disclosed or unclassified more often, with 33% saying it should not and the remainder "not sure" of their stance. Those numbers remain about the same if broken down by either DoD officials or industry.

However, almost 58% of respondents believe that American offensive space-based capabilities should not be declassified, with only 23% calling for great transparency of those systems. Interestingly, defense officials are 10% more likely to call for declassifying offensive space systems.

The survey results come at a time that DoD is grappling with the question of over-classification, with Gen. John Hyten, the vice chairman of the Joint Chiefs of Staff, leading the charge. As Breaking Defense first reported, Hyten is pushing declassify the existence of a secret space weapon program and provide a real-world demonstration of its capabilities.

Said Johnson, "There is no question in my mind that space has been over-classified for a long time. The hard task is finding the right balance going forward. The American people and our friends and allies need to understand the threats we face in space."

"Multiple US administrations have made it a priority to deter attacks against US space assets and establish norms of responsible behavior in space," Weeden noted. "Given those priorities, I think the US needs to be more open about its offensive capabilities, although it should keep a lot of the specifics classified like we do in other domains. We talked about the existence of submarines and stealth bombers, but not how fast they can go or how stealthy they really are."

Another area of the poll covered concerns about how DoD is handling its data related to space. A frequent line from DoD officials is that the department is drowning under a "tsunami of data," where the Pentagon has plenty of assets to gather information but doesn't know how to really handle it.

That concern is reflected in that 47% of respondents ranked the US national security enterprise's current data-processing posture as adequate, just barely out-polling "poor" at 44%. Less than 10% of respondents said it was "good." And industry seems less impressed than DoD with its capabilities; where 37% of DoD respondents reported that the current posture is poor, 46% of contractor respondents gave that low grade.

For his part, Weeden thinks the respondents may be too positive, putting himself firmly in the "very poor" category, in part due to multiple failed acquisition efforts over the last two decades that have left the data infrastructure in bad shape.

Has Space Force Helped Improve Space Acquisition? Survey Respondents Are Split

While almost 20% of overall respondents believe that the Space Force is not effective "at all" at improving space acquisition, there is a major split between views of DoD and industry; just 4% of DoD respondents said Space Force hasn't helped, while 23% of industry respondents held that view.

Will systems like the SBIRS (Space Based Infra-Red System) satellite be easier to procure in the future? (File)

By AARON MEHTA on October 28, 2021 at 6:28 AM

WASHINGTON: Perhaps the biggest focus of America's space reorganization push of the last few years has been to try and get the famously slow-moving space acquisition community consolidated into a more logical setup, versus the balkanized office structure that was previously spread across multiple services and agencies.

How effective that has been seems very much up for debate. Congress has expressed concern the reorg has not happened quickly enough, and Air Force Secretary Frank Kendall continues to tinker with the layout.

But respondents to the first ever Breaking Defense Space Survey, at least, see reasons for some optimism.

The largest cohort of respondents, 37%, reported that the Space Force has been "moderately effective" at improving space acquisition, with 29% saying it has been "slightly effective," and 11% "very effective."

Notably, while almost 20% of overall respondents believe that the Space Force is not effective "at all" at improving space acquisition, there is a major split between views of DoD and industry; just 4% of DoD respondents said Space Force hasn't helped, while 23% of industry respondents held that view.

To Brian Weeden, head of program planning at the Secure World Foundation, the Space Force's impact on acquisition has been "minimal." However, Weeden said he's not surprised there is a split between views inside and outside the building.

"I think it's harder for those inside the Space Force to step back and honestly evaluate its progress to date given the intense pressure to have it be seen as successful," he said.

Justin Johnson, who was involved in discussions around the creation of the Space Force while at the Pentagon during the Trump administration, agreed that the newest service "still isn't move fast enough" to accelerate space capabilities. "The numbers from industry are consistent with perspectives I hear, particularly from the newer and more innovative parts of the space industry," he said.

Another part of the acquisition reorganization was the creation of the Space Development Agency. A stand-alone office reporting up to the undersecretary of defense for research and engineering, from the start there have been questions about why SDA is not part of the Space Force or under the Department of the Air Force's acquisition community.

Kendall has recently made moves to speed up the SDA's transfer to the DAF, and he's likely to find support, based on respondents to the poll. The largest group of respondents, 42%, reported that the Space Development Agency should live under the Space Force; 32% feel SDA should continue to operate independently, with 25% saying they aren't sure. The number supporting SDA's merger into the Space Force jumps to 47% when polling just defense officials, showing a plurality of support for SDA to no longer exist as an independent entity.

Johnson noted that the idea was always for SDA to eventually move into Space Force, and said that while the agency "hasn't been perfect," it's moving faster than almost anywhere else in the space enterprise. "So the question is whether pulling SDA into the Space Force can achieve more unity of effort without squashing the energy and momentum that SDA is bringing."

Weeden agrees that bringing SDA inside the Space Force comes with some risks of lost ideas.

"If the goal is to harmonize and consolidate defense space acquisitions, then I'm not surprised at the push to bring SDA back into the fold," said Weeden. "However, it was originally created because there was too much resistance inside Air Force Space Command to changing the way acquisition was done, and if it is brought back into the Space Force, I think there's a good chance the new approach the SDA has developed could be lost."

Is the Space Force doing what it's supposed to?

Respondents to the Breaking Defense Space Survey have differing opinions on how effective the Space Force has been, two years in.

The Space Force is two. Its growing pains are real. (Greg Nash – Pool/Getty Images)

By AARON MEHTA on January 13, 2022 at 10:23 AM

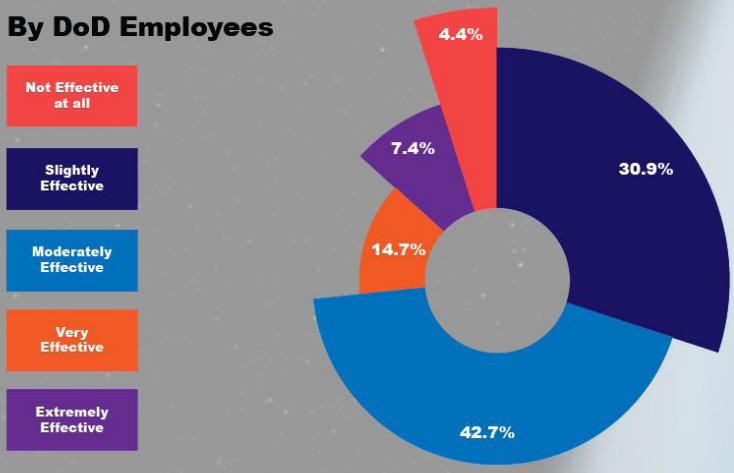
WASHINGTON: In December, the Space Force turned two years old, which, as a key member of Congress recently told Breaking Defense, means the service has entered the toddler stage. It also means that lawmakers are ready to start asking whether the service is operating as it needs to, particularly in the realm of acquisition reform, a priority for 2022.

During the first ever Breaking Defense Space Survey, we polled almost 500 space professionals on a variety of topics, including the greatest threats to America's space ambitions, the growing role of the Space Force and what space capabilities need the most investment going forward. As part of that, we asked a number of questions about America's youngest military branch and how well it plays with others.

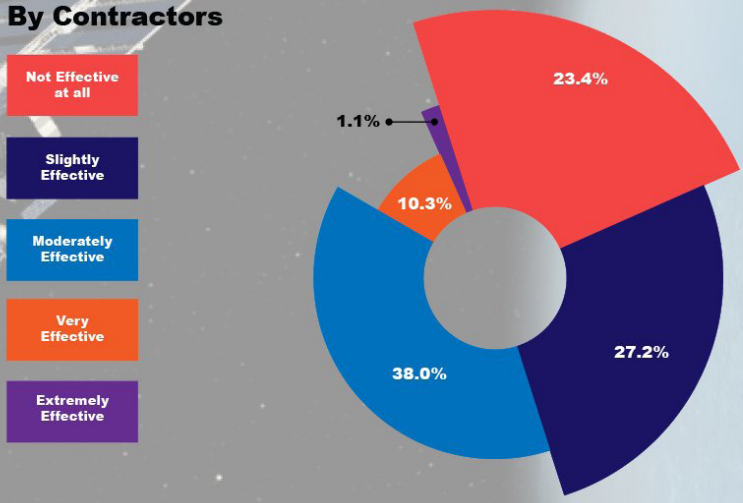
In the graphics below, we present the responses to three key questions about the Space Force – something of a two year checkup.

How effective has Space Force been at improving space acquisition?

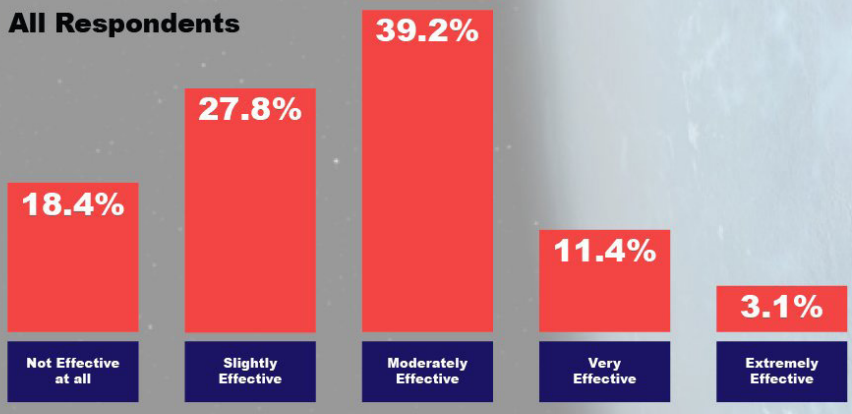
By DoD Employees



By Contractors



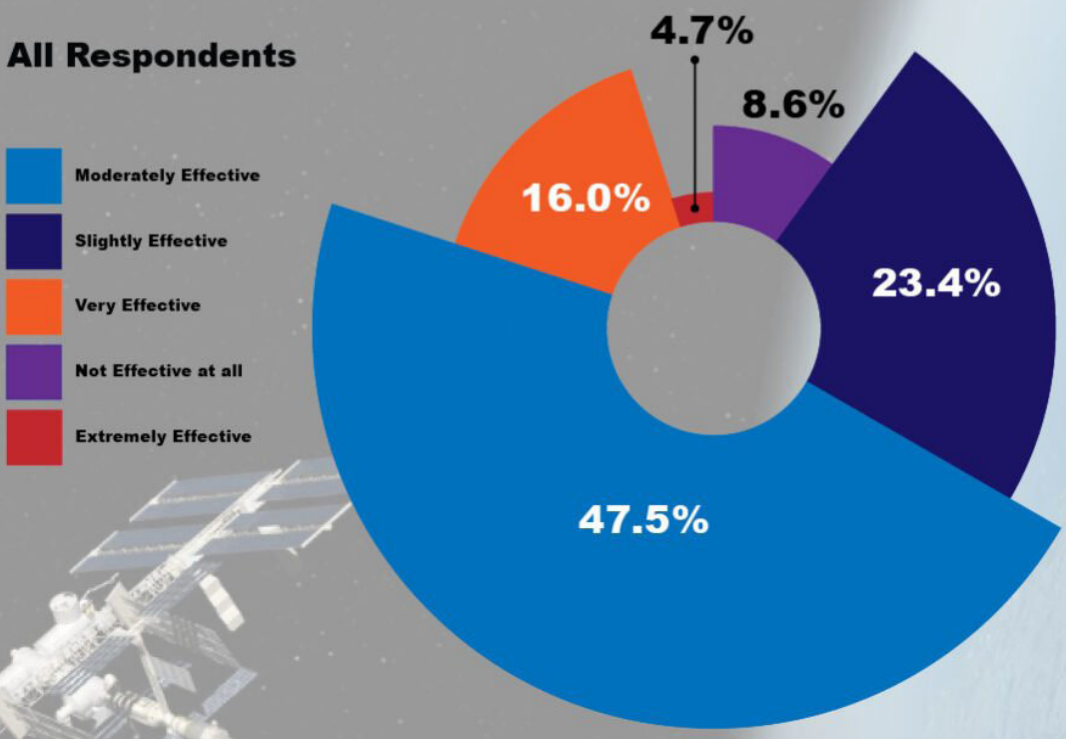
All Respondents



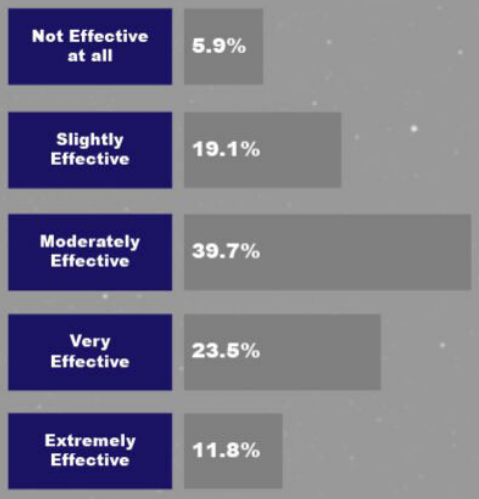
BREAKING DEFENSE

How effectively do the Intelligence Community, Air Force, and Space Force work together?

All Respondents



By DoD Employees



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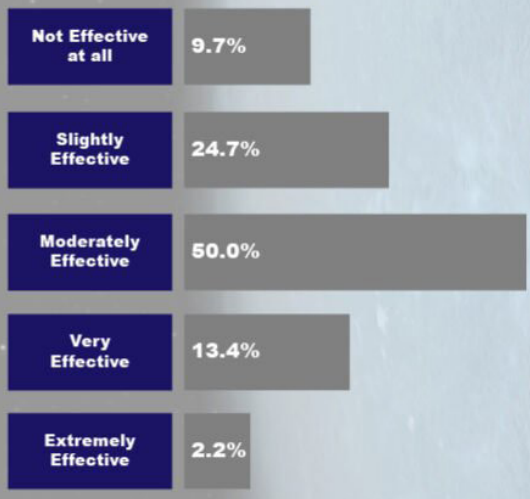
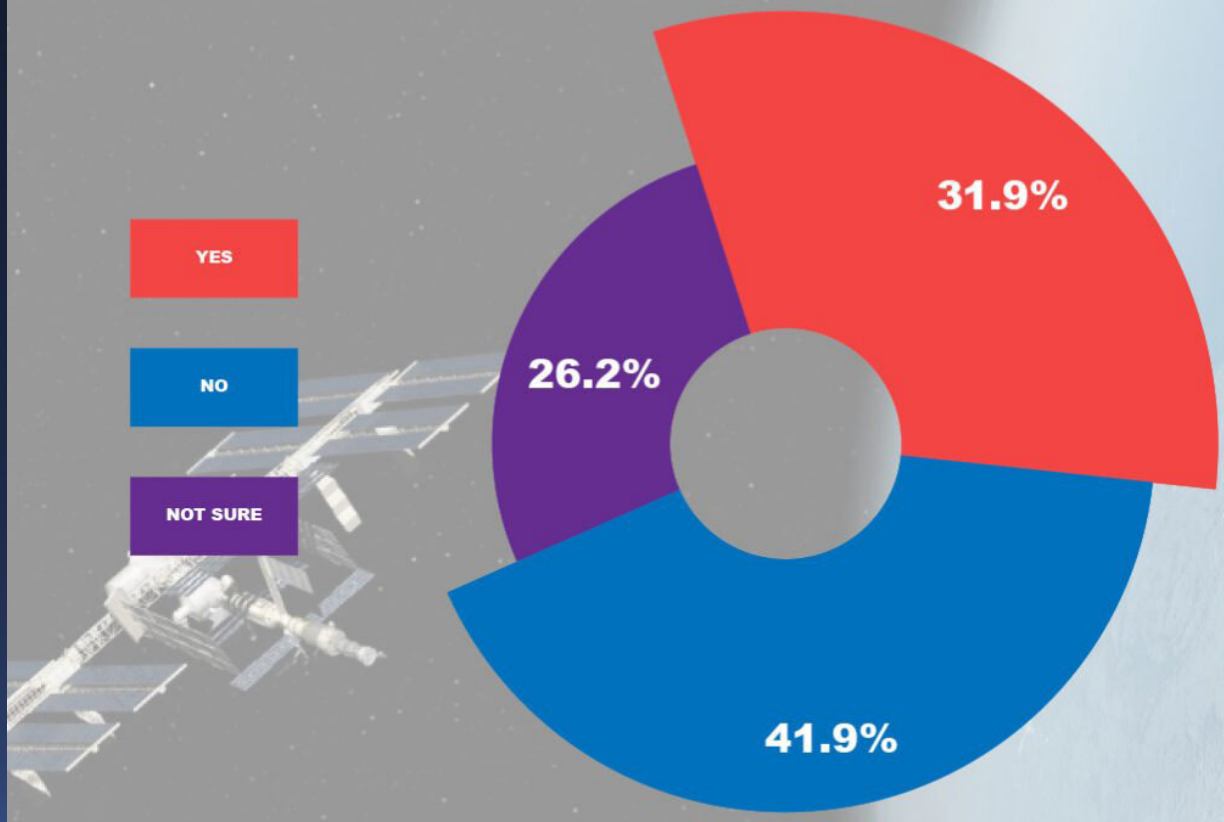


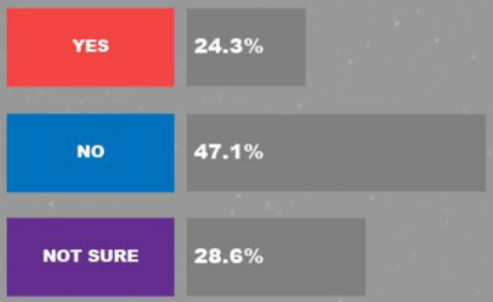
BREAKING DEFENSE

Should the Space Development Agency continue to operate independently of the Space Force?

All Respondents



By DoD Employees



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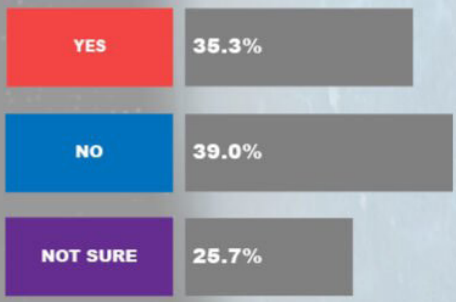


BREAKING DEFENSE

Space Force Plans Up To $2.3B In COMSATCOM Contracts

The planned buy with the largest potential value is for DoD-wide SATCOM services from commercial operators of p-LEO constellations, with multiple awards totaling $875 million slated in August 2022.

SpaceX plans to put some 40,000 Starlink satellites in Low Earth Orbit.

By THERESA HITCHENS on October 29, 2021 at 1:21 PM

WASHINGTON: Beginning next month, the Space Force intends to issue a series of solicitations for commercial satellite communications bandwidth, equipment and services — with up to $2.3 billion in awards to be issued between 2022 and 2023.

The acquisition plan, outlined today in an industry briefing by Mike Nichols of the Commercial Satellite Communications Office (CSCO), covers COMSATCOM bandwidth from L-band to Ku-band to X-band for a variety of US military organizations, including Combatant Commands and the Space Force itself. Under the plan, CSCO intends to issue requests for proposals (RFPs) in 2021 worth up to $970.1 million, and worth up to $1.33 billion in 2022. The actual contract awards are expected to be made in 2022 and 2023, respectively.

According to the Breaking Defense Space Survey, which ran from mid-August to mid-September, nearly 54% of DoD officials responding consider COMSATCOM to be 'extremely important' in wartime, with another 34% tagging it as 'very important.' Indeed, Chief of Space Operations Gen. Jay Raymond has been pushing to increase Space Force's reliance on commercial providers.

CSCO, headed by Clare Grason, is the sole DoD authority for acquisition of COMSATCOM services and capabilities. It serves as a middleman between commercial satellite operators and then matches the needs of various operational commands and other DoD customers to a provider — helping manage the contracting process. The office formerly was an arm of the Defense Information Systems Agency, but was transferred to Air Force Space Command in 2018 and now resides under Space Force's acquisition unit, Space Systems Command.

In the slides presented by Nichols today, CSCO explained that its acquisitions cover four "service areas."

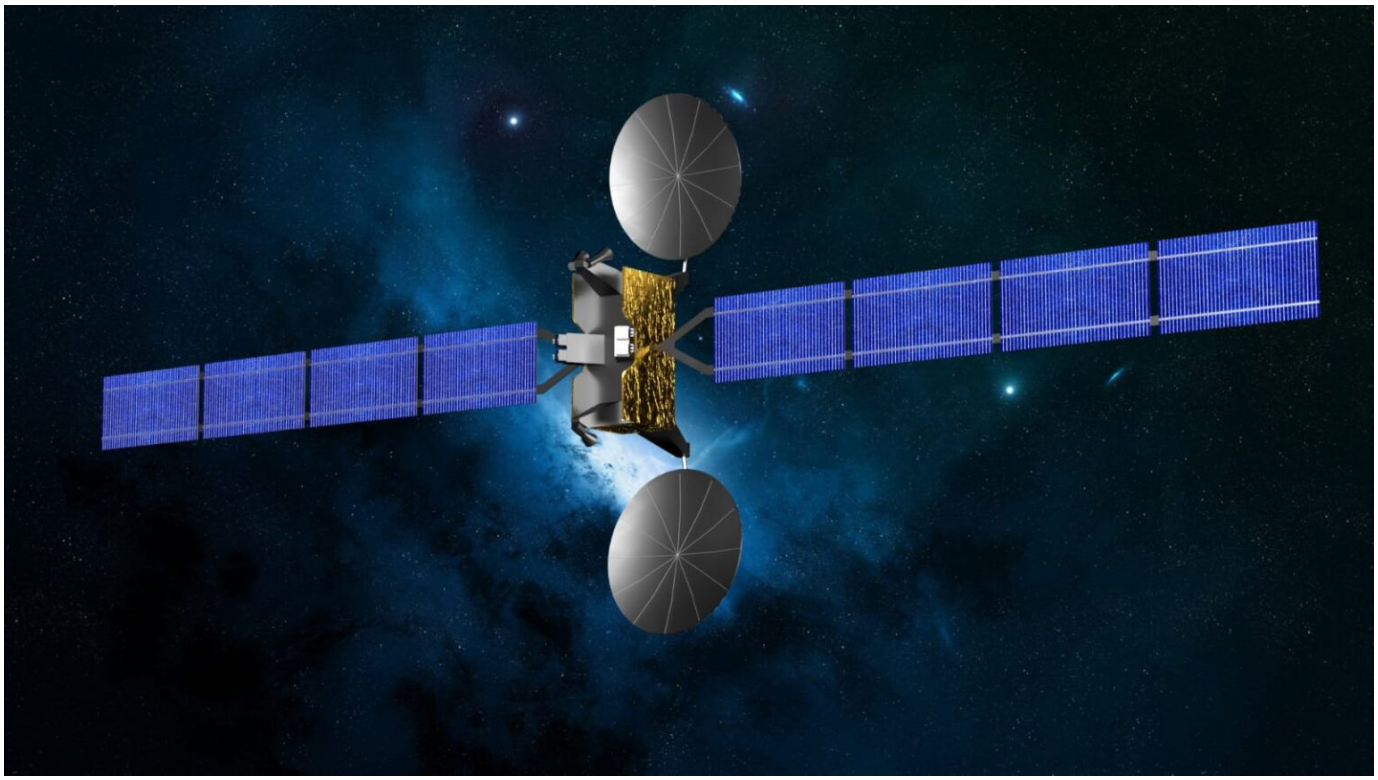
- **COMSATCOM Transponded Capacity (CTC)** includes requirements with satellite bandwidth and power only, as well as limited engineering services such as link budgets and transmission plans. It allows customer-proposed waveforms and industry-approved solutions to apply leased bandwidth to meet individual requirements.
- **COMSATCOM Subscription Services (CSS)** are for use with fixed satellite services (FSS) or mobile satellite services (MSS). It uses contractor determined waveforms that are billed on a per-use basis. CSS includes rates for vendor-defined network management monitoring engineering, integration, licensing, and operations required to deliver the services.
- **Complex Commercial SATCOM Solutions (CS3)** allows DoD to build large, complex, custom satellite solutions. These include satellite transport (bandwidth), fixed or mobile satellite service, and service-enabling components such as terminals, handsets, and tail circuits with engineering services to integrate, operate, and maintain the solution.
- **COMSATCOM Satellite Business Solutions (SBS)** is a solution other than the FCSA solutions for FSS or MSS. Prospective acquisitions that are not anticipated to use FCSA solutions may utilize existing Blanket Purchase Agreements (BPAs), Indefinite-Delivery Indefinite-Quantity contracts (IDIQs) or using full and open competition.

Overall during 2021 and 2022, the planned acquisition with the largest potential value is for DoD-wide SATCOM services from commercial operators of large constellations in Low Earth Orbit, known as p-LEO, for "proliferated LEO," satellites. That solicitation is expected to go out to industry in March 2022, with an award in August 2022 of an indefinite delivery/indefinite quantity (ID/IQ) contract worth up to $875 million. However, that contract will not be managed by CSCO, according to the slides presented today, but rather by Space Systems Command at a higher level.

According to Nichols' slides, CSCO will award multiple ID/IQ awards for p-LEO "satellite low-latency services, equipment and capabilities for all domains and use cases, to include both user-to-user capabilities and reach-back capabilities such as terrestrial back haul for end-to-end connectivity."

The second largest planned buy is for the Army's Blue Force Tracker II program that uses GPS and other signals to provide location information about friendly forces. The RFP is to be released in December 2021, with a contract award for up to $655 million planned for June 2022. The contract will include acquisition of "L-band channels, SHF satellite connectivity, internet service desk, rack hosting and hands-on support services at each satellite earth station, and Host Nation Agreement services."

Israeli space firms start thinking small, with national security implications



Concept art for IAI's Mini Communication Satellite design. (IAI)

By ARIE EGOZI on November 08, 2021 at 9:04 AM

TEL AVIV: For decades, Israel has stood as one of the smallest nations to have an indigenous space program, with a national security capability built around large, exquisite capabilities.

Now, with the potential of small satellites — cheaper to launch, cheaper to design and cheaper to lose in a combat scenario — being embraced around the globe, Israel's government is considering its options. And unsurprisingly, Israel's major industrial players have followed suit, with the hopes of cashing in on both domestic needs and a potentially robust export market.

Isaac Ben-Israel, the chairman of the Israeli space agency, told Breaking Defense that smaller, lighter systems are becoming increasingly popular, noting the decrease in launch prices and the benefit that "when in space, little energy is needed in case the satellite goes out of its designed orbit."

Ben-Israel said that Jerusalem made a decision many years ago to achieve full capability in space with security at top of mind. Hence, the focus on spy satellites first, followed by communication satellites and launchers. "These capabilities are being upgraded all the time," he said, singling out a new system from Israel Aerospace Industries (IAI), Israeli's leading defense firm, as an example.

That system, the Mini Communication Satellite, or MCS, was rolled out on Oct. 25. Weighing roughly 700 kg (1,540 pounds) upon launch, the digital communication payload is significantly lighter than IAI's previous full-size communication systems, which have an average weight of 5,000 kg (11,000 pounds). As a result, multiple MCS can be launched as part of a rideshare with other satellites, lowering the cost per launch.

IAI, which is the main space company in Israeli, says that the new satellite, which is equipped with an electrical propulsion system developed specifically for this design, has a life expectancy of no less than 14 years, and is specifically designed to provide "multi-zone communication services to customers or countries with diverse communication needs."

The capability is based off IAI's development of the Dror-1, a national communication satellite that IAI went under contract to build in 2020. As part of that, the company developed an advanced digital communication payload and a "space smartphone" capability it says will provide flexibility for operators

According to Shlomi Sudri, general manager of IAI's space division, the MCS can serve as either a complementary or focused regional system. Notably, he said, "IAI is in touch with a number of customers globally" about buying the new design.

While the MCS is aimed more at the international market than a domestic one, it goes without saying that IAI having this capability in-country could benefit the Ministry of Defense down the road, should the government decide it needs alternative systems.

Accompanying the MCS is a new ground cloud-based "virtual" ground station being offered from IAI, known as the Blue Sphere. The company claims the new ground station will increase the amount of data coming to and from the satellite system.

The setup, per the company, will allow the satellite to broadcast data to any ground stations equipped with the software, where it is immediately uploaded into the cloud. This means that rather than a user needing to wait for the satellite to pass overhead of any one ground station, the satellite can transfer information to any Blue Sphere equipped console — thus, operators can receive the information even if the satellite is halfway around the world.

Improved ground station technology is vital for future space operations, according to respondents of the Breaking Defense Space Survey. 65% of respondents described ground-based space capabilities as either "very important" or "extremely important" for their mission, with ground stations viewed as the most important terrestrial capability.

For years, IAI has had a stranglehold on Israel's space procurement. But the growing demand for space assets, and the willingness to look to smaller systems as opposed to hugely expensive, exquisite capabilities, means other companies are looking to get into the game.

One key part of Israeli's space structure are a number of advanced spy satellites in Low Earth Orbit, known as the Offeq series developed and manufactured by IAI. However, these systems cannot keep a persistent watch over areas of interest, which creates potential vulnerabilities when watching for ballistic missile launches.

As a result, the Israeli MoD contracted Rafael to develop a classified series of SIGINT nano-satellites that will operate in swarms to allow Israel to get real time warnings on evolving threats

These satellites are designed to locate and define electromagnetic signals emitted by communication systems and radars, giving a more efficient early warning system for launches.

Smaller startups are also looking to cash in. Perhaps the most notable is a company called Effective Space, which is working to develop a fleet of "maintenance satellites," weighing less than 880 pounds each that will attach themselves to an older satellite already in orbit and serve as essentially a replacement propellant.

Earlier this year Astroscale US (the American subsidiary of Japan-based Astroscale), purchased the rights to that design from Effective Space, with Arie Halsband, Effective's founder, becoming CEO of the new Astroscale Israel.

One Israeli government source described the deal as "the beginning of a commercial competition between the Israeli companies and those in other countries" over small satellite systems.

Another Israeli company, NewRocket, is developing a gel based engine propellant, which the company is marketing as stable and non-toxic — a "green propulsion" capability that has the benefits of both liquid and solid propellants. A company spokesman said the technology will meet the "strictest industry regulations."

The major threats and challenges for America in space

A first-ever Breaking Defense space survey asked professionals in defense- and space-related fields about what worries them the most, and where America is falling behind.

China's ambitions in space could pose a threat to American interests. (Lintao Zhang/Getty Images)

By AARON MEHTA on January 06, 2022 at 10:23 AM

WASHINGTON: It's become a standard line when Pentagon officials discuss space: the warfighting domain is more "contested and congested" than ever before. But what does that mean in real terms?

During the first ever Breaking Defense Space Survey, we polled almost 500 space professionals on a variety of topics, including the greatest threats to America's space ambitions, the growing role of the Space Force and what space capabilities need the most investment going forward. As might be expected, quite a few of the topics covered the question of what challenges the US faces as it focuses increasingly on military space.

In the infographics below, we present the responses to three key questions about America's potential opposition.

Which countries pose the greatest threat to US and allied space operations?

Rank these countries in order from 1-5

#1 China
(Average Ranking 1.30)

#2 Russia
(Average Ranking 2.03)

#3 North Korea
(Average Ranking 3.55)

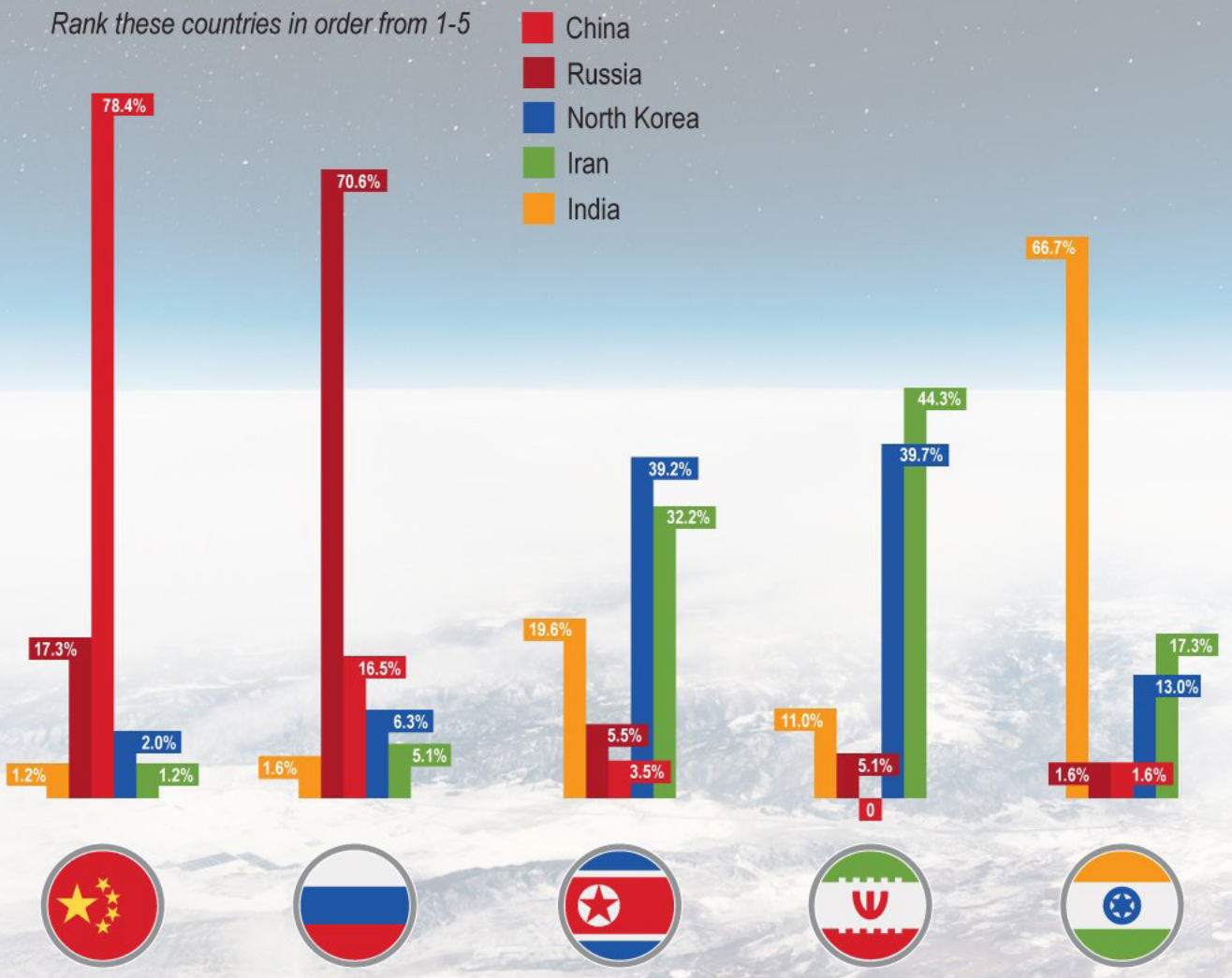
#4 Iran
(Average Ranking 3.71)

#5 India
(Average Ranking 4.40)

BREAKING DEFENSE

Which countries pose the greatest threat to US and allied space operations?

Rank these countries in order from 1-5



No. 1 Ranking
78.4% Ranked China #1

No. 2 Ranking
70.6% Ranked Russia #2

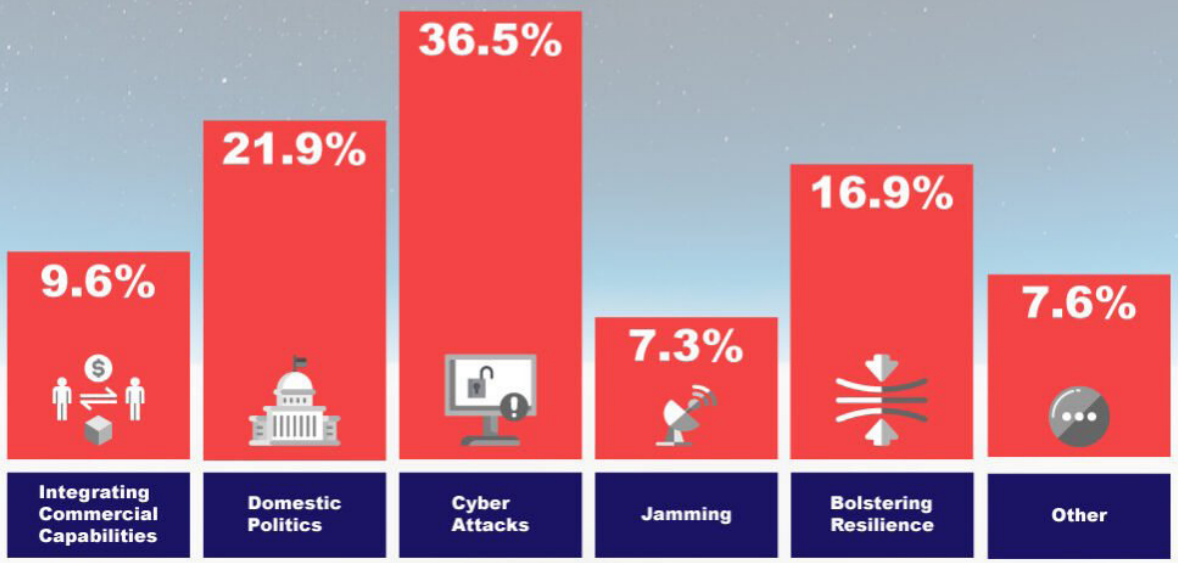
No. 3 Ranking
39.2% Ranked N. Korea #3

No. 4 Ranking
44.3% Ranked Iran #4

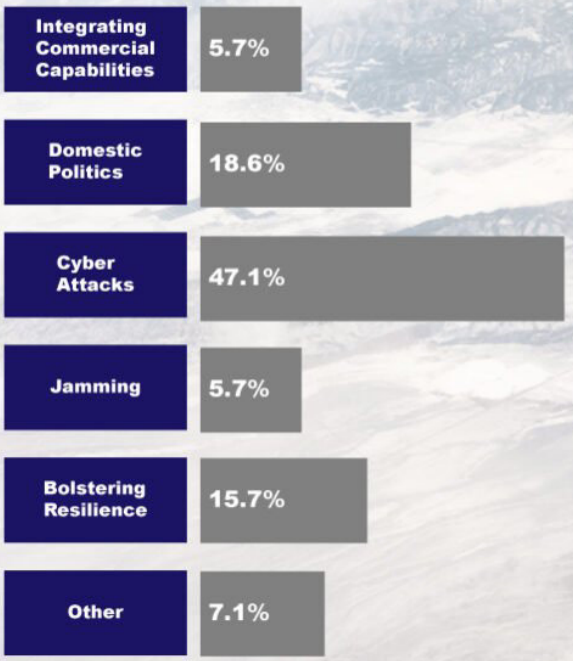
No. 5 Ranking
66.7% Ranked India #5

BREAKING DEFENSE

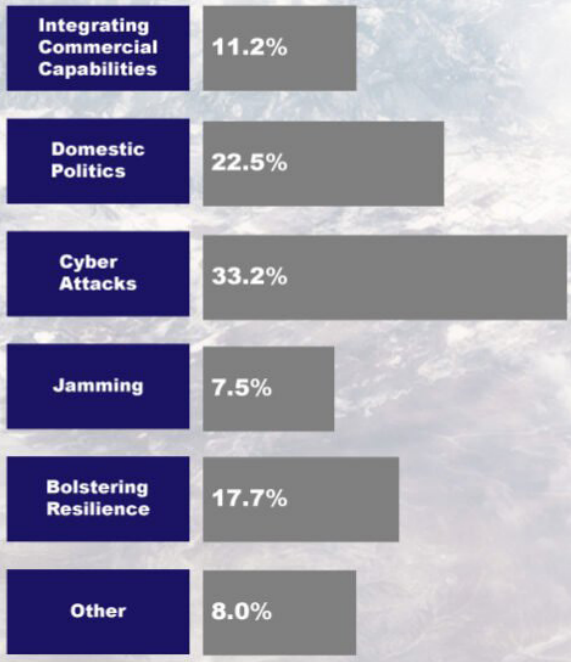
What will be the greatest challenge to the US national security space enterprise in the next 5 years?



By DoD Employees

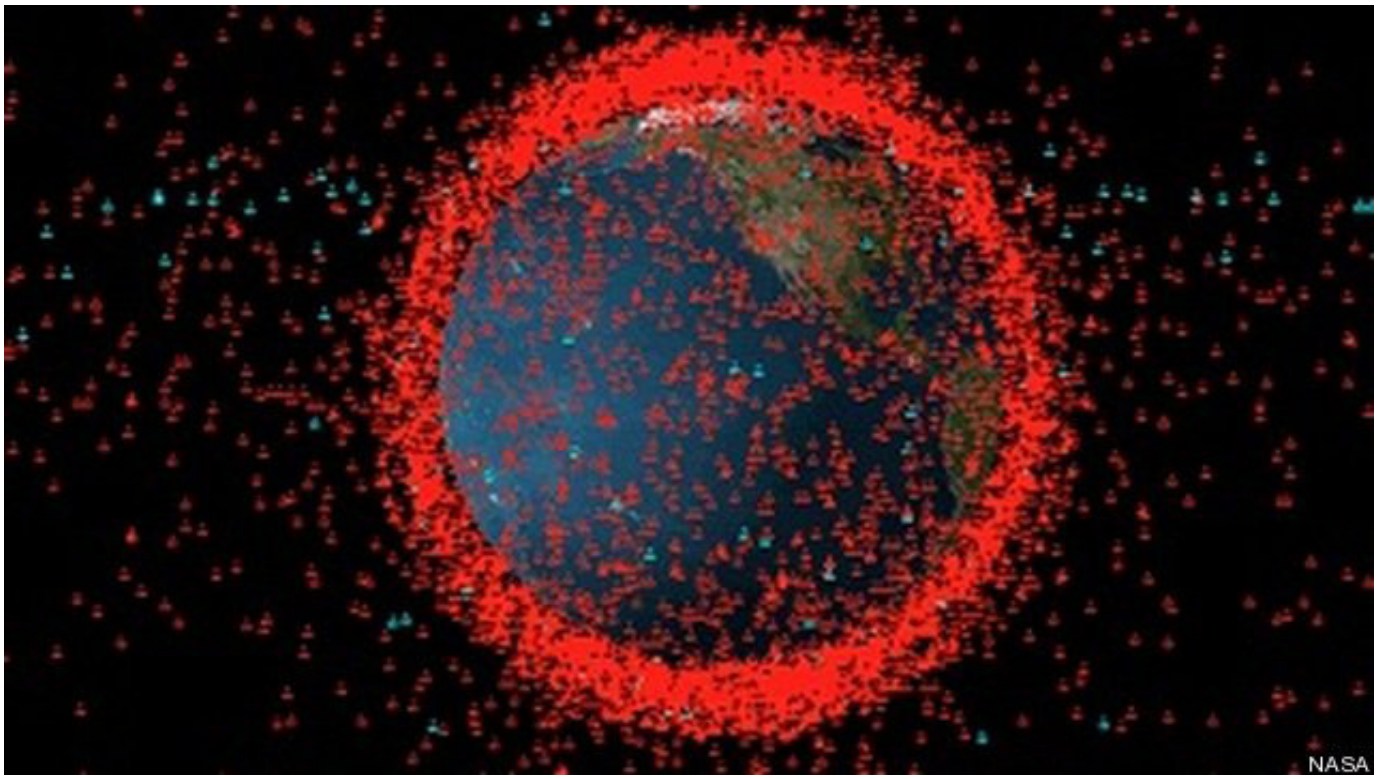


By Contractors



Russian suspected ground-launched ASAT test scatters dangerous debris through LEO

Consensus is forming that the most likely cause of the breakup was a strike by a A-235 / PL-19 Nudol ASAT system



Satellites and space debris in orbit around Earth. (Aerospace Corporation)

By THERESA HITCHENS on November 15, 2021 at 2:26 PM

Updated Nov. 15, 2021 at 5:10 p.m. ET with statement from Gen. James Dickinson, SPACECOM head.

WASHINGTON: A Russian test of a direct ascent anti-satellite weapon has created a field of around 1,500 pieces of space debris, putting global systems and even the International Space Station at risk, the US government confirmed Monday afternoon.

For hours Monday, the Pentagon was careful not to confirm anything as rumors swirled — and expert sleuths poured over data — about Russia having knowingly created a new debris field by destroying on of its satellites. One military source told Breaking Defense it "looks like" the debris was caused by a ground-launched missile; that same source claimed around 1,500 pieces of debris have now been thrown wildly into orbit.

That debris figure, as well as Russia's role in the situation, was officially confirmed by State Department spokesman Ned Price, who said "Russia's dangerous and irresponsible behavior jeopardizes the long term sustainability of our space and clearly demonstrates that Russia's claims of opposing the weapons and weaponization of space are disingenuous and hypocritical."

Added Pentagon spokesman John Kirby, "Obviously we're concerned about any nation that would weaponize space, that makes space less conducive to peaceful commercial enterprises and exploration. We want to see the space domain subject to international norms and rules so it can be explored by all spacefaring nations."

Kirby added that the US was not given any advance notice of the Russian test.

Gen. James Dickinson, Space Command head, issued a statement this evening condemning the test, stressing that the debris field will "likely generate hundreds of thousands of pieces of smaller orbital debris" beyond the 1,500 pieces now being tracked by the military.

"Russia has demonstrated a deliberate disregard for the security, safety, stability, and long-term sustainability of the space domain for all nations," he said. "The debris created by Russia's DA-ASAT will continue to pose a threat to activities in outer space for years to come, putting satellites and space missions at risk, as well as forcing more collision avoidance maneuvers. Space activities underpin our way of life and this kind of behavior is simply irresponsible."

While waiting for confirmation from the US, space scientists from around the world took to Twitter to analyze the situation, with consensus quickly forming that the most likely cause of the satellite breakup was a strike in the wee hours this morning or late yesterday by a A-235 / PL-19 Nudol ASAT system, launched from the Plesetsk Cosmodrone some 800 kilometers north of Moscow. Nudol, has been tested at least 10 times before, according to Secure World Foundation's 2021 Global Counterspace Report.

However, Pavel Podvig, a senior research fellow at the United Nations Institute for Disarmament Research in Geneva, Switzerland, told Breaking Defense that Russia up to now has never actually conducted a ground-based "kinetic kill" interception. This fact, he suggested, might have been what motivated Moscow to do the test — simply to prove that it the Nudol could do the job it is designed for.

Commercial space-tracking startup LeoLabs confirmed in a Tweet that its radar has picked up a large debris cloud where the defunct signals intelligent satellite Russian Cosmos-1408, launched in 1982 and orbiting at about 480 kilometers in altitude, was previously located.

Jonathan McDowell, an astrophysicist at the Harvard-Smithsonian Center for Astrophysics, tweeted that a satellite the size of the Cosmos-1408, with a mass of some 1,750 kilograms, would likely result in "thousands" of pieces of "cataloged" debris — meaning debris bigger than the size of a softball that can be traced specifically to the bird's break up and tracked by the 18th Space Control Squadron.

However, as McDowell noted, it usually takes weeks for SPACECOM to gather up all the tracking data and release it via its public catalog of space objects online at Space-Track.org.

The threat of a kinetic strike against satellite systems is hardly an unknown one. In the recent Breaking Defense Space Survey, respondents listed both "anti-satellite technology" and offensive actions by China or Russia as a potential top concern, and listed Russia as the second-most threatening nation to American interests in space.

As even tiny pieces of space debris, the size of a paint fleck, can damage a satellite, the news of yet another nation deliberately taking actions that result in thousand of pieces of dangerous junk has piqued concern among space watchers.

Since the debris field appeared, crew aboard the International Space Station have several times been told to take shelter in case the station takes damage as it passes through the debris — raising the specter of a political incident for Russia should any of the ISS crew, or those aboard China's own Tiangong space station, be injured.

"If nothing else, this proves the need to have established agreement as to what kinds of behavior the international community has come together and deemed to be unacceptable, since right now there is nothing like that to point to demonstrate that," summed up Victoria Samson, Secure World's Washington office director.

Allies eyeing 'niche' space capabilities for warfighting with US

"The key to success is frank and open discussion ... tearing down those information sharing barriers, to be sure that we're truly interoperable," said Australian Air Commodore Nicholas Hogan.

President Joe Biden on Sept. 15, 2021, announced a new national security initiative in partnership with Australian Prime Minister Scott Morrison (L) and United Kingdom Prime Minister Boris Johnson (R). (Win McNamee/Getty Images)

By THERESA HITCHENS on November 19, 2021 at 10:31 AM

WASHINGTON: The US Space Force and its like-minded counterparts are increasingly eyeing ways to avoid duplicating capabilities, with the American service setting up a series of agreements in hopes of each country bringing its best hand to the fight.

"There may be future architectures for some mission area [where] we get together as allies and say, you know, we'll concentrate on this piece here in the United States, and maybe the UK agrees to concentrate on this piece, and Australia concentrates on this piece. And together we bring an integrated by design architecture forward," Lt. Gen. John Shaw, Space Command deputy, said Nov. 17 during a panel discussion at the American Institute of Aeronautics and Astronautics's ASCEND conference.

Lt. Gen. Nina Armagno, Space Force staff director, elaborated on Shaw's point, noting that the service already has cooperative development efforts underway via the Space Systems Command (SSC) Partnership Office led by Deanna Ryals.

"We kind of used to think of allied partnership, as: 'hey, Australia, why don't you buy the next satellite, if you will?' Today, we're talking about getting together from concept, from design and working together on future capabilities and projects," she said.

"In fact, we've signed an MOU with 10 countries," including the UK and Australia, on "responsive space capabilities," she added. "We all are looking at collaborating on burgeoning science and technology, research and development needs that we all see could benefit all of our countries as we move forward."

Partnership Arrangements

That MOU process, which dates back to 2014 "was established to initiate, conduct and manage research, development, test and evaluation (RDT&E) cooperation projects related to responsive space capabilities. Additionally, the RSC MOU allows the exchange of information for harmonizing the participants' military requirements to assist in defining potential cooperative efforts under the RSC MOU," Angela Lindemuth, deputy director of SSC's International Affairs Capabilities Development Division, told Breaking Defense in an email.

Participating countries include Australia, Canada, Germany, Italy, Netherlands, New Zealand, Norway, Spain, Sweden, and Great Britain, she said.

Lindemuth, who serves as lead for activities under the MOU, explained that there currently are four multilateral "Project Arrangements (PAs)" underneath the MOU, although she did not elaborate on which countries participate in which ones. These are:

Micro-Satellite Military Utility (MSMU) PA: to evaluate the utility, performance, technical feasibility, and potential cost of microsatellite concepts to determine the extent to which military Microsatellite systems can provide a cost-effective replacement or complement to other space assets.
Military Optical Satellite Communications and Optical Space Data Relay (MOSCOM) PA: to determine the interoperability, benefits, and limitations of evolving optical satellite communications technologies, including data relay and machine to machine interactions.
Responsive Launch and Range (ReLaR) PA: explore, identify, and assess concepts to reduce the cost of launch and improve the military space launch responsiveness of the Participants to this Project. This ReLaR PA will explore responsive space capabilities-related technologies that may increase the responsiveness of launch operations.
Low-Light Automatic Identification System (AIS) for Maritime Domain Awareness (LLAMDA) PA: The development of a low-cost non-cooperative space-based maritime surveillance capability using an EO sensor and a micro-satellite approach.
"These are cooperative RDT&E efforts focused on outcomes that explore small, low-cost, rapidly-implemented, space-based solutions to achieve 'Assured Space Power Focused on Timely Satisfaction of Joint Force Commanders' Needs'," Lindemuth said.

Allies Scope 'Niche' Capabilities

For its part, the United Kingdom already is turning the country's military space focus towards bringing "niche" capabilities to the fight, Air Vice Marshall Harv Smyth, Defense Ministry director for space, told the virtual panel. London, he said, recognizes that it can never match DoD's space capabilities, but instead must strive to "add value" and "bring resilience" to coalition efforts.

"From a UK perspective, we're doing quite a bit of analysis on just understanding where we have niche capabilities that we could bring to the table and offer goodness," Smyth said.

For example, he cited the End-of-Life Services by Astroscale demonstration (ELSA-d) by Japanese startup Astroscale, which now has subsidiaries in the UK and US. The UK government licensed that debris removal mission, which launched in March and in August demonstrated the spacecraft's ability to capture and release a satellite.

Smyth noted that while Britain is trying to build up its own space capabilities, and that somethings will always be "sovereign stuff," the central idea is to build an architecture and strategy from the ground up to allow interoperability. He said he is constantly advising his UK teammates: "let's not build an architecture that has a three British three-pin plug and then we're trying to plug it into a US two-pin socket. That will be an own goal. There's no reason for us to do that."

"Australia's well behind the US and UK, and but we're rapidly gaining," said Air Commodore Nicholas Hogan, director general of the Australian Defense Force's ongoing "space domain review." He stressed that "interoperability is key" to Canberra's approach for building up its space capabilities. "It's one of our design principles."

Australia's MoD hopes to release a new "defense space strategy" by the end of this year or early next year, he said, in which "education on the criticality of space and global dependence" will be highlighted. In May, the ministry announced that it also intends to establish its first-ever "space division" under the Royal Australian Air Force early next year.

The US Space Force has been steadily strengthening long-standing space ties to Australia as Canberra has moved to bolster its indigenous capabilities with a wary eye on China. Australia has been of particular interest to DoD as a partner in the space situational awareness (SSA) mission because the US Space Surveillance Network, which includes a number of radar facilities, lacks coverage of the Southern Hemisphere.

Hogan said that one of Australia's key areas of focus is trying to "scale up" innovative efforts quickly.

Classification Woes Continue

Not everything is perfect, however.

Both Smyth and Hogan pressed politely, but firmly, on the need for the US to reduce classification levels to allow improved information sharing with allies about its space activities, as well as those of potential adversaries.

And while the US has made some progress (as pointed out by Shaw and Armagno) in declassifying information about adversary capabilities, it has pretty much failed to unlock the so-called green door on its own capabilities — despite strong support from senior US military space leaders. Demonstrating the obstacles to doing so, nearly 58% of respondents to Breaking Defense's first Space Survey said that the US should not declassify more information about its own offensive capabilities.

"The key to success is frank and open discussion … tearing down those information sharing barriers, to be sure that we're truly interoperable," Hogan said. "Our three nations are innovating and, at times, I can see that we are duplicating without knowledge of what we're doing. So greater information sharing helps us … so that we can harness the creativity more efficiently and effectively to outpace our competitors and to shore up access to space."

"I think alliances is where we have our key strength," said Smyth, "unlike our potential adversaries like China and Russia, who in many ways are operating alone. But for us to make those alliances work effectively, we must be able to share and we must be able to share meaningfully and at the speed of relevance."

He noted that historically, US capabilities "have been very highly classified for many reasons, many of which sit in special access compartments." So the question is "how do we get beyond some of those classifications to start to unravel the challenge of 'no foreign,' and to unravel that in a meaningful way?"