Next Generation Space Defense

MILSATMAGAZINE

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The SICRAL GEO satellite, developed by Telespazio and Thales Alenia Space, is Italy's satellite system for military communications. Artistic rendition is courtesy of Thales Alenia Space.

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Simon Payne
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Evan Grey
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DISPATCHES

NETWORK INNOVATIONS + U.S. GOVERNMENT ANNOUNCES JOINT MULTI-ORBIT RF SENSING DEPLOYMENT WITH INTEGRASYS + AVL TECHNOLOGIES

Network Innovations U.S. Government (NIUSG), a subsidiary of Network Innovations, has announced that the company has completed the deployment of a Multi-Orbit RF Sensing platform in partnership with INTEGRASYS and AvL Technologies.

This supports ongoing collaboration with the three companies in *Space Domain Awareness* (SDA) and *SATCOM Situational Awareness* (SATCOM SA) *as a Service* efforts. This platform will deliver processed data at the tactical edge to customized customer endpoints, including the Global Data Marketplace.

The turnkey data-service capabilities in this prototype contract align with the end user's preferred aggregation, analysis, and distribution system and support the desired data rights to be relevant in modern conflicts and joint operations.

INTEGRASYS

CONTROLSAT Carrier Monitoring System

At the core of this deployment is ***Controlsat***, INTEGRASYS' advanced *Carrier Under Carrier* monitoring system, integrated by Network Innovations to enable real-time RF sensing in complex multi-orbit environments. Controlsat detects, analyzes, and visualizes overlapping carriers without interrupting service—ensuring continuous signal awareness, interference detection, and mission resilience. Its precision is critical for high-demand government operations where performance and reliability are non-negotiable.

Mike Felix, Vice President, Advanced Programs for Network Innovations U.S. Government, said, "NIUSG is excited to continue our demonstrated success of bringing new capabilities and value to our customers through novel prototypes on aggressive timelines. We will leverage our strengths in software development, systems integration, and Ground-Station-as-a-Service (GSaaS) to expand our customers' capabilities in radio frequency sensing. By leveraging award-winning capabilities from our partners INTEGRASYS and AvL Technologies, we will provide new AI-driven SATCOM and signals monitoring, interference detection, and geolocation capabilities to our key stakeholders. This also pushes forward our joint efforts to modernize and more tightly integrate intelligent Electronic Warfare solutions."

Paul Sandoval, Vice President of Sales-Americas, at INTEGRASYS, said, "We're proud to partner with NIUSG to deliver an advanced, AI-assisted RF Spectrum Awareness system powered by our innovative software portfolio." At the heart of this innovation is INTEGRASYS' AI4RF – a core technology enabling real-time sensing and transmission of RF spectrum data, including signal classification, EMI interference detection, and geolocation. Leveraging geographically distributed RF sensors and taskable multi-orbit, multi-frequency AvL Technologies X/Y antennas, the system provides precision data exactly where and when it's needed."

Dave Provencher, Vice President of Business Development for AvL Technologies, said, "AvL Technologies is honored to have been selected by Network Innovations U.S. Government (NUISG) for this prestigious program. Our field-proven 2.4mXY terminal was chosen for its full hemispherical tracking capability and its ability to operate in X, Ku, and Ka bands with rapid changeover, making it a truly multi-orbit multi-band solution."

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DISPATCHES

MODERNIZED GPS OPERATING SYSTEM CLOSER TO OPERATIONAL INTEGRATION

The U.S. Space Force's Space Operations Command (SPoC) has accepted a modernized operating system for Global Positioning System (GPS), which is designed to maintain resiliency of the constellation and improve positioning, navigation and timing services to meet user demand now and in the future.

The ***GPS Next Generation Operational Control System*** upgrade is one of several current *Space Systems Command* acquisition programs, which, in aggregate, will deliver numerous modernized GPS III enterprise capabilities. The other programs include the GPS III/IIIF satellite vehicles and Military GPS User Equipment.

These modernized enhancements will enable improved signal access in electronically impeded environments; improved ability to detect failures; improved position and time transfer accuracy; and improved capability ensuring integrity and uninterrupted availability of the military code.

The Guardians in Mission Delta 31 partnered with SSC to develop a methodical process of transition exercises, transition rehearsals and constellation transfer trials to ensure the integrity and capability of the system prior to complete transfer, explained U.S. Space Force **Col. Stephen Hobbs**, MD 31 commander. "*Additionally, there are risk reduction activities designed to demonstrate OCX's ability to integrate using residual, on-orbit GPS satellites.*"

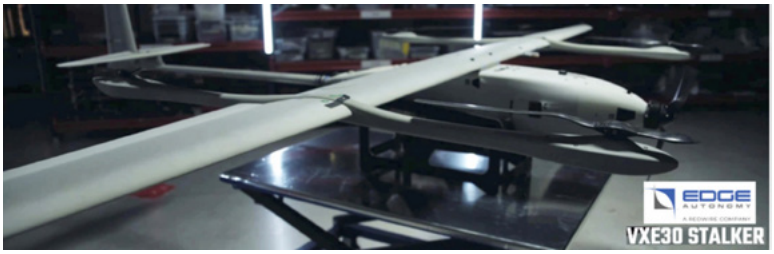
OCX delivery was initiated by contractor Raytheon to the U.S. Government via the submission of the Department of Defense Form 250 on July 1, 2025. Upon acceptance of the system, MD 31 will continue integrated systems testing, Operational Readiness Exercises and preparation activities for the GPS constellation transfer.

> *One of our missions is to deliver sustained, reliable GPS capabilities to America's warfighters, our allies and civilian users. The current enterprise modernization efforts underway gives users confidence that GPS will continue to provide worldwide premier PNT service," said Cordell DeLaPena, Space Systems Command program executive officer for Military Communications and Positioning, Navigation and Timing.*

REDWIRE ANNOUNCES ADDITION OF THE EDGE AUTONOMY STALKER UAS TO THE DOD'S BLUE LIST OF APPROVED DRONES

Redwire Corporation (NYSE: RDW) has announced that the Stalker uncrewed aerial system (UAS), developed by Redwire's wholly owned subsidiary, Edge Autonomy, has been granted an Authority to Operate (ATO) and is now on the Defense Innovation Unit (DIU) Blue UAS list.

The DIU Blue List contains technology vetted and approved by the Department of Defense (DoD) authority for universal use across government agencies. Drones on the DIU Blue List are subject to rigorous testing to ensure they meet stringent cybersecurity, NDAA-compliance, and operational requirements. This process ensures that the necessary technology is in place to maintain and promote national security while addressing operational challenges at speed and scale.



Edge Autonomy, a wholly owned subsidiary of Redwire, specializes in delivering innovative autonomous systems, advanced optics, and resilient energy solutions that are being used by the DoD, U.S. Federal Civilian Agencies, and allied governments. With nearly four decades of technology heritage and manufacturing expertise, Edge Autonomy's experienced team delivers proven solutions based on real-world mission needs.

With nearly two decades of flight operations around the world, the Stalker UAS is a secure, battle-proven solution for ISR missions in all environments. The addition of the Stalker UAS to the DIU Blue list will enable more government agencies and operational units to gain access to this cutting-edge system

> *The Blue List selection is an important recognition that streamlines Redwire's ability to deliver combat-proven, commercially developed UAS technology at scale to meet the Department of Defense's evolving mission needs," said* ***Peter Cannito****, Chairman and CEO of Redwire.*
> *"As the White House looks to advance the domestic commercialization of UAS technologies at scale and ramp up domestic production, Redwire is positioned at the forefront of strengthening our nation's drone industrial base and delivering unmatched capabilities to the U.S. warfighter."*

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YORK SPACE SYSTEMS' PARENT COMPANY TO ACQUIRE ATLAS SPACE OPERATIONS

York Space Systems has agreed to acquire ATLAS Space Operations—this move brings York a powerful, software-led, ground architecture that simplifies operations, removes integration barriers, and enhances space-to-ground resilience—accelerating York's ability to deliver secure, mission-ready space systems at unmatched speed and value.

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Drones on the **DIU Blue List** are subject to rigorous testing to ensure they meet stringent cybersecurity, NDAA-compliance, and operational requirements.

This process ensures that the necessary technology is in place to maintain and promote national security while addressing operational challenges at speed and scale.

ATLAS will play a key role in York's **Golden Dome** architecture, a next-generation defense solution that unifies spacecraft, software, and ground operations to deliver full-spectrum capabilities across contested environments.

ATLAS will continue to operate independently under its existing brand, serving its diverse portfolio of customers across the space industry.

Founded in 2015, ATLAS delivers secure, cloud-native connectivity through its ***Freedom® Ground Software as a Service*** (**GSaaS**) platform, which provides a single API access point to a global network of more than 50 antennas in 20+ countries and is the only GSaaS provider based in the United States.

By shifting the complexity of satellite communications from hardware to software, ATLAS has built a federated network-of-networks that enables real-time tasking, automated scheduling, and seamless cloud delivery of mission data.

The result is a flexible, scalable solution that reduces cost, risk, and time to orbit for a growing roster of government and commercial customers.

The Freedom® platform simplifies ground operations through a single API that abstracts away the complexities of legacy ground station networks.

Whether operating a single satellite or a proliferated constellation, customers can onboard faster, stream data directly to the cloud, and flexibly access global infrastructure without building it themselves.

This acquisition will strengthen York's ability to deliver integrated, mission-ready systems by pairing its high-performance spacecraft and software-defined operations with ATLAS's proven ground communications platform, thereby enhancing end-to-end mission delivery, and accelerating deployment timelines, improving data flow from space to ground, and enabling more resilient, autonomous operations across both commercial and national security missions.

The acquisition of ATLAS is pending FCC approval and other customary closing conditions.

> *"ATLAS has built one of the most sophisticated and secure ground communications platforms in the industry," said **Dirk Wallinger**, CEO of York. "This acquisition will enhance York's ability to deliver mission-ready systems on the timelines our customers demand while continuing to support the broader space ecosystem with best-in-class ground solutions."*

> *York shares our vision for a future where space systems are faster, smarter, and seamlessly integrated," said **Corey Geer**, CEO of ATLAS. "Together, we are building the infrastructure to meet that future head-on, reducing risk, increasing resilience, and enabling critical data delivery on demand."*

DISPATCHES

DAWN AEROSPACE JOINS THE 10 MILLION EUROS LEO2VLEO SATELLITE CONSORTIUM

Recently, Dawn Aerospace had the official kick-off of the LEO2VLEO project, a European Defence Agency-backed program to develop the continent's first maneuverable military satellite constellation operating between Low Earth Orbit (LEO) and Very Low Earth Orbit (VLEO).

Co-funded by the ***Netherlands Ministry of Defence*** and the ***Austrian Armed Forces,*** the project includes the development of three 16U satellites, equipped with propulsion systems developed by Dawn. These custom-built propulsion systems will enable both formation flying and rapid orbital changes—the latter capability being key to demonstrate the ability to operate in VLEO and thereby enhancing satellite performance on demand in a crisis.

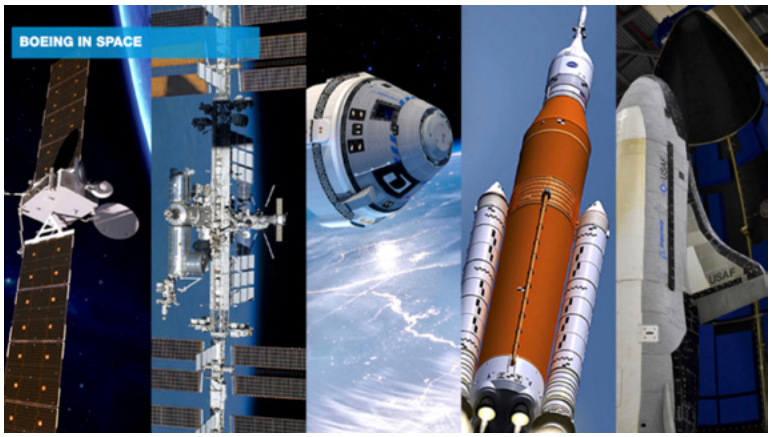
The simplicity and responsiveness of Dawn's green propulsion is particularly suited for this fast-paced program, alongside rapid delivery timelines. Furthermore, the program aligns with the recent launch of the Royal Netherlands Air and Space Force, the Dutch Ministry of Defence recognizing the importance that space-based assets in maintaining safety and security.

With the launch planned within two years, the constellation illustrates forward-thinking in Europe's increasing focus on responsivity, to adapt satellite operations in real time—a growing requirement for defense readiness in contested domains.

> *Europe is taking a major leap in space responsiveness and sovereign capability," said* ***Jeroen Wink****, Director at Dawn Aerospace. "Dawn's propulsion technology is built for missions that demand urgency, flexibility, and reliability—and LEO2VLEO exemplifies all three."*

DISPATCHES

BOEING SECURES $2.8 BILLION CONTRACT TO ENHANCE U.S. STRATEGIC SATCOM CAPABILITIES



***Boeing** [NYSE: BA] was recently awarded a $2.8 billion contract for the Evolved Strategic Satellite Communications (ESS) program, the space-based component of the U.S. nuclear command, control, and communications (NC3) architecture—the initial contract is for two satellites, with options for two more in the future.*

The ESS space vehicles will provide increased capacity, flexibility, reliability and resilience compared to the strategic communications satellites currently on orbit. Since 2020, Boeing has been executing technical maturation and risk reduction under a rapid prototyping contract for the U.S. Space Force.

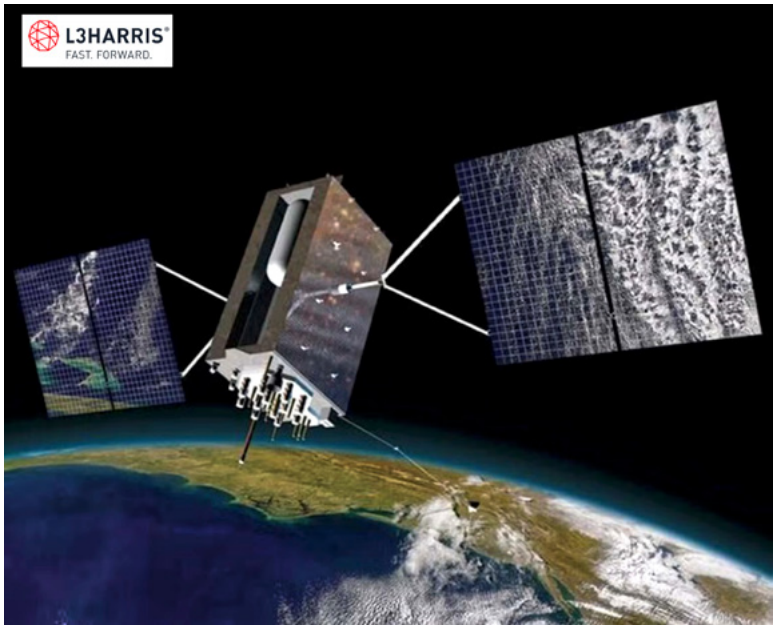
Boeing's ESS solution is underpinned by technology the company has developed for the *Wideband Global SATCOM* (**WGS**)-*11* and *WGS-12* satellites and has already proven on-orbit aboard the commercial O3b mPOWER constellation.

Building on these developments, this strategic military communications satellite constellation will be equipped with flexible and resilient signals to protect against interruption or interception.

When deployed in geostationary orbit (GEO)—about 22,000 miles or 35,700 km from the Earth's surface—ESS will provide persistent coverage to strategic warfighters worldwide. The spacecraft will leverage a highly protected waveform and classified technologies developed in partnership with the U.S. Department of Defense. Boeing is set to deliver the first of two space vehicles by 2031.

It's a critical time to advance U.S. space capabilities to ensure peace through strength," said Cordell DeLaPena, the U.S. Space Force Program Executive Officer for the Military Communications and Positioning, Navigation, and Timing Directorate. "The strategic communication mission requires protection, power and always-available capability, even through adversary attempts to interrupt our connectivity. These satellites will provide connectivity from space as part of a refreshed NC3 architecture for our nation."

L3HARRIS HAS THE FUTURE OF PNT READY NOW



This ready-now solution can provide the USSF with the ultimate flexibility to efficiently field smaller, multi-launch capable satellites to augment or disaggregate the constellation.

During a two-day event, the company conducted a comprehensive *Design Concept Review* (**DCR**) showcasing a *Resilient-GPS* (**R-GPS**) prototype that performed beyond current requirements. The session demonstrated the ability to accelerate the existing USSF R-GPS roadmap for a more resilient PNT infrastructure.

Using their ***Navigation Technology Satellite-3*** (**NTS-3**) reprogrammable payload and ***National Security Agency***-certified reprogrammable cryptography, L3Harris successfully simulated the commanding of an R-GPS satellite to transmit navigation signals that were acquired and tracked by a monitor station receiver, as well as Military User Equipment and commercial receivers, signifying that R-GPS can seamlessly and efficiently be integrated into the existing GPS infrastructure.

L3Harris followed a "prototyping with purpose" approach, which is much more than a laboratory demonstration. The review showcased maturity far beyond a traditional Preliminary Design Review, translating into a low-risk, achievable plan for future development phases of the R-GPS program. The L3Harris R-GPS design includes capabilities aligned to future Lite Evolving Augmented Proliferation, providing an opportunity for roadmap acceleration and reduction in lifecycle costs.

The DCR conveyed how the L3Harris R-GPS satellite will minimize impact on the Control Segment and maintain backward compatibility with current and in development user equipment to ensure operational compatibility.

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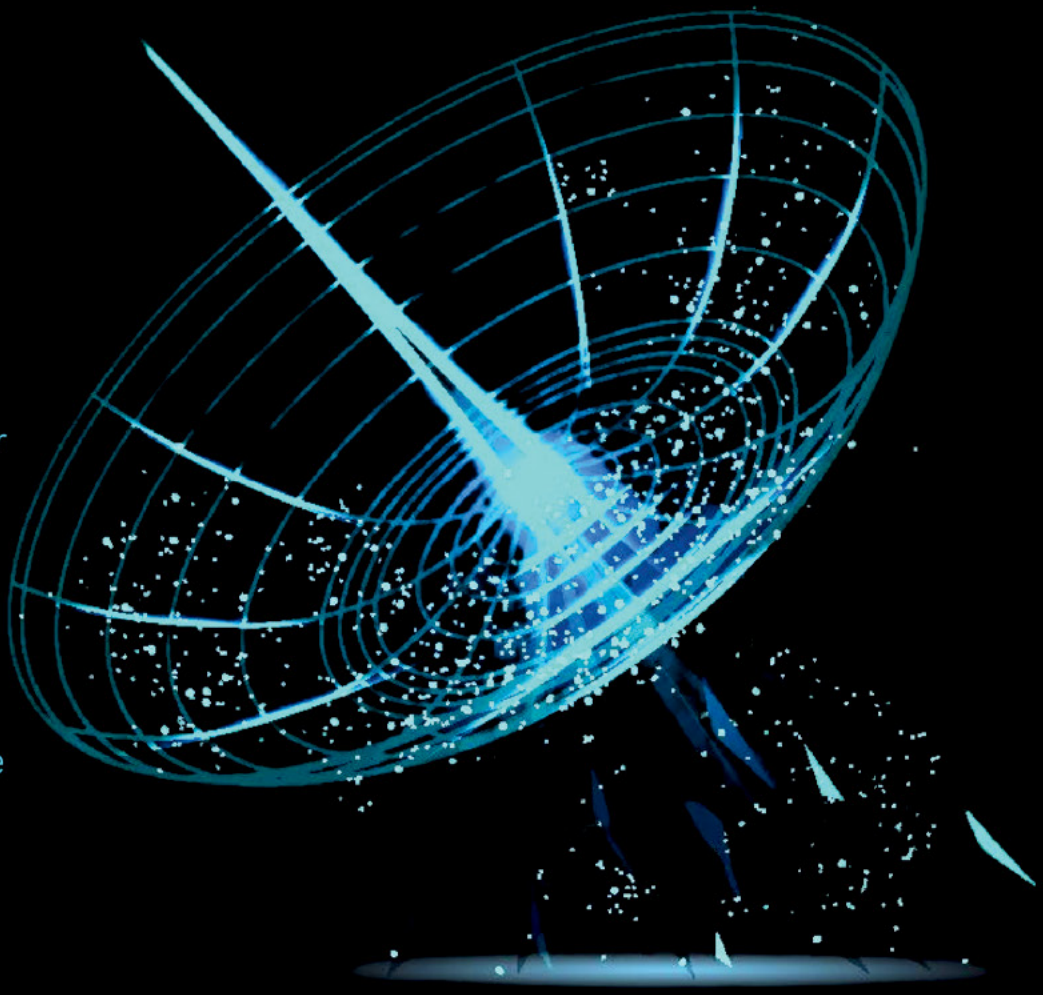

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DISPATCHES

USSF RELEASES 'PRINCIPLES FOR SPACE ACCESS RESOURCING DECISIONS

The U.S. Space Force (USSF) has released the organization's Principles for Space Access Resourcing Decisions Annex to the Commercial Strategy.

The annex details how the service will consider and prioritize commercial space sector requests for government resources, as well as government investment decisions.The annex features nine principles, rooted in law, that will guide the ***Assured Access to Space Enterprise***'s decision-making on a variety of resourcing decisions including acquisition strategies, investment priorities and property allocation.

The annex signals an acknowledgment of the evolution of the space access landscape from the 1950s, in which the government was the primary customer, to today where commercial space activities account for the preponderance of launch manifest activities.

> *"Our access to space is foundational to our national security and our way of life," said Deputy Chief of Space Operations for Strategy, Plans, Programs and Requirements,* ***Lt. Gen. Shawn N. Bratton****. "These principles reflect our understanding that a strong commercial space industry is a force multiplier for the U.S. Space Force. We are committed to working alongside our industry and allied partners to ensure safe, reliable and resilient access to space for decades to come."*

> *"For decades, our partnership with the commercial space sector has been instrumental in securing America's access to space," said* **Lt. Gen. Philip A. Garrant***, commander of Space Systems Command. "We are committed to making strategic decisions that ensure our national security needs are met, while also fostering a robust and competitive commercial space industry. The strength and innovation of the commercial sector is ultimately a force multiplier for our national security."*

HONEYWELL AEROSPACE AWARDED U.S. GOVERNMENT CONTRACTS TO DEVELOP QUANTUM SENSOR-BASED NAVIGATION SYSTEMS

Honeywell Aerospace (NASDAQ: HON) has been selected by the U.S. Department of Defense's (DoD) Defense Innovation Unit (DIU) to participate in the Transition of Quantum Sensing (TQS) program.

The program aims to accelerate adoption of quantum sensors to address near-term alternative *position, navigation and timing* (**PNT**) and *intelligence, surveillance and reconnaissance* (**ISR**) applications for the U.S. Joint Forces Command.

Honeywell has been selected to support the TQS program under two DoD contracts: **CRUISE** (*Compact Rubidium Unit for Inertial Sensing and Estimation*) and **QUEST** (*Quantum Enabled Sensor Technologies for MagNav*).

The CRUISE program, established by the DoD in partnership with ***Vector Atomic***, will focus on developing quantum sensor-based *Inertial Measurement Units* (**IMUs**) to provide a standalone navigation solution without relying on traditional *Global Navigation Satellite Systems* (**GNSS**) susceptible to jamming and spoofing. Honeywell will support the development of this quantum-sensor-based technology, which will enable the measurement of acceleration and orientation from an IMU mounted to a vehicle to calculate changes in position and velocity. As a result, it will meet next-generation performance requirements at a lower size, weight and power than existing products.

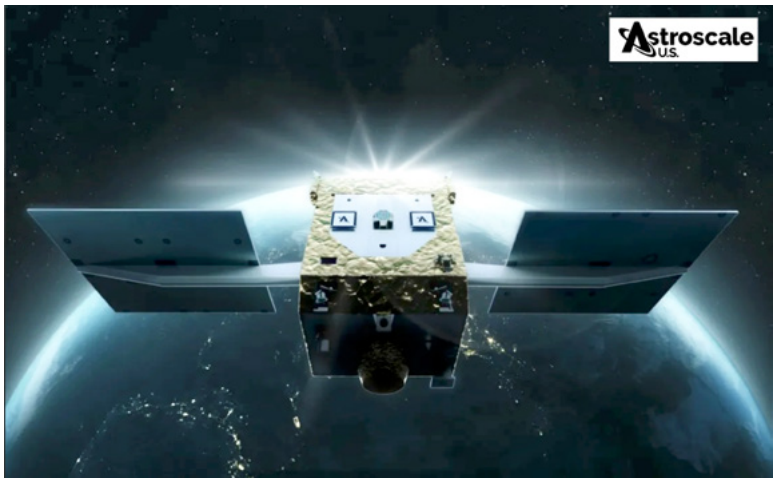
The QUEST program aims to advance the performance of *magnetic anomaly aided navigation* (**MagNav**), which is a GNSS-independent navigation technique that uses quantum magnetometers to leverage measurements of the magnetic field of the Earth as a navigation signal.

Through the program, the DoD aims to improve these quantum magnetometers and demonstrate their utility in GNSS-denied flight. Building on its deep expertise in innovative navigation solutions, Honeywell's main contribution will be to generate novel algorithms that use these sensors and improve navigation accuracy.

> ***Matt Picchetti,*** *vice president and general manager, Navigation and Sensors, Honeywell Aerospace Technologies, said,. "Quantum sensors have the potential to augment existing navigation solutions, helping pilots operate with greater confidence. Honeywell's pedigree* in fielded sensors and navigation solutions provide us with a unique *perspective to ensure the technology is viable beyond the laboratory. As quantum sensor-based navigation technology matures, we believe it has the potential to displace existing technologies as well as be a serious disruptor to the inertial and magnetic sensor industries. Most importantly, it could improve navigation in high-stakes environments—enhancing safety, efficiency and overall mission success for the DoD."*

DISPATCHES

ASTROSCALE U.S. SIGNS SPACE ACT AGREEMENT WITH NASA TO ADVANCE NATIONAL SECURITY ON-ORBIT SERVICING CAPABILITIES



***Astroscale U.S.* has signed a reimbursable Space Act Agreement with *NASA's Goddard Space Flight Center* (GSFC) to test rendezvous, proximity operations, and docking (RPOD) capabilities of the Astroscale U.S. Refueler spacecraft.**

Astroscale U.S. will test its Refueler at GSFC in preparation for Astroscale U.S.'s two refueling operations of U.S. DoD satellites in *Geostationary Orbit* (GEO) for the ***United States Space Force*** (**USSF**).

GSFC is a premier test site, known for supporting landmark missions such as the Hubble Space Telescope servicing efforts as well as other NASA *in-space servicing, assembly, and manufacturing* (ISAM) projects.

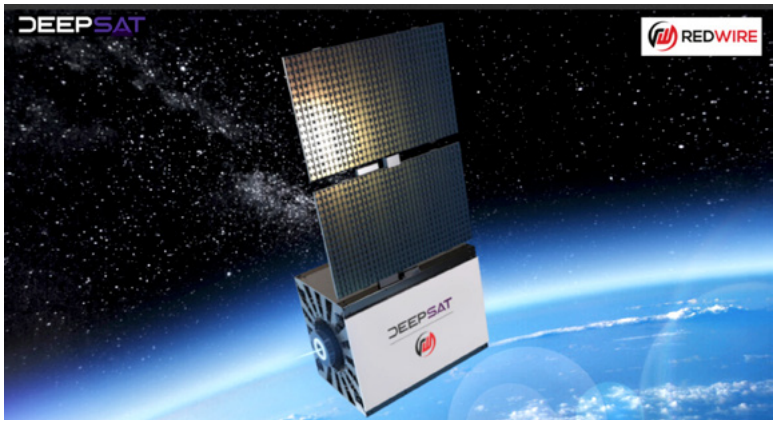
The Space Act Agreement enables Astroscale U.S. to validate the Refueler spacecraft's complex RPO and docking maneuvers with high fidelity.

The partnership illustrates the opportunities unlocked by the center's renowned ISAM robotic testing facilities. Testing of the Refueler spacecraft at GSFC is expected to conclude in August 2025.

> *"Conducting orbital maneuvers to match the orbit and attitude of a client spacecraft, closely approach, and then dock to it — commonly known as RPOD — is a series of incredibly complex activities," said **Dr. Clare Martin**, Executive Vice President of Astroscale U.S. "We're thrilled to enter into this Space Act Agreement with NASA's Goddard Space Flight Center, which provides one of the most flight-like testing environments available. This opportunity allows our team to test like we fly, leverage GSFC's deep expertise in on-orbit servicing and assembly, and build on Astroscale's global, flight-proven leadership in RPO."*

> *"Part of our mission is to enable industry to develop new in-space capabilities and help ensure the continued advancement of on-orbit servicing," said **Jill McGuire**, Associate Director for NASA's Exploration and In-Space Services (NExIS) Projects Division at GSFC.*

DEEPSAT SELECTS REDWIRE'S AI-POWERED DIGITAL ENGINEERING SYSTEMS FOR PRECURSOR MISSION IN VLEO



***Redwire Corporation* (NYSE: RDW) has been awarded the first phase of a multi-phase contract by DeepSat, an Earth Observation (EO) startup, to provide advanced modeling, simulation and design services for a planned, dual-use, Very Low Earth Orbit (VLEO) satellite constellation.**

The contract represents DeepSat's first step toward deploying a VLEO constellation designed to serve customer missions with high revisit and on-orbit AI for advanced sensor fusion.

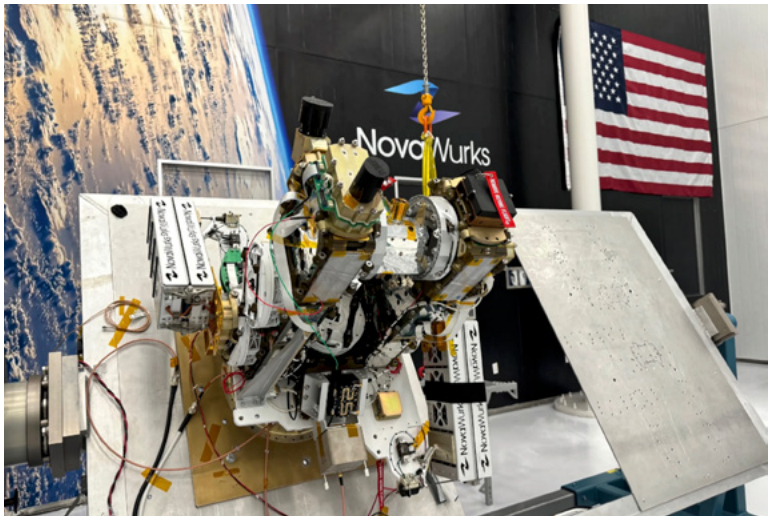
Under this initial contract phase, Redwire will leverage its Acorn 2.0 Agent-Based Modeling and Simulation (ABMS) software to support the architectural design and performance optimization of the DeepSat constellation. Acorn 2.0's high-fidelity, agent-based approach will allow DeepSat to rapidly evaluate system behavior, mission utility, and operational scenarios across a wide range of conditions, enabling an accelerated development to launch timeline.

DeepSat's advanced VLEO satellite constellation will combine high revisit rates with on-orbit AI and multi-domain intelligence, surveillance and reconnaissance (ISR) capabilities. The platform enables resilient, real-time, AI-powered Earth intelligence for critical missions such as vessel detection, energy infrastructure monitoring and disaster assessment across civil, commercial, and defense.

DISPATCHES

SEOPS INTEGRATES EPIC ATHENA ON THE TRACERS MISSION WITH SPACEX

***SEOPS Space** is providing the capacity, mission management and integration services for EPIC Athena, a 110 kg pathfinder spacecraft funded by **NASA**, the **National Oceanic and Atmospheric Administration** (NOAA), and the Department of Defense's U.S. Space Force (USSF)'s **Space Systems Command** (SSC).*



EPIC Athena represents the fifth of six spacecraft to launch under the ***Rideshare 2024-Blaze*** contract between SEOPS and the USSF's SSC.

As a secondary rideshare payload on ***NASA*** and the ***University of Iowa***'s upcoming ***TRACERS*** mission, EPIC Athena is a ***Department of Defense*** (DoD) Space Test Program mission containing a DoD experiment.

SEOPS has provided integration and mission services for more than 400 satellite deployments, including for the **U.S. Space Force**, **NRO** and **NASA**, as well as

commercial organizations around the world. The spacecraft is slated to launch on a ***SpaceX Falcon 9*** later this month from **Space Launch Complex 4E** (SLC-4E) at **Vandenberg Space Force Base** in California.

The mission is a technology pathfinder of ***NovaWurks' Hyper-Integrated Satlet*** (**HISat**) disaggregated satellite platform for making critical Earth science sensing measurements. Equally important is the goal to prove out technical partnerships and processes between multiple federal agencies to create a simple, rapid and highly integrated bus-payload system as a more affordable way to launch missions on a reduced schedule.

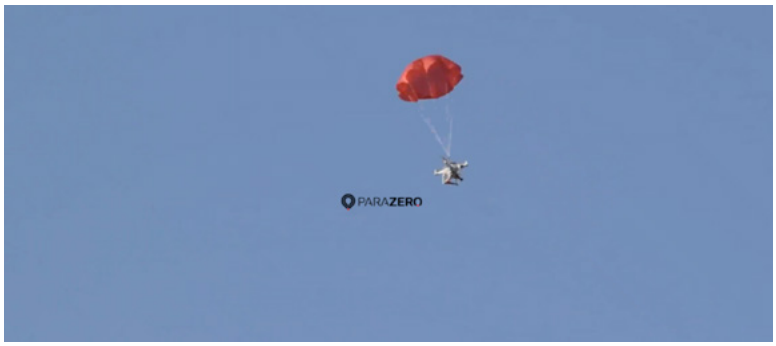
NovaWurks designs, manufactures and operates satellites based on the ***HISats*** architecture, or ***SLEGO***™, at its production and engineering facilities in Southern California.

> *It's always a privilege to work with the federal government on missions, and this one was particularly rewarding because of its goal to advance rapid response capabilities," said **Chad Brinkley**, chief executive officer of SEOPS. "It's in our wheelhouse and aligned with our goals of providing space access without compromise to organizations around the world."*

> ***Dr. Roberta Ewar**t, chief technology officer for the SSC, said, "NASA, the Space Force and NOAA have strategically aligned efforts to gain wisdom from the EPIC Athena Sensorcraft, from demonstrating key capabilities to spearheading efficiencies and new ways of collaborating across the federal government, all while creating a transformational advantage for our country."*

DISPATCHES

PARAZERO COMPLETES FIELD TRIAL OF THEIR DEFENDAIR SYSTEMS NEW CONFIGURATION



***ParaZero Technologies Ltd.* (Nasdaq: PRZO) has completed a field trial for an enhanced variant of the company's DefendAir system, marking a significant expansion of the company's multi-layered drone defense capabilities.**

The trial, conducted in Israel, tested a new stationary net turret launcher system to provide 360 perimeter defense against hostile drones. The DefendAir system's turret variant is integrated with an advanced optical detection and tracking system. This integration enables a fully autonomous operation—from threat detection and tracking to successful interception—representing a notable leap in the system's overall autonomy and performance.

The enhanced net launcher layout allows the deployment of a significantly larger net, providing broader area coverage and improved effectiveness against faster and larger drone threats. This capability is designed to secure high-value sites such as critical infrastructure, government buildings and other valuable assets against complex drone attacks.

According to a recent market research, the global anti drone market size was valued at $2.4B in 2024. The market is projected to grow from $3.1B in 2025 to $12.24B by 2032, exhibiting a CAGR of 21.62% during the forecast period.

With this expansion of the DefendAir product line alongside the DefendAir in its portable net gun configuration, ParaZero expands its defense offering and portfolio while also strengthening its position in the evolving C-UAS market, offering a versatile and scalable suite of solutions tailored to mobile and stationary defense needs across defense and homeland security sectors.

> ***Ariel Alon,** CEO of ParaZero, said, "This successful trial demonstrates the agility of our engineering teams and our strategic commitment to building an integrated, layered defense ecosystem. As threats evolve, so must the tools designed to stop them—and this milestone represents a meaningful expansion of ParaZero's ability to protect high-value assets against emerging aerial threats."*

L3HARRIS + ELT GROUP TO ESTABLISH MULTI-SENSOR TEST FACILITY IN ITALY

***L3Harris Technologies* (NYSE: LHX) has partnered with *ELT Group* of Italy to establish a multi-sensor test facility for commercial, military and government programs.**

This collaboration marks the first time an ***Intelligence, Surveillance and Reconnaissance*** (**ISR**) test and calibration facility of this type will be available outside of the United States. L3Harris and ELT Group will work together to create an in-country center of excellence for the Italian military and allied nations.
The new facility will support the G550 Joint Airborne Multi-Mission, Multi-Sensor System and Electronic Attack aircraft along with other air, surface and maritime platforms.

L3Harris Technologies Integrated Mission Systems President Jon Rambeau and ELT Group CEO and COO Domitilla Benigni take part in a ceremonial signing to formalize a new strategic partnership to establish a multi-sensor test facility for commercial, military and government programs.

> *"L3Harris' industry partnerships deliver long-term benefits that support Italian businesses, while also maximizing mission readiness for military units," said Jon Rambeau, President, Integrated Mission Systems, L3Harris. "This new sensor test facility further strengthens Italy's defence infrastructure."*

> *"ELT Group is pleased to be selected as a partner company for this important program, bringing forward more than 70 years of expertise supporting allies in ISR, multi-mission and electronic attack operational support," said Domitilla Benigni, CEO and COO of ELT Group. "This cooperation marks the first step in developing next-generation capabilities in the Italian test and operational range environment."*

DISPATCHES

LEOLABS SELECTED BY USSF TO FURTHER DEVELOP NEXT GENERATION SCOUT CLASS RADAR TO DETECT + TRACK LAUNCHES

Photo of the LeoLabs' mobile radar platform

LeoLabs was recently selected for a $4 million Tactical Funding Increase (TACFI) opportunity by SpaceWERX, the innovation arm of the U.S. Space Force (USSF). The Air Force Research Laboratory (AFRL) is projected to contribute up to $2 million, which is matched with $2 million in private capital, for a total $4 million TACFI effort.

Under the TACFI, LeoLabs will develop and deploy a software upgrade for its expeditionary Scout-class radar—a new, containerized *S-band Direct Radiating Array* (**DRA**) the company announced in April—to detect and track foreign launches. LeoLabs will also create a software development plan to upgrade the radar to perform track-while-scan for highly maneuvering objects such as missiles and hypersonic glide vehicles.

Scout radars are designed for mobility, modularity, and rapid deployment and can be easily transported to any location worldwide in response to dynamic *Space Domain Awareness* (**SDA**) missions, including monitoring foreign launches. The system can be deployed solo or in dense networks depending on mission requirements.

This TACFI follows LeoLabs' recent $60 million *Strategic Funding Increase* (**STRATFI**) award by SpaceWERX to deploy a Seeker-Class Ultra High Frequency DRA radar in the Indo-Pacific region by 2027.

The TACFI initiative is open to companies with *Small Business Innovation Research* (**SBIR**) Phase II contracts awarded within the past two years and strengthens the defense industrial base by accelerating the transition of advanced capabilities to the warfighter. LeoLabs was awarded a SBIR Phase II in 2024 that led to the development of its next-generation Scout-class radar, which will be enhanced with further software development under this TACFI.

> *"Being selected for both a TACFI and a STRATFI within a short timeframe is a powerful vote of confidence in LeoLabs' ability to deliver persistent Orbital Intelligence for the U.S., its Allies, and partners," said LeoLabs CEO* **Tony Frazier**. *"It also reinforces the urgent need for next-generation radar systems and corresponding advanced software to meet evolving national security challenges and support rapidly evolving SDA requirements."*

ROCKET LAB COMPLETES CDR FOR SDA'S T2T BETA CONSTELLATION

Rocket Lab National Security LLC, a wholly-owned subsidiary of Rocket Lab USA (Nasdaq: RKLB), successfully completed the firm's Critical Design Review (CDR) for the Space Development Agency's (SDA) Tranche 2 Transport Layer-Beta (T2TL-Beta) program.

The milestone follows Rocket Lab's successful *Preliminary Design Review* (**PDR**) in late 2024, confirms that spacecraft design, manufacturing approach, and systems architecture meet all mission requirements and enables the program to move into full-scale production.

As a prime contractor, Rocket Lab will deliver a constellation of 18 spacecraft for the *T2TL-Beta* program, part of the ***Proliferated Warfighter Space Architecture,*** a resilient, low-latency communications network in LEO that support real-time connectivity for U.S. and allied forces worldwide.

Rocket Lab's spacecraft for the T2TL-Beta program is based on its high-performance ***Lightning*** platform, tailored for the power and data-handling demands of national security LEO constellations.

As a vertically integrated provider, Rocket Lab designs and manufactures its spacecraft buses and key subsystems in-house, including solar panels, composite structures, star trackers, reaction wheels, radios, avionics, flight and ground software, launch dispensers, and more allowing the Company to maintain tight control over quality, cost, and schedule.

> ***"The Proliferated Warfighter Space Architecture is reshaping how the U.S. secures space for the joint force, and Rocket Lab is proud to be a contributor," said* Brad Clevenger*, President of Rocket Lab National Security. "With proven platforms and in-house production across key systems, we're building the backbone of resilient on-orbit capability for the warfighter. Our successful completion of CDR further demonstrates our ability to deliver trusted technology at the speed and scale needed to support national security space."***

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THE MOVE TO Q- AND V-BAND

Exploring the future of MILSATCOM + SATCOM

Author: Tudor Williams, Chief Technology Officer, Filtronic

In a world where communication needs to be instant, and 100% reliable, regardless of location, RF has a critical role to play—and Q/V-band is a key player, one that could more than double the bandwidth of current satellite systems, bringing us closer to faster, more reliable communication — whether it's for Earth-based or non-terrestrial networks.

Despite its potential, the reality of Q-/V-band adoption comes with technical challenges, said *Tudor Williams*, Chief Technology Officer at RF- and mm-Wave specialist, ***Filtronic***.

While Ka-band has been key in satellite communications, Q & V band—covering frequencies from 47 to 52 GHz—is now a promising option for next-generation networks.

Q-/V-band offers a much wider spectrum, which means it can deliver faster data speeds, for more users with more efficient communication between satellites and ground stations.

This makes it particularly attractive for industries like satellite communications and Earth observation, where the need for faster, more reliable data transfer is always on the rise.

However, switching to Q&V band isn't a simple task. There are some technical hurdles to jump over first, and one of them is that today's satellite systems use *Traveling Wave Tube Amplifiers* (*TWTAs*), which have been the go-to for decades.

TWTAs can provide high power amplification, but are expensive and complex to manufacture and have a limited lifetime.

Solid-state technology

That's where semiconductor technology comes in. ***Solid State Power Amplifiers*** (SSPAs) offer an alternative to TWTAs, particularly those built with ***Gallium Nitride*** (**GaN**), which can offer similar performance to TWTAs but are smaller, simpler to manufacture, more cost-effective and have a longer lifetime often > 15 years.

In turn, these could lower costs, speed up production and make satellite systems much more scalable.

Why does this matter? In industries such as MILSATCOM and SATCOM, ***size, weight and power*** (**SWaP**) and particularly for 'new space,' cost are crucial. Satellites, especially those used in military or deep-space missions, have strict space and weight limits.

Here, solid-state amplifiers offer a more compact and powerful solution, which is exactly what's needed for high-frequency systems like Q- & V-band.

Plus, as semiconductor nodes continue to shrink—going from 0.15 microns to even smaller gates length <100nm—these devices are only going to perform better.

Communications

The disruptors might be targeting ultra-high frequencies like ***E-band***, where Filtronic has been at the leading edge for more than 10 years. However, for many satellite operators, Q- & V-band is the next step.

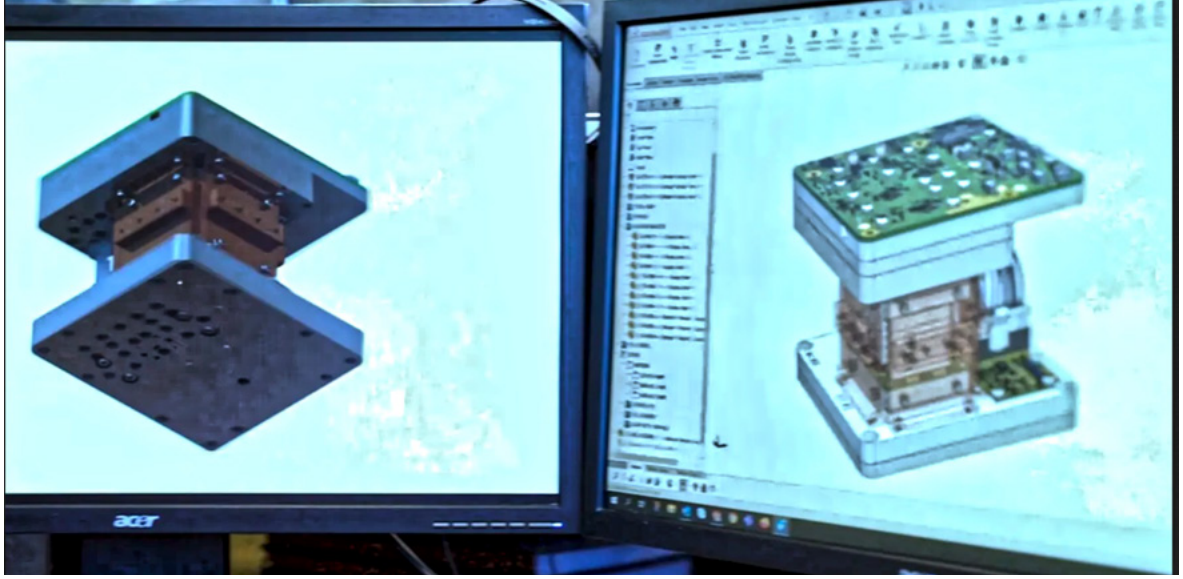
Relatively, it is easier to develop and doesn't have the same level of atmospheric attenuation issues that come with higher frequencies.

Additionally, it uses the combination of both Q- & V-bands, which maximizes bandwidth and ensures performance.

A great example of Q-/V-band technology in action is the ***European Space Agency's ARTES*** initiative, which is driving forward the development of advanced satellite communications.

Filtronic has secured a contract with ESA to develop cutting-edge RF solutions for next-generation satellite networks, at Q-/V-band, as well as K- & Ka-band.

The project focuses on developing high power, high linearity feeder links for satellite payloads.



To make this work, different frequency bands are used for specific tasks—Q-band is used for the downlink from the satellite to the ground stations, as this high-power feeder link enables high data throughput to meet the needs of expanding New Space constellations.

For receiving data on the satellite, V-band comes into play, allowing access to large bandwidth for significantly higher data rates. This setup makes data transmission much more efficient and plays a key role in boosting broadband access. It's especially important for mega constellations, which are essential for meeting the growing global need for fast and reliable data.

Secure Comms

Beyond boosting commercial satellite services, Q- & V-bands hold great potential for secure communications, particularly for defence. The narrower beam width at higher frequencies is less susceptible to interception or jamming, which is crucial for military-grade communication systems.

As frequencies increase, the signal becomes more focused. Lower frequencies spread out, making them easier to intercept. But at millimeter-wave frequencies like Q- & V-band, the signal is more targeted and less vulnerable to interference.

This makes Q-/V-band ideal for secure communications, particularly in sensitive, high-risk environments like battlefield operations. They are also harder to jam with interferers as the power required would be beyond conventional systems.

While tactical communications at millimeter-wave frequencies aren't widespread yet, their potential for better security and more efficient data transmission is driving growing interest within defence sectors.

Higher frequencies are also improving missile technology, particularly in millimeter-wave seekers. The increased resolution of radar and detection systems at these frequencies allows for enhanced spatial awareness, crucial for pinpointing targets with greater accuracy. With the same protection from jamming in contested environments.

The thermal challenge

As promising as Q-/V-band is, one major challenge it faces is heat management. Higher frequency devices are less efficient so naturally convert more power into heat, which becomes especially problematic in space or other extreme environments where space and weight are at a premium and thermal management difficult.
The good news is that advances in semiconductor technology, particularly in the aforementioned GaN, are helping to address this.

With improvements in GaN, including smaller gate lengths and more efficient designs, it's possible to increase power output while improving efficiency.

To tackle thermal issues, materials like copper-tungsten or diamond heat-spreaders can be used and potentially combined with innovative cooling techniques, such as liquid cooling.

These solutions are critical to ensuring systems continue to function effectively in the challenging environments of satellites and military operations.

GaN is key in these efforts as its high breakdown voltages and excellent thermal conductivity make it perfect for high-frequency applications.

However, it's not without challenges. GaN devices tend to generate high heat densities with hot spots around transistors, sometimes reaching over 300°C, which can lead to system failures without effective thermal management.

What's next for Q & V band?

Q-/V-band holds significant potential to transform satellite communications, offering faster speeds, more secure connections and greater efficiency. While there are challenges to overcome—from system design to thermal management and GaN production—the industry is making great strides toward solving them.

For example, Filtronic is tackling thermal management by employing waveguide combined amplifier structures, providing very high power, while spreading thermal loads across multiple devices instead of concentrating them in one spot.

Along with conventional forced-air cooling methods, there's also the option to use liquid cooling for high-power configurations, giving more flexibility for future system designs. With innovations in semiconductor technology, solid-state amplifiers, Q-/V-band is becoming a game-changer for the future.

Projects such as the ARTES initiative and the work happening at companies like Filtronic are pushing technology forward, and we're just scratching the surface of what's possible.

Q-/V-band is bringing all closer to a future where data bandwidth capacity is significantly increasing. Whether it's for global networks or scientific missions, the future's is certainly looking bright, and Q-/V-band is going to be at the heart of critical communications.

filtronic
filtronic.com

Author Tudor Williams is the Chief Technology Officer at Filtronic.

About Filtronic
Filtronic has been at the forefront of RF technologies for 45 years. The company has a world-class reputation for high performance, innovation, quality and high reliability and specializes in mission critical communications for aerospace, defence, space, telecommunications infrastructure and critical communications.

THE GOLDEN DOME FOR AMERICA

Author Teams
Bryce Tech
Defense Intellligence Agency
Department of Defense
Lockheed Martin
Missile Defense Agency
Northrop Grumman authors
Satnews editors

Revolutionizing U.S. Homeland Missile Defense

Golden Dome stands as a layered defense shield, safeguarding the American homeland with unwavering precision, ensuring the security and resilience of our nation.

Golden Dome for America is a revolutionary concept to further the goals of peace through strength and President Trump's vision for deterring adversaries from attacks on the homeland.

This next generation defense shield will identify incoming projectiles, calculate trajectory and deploy interceptor missiles to destroy them mid-flight, safeguarding the homeland and projecting American Strength.

THE CHALLENGE

Mobilize American industry and innovation to deliver the first Golden Dome for America defenses by the end of next year.

While we deploy that combat-proven foundation, the company will bring in the best and brightest of American innovation to rapidly develop game-changing tech—like space-based interceptors and hypersonic defenses—that will ensure America's Golden Dome stays well ahead of adversary threats.

THE APPROACH

The fastest, most efficient path to a Golden Dome for America is to bring the best of the defense and commercial industries together as a whole of industry approach.

This is a Manhattan Project-scale mission, one that is both urgent and crucial to America's security.

Lockheed Martin is ready to partner with the best in industry, emerging and large technology companies together to safeguard our nation.

The company lead the *MDA's National Team for C2BMC* and successfully built the world's most powerful missile defense software network, which connects forces around the world 24x7.

The firm has proven its ability to work across industry to bring the best of the best to the warfighter and Lockheed Martin has existing partnerships with defense, commercial tech companies and newer contractors to deliver proven and next-generation capabilities to the fight.

THE RISK

If a missile is coming over the horizon, that's not the time to do beta testing. Build on a combat-proven foundation today, while innovating for the future.

This mission is too vital to leave to chance. Missile defense requires more than just AI or software expertise.

The mission is about connecting a global array of complex systems that need to work at lightning speed and with pinpoint precision at the mission's moment of truth.

THE SOLUTION

Lockheed Martin has the proven, mission-tested capabilities and track record of integration to bring this effort to life.

With that combat-proven foundation in place, our open architecture approach allows the best of commercial, defense and newer contractors to build game-changing innovations into the system as they become available, expanding range, territorial coverage, accelerating timelines, and strengthening deterrence.

This mission can't be left to chance with unproven technology—the mission must be met with proven capability providers, who can deliver the greatest innovation, with high reliability, at scale, and ahead of need.

Focused on the mission and the partnerships needed to succeed, the company's innovative solutions will safeguard the homeland and ensure America's continued security and prosperity.

High-fidelity discrimination distinguishing real threats from decoys, increasing effectiveness and conserving costly interceptors.

• A future-proof design with open architecture supporting software upgrades and seamless integration across evolving defense systems, ready to counter advanced threats.

Building the American Shield: It Starts with Detection

Lockheed Martin's S-band radar technology comes in to the picture at this point...

This technology powers next-generation radar systems such as the ***Long Range Discrimination Rada***r (**LRDR**), **TPY-6** and **SPY-7**, delivering modular, high-power coverage across land, sea, and space.

LRDR

The Long Range Discrimination Radar (LRDR) program is the backbone of the ***Missile Defense Agency***'s layered defense strategy to protect the U.S. homeland from ballistic missile attack.

LRDR is a long range radar that will provide precision metric data to improve ballistic defense discrimination and replace existing sensors in the ***Ballistic Missile Defense System*** (**BMDS**).

With a mission of protecting the homeland, LRDR will keep pace with evolving ballistic missile threats and increase the effectiveness of ground based interceptors.

The program is built upon the U.S. government's long-term investment in S-Band radar, ground-based radar, and systems integration, as evident in such Lockheed Martin technologies as the *Aegis Combat System*, *Space Fence* and *Aegis Ashore*.

This solid state, *gallium nitride* (**GaN**)-based radar uses the company's *Open GaN Foundry* model, which leverages relationships with strategic GaN suppliers.

LRDR combines proven solid-state radar technologies with proven ballistic missile defense algorithms, all based upon an open architecture platform capable of meeting future growth.

Designed for flexibility and speed, this technology forms the first line of detection in today's layered missile defense architecture.

Why This Matters

This isn't just a radar, it's a strategic enabler with mission-critical benefits and the powerful S-band technology provides:

- *Early, persistent tracking of ballistic missiles from launch to midcourse, giving commanders time and clarity to make the correct decisions*

Proven in Action

Scalable and adaptable, this radar technology supports missions from homeland defense to maritime operations.

During FTX-26a, LRDR successfully tracked and discriminated a live ballistic missile threat in a complex environment.

The ***U.S. Missile Defense Agency*** (**MDA**), in cooperation with ***U.S. Space Force*** and ***U.S. Northern Command***, conducted a flight test on June 23, 2025, in which the LRDR at *Clear Space Force Station*, Alaska, successfully acquired, tracked and reported missile target data to the ***Command and Control Battle Management and Communications*** (**C2BMC**).

C2BMC

Command, Control, Battle Management & Communications
The centerpiece of the ballistic missile defense system

Responding to ballistic missile threats presents an unprecedented challenge of speed, precision, and coordination among numerous weapons systems, sensors, and warfighters.

Decision cycles are reduced to minutes, and in some cases seconds, during which air, ground, sea, and space sensor-interceptor-communications elements must be orchestrated into engagement scenarios that seamlessly detect, track, target, and engage incoming missiles.

To counter these threats, the United States is fielding a ***Ballistic Missile Defense System*** (***BMDS***) capable of destroying a missile in all three phases of flight -boost, midcourse and terminal.

Unifying Components of the BMDS for Global Missile Defense

- *Planning capability to optimally locate sensors and weapons systems to counter identified threats*
- *Situational awareness of the evolving battle and status of defensive assets at all leadership levels*
- *Battle management to optimally pair sensors and shooters for effective and efficient BMDS asset utilization and engagement*
- *Sensor netting to detect, identify, track, and discriminate threats*

Global engagement management to optimally pair the right sensors and weapons systems against multiple threats for the highest probability of hit-kill and to best manage the shot magazine

- *Global communications networks to efficiently manage and distribute essential data*
- *Missile detection and engagement management & control across strategic, tactical, and operational domains*
- *Networks and unifies BMD sensors, weapon systems and Warfighters worldwide*
- *Automated real-time, multi-source information provides a single, near real-time C2 picture*
- *Allows Commanders to quickly assess missile threats and execute a coordinated, immediate response*
- *Supports advanced strategic planning and wargames*
- *Deployment was started in October of 2004*
- *Supporting military echelons 24/7*
- *Additional capability fielded in periodic spirals*

The C2BMC element is the critical tool that links the various individual sensor-interceptor-communications elements into one coordinated system using the best offensive/defensive attributes of each element, ensuring the highest BMDS capability for protection against all types of ballistic missile threats in all regions and in any phase of flight.

The C2BMC element provides the Commander's command, control, battle/sensor management, and communication tools to optimize the BMDS elements for a coordinated and lethal defense.

As the industry lead for the ***C2BMC National Team***, Lockheed Martin continues to field an operational capability that links the numerous sensors, weapons, and command and control systems currently used in the individual U.S. missile defense programs or elements.

This effort involves the integration of hardware and software elements that will tie together the entire global missile defense. The company is keenly aware of the importance of this responsibility, and is committed to helping customers be successful in their defining moments.

This was the radar's first flight test tracking a live *Intercontinental Ballistic Missile* (**ICBM**) representative target.

Flight Test: LRDR
During this test, named Flight Test Other-26a (FTX-26a), a target developed by MDA was air launched over the northern Pacific Ocean.

The target flew more than 2,000 kilometers off the southern coast of Alaska, where it was tracked by LRDR, as well as the ***Upgraded Early Warning Radar*** (**UEWR**) located at ***Clear Space Force Station***. Sensor data was passed to *Ground-Based Midcourse Defense* (**GMD**) to support a simulated engagement.

*"This was a key test in the development of the LRDR system and its integration into the C2BMC network," said MDA Director Lt. **Gen. Heath Collins**. "LRDR will provide USNORTHCOM and the United States Space Force with the ability to precisely track ballistic missile threats as well as other space objects, advancing our ability to deter adversaries and bolster our homeland missile defense."*

Initial indications show that LRDR, C2BMC, and GMD Fire Control met mission requirements.

Program officials will continue to evaluate system performance based upon telemetry and other data obtained during the test. FTX-26a will support the operational assessment of LRDR, validation of LRDR modeling and simulations.

> *"Deterrence begins with detection, and the successful FTX-26a demonstration underscored LRDR's ability to detect and track threats at extended ranges, while accurately distinguishing between targets and non-targets," said **Rick Cordaro**, vice president of Lockheed Martin's Radar and Sensor Systems.*
>
> *"This technical advancement will significantly bolster our nation's deterrence capabilities, providing a game-changing asset for homeland defense. With its open architecture, LRDR will facilitate the seamless integration of emerging technologies and software, enabling warfighters to receive timely, actionable information for decision-making and drives rapid response."*
>
> *"This was a key test in the development of the LRDR system and its integration into the C2BMC network," said the MDA Director. "LRDR will provide USNORTHCOM and the United States Space Force with the ability to precisely track ballistic missile threats as well as other space objects, advancing our ability to deter adversaries and bolster our homeland missile defense."*
> *"In 2024, the Missile Defense Agency used the Aegis Guam System — integrated with a scaled version of LRDR (AN/TPY-6)—to intercept a live ballistic missile target. This flight test was a critical milestone in the defense of Guam and the region, " said the Commander, Joint Task Force-Micronesia, Rear Adm. **Greg Huffman** said.*
>
> *He continued, "This test confirmed our ability to detect, track, and engage a target missile in flight, increasing our readiness to defend against evolving adversary threats. The event's success is a testament to the incredible work of the team both within the DoD and the Government of Guam. It has supported multiple space domain awareness events, confirming the ability to track satellites, debris, and orbital threats.*
>
> *"This long-range discrimination radar is designed to defend the homeland by providing [the] unparalleled ability to search, track and discriminate multiple objects simultaneously, said Lt. Gen. **A.C. Roper**—U.S. Northern Command Deputy Commander.*

*Additional LRDR information is available via the MDA Fact Sheet PDF, available for reading **at this direct link...***

Secretary of Defense Pete Hegseth Statement on Golden Dome for America
Authored by Department of Defense Public Affairs

*"The **Department of Defense** (DoD) welcomes President Trump's announcement regarding the Golden Dome for America, a next-generation missile defense shield. This bold initiative, formalized in Executive Order (EO) 14186 on January 27, 2025, represents a historic investment in American security and fulfills our duty to protect the homeland first and foremost.*

"The Golden Dome will progressively protect our nation from aerial attacks from any foe. Within the last four decades, our adversaries have developed more advanced and lethal long-range weapons than ever before, including ballistic, hypersonic, and cruise missiles capable of striking the homeland with either conventional or nuclear warheads. Golden Dome is designed to leverage some past investments but will also use next-generation technology to defend against the evolving, and complex threat landscape.

"In response to the President's bold vision and clear direction, the Department has developed a draft architecture and implementation plan for a Golden Dome system of systems that will protect our homeland from a wide range of global missile threats. This historic investment builds on two of the Department of Defense's three main objectives: rebuilding our military capability and re-establishing deterrence.

"The Golden Dome builds on what have always been strengths of the United States: bold vision, innovation, and cutting-edge technology. As the President stated in the EO, the Golden Dome will include space-based interceptors and sensors. Some U.S. technology in space such as space-based sensors and air and missile defense exist today, but all of the systems comprising the Golden Dome architecture will need to be seamlessly integrated. Golden Dome will be fielded in phases, prioritizing defense where the threat is greatest.

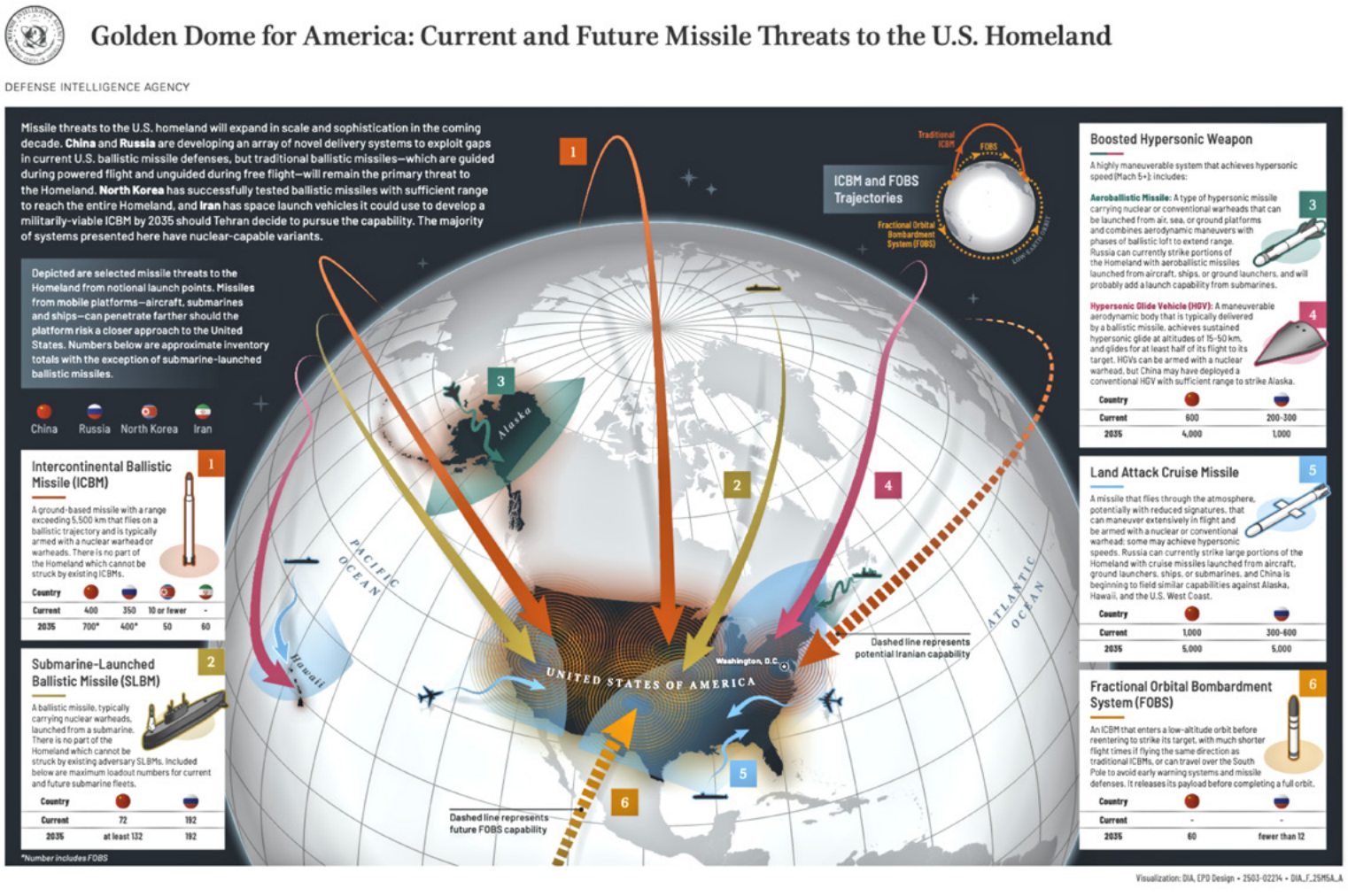
"The DoD is working with the Office of Management and Budget to develop a plan to fund recommended capabilities arising from the President's directive, allowing sufficient time for consideration by the President before finalization of the Fiscal Year 2026 (FY 2026) Budget. We are working with Congress to secure $25B of funding in the One Big Beautiful reconciliation bill for critical capabilities necessary to ensure the protection of the U.S. homeland from the aerial threats of today and tomorrow. We look forward to continuing that work with Congress to secure funding for critical capabilities necessary in the FY26 budget request.

"The United States will continue to enhance its existing capabilities to provide a thorough layered defense for its homeland. This EO does not represent an abandonment of existing ground, sea, and air-based kinetic defenses focused on missile interception in the midcourse or terminal phases of flight. Golden Dome is being designed in close coordination with NORAD, USNORTHCOM, USSPACECOM, and other DoD stakeholders to ensure full interoperability and real-time integration with our existing defense architecture.

"The Department remains committed to providing our nation with a strong, credible deterrent and will ensure all work done on Golden Dome for America adds to and does not detract from our ability to deter nuclear and non-nuclear strategic attacks on the United States. Our goal is peace through strength. Golden Dome ensures that the American homeland is not left exposed while adversaries develop more advanced and lethal long-range weapons."

Defense Intelligence Agency (DIA) releases 'Golden Dome' missile threat assessment

Infographic credit: DIA



*The **Defense Intelligence Agency** recently released an unclassified assessment titled "**Golden Dome for America: Current and Future Missile Threats to the U.S. Homeland**" to depict threats a sophisticated missile defense system for the United States would defend against.*

The product presents the agency's unclassified intelligence on adversary missile threats and capabilities.

In the coming decade, missile threats to the U.S. Homeland from more advanced conventional- and nuclear-capable delivery systems will expand in scale and sophistication.

DIA profiles the missile threat and inventories in six categories: *intercontinental ballistic missiles*, *submarine-launched ballistic missiles*, two types of *hypersonic weapons*, *land attack cruise missiles*, and *fractional orbital bombardment systems*.

The strategy behind Golden Dome for America requires speed, certainty, and scalability across layered homeland defense, said Lockheed Martin, requiring...

- *Speed—to react quickly*
- *Certainty—to engage the correct targets*
- *Scalability—to adapt across theaters future threats*

Radar technologies must deliver on all fronts—with fielded systems, proven results, and readiness for tomorrow's fight. As Lockheed Martin stated, "*The bottom line is... You can't stop what you can't see.*"

MILLISECONDS MATTER

Authors: William Furlong and Caroline Mroz

Northrop Grumman is also involved in the Golden Dome project and the company offers this article at their infosite...

Providing for the common defense — as the Founding Fathers wrote in the preamble to the U.S. Constitution — is an essential charge of the U.S. government.

Today, upholding America's national security is more critical, and challenging, than ever before. A wide range of adversaries have and continue to develop threat capabilities that threaten the American homeland—ranging from unmanned systems to intercontinental ballistic missiles to new, sophisticated threats such as ***hypersonic weapons***.

Addressing this unprecedented threat landscape requires the nation to lean into our missile defense legacy while thinking beyond what was done in the past. Weaving together experience and innovation, the U.S. government is partnering with industry to rapidly field a **Golden Dome** for America—an end-to-end, integrated homeland defense '*system of systems*' to protect the American people.

> *"As threats evolve and emerge, this once-in-a-generation initiative is urgently needed," said **Vice President Raymond Sharp**, who is leading the company's Golden Dome efforts. "We're bringing our missile defeat thought leadership to get after this problem, and we're ready to lead the way in delivering a comprehensive architecture to protect our nation. We have the most diversified portfolio of missile defense capabilities; we have ready-now technologies and products that are essential to a strong Golden Dome capability and our people are currently providing much of the nation's missile defense infrastructure."*

While a missile event can happen in minutes, imagine it in freeze-frames of a film. In the first frame, a missile launches; the following frames form its trajectory toward its target, which looks different, depending on whether the missile is a traditional long-range ballistic missile, a high-speed hypersonic missile or a shorter-range cruise missile. If the missile continues unmitigated, the final frame will show the weapon reaching its target.

As with any film, there's always something happening off-camera. Even before a weapon is launched, America's integrated sensing systems in space, in the air and at sea provide indications and warnings of impending attacks.

Through the Golden Dome effort, the U.S. will expand capabilities that prevent and disrupt missiles from launching at all—before the film even begins. If an adversary does execute a missile attack, it will likely be multiple missiles at once requiring a robust missile defense architecture.

Today, the U.S. fields a range of surface-launched kinetic interceptors, which are powered by solid rocket motors and neutralize incoming ballistic, hypersonic and advanced cruise missiles in and above the atmosphere.

Through Golden Dome, an integrated network of space-based interceptors would be fielded—an innovative concept requiring cutting-edge technologies and deep-rooted space and missile defense expertise.

> *"Interceptors are critical to our nation's missile defense architecture," said **Wendy Williams, Vice President and General Manager**, Northrop Grumman Launch and Missile Defense Systems Division. "They are a powerful tool in our nation's arsenal for countering a range of threats, and Northrop Grumman has delivered this capability for decades."*

The Eyes and Brains of the Mission

Once a threat is launched, the nation's warning systems detect the launch, identify the type of threat and track its trajectory, all in a matter of seconds. For decades, Northrop Grumman has been a key provider of the systems, payloads and algorithms that enable this critical capability.

> *"Missile warning and tracking systems are our nation's eyes in the sky, delivering a decisive advantage," said **Chris Adams, Vice President and General Manager**, Northrop Grumman Strategic Space Systems Division. "Our sensing systems not only give our warfighters advance notice but supply crucial information to inform their decision-making in these high-pressure moments."*

The information from these systems is delivered via ground-based technologies to sites that employ sophisticated software to process and fuse the data, conveying a 3D-fidelity view of the situation to decision makers and warfighters.

Currently, multiple regional and branch-specific *command and control* (**C2**) systems direct U.S. responses to foreign missile threats in specific theaters of operations.

Through Golden Dome for America, these C2 systems would be integrated to provide a real-time picture of the global battlespace of missile threats.

This would enable existing regional C2 systems, such as the ***Integrated Battle Command System*** (**IBCS**), to take data collected by sensors like the ***AN/TPS-80 Ground/Air Task-Oriented Radar***—which detects, identifies, and facilitates engagement of airborne threats—and more effectively share that information in the Golden Dome environment.

Golden Dome is fast-tracking advanced homeland defense capabilities and combining the best of existing and new programs on this expedited timeline will require not only partnership and integration, but innovation and expertise—as well as the facilities, workforce and supply chain to support this rapid pace.

Photo of an Integrated Battle Command System site, courtesy of Northrop Grumman

"Northrop Grumman has been at the forefront of homeland defense for decades and is delivering advanced capabilities now," said Raymond. "We're ready to accelerate and innovate to address this national challenge."

Golden Dome for America is a once-in-a-generation defense initiative that will protect the homeland from the escalating global missile threat, combining the best of existing and new programs to ensure it's delivered with speed.

This complex effort requires industry to bring forward critical thought leadership, architectures and technologies.

With one of the most diversified portfolio of capabilities in missile defense, Northrop Grumman brings trusted, ready-now, next-gen technologies for end-to-end missile defeat.

The company is a proven integrator who delivers this technology with speed, through advanced software development, new hardware design, material science and manufacturing at scale—ready to deliver a comprehensive architecture to protect our nation.

Companies under contract consideration or already awarded

The ***SpaceX*** / ***Palantir*** / ***Anduril*** team have pitched their proposals, with SpaceX plans to produce from 400 to 1,000 unarmed satellites that will be designed for global missile detection and tracking—however, the disagreements between the **President** and **Elon Musk** may inhibit this current "front runner"role for the company.

Boeing / L3Harris / Leonardo DRS / Lockheed Martin / Northrop Grumman, Raytheon Technologies are likely contract recipients.

Additional participation pitches for involvement include ***Amazon Kuiper, Andril, Palantir and SpaceX***.

Amentum has already been selected and will provide ground system infrastructre.

** The Golden Dome, as of this writing, remains in the procurement and conceptual design phases.*

U.S. National Missile Defense—Today and the Future Produced by BryceTech

The proposed Golden Dome concept—a future global network of space-based interceptors designed to engage missile threats earlier, including during the boost phase—will rely on the U.S. industrial base and commercial space industry. BryceTech identified key commercial capabilities relevant to Golden Dome, such as:

- *Satellite manufacturing to mass-produce buses and payloads*
- *Data integration that combines satellite and sensor inputs for actionable insights*
- *Command, control, and communications systems enabling coordinated decision-making*
- *In-space interceptors designed to detect, track, and destroy missiles*

Explore the commercial space capabilities supporting Golden Dome in the full infographic below.