



AFWERX
2023 ANNUAL REPORT



COVER IMAGE PHOTOS



Maj. Marisa King, 2nd Bomb Wing commander executive and pilot, inspects a B-52H Stratofortress while preparing for take off at Barksdale Air Force Base, Louisiana. An all-woman aircrew from the 96th BS, 11th Bomb Squadron, 20th Bomb Squadron and the 2nd Bomb Wing is flying for Women's History Month.

(U.S. Air Force photo by Senior Airman Max Miller)



Capt. Hightower is assigned to U.S. Space Force's Space Operations Command at Headquarters SpOC, on Peterson Space Force Base, Colorado. SpOC generates, presents, and sustains combat-ready intelligence, cyber, space and combat support forces and serves as the USSF Service Component to U.S. Space Command.

(U.S. Space Force Photo by Tech. Sgt. JT Armstrong)

AFWERX | SPACEWERX

MISSION

AFWERX accelerates agile and affordable capability transitions by teaming leaders in innovative technology with Airman and Guardian talent.

VISION

Forge an innovation ecosystem that delivers disruptive Air & Space capabilities.

MANTRA

Unleashing American Ingenuity

Photo by Airman 1st Class Hayden Legg



When I was handed the reins in December 2022, AFWERX had already gone through many changes, moving from its start-up phase to being a fully functioning organization. AFWERX was an experiment, and the experiment worked! We learned a lot from that adventure, and it was time to apply those lessons and enter AFWERX 3.0.

This year, we turned our focus to transforming three distinct programs – AFVentures, Spark and Prime – each of which were operating individually under our umbrella, into overlapping components of a collaborative, cohesive, mission-focused organization. This is the vision we are working toward in 3.0, but we are not there yet.

I started my tenure as the Director with three priorities in mind: Strengthen Our Team, Commercialize the Force, and Connect the Ecosystem.

- 1. Strengthen Our Team.** Our top priority is acquiring and training talent as we build our team. It is time to institutionalize what we do, and that requires dedicated time spent hiring, training, and acquiring tools, and then organizing and communicating well. Every step towards full operational capability means we are more effective in our jobs and can achieve a healthy work/life balance, both of which are essential for long-term success.
- 2. Commercialize the Force.** Commercial R&D is moving at a far faster rate than the government. Our mission is to leverage this in order to bring technology into the hands of our warfighters. We accomplish this first through the execution of our programs, and second, by keeping our hand on the pulse of industry and the current state of the art.
- 3. Connect the Ecosystem.** AFWERX is the connective tissue that holds together a myriad of stakeholders, including a vast pool of private sector businesses and investors, operators, planners, lab directorates, and program offices across the service. We also interface with other government agencies and our sister services. We need to leverage and strengthen these connections, and steer the ecosystem toward a common set of shared tools and information. We accelerate change by fortifying the pathway from the technologist, who knows what is possible, to the warfighter, who knows what is needed.

These priorities remain the same for 2024. We have made exceptional progress in building the premiere innovation team for the Department of the Air Force. We have rebranded our mission, vision and mantra for AFWERX 3.0. We have grown as an organization, improved our tools, and built connections across the government and industry in order to harness innovation to address our nation's biggest threats.

AFWERX is a unique program that is connecting the best ideas in the private sector with Airmen and Guardian talent, and transitioning those ideas into the hands of our ultimate user: our warfighters.

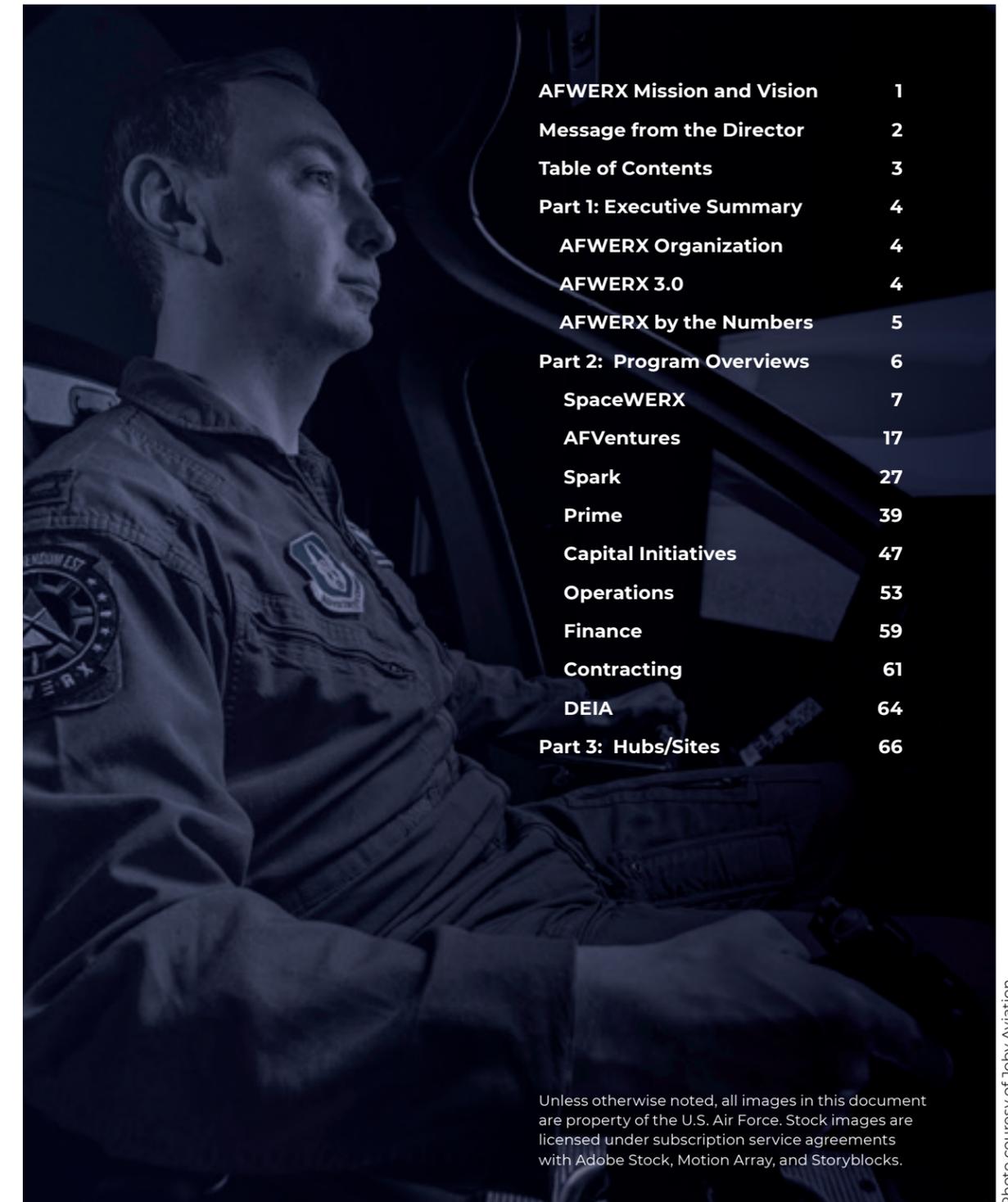
American ingenuity is the cornerstone of what we do. Our American people are our superpower. The ingenuity that comes from within our own ranks – our science and technology community, our universities, and our small businesses – has been instrumental in our growth as a nation.

Please enjoy reading this report and learning about the successes of our past year.



U.S. Air Force photo by R.J. Orlez

COL ELLIOTT LEIGH
AFWERX DIRECTOR
DAF CHIEF COMMERCIALIZATION OFFICER



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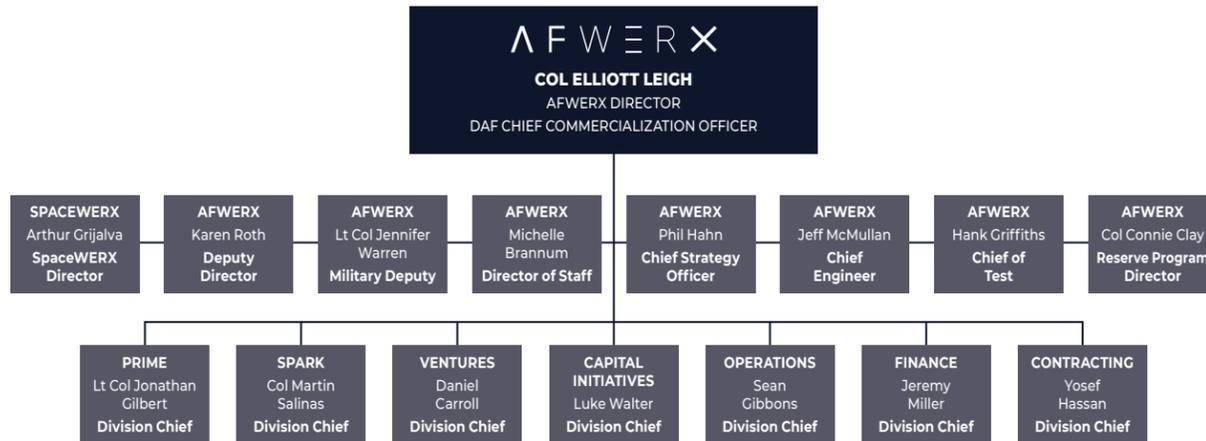
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Capt. Terrence McKenna, AFWERX Agility Prime test and experimentation lead, trains in a Joby electric vertical takeoff and landing (eVTOL) simulator. The Joby is a five-seat, zero-emission eVTOL aircraft.

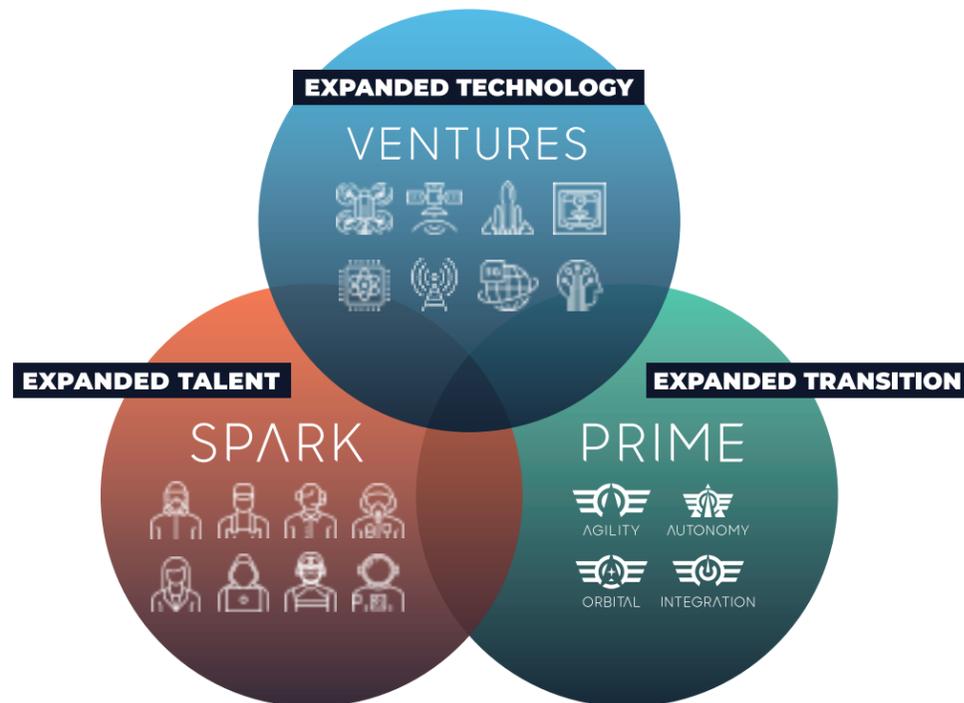
Photo courtesy of Joby Aviation

PART 1: EXECUTIVE SUMMARY

AFWERX ORGANIZATION As the innovation arm of the Department of the Air Force and powered by the Air Force Research Laboratory (AFRL), AFWERX brings cutting edge American ingenuity from small businesses and start-ups to address the most pressing challenges of the DAF.



AFWERX 3.0 The four core arms of AFWERX – AFVentures, Spark, Prime and SpaceWERX – serve to expand the defense industrial base for advanced technologies, empower Airmen and Guardian talent, and drive faster technology transition to operational capability.



EXECUTIVE SUMMARY

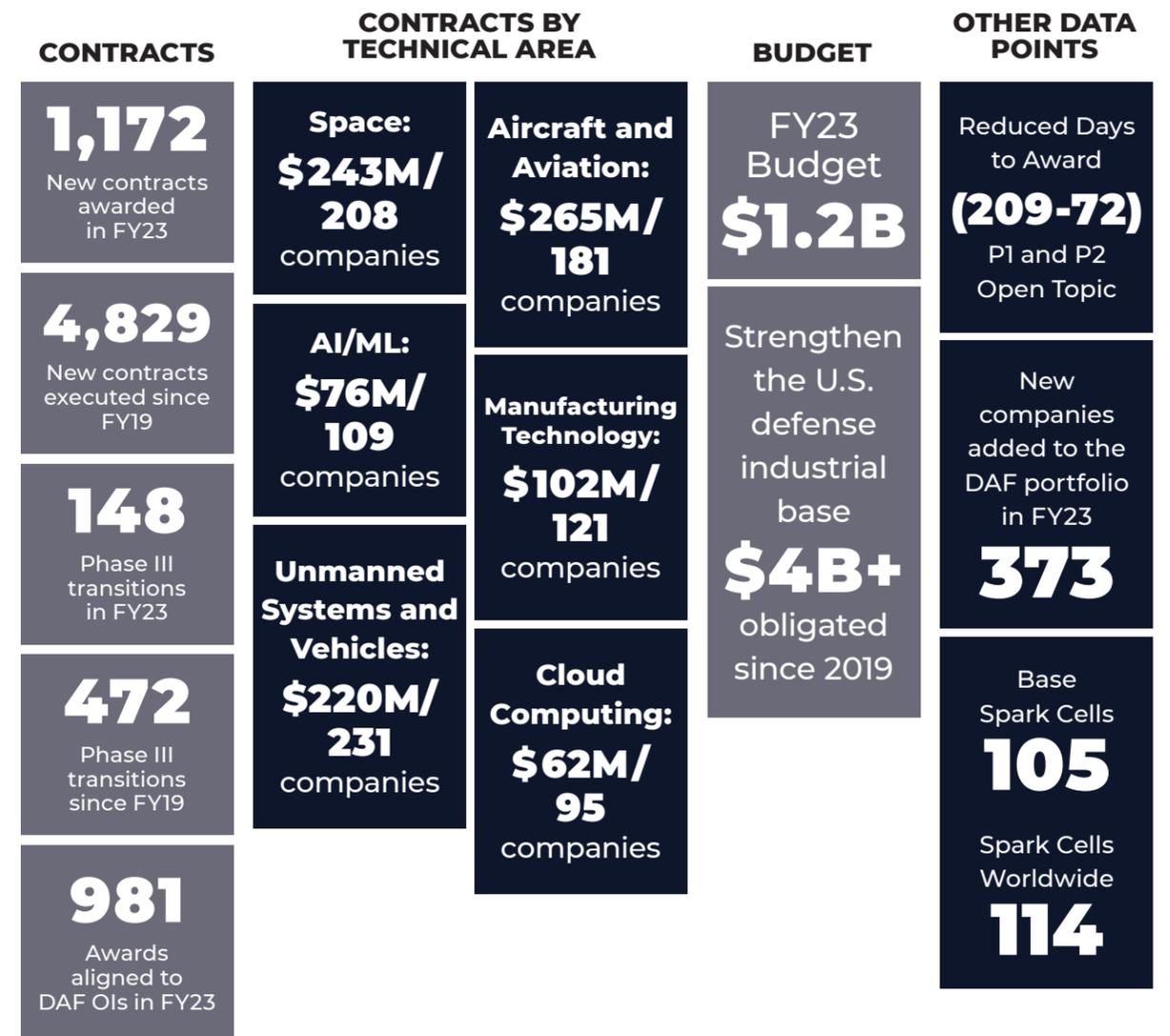
AFWERX teams internationally across academia, industry and government to develop technology, expand talent and transition dual-use capabilities.

Mission: AFWERX accelerates agile and affordable capability transitions by teaming leaders in innovative technology with Airman and Guardian talent.

Mantra: Unleashing American Ingenuity

Vision: Forge an innovation ecosystem that delivers disruptive Air and Space capabilities.

AFWERX BY THE NUMBERS:



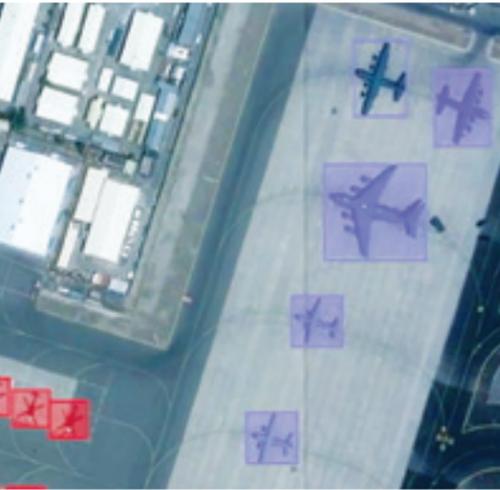
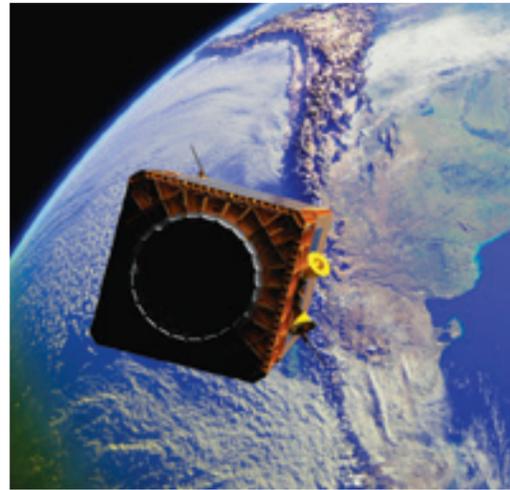


Image credits Row 1: 1. TSgt Matthew K Steht, USAF ANG 144 AMXS/MXAAA; 2. Courtesy of Orbital Sidekick LLC; 3. Richard Gonzales.
 Row 2: 1. Courtesy of Orbital Insight Inc.; 2. AFWERX Spark Refinery Staff; 3. Courtesy of Archer Aviation Inc.
 Row 3: 1. Dennis Stewart; 2. Courtesy of DEFCON-AI; 3. Courtesy of Specular Theory

SPACEWERX

OVERVIEW

MISSION

SpaceWERX accelerates agile and affordable capability transitions by teaming leaders in innovative technology with Guardian talent.

VISION

Forge an innovation ecosystem that delivers disruptive Space capabilities.

MANTRA

Unleashing American Ingenuity

STRATEGIC CONTEXT

SpaceWERX identifies, acquires and integrates innovative capabilities into the U.S. Space Force while cultivating partnerships among our nation's Space Guardians and top problem solvers.

OVERVIEW

As the innovation arm of the U.S. Space Force, SpaceWERX inspires and empowers collaboration with innovators to accelerate capabilities and shape our future in space. Headquartered in Los Angeles, SpaceWERX is a unique directorate within AFWERX that is jointly staffed by the Air Force Research Laboratory and Space Systems Command. SpaceWERX employs 28 military, civilian and contractor personnel executing an annual \$457 million budget. Since it was aligned under AFRL in August 2021, SpaceWERX has executed 906 contracts worth more than \$690 million to strengthen the U.S. defense industrial base and drive faster technology transition to operational capability.

PHASE II SBIR CONTRACTS AWARDED

211 Specific Topic Phase II Contracts Awarded

In FY23, SpaceWERX achieved a significant milestone by awarding 221 Phase II Specific Topic contracts valued at over \$400 million. These contracts, stemming from completed Phase I efforts or direct-to-Phase II awards, highlight our

dedication to advancing research and development. The decision to pursue projects without a preceding Phase I is guided by scientific and technical feasibility. Each Specific Topic is carefully tailored to address specific Air Force end user needs, providing a platform for small businesses to propose innovative solutions. Space Ventures collaborates with industry to accelerate capabilities and create pathways for innovators and private investors to contribute to Space Force technologies. The Space Force acts as an early-stage investor, offering non-dilutive capital to expedite commercialization and partnerships addressing military needs, emphasizing our commitment to cutting-edge technology and national defense.

142 Open Topic Phase II Contracts Awarded

In 2023, SpaceWERX awarded 142 space-focused contracts through the technology-agnostic Open Topic Phase II Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) program. These awards, reflecting SpaceWERX's dedication to fostering technology excellence, boast a projected value of \$151 million. The breadth of research and development work being conducted underscores our pivotal role in shaping the future of the industry.



Image by NASA

THE BRIDGE

In 2023, SpaceWERX partnered with DTi, a California non-profit, to open The Bridge, an innovation-collaboration center, in Culver City, California. The Bridge initiative seeks to boost the space industry's economic development within Los Angeles County and more broadly across the state. The Bridge is a community concept that was established to connect entrepreneurs, technologists, brands, private organizations and local policymakers. It also serves as the proving ground for a deliberate public-private partnership. During the first months after it launched, the center hosted more than 400 visitors, including local civic leaders, venture capitalists, small businesses, Hollywood film industry officials and innovation ecosystem representatives.

The highlight of the year was hosting a dinner and mixer for Dee Dee Myers, director of the California Governor's Office of Business and Economic Development (GO-Biz) and a senior advisor to Gov. Gavin Newsom. In addition to those roles, Myers also heads the state's newly established Space Industry Task Force. The Bridge serves as the connection between the task force, SpaceWERX and the Greater Los Angeles space industry. The intimate dinner gathered key stakeholders from several sectors. Attendees included: Laurie Leshin, director, NASA Jet Propulsion Laboratory; Fesia Davenport, chief executive officer, Los Angeles County; George Joblove, president of technology, the Academy of Motion Pictures Arts and Sciences; the Academy of Motion Pictures Arts and Sciences; state Rep. Al Muratsuchi; state Sen. Lola Smallwood-Cuevas; 12 other public- and private-sector leaders, venture capitalists and academics. An after-dinner mixer allowed the SpaceWERX team a chance to meet new tech companies and put on full display the future of The Bridge as a major meeting place and resource center for both Los Angeles County and California.

Since then, The Bridge has hosted countless one-on-one meetings with attendees. Those meetings have resulted in a strategic partnership with the county's economic development and research arm, LACEDC, along with the establishment of a working relationship between The Bridge and California's Space Industry Task Force. That momentum will carry into this year with the inaugural kick-off of its commercialization support and accelerator program, Innovate to Accelerate (i2a), directly supporting the TacRS D2P2 cohort companies. The Bridge has recently relocated to El Segundo, CA to be closer to Space Systems Command.



GO-Biz dinner



Inaugural dinner

Photos by AFWERX

Photos by AFWERX

BRANCHES

Space Ventures

Space Ventures works with industry to identify, mature and accelerate strategic capabilities. This investment arm creates pathways for innovators and private-capital investors to advance essential Space Force technologies. In this capacity, Space Force becomes an early-stage investor by providing non-dilutive capital to accelerate commercialization and partnerships that address strategic military needs.



Image by Storyblocks

ACCELERATORS

The Space Force Accelerators Program was founded in 2017 to fuel innovation in the Space Force. Funded by the Air Force Research Laboratory Space Vehicles Directorate and supported by SpaceWERX, the program discovers and advances seed-stage technologies in the commercial and academic sectors that could help government customers advance their missions.

The program achieves its goals through two keystone startup accelerators: the Catalyst Space Accelerator (<https://catalystaccelerator.space/>), executed under a Partnership Intermediary Agreement between the AFRL in New Mexico and the Catalyst Campus for Technology Innovation, and the Hyperspace Challenge (<https://hyperspacechallenge.com/>), executed through an agreement between the AFRL in New Mexico and the Central New Mexico Community College. These

accelerators foster nontraditional partnerships for the DOD within the commercial and academic innovation ecosystems to promote rapid acquisition of innovative, dual-use space technologies.

Calendar year 2023 marked the Catalyst Space Accelerator's 11th and 12th cohorts and the Hyperspace Challenge's fifth cohort. Each program continues incorporating lessons learned from previous rounds while also experimenting with new offerings. Highlights for each program are summarized below.

CATALYST SPACE ACCELERATOR

In 2023, the Catalyst Space Accelerator addressed two themes – Defensive Cyber Operations, and Artificial Intelligence/Machine Learning for Space and Maritime Applications. The latter theme addressed the needs of both the Space Force and the Navy. Each theme included several use cases from government organizations, providing participating companies broad exposure to a range of possible government needs.

Ninety-two companies participated in the 12 cohorts. Impacts for the 2023 cohorts will be analyzed this year. However, from 2018–2022, those same 92 companies collectively won 348 contracts, representing roughly \$281 million in follow-on contract funding (federal and non-federal entities). Due to traction gained in the accelerator, these companies hired 392 employees in 2022 alone, 79 percent of whom are full time. Since 2018, a total of 1,325 jobs have been added to the nation's economy, mobilizing incredible talent from the US Space sector towards dual role technologies.

HYPERSPACE CHALLENGE

The Hyperspace Challenge's 2023 theme was Protecting Space Assets in partnership with Space Force's Space Rapid Capabilities Office. Officials identified three focus areas: increasing space visibility and awareness, advancing space analysis and vehicle autonomy, and increasing space vehicle lifespan and maneuverability. Six companies joined the challenge, bringing the Hyperspace Challenge team's participation to 67 since it began. Impacts for 2023 will be analyzed during the current year.

In addition to the Hyperspace Challenge's core offering, the program has explored methods for extended support to companies post-accelerator. This includes the 2022 Hyperdrive Space Summit which brought together about 150 alumni from several accelerator programs, investors, members of academia, government innovators, and other ecosystem experts to forge deeper government

and commercial relationships. Also in 2023, the Hyperspace Challenge initiated a bi-monthly webinar series covering a range of topics designed to inspire and provide continuing support to the space ecosystem. Hundreds of participants have joined the 21 live webinars.

STRATFI/TACFI

The Strategic Funding Increase, or STRATFI, and Tactical Funding Increase, or TACFI, programs catalyze the relationships between DAF end users and acquisition professionals, private-sector innovators and investors. These programs bridge the capability gap between current SBIR/STTR Phase II efforts and Phase III scaling efforts, facilitating the delivery of strategic capabilities for the DAF.

Space Spark

Space Spark seeks to empower innovation at the operational edge by connecting end users to lab engineers and acquirers to pursue novel solutions to their toughest challenges. Spark provides platforms through our accelerators, challenges, velocity, and colliders for our end-users, acquisition professionals, and engineers to collide with industry and academia to innovate.



Photo by U.S. Space Force

FY2023 SUMMARY

COACHES AND CUSTOMER DISCOVERY

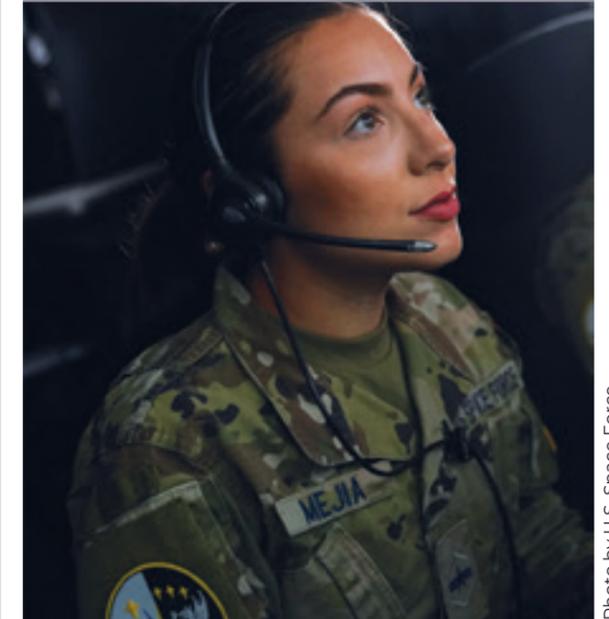


Photo by U.S. Space Force

Coaches guide companies through a curriculum to help them understand their value proposition to end users.

COLLIDERS

The Technology Collider aims to connect space operators with small businesses and startups, allowing for an exchange of knowledge, challenges and potential solutions. SpaceWERX Colliders benefit operators by giving them access to prototype solutions focused on existing operational requirements. In addition, space operators who attend colliders also gain insights that inform new operational needs. The collider's collaborative nature fosters improved decision-making, enhanced collaboration, and the potential for operational transformation within the space operator's domain.

SPACEWERX REVERSE COLLIDER

The SpaceWERX Reverse Collider builds a platform allowing SBIR-eligible companies to connect and engage with Space Force end users to discuss current mission needs, as well as emerging mission-area challenges. The collider focuses on discovering commercially available solutions that can be tailored to DOD needs and solutions in developing sectors with potential commercial applications that can be incubated with SBIR/STTR funding.

23.6 D2P2 OPEN TOPIC

The timing of the March 2023 Reverse Collider was intentional so as to align with the 23.6 D2P2 Open Topic opportunity. This not only provides agile prototype development for warfighters, but also accelerates commercial innovation by connecting solution providers to their DOD end users to realize their value proposition. By encouraging industry to build a product that is intentional from conception, we are kick-starting customer discovery as the solution is aligned to a mission area by nature.

To gauge the event’s effectiveness, we will continue monitoring the results of the 23.6 D2P2, tracing awards to the companies that attended the event and align with the mission areas that were covered. We will also remain in close contact with the end-user community during the SBIR process, maximizing our potential to deliver scalable capabilities.

We were able to trace four of the D2P2 award histories to the companies that participated in the March 2023 reverse collider, with one tied directly to U.S. Space Command, which drove more than \$5 million into the portfolio through the event.

DELTA 6

The Delta 6 Reverse Collider took place in June 2023. The overall mission area, Enhanced Battlespace Awareness, sought complete situational awareness of the operational environment via a full operational view to protect and defend all space mission systems, including supporting systems. This capability is predicated on having access to the appropriate data and networks, including:

- Visibility for Industrial Control systems and Supervisory Control and Data Acquisition networks
- Ability to perform defense cyber operations on various Internet of Things devices

COMBAT DEVELOPMENT TEAMS (CDTs)

Combat Development Teams are innovation stewards responsible for engaging each of their squadrons to identify, validate and align problem areas with innovative solutions. Additionally, the CDT as a Delta-level acquisition advocate ultimately leads innovation for their respective Delta, including portfolio management of all capabilities and initiatives developed for that Delta.

- **Delta Discovery Team (D2)** is a SpOC-funded and chartered CDT support team that works collaboratively within each Delta to train and enable Guardians to think and innovate with

an agile mindset. They also lead intensive problem-area discovery for newly formed Deltas and Squadrons and host the current tracking software on Platform.

- **Mission Area Teams (MATs)** are unique to each mission area, and are advocates to the appropriate Program Office for CDT-proposed efforts to include program funding for sustainment.

These teams have proliferated beyond SpOC and now include SSC’s SLD 30 and SLD 45, as well as STARCOM Deltas 1 and 13 with plans to further implement CDTs within SSC.

Space Prime

Space Prime deploys a diverse industry partnership engagement strategy to identify nascent space technology sectors that, if “primed”, could advance U.S. national security and economic prosperity. Prime engagement is not limited to just government investment, but also allows SpaceWERX to address key policy concerns as well as offer testbeds and platforms to advance capabilities.

ORBITAL PRIME

Overview Launched in 2022, Orbital Prime is the first Space Prime program initiated under SpaceWERX. The program has two primary objectives: (1) seeding advanced technology to accelerate the In-space Servicing, Assembly and Manufacturing, or ISAM, mission area, and (2) creating favorable market conditions for the emergence of a commercial ISAM marketplace. Orbital Prime is seeding technology in three focused ISAM areas: Acquisition; Remote Proximity Operations and Docking; and Servicing. A mature ISAM ecosystem will enable a transformational space mobility capability, which will allow the U.S. to pivot its architectural design decisions to incorporate new in-space logistics capabilities, such as refueling, assembly and non-cooperative transportation. In addition, the creation of a viable commercial ISAM



SPACEWERX
ORBITAL PRIME



Image courtesy of OrbitFab, Inc.

Orbit Fab is building the first commercial fuel depot in geosynchronous orbit.

market accelerates the availability of ISAM services for national security space while also significantly decreasing the cost burden for space Programs of Record that leverage these services. The ISAM technology under development also has broad applicability to a variety of other space mission areas, such as space domain awareness and space superiority.

The How The Orbital Prime program is improving the opportunity for companies awarded SBIR/STTR contracts to successfully transition their technology by implementing a focused Cohort Development Program and an Ecosystem Orchestration management approach. SpaceWERX’s Orbital Prime Cohort Development Program provides companies with additional non-monetary resources to best position each company for a successful technology transition. These non-monetary resources include access to government technical Subject Matter Experts and test facilities, information on government procurement processes, introductions to sources of non-dilutive and dilutive capital, and networking opportunities with potential transition partners and end-users. The Ecosystem Orchestration approach allows ecosystem

participants to develop relationships, identify high-value connections, and conduct various transactions with the ISAM ecosystem. The ecosystem allows SpaceWERX to increase its return on investment by maintaining an understanding of the ecosystem’s landscape, leveraging natural ecosystem effects, and “orchestrating” improved interactions and information sharing between entities to achieve Orbital Prime goals.

- **Seeding Technology.** SpaceWERX awarded 50 Phase II contracts to 41 different companies through the SBIR/STTR program, valued at \$81 million. This brings the total Orbital Prime contracts awarded to 175, with a combined contract value of \$121 million. These contracts, demonstrations and prototype deliveries will occur from early to mid-2024. In addition, three Orbital Prime companies have submitted STRATFI proposals, which are currently under evaluation. The STRATFI awards would lead to on-orbit demonstrations of three different ISAM capabilities—Space Mobility (satellite relocation), recycling and servicing. Additionally, four more companies submitted TACFI proposals (currently under evaluation) to further develop their technologies and achieve on-orbit technology demonstrations.
- **Commercial ISAM Market Emergence.** Through the Ecosystem Orchestration approach, SpaceWERX has been able to facilitate a variety of connections, which indicate the beginning of a commercial ISAM Marketplace.
- **NASA awarded Mission Concept Study** contracts to five companies for a future Active Debris Remediation mission. Four of those five companies are Orbital Prime companies. Additionally, NASA is considering sponsoring several Orbital Prime companies for a TACFI contract.
- **Scout Space**, an Orbital Prime company, is a subcontractor to SRI International under the Intelligence Advanced Research Projects Activity (IARPA) Space Debris Identification and Tracking (SINTRA) program.
- **Orbit Fab**, an Orbital Prime company, is subcontracted to Astroscale US to provide in-space refueling technology under the Space Enterprise Consortium Other Transaction Agreement between Astroscale US and Space Systems Command Assured Access To Space programs.

SUCCESS STORIES

Satellite Vision Algorithms

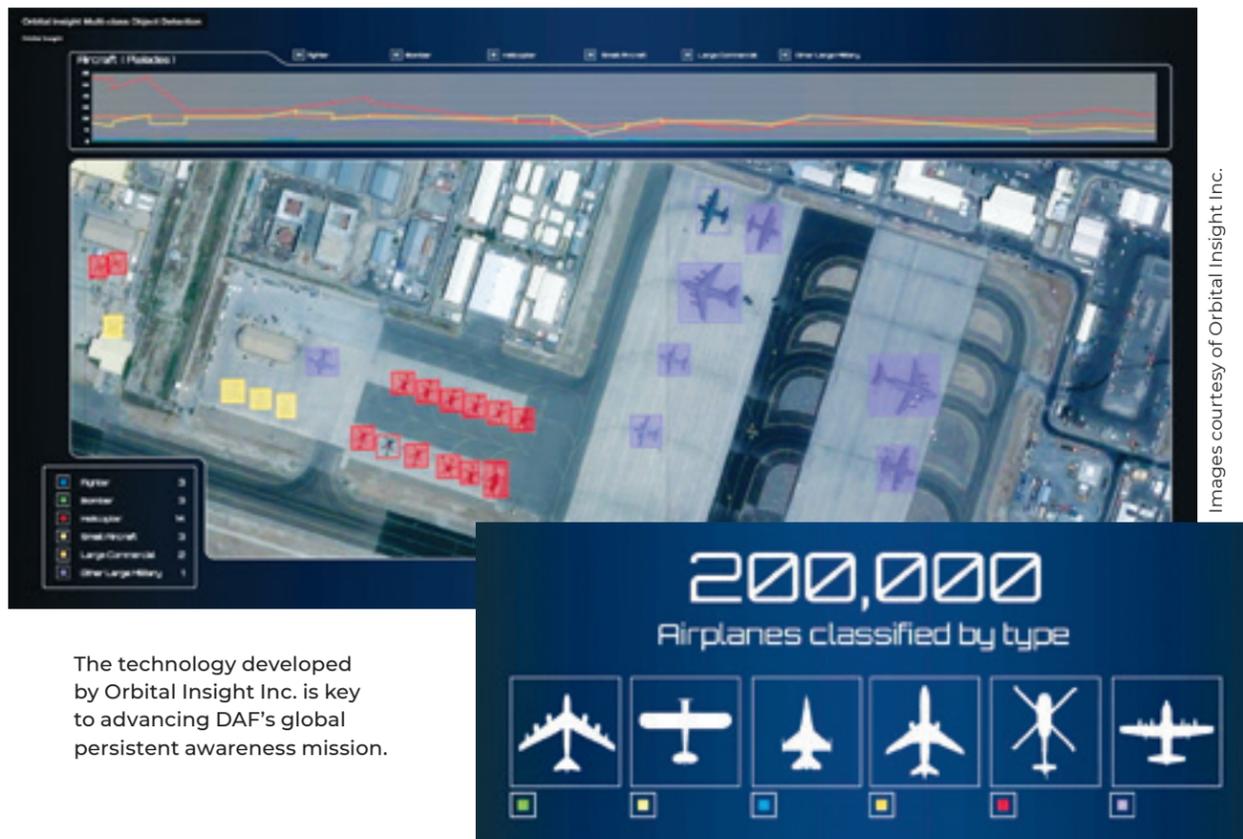
Orbital Insight Inc. is in the final stages of developing a dual-use geospatial data ingestion and processing platform to identify ground assets.

The Palo Alto, California-based company's software analyzes data from multiple sources, including both commercial and high-side satellite imagery, to make decisions in real time. This technology is key to advancing DAF's global persistent awareness mission. A STRATFI SBIR recipient in its fourth year of software development, the company's platform is now months away from a final go-no go decision. Militarily, the software is expected to leapfrog Combatant Commander use of imagery to improve battlefield decision science. On the commercial side, applications are endless across the biodiversity and supply chain management markets, with the software allowing for more precise research analysis to make imagery data driven decisions.

Orbital Insight supports the DAF's 548th Intelligence, Surveillance and Reconnaissance Group with ISR trend analysis, change detection, persistent monitoring and other reporting missions.

In July 2019, AFWERX awarded the company a \$1.5 million Phase II SBIR contract. During this period, Orbital Insight delivered a computer vision algorithm to detect and classify aircraft models in satellite imagery, demonstrated the ability of its geospatial analytics platform, and extended licenses to multiple units to show scalability of value across the Distributed Common Ground System enterprise.

In August 2020, Orbital Insight was awarded a \$3.5 million STRATFI SBIR contract by the Air Force Life Cycle Management Center's Digital Directorate, plus a private investment of \$7 million from venture capital firms. In October 2024, the company is expected to transition to a Phase III DHS contract to deliver enhanced geospatial analytic capabilities to the DAF's DCGS enterprise, accelerating production and delivery of intelligence to DAF decision makers.



The technology developed by Orbital Insight Inc. is key to advancing DAF's global persistent awareness mission.

Three SpaceWERX Challenges Drive Diversity of Thought, Solutions for Space Strategy

SpaceWERX launched three strategically relevant Challenges to support key elements of the Space Force Strategy. Each of these challenges brought together thought leaders, industry and academia to learn from each other on the current state of the art in a rapid form of collaborative

high-quality market research that helps the Space Force get solutions to problems. Every challenge platform and process helps the service to increase knowledge by building out an ecosystem worth of knowledge and accelerating the path from idea to deployed solution.



AFWERX Challenge is a rapid, high-quality market research program that helps the DAF get solutions to problems from collaboration with industry and academia.

Hyperspectral Imagery

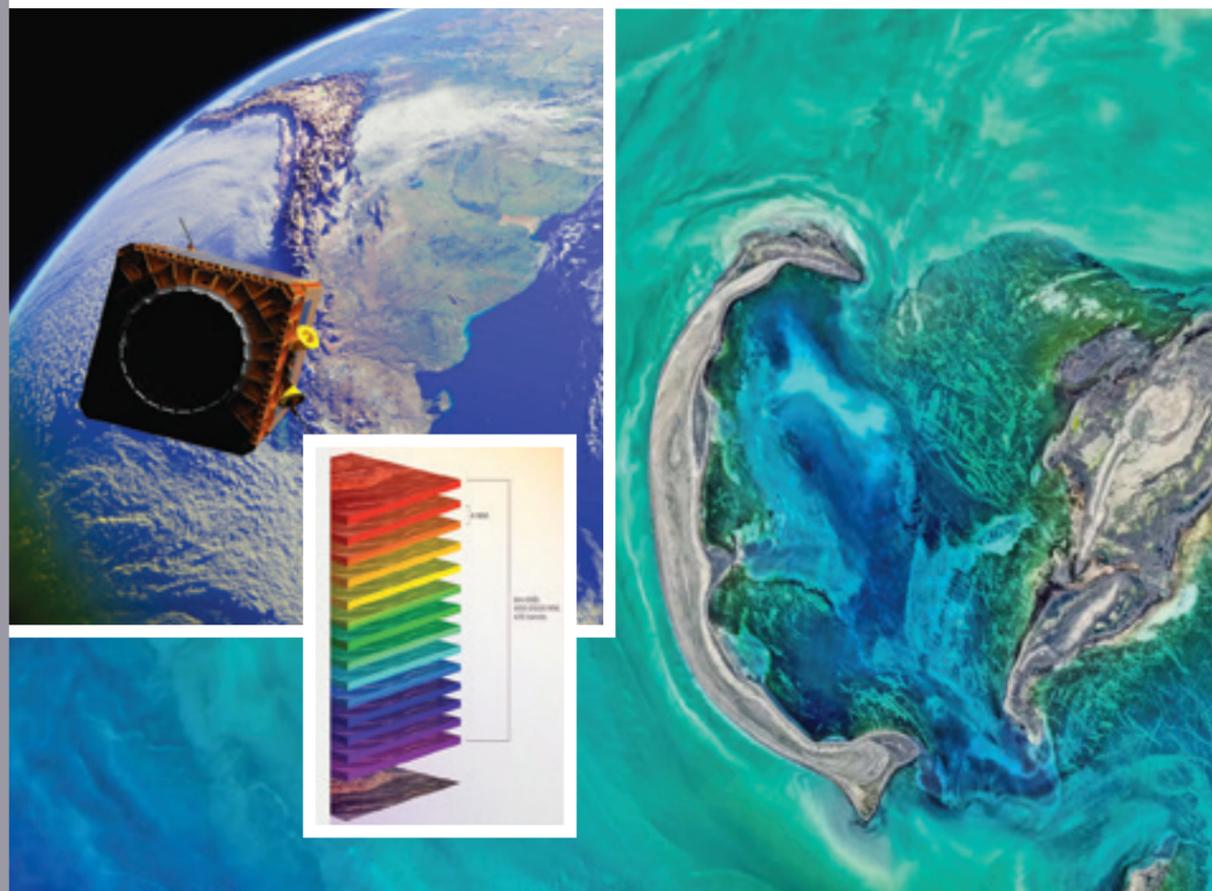
Orbital Sidekick LLC

TECHNOLOGY

Orbital Sidekick (OSK) provides a low-cost, high-fidelity monitoring capability to defense and intelligence, as well as to energy infrastructure, with a major focus on the \$10 Billion pipeline monitoring market.

OPERATIONAL IMPACT

As of June 2023, OSK successfully launched its first three of six GHOST™ constellation satellites. OSK is working with multiple commercial partners, including the AFRL Space Vehicle Directorate, towards implementing a low-cost space-based hyperspectral imaging infrastructure with the ability to provide frequent revisit rates across the plant.



Images courtesy of Orbital Sidekick LLC

TOTAL FUNDING 2 Contracts | **\$16.82M Total Gov't Funding**



AFWERX
ADVENTURES

OVERVIEW

MISSION

AFVentures funds emerging technologies to deliver Air Force and Space Force capabilities and broaden access to disruptive innovation. The division transforms the national security innovation base by attracting and scaling small businesses via government and private capital.

VISION

Collaborates with small businesses to develop and deliver disruptive Air and Space capabilities.

STRATEGIC CONTEXT

Our success is achieved by connecting novel commercial solutions with defense problem sets, de-risking Airmen and Guardian initiatives to fill capability gaps and transition technologies.



Photo by Jennifer Bryant

OVERVIEW

Private investment comprises more than 80 percent of these small business-generated technologies to meet operational needs by creating simple, easy-to-use pathways for dual-use innovation and private investment. As part of the process, AFVentures brings together government technologists, operators and acquirers with small businesses, investors and academia.

To enable small businesses to scale and mature the most promising technologies, AFVentures leverages government funds of increasing value. This process allows small businesses to transition from prototyping to fielded systems, crossing the so-called "valley of death." Partnership is imperative and AFVentures works to reduce barriers to entry and attract the best technology to solve Department of the Air Force problem sets.

Since the launch of AFWERX 2.0, AFVentures has increased the value of the DAF Small Business Innovation Research/Small Business Technology Transfer program to DAF end users and small businesses. AFVentures is delivering more awards faster than ever to small businesses, averaging 1,679 contract awards annually since FY2020, versus 525 contract awards per year between FY2015 and FY2018. Simultaneously, the time necessary to award Open Topic contracts has fallen 62 percent compared to pre-AFWERX 2.0 levels.

In total, AFVentures has added more than 2,470 new companies to the DAF's small business portfolio since the launch of the Open Topic in September 2018. Moreover, the division is adding new companies 3.2 times faster than before AFWERX 2.0. This rapid increase in the DAF's small business portfolio has drawn the attention of DAF customers and end users, leading to more non-SBIR, follow-on government contracts with AFVentures' small business portfolio than ever before.

In FY2023, DAF non-SBIR Phase III contract funding grew 17 percent to \$958 billion, versus \$819 billion during the prior fiscal year. This year-over-year gain indicates the portfolio is continuing to have a greater positive impact on Airman and Guardian capabilities.

At the same time, private investors have invested more than \$32 billion in AFVentures' SBIR/STTR portfolio companies since AFWERX 2.0 launched, enabling the portfolio's small businesses to scale up. Currently, AFVentures has more than \$1.9 billion in contracts in its portfolio across more than 1,044 small businesses.

AFVENTURES SUCCESS SNAPSHOT

\$29B+
private investment
in SBIR portfolio companies
since AFWERX 2.0 launch

Open Topic Phase I time to award
-54%
Versus
3 years prior

3.2x*
number of
annual awards
FY21-23
VS
FY15-18

2,534
small businesses
Added to our portfolio since
Open Topic launch

*Open Topic increased capacity through 2019, so it was removed from this metric since it doesn't belong in the pre-Open Topic FY15-18 base-line period or the fully ramped FY20-22 current period.

\$1.9B
in Contracts Under Management Across
898 Small Businesses

Open Topic Phase I Time to Award
78 DAYS
in FY23, which is a 45% decrease from FY22 and a 54% decrease from before AFWERX

2,400+
Companies added to DAF Portfolio since Open Topic Launched (estimate Sep 24, 2018)

1,673
Annual Awards since FY20 still up 3.2x vs. Pre-Open Topic

Growth in AFVentures SBIR Portfolio Companies Since October 1, 2014

NUMBER OF CUMULATIVE UNIQUE COMPANIES AWARDED SINCE THE END OF FY2014

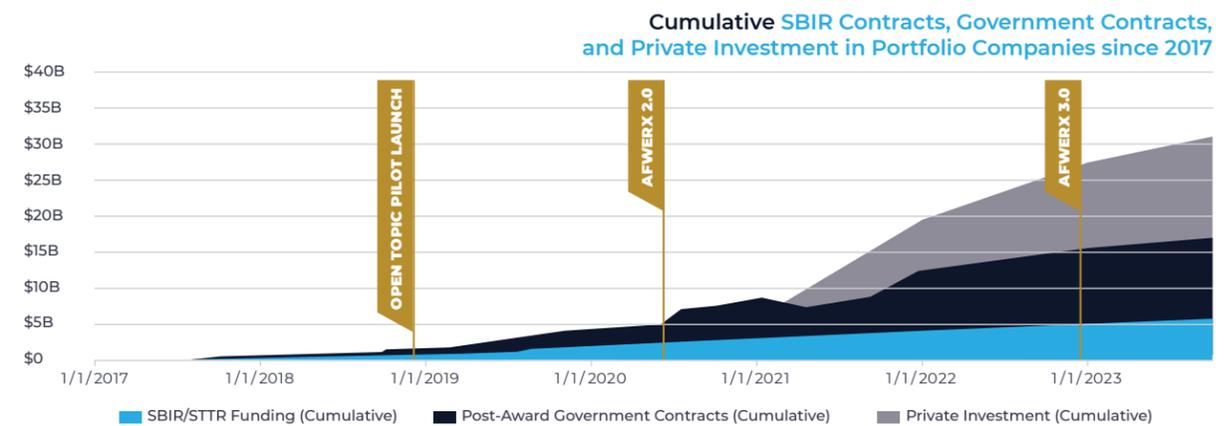
ANNUAL PHASE III AWARDS

148
FY23 Annual Phase III Awards

43 out of 3138
1.4%
of AFWERX portfolio companies were last valued at at least **\$1B** according to Pitchbook

680
Companies Have Won Post-SBIR Award Government Contracts Worth **\$5.3B** Since AFWERX 2.0 Launched

704
SBIR Portfolio Companies Have Won **\$31.7B** in Private Investment Since AFWERX 2.0 Launched



Only includes government contracts or private investment after each company's first post-2017 SBIR/STTR award.

SBIR INTRO

The AFVentures SBIR/STTR program is divided into three phases:

Phase I: AFVentures awards companies short-term contracts between \$75,000 - \$180,000, with three to six months to develop concepts, test feasibility and identify potential DAF customers.

Phase II: AFVentures awards small businesses with feasible concepts up to \$1.8 million to develop a prototype through research, development, test and evaluation based on Air and Space Force needs. If a business has already completed a feasibility study and has an identified Air Force customer, it can apply for a Direct-to-Phase II (D2P2), where it competes for a Phase II without a prior Phase I.

STRATFI/TACFI: In an effort to help bridge the "valley of death," where a technology moves from a Phase II prototype to full-scale production in Phase III, the AFVentures program has developed the

Strategic Funding Increase (STRATFI) and Tactical Funding Increase (TACFI) Programs. Small businesses that have been awarded a Phase II contract within the last two years are eligible to apply for this annual notice of opportunity. The program requires various levels of matching funding and avenues for Defense and/or Industry matching, depending on the program sought.

Phase III: The SBIR/STTR Phase III is often referred to as the commercialization phase. It includes work derived from an effort under a prior SBIR/STTR funding agreement, but the work is funded by a source outside the SBIR/STTR program. A key SBIR/STTR component is that once a company has received a Phase I or II award, sole-source Phase III awards may be made to the company since competition requirements were satisfied under Phase I and II. Phase III awards indicate that the technology has transitioned to government end users.

There are three opportunities within the Department of the Air Force SBIR/STTR program: Open Topic, Specific Topic and the STRATFI/TACFI program.

BRANCHES

Open Topic

In the Open Topic, industry submits technology-agnostic solutions and encourages industry to submit innovative capabilities that can meet a defense need. This program focuses on dual-use technologies that have both commercial viability and defense applications to ensure long-term scalability. Additionally, this program often funds solutions with existing or proven commercial applications that require research and development to integrate into DAF missions.

The Air Force evaluates whether to conduct a feasibility study on the proposed project. If the DAF end user and customer are interested in the project post-feasibility study (Phase I), they sign a customer memorandum indicating their intent to work with the small business on transitioning the proposed technology to warfighters.

Once the small business has a memorandum in hand, they can compete for the opportunity to develop a prototype. During Phase II, or the prototyping phase, the small business works directly with a Technical Point of Contact (TPOC), to build and adapt the solution to fit DAF needs.

Open Topic schedules two Phase I and two Direct to-Phase II solicitations evenly spread throughout the year. This schedule is predictable, repeatable, and consistent, allowing for small business and government planning. The Open Topic continues to attract significant industry interest,

drawing a record-breaking 1,500-plus small business proposals during the recent 23.7/E cycle.

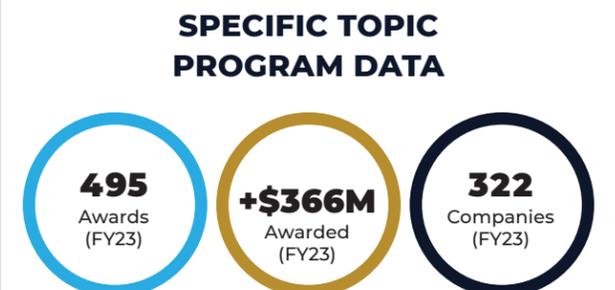
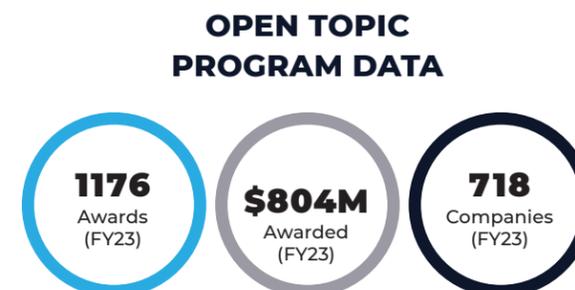
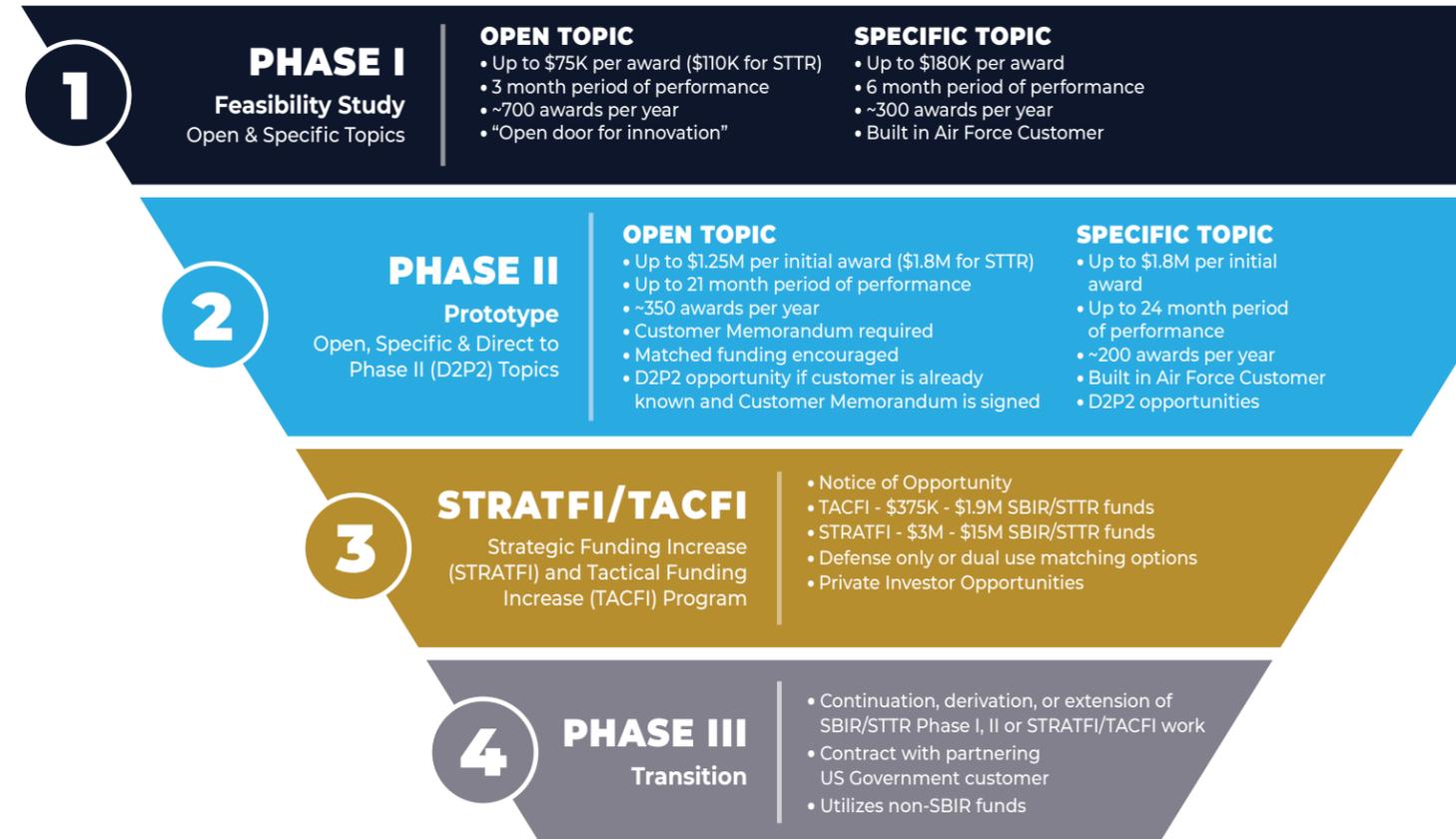
In FY2023, the program continued to improve transparency with industry and reduce knowledge barriers for startups and companies already familiar with government contracts.

Specific Topic

The Specific Topic program seeks innovative solutions for a particular problem specified by a DAF end user. Specific Topics have clearly defined requirements optimally aligned with DAF Operational Imperatives and a stated Air Force or Space Force customer. The customer organization is responsible for evaluating small business proposals to ensure the work meets customer needs, as well as issuing contract awards. Upon award of a Phase I, Phase II, or D2P2, small businesses will work alongside the DAF specified end user to address the capability gap or problem statement put forward in the solicitation. The Specific Topic Program utilizes the OSD Broad Agency Announcement (BAA) solicitation three times per year.

During FY2023, the Specific Topic Team managed the execution of nearly 500 contracts across 30 different customer organizations valued at \$367 million. As committed, the AFVentures Specific Topic program implemented a topic selection process to ensure solicitation topics and DAF SBIR/STTR funds aligned with DAF senior leadership priorities with both technical and operational considerations.

AFVentures - HOW THE PROGRAM WORKS



STRATFI/TACFI

In an effort to help bridge the “valley of death” between Phase II and Phase III, the AFVentures program has developed the Strategic Funding Increase (STRATFI) and Tactical Funding Increase (TACFI) Programs to get the most promising technologies into the hands of the warfighters.

To be eligible, a small business must have been awarded a Phase II contract within the last two years. For a TACFI, companies may receive between \$375,000 and \$1.9 million in supplemental SBIR funding if matched one-to-one with other government funding or private funding. For a STRATFI, companies may receive between \$3 million and \$15 million if matched either (1) one-to-two with other government funding or (2) one-to-one with other government funding along with one-to-two with private funding, providing a possibility of up to \$60 million total in combined funding.

From FY2022-2023, AFVentures implemented a new, web-based tool to streamline the review process, ultimately selecting 67 TACFIs and 22 STRATFIs for \$370 million in SBIR funds, a total of \$449 million in other government matching funds and \$465 million in private matching funds.

For the program year 2023 cycle, AFVentures has continued to improve and scale the program. The team implemented new tools, streamlined processes, and engaged senior leaders to seek out and fund programs with the greatest possible impact to the DAF’s strategic vision. STRATFI and TACFI contracts require that a government champion submit candidates. AFVentures continues to raise the bar to further develop and support the transition of the most promising technologies within the AFVentures SBIR/STTR portfolio.

Program Outcomes

AFVentures’ goal is to use a range of funding tools to enable small businesses to deliver and scale capabilities to end users across the DAF. The team achieves this by opening the door, both for DAF wide users to provide specific problem statements for Specific Topics and for companies to adopt their innovative technologies for DAF use via the Open Topic.

AFVentures Small Business Programs Support DAF-wide Users

DAF-wide end users/customers form the most important part of the AFVentures SBIR/STTR program. In FY2023, the Open Topic made 998 awards, spanning all Air Force Major Commands and the US Space Force, validating that the AFVentures approach is reaching DAF-wide. Specific Topic supported 4,951 awards spread across 11 different AFRL organizations, Air Force Materiel Command and Space Systems Command. For FY2022 the STRATFI/TACFI program supported the award of 89 contracts to small businesses supporting end-user organizations across all MAJCOMs.



Photo by AFWERX

Meghan Scott, AFVentures Program and Integration Lead, speaking at America’s Seed Fund Road Tour – Midwest 2023, which took place from July 17-21 and was the first in-person tour since 2019.

MAKING BIG BETS ON GREAT IDEAS

STRATEGIC & TACTICAL FUNDING INCREASE PROGRAM: STRATFI | TACFI

PURPOSE

- 1 Catalyze** relationships between Air Force and Space Force end-users and acquisition professionals, private-sector innovators, and investors.
- 2 Bridge the capability gap** between current SBIR/STTR Phase II efforts, resulting in SBIR/STTR Phase III scaling efforts that facilitate the delivery of strategic capabilities for the Department of the Air Force.

TACFI | Tactical Funding Increase
\$375K – \$1.9M

STRATFI | Strategic Funding Increase
\$3M – \$15M

ELIGIBILITY

- Small Business Concern (SBC) must meet **ALL** of the following criteria.
- Company is considered a SBC and eligible for a SBIR/STTR award
 - SBC is on an active SBIR/STTR PII or completed a SBIR/STTR PII within 2 years of Capability Package Submissions
 - The subject PII effort has not already been awarded a second (AKA “sequential”) PII
 - At least 90 days have passed since the beginning of the associated PII execution
 - SBC is not executing a prior STRATFI effort at the time of submission
 - Anticipated work is to be performed in the United States

MATCHING OPTIONS

	Defense-Only	Dual-Use
TACFI	1:1 SBIR/STTR: Gov	1:1 SBIR/STTR: Private
STRATFI	1:2 SBIR/STTR: Gov	1:1:2 SBIR/STTR: Gov: Private

Notice of Opportunity → DAF Customer RFP Release and Contract Award

PY22 STRATFI RESULTS

- ★ **86** Selected (23 STRATFI / 63 TACFI)
- \$ **\$364M** in SBIR funds
- \$ **\$274M** in matching government funds
- \$ **\$332M** in matching private funds over a four-year period of performance

3D Printed Buildings

ICON Technology, Inc.

TECHNOLOGY

ICON is a 3D printing company that specializes in the construction of buildings utilizing proprietary materials and technologies. Through collaboration with the Texas ANG and AFWERX SBIR Program, ICON has constructed structures across multiple military facilities, while growing its business and technology.

OPERATIONAL IMPACT

Tyndall Air Force Base, following the catastrophic damage from Hurricane Michael in late 2018, is working with ICON to construct 3D printed concrete buildings using computer aided design (CAD) or digital 3D model. Engineers at AFIMSC are leading the research and development for possible future military construction projects.

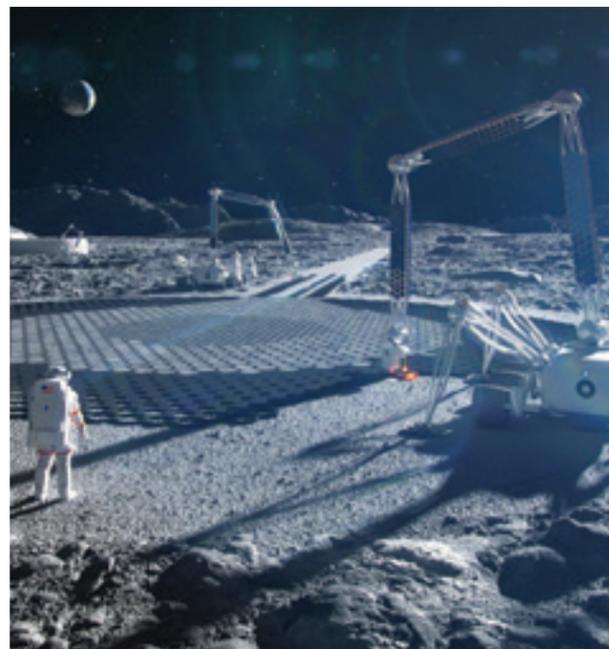
FUNDING ORGANIZATIONS

AFIMSC, ANG, NASA

“ [The Tyndall 3D printed facility] is the first military building that we know of the meets the ‘Miami-Dade wind code standard.’ ”

- Brian Skibba

Airbase Technologies Branch Chief,
Air Force Civil Engineer Center



Photos and image courtesy of ICON Technology, Inc



TOTAL FUNDING \$29.1M Phase II STRATFI (includes \$14.55M Private Funding)
\$57.2M NASA Phase III

AR/VR Training Tools

Specular Theory

TECHNOLOGY

Specular Theory has developed immersive AR/VR training tools that extend and enhance the availability of training for C-17, KC-46, C-130, KC-135, B-52, T-1, T-1AMP and T-6 aircrews.

OPERATIONAL IMPACT

Specular Theory's flagship products, MAT and EARL, enable aircrews to train outside of the sim and aircraft, not only reducing time and costs but producing higher quality graduates.

FIELDING

Currently supporting mobility and bomber aircrew training at the FTUs and Wings across the USAF. Interest in expanding training to more aircraft.

FUNDING ORGANIZATIONS

AMC, AFLCMC/WNS, AFGSC, AETC

“ We have recently cut 1 sortie from 3 different syllabi which will save the government \$13.42M a year. ”

- Col Patrick Schuldt
Chief, MAF/SOF/PR Graduate Training
Division, 19th Air Force



Photos courtesy of Specular Theory

TOTAL FUNDING \$1.5M SBIR | \$12.5M Phase III Gov't Funding

Artificial Intelligence

DEFCON-AI

TECHNOLOGY

DEFCON AI is developing cutting-edge technology solutions to provide operationally relevant decision points to the next generation of mobility leaders and logistics organizations. They are working directly with AMC on Development tools that strengthen the warfighter and warfighting capabilities.

OPERATIONAL IMPACT

Out of this tool comes statistics and analysis of the validity of each COA which lets our senior leaders come to better informed decisions. This further allows Air Mobility Command to test their planners' derived COAs versus a smart adversary that can identify weaknesses and gaps in our answers.

FUNDING ORGANIZATIONS

AMC

“ DEFCON AI is building an AMC COA development and wargame tool with a Red Smart Agent capability. This allows us to test our planners' derived COA's versus a smart adversary that can identify weaknesses and gaps in our answers. Out of this tool will come statistics and analysis of the validity of each COA which lets our senior leaders come to better informed decisions. ”

- Lt Gen Randall Reed
AMC Deputy Commander



Image courtesy of DEFCON-AI

TOTAL FUNDING \$1.45M SBIR Phase II

Monitoring Fatigue and Stress

NIRSense, Inc.

TECHNOLOGY

NIRSense, Inc. has created a neural monitoring system that tracks fatigue and cognitive stress. The Aurelian system device combines EEG and functional near-infrared spectroscopy brain monitoring devices to create headgear that detects signs of stress or injury and stimulates brain activity.

OPERATIONAL IMPACT

The Aurelian system is intended to improve flight crew safety by detecting irregular or declining mental activity in the cockpit, which lessens the likelihood of accidents. The wearable and lightweight designs allow the user to incorporate the Aurelian into a flight uniform with the ease and comfort of a baseball cap. The system is non-invasive and can be used in changing environments.

FUNDING ORGANIZATIONS

AFWERX, DoD, AFRL, 711th Human Performance Wing

“ AFRL/RXEB is very pleased with the performance of this D2P2 effort. The team engaged with partnering institutes, as well as end-users. ”

- Regina Shia
TPOC, AFRL Materials and Manufacturing Directorate



Photos courtesy of NIRSense, Inc.

TOTAL FUNDING \$1.5M D2P2 | \$850K Phase II Follow on FY24 and FY25

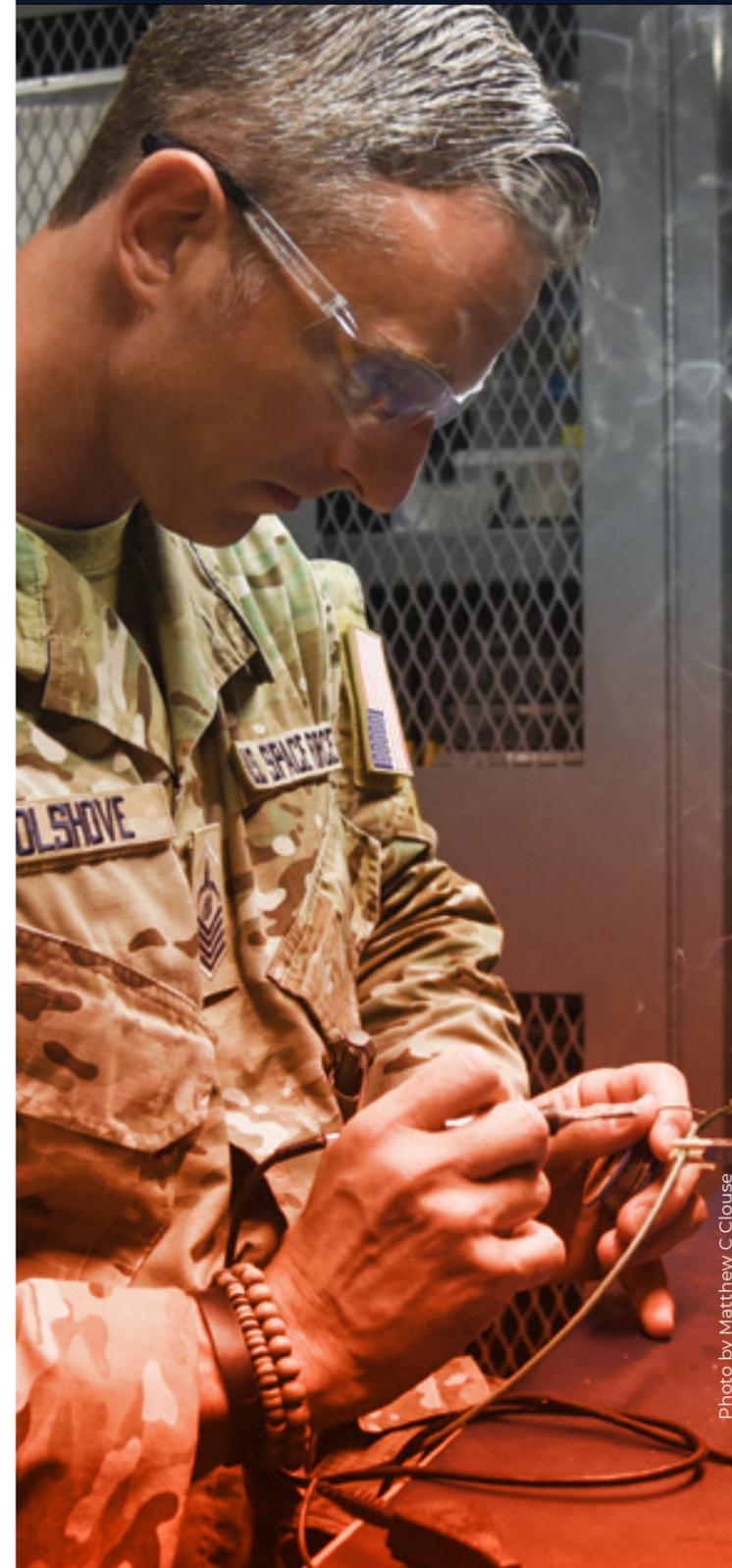


Photo by Matthew C Clouse

OVERVIEW

MISSION

AFWERX Spark marshals capability, cultivates talent and connects Airmen and Guardians.

VISION

Advance innovation culture by connecting diverse, innovative people from traditional and non-traditional communities. Accelerate impact by integrating, adopting, and fielding promising technologies.

MANTRA

Empowering innovators - Accelerating results.

STRATEGIC CONTEXT

Spark provides the connective tissue Airmen and Guardians need to improve their creative thinking and collaborate with like-minded peers. The division operates through a decentralized structure, allowing it to draw on the greatest possible pool of innovators. Spark resources such as expertise, funding and specialized innovation processes have all proven crucial when transitioning a variety of technological and procedural breakthroughs into production and execution. Further, other AFWERX developmental activities stand to benefit through the rapid feedback loops and tighter integration with end users afforded by the Spark ecosystem.

OVERVIEW

Innovative Airmen and Guardians will drive the Department of the Air Force's future success. All too often, however, they face cutting-edge challenges with equipment and procedures that are obsolete, tailored to the wrong problem or simply ineffective. While so far these inefficiencies have largely remained little more than a source of frustration for men and women in uniform, they threaten to undercut the Air and Space Forces' ability to win a future fight against a dangerous and motivated adversary. Across all ranks, regions and missions, Airmen and Guardians must routinely challenge the status quo and aggressively seek to apply unique experience and skills to improve the DAF. There are innumerable opportunities for innovation to solve critical warfighting needs. However, grassroots solutions are rarely able to make the leap from idea to execution. Innovators within the forces, or "intrapreneurs," need resources such as training, funding and access to scaling mechanisms, in order to refine and implement their vision.

OVERVIEW

AFWERX Spark advances innovation culture by connecting diverse, innovative people from traditional and non-traditional communities; and accelerates impact by integrating, adopting and fielding promising technologies.

Spark Catalyst

Spark Catalyst focuses on building innovation networks and training Airmen and Guardian innovators. It also facilitates the creation of ideas and the transformation of those ideas into prototypes that solve warfighter problems. To do this, the Spark Catalyst Branch has three teams in its portfolio: the People Team, the Training Team and the Accelerator Team. Each team serves a critical function/community in seeding the top of the Spark funnel. Spark operates as the glue holding the DOD innovation ecosystem together.

Spark Arc

Spark Arc was established in 2023 to focus on transitioning the best Airmen and Guardian ideas and prototypes into sustainable operational capabilities for the warfighter. In addition to transitioning high-priority projects, this branch also aims to identify the biggest barriers to transition

the Spark community faces and build consistent/repeatable/scalable solutions to minimizing or removing each of those barriers to make it as easy as possible for the Spark community to bring capabilities to the warfighter.

Spark Acquisition Strategy

AFWERX Spark aims to turn Joint Chiefs of Staff Chairman Gen. Charles Q. Brown Jr.'s vision of 'Accelerate Change Or Lose' into a repeatable process to deliver capabilities to the warfighter. We do this by, first, exponentially increasing the number of innovative ideas that come from the tactical-level operators who are closest to the problem. Next, we shepherd the best of those ideas through the acquisition process, turning innovations into acquisitions. We do this by simplifying, compartmentalizing and democratizing the acquisition process so the best ideas can make it through the funnel while checking the boxes that the sustainment community requires. The goal here is to make it as easy as possible for MAJCOMs and PEOs to adopt warfighter solutions tied to DAF Operational Imperatives. Each Spark program (as well as AFWERX and joint programs) solves a critical milestone in the acquisition process, with some programs touching multiple parts of the acquisition pipeline.



Photo by Michael Madero

Col. Elliott Leigh, AFWERX director and chief commercialization officer for the Department of the Air Force, kicks off the Fed Supernova Spark Collider event with a briefing to attendees at Capital Factory in Austin, Texas, Aug. 22, 2023.

114
Spark Cells Worldwide

SPARK CELLS TO DATE:
114 teams worldwide
 ▶ **7** in-person ecosystem events assembled **296** government members from **79** bases
 ▶ **51** Operational Innovation Cells, including one at every MAJCOM, AFIMSC, ANG and others
(based on 2023 events)

AUGMENTEE PROGRAM
(to date)

▶ **7,000** augmentees
 ▶ **3,000** evaluators
(in the last SBIR/STTR cycle)

COLLIDER

1 22 33
collider industry government participants

FELLOWSHIPS

▶ Hosted **5** cohorts
 ▶ **173** Fellows from every MAJCOM, Active Duty, Guard, Reserve, and Civilian:

- GED to PhD
- O1-06
- DO-2 & DO-3
- E3-E8
- GS-5 to GS-14
- engineers
- program managers
- pilots
- flight line operators
- maintainers

REFINERY

- ▶ **5** cohorts in FY23
- ▶ **63** Airmen graduates
- ▶ **47** projects refined
- ▶ **6** patents pending
- ▶ **15** actively transitioning
- ▶ **\$7.3M** of follow on funds
- ▶ Created **1** MAJCOM position for project transition

"The Refinery did what they said they would do: assist in de-risking the project and make connections with stakeholders. They went above and beyond by funding project participants to meet face-to-face with crucial stakeholders which overall accelerated the entire project!"

-TSgt Daniel Trombone, 99 CES/CED, EOD Robot Depth Perception Project

<p>SPARK INNOVATION TRAINING</p> <ul style="list-style-type: none"> ▶ 2 Design Warfare cohorts ▶ 3 Spark Lab classes ▶ 176 personnel trained ▶ 5 MAJCOMs supported ▶ 628 Customer Discovery Interviews 	<p>PROJECT ARC</p> <ul style="list-style-type: none"> ▶ 42 people ▶ 2 cohorts ▶ 18 bases ▶ Worked 87 projects ▶ Saved DAF \$30M and 50K hours annually 	<p>VISION</p> <ul style="list-style-type: none"> ▶ 3,627 projects ▶ 5,573 users <p>VISION has continued to expand into the joint innovation ecosystem as well, with the Army Applications Lab and 18th Airborne Corps and NavalX initiating pilot projects to test the capability within their respective user bases.</p>
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BRANCHES

Spark Catalyst

Tactical Innovation Cells (“**Spark Cells**”) are a decentralized network of innovation cells at Air and Space Force bases around the world. These small groups enable Airmen and Guardians to execute locally generated ideas and projects. The first Spark Cell began at Travis Air Force Base, California, in 2016, and there are now 114 worldwide. Operational Innovation Cells operate at the MAJCOM, National Guard Bureau and Center levels. These cells focus on DAF operational priorities and identifying cross-cutting initiatives, applying their deep knowledge of DAF corporate processes to scale more and better grassroots solutions to the field.



Photo by Staff Sgt. Kyndal Lievano

AFWERX Spark serves as the connective tissue linking all of these cells by promoting increased communication, collaboration and awareness of available innovation tools and resources via recurring virtual and in-person touchpoints. In 2023, AFWERX Spark hosted five in-person ecosystem events that brought together 220 government members from 60 innovation cells. And finally, AFWERX Spark presented as a tech exhibitor at the 2023 AFA Air, Space & Cyber Conference alongside Tesseract, Morpheus, Arcwerx, IMSC Innovation Team, and more than 20 Spark cells over three days.

The **Spark Collider Program** provides virtual and in-person events to connect industry partners to government customers, subject matter experts and end users. These events typically focus on a mission or technology vertical and serve as an accelerant to connect AFVentures Open Topic SBIR/STTR Phase I and II companies to customers and scaling partners. In 2023, one Collider was held in conjunction with FedSupernova in Austin, Texas. During this event government problem owners from Air Force Special Operations Command, Air Force Civil Engineer Center, Air Force Security Forces Center, and Air Force Office of Energy Assurance pitched their problems in support of Operational Imperatives Five and Seven to 22 small businesses. Additionally, those in attendance spent nearly two hours having one-on-one discussions in order to dive deeper into the pitches they heard or the solutions they were working on.



Photo by Kacey Napier

The 1st Special Operations Wing Spark Cell hosts the eastern Crossflow event at Hurlburt Field, Florida, July 11, 2023. More than 50 Airmen attended to connect, collaborate and learn best practices to further their base innovation program.



The **Spark Augmentee Program** mobilizes large cohorts of decentralized DAF talent to tackle hard challenges. Most notably, in FY23 the program has sourced upwards of 6,714 Subject Matter Experts to accomplish more than 17,550 evaluations for the AFVentures Small Business Innovation Research/ Small Business Technology Transfer program Open Topic. From 2021 to 2024, evaluators sourced by the Spark Augmentee Program evaluated proposals representing over \$3.29 billion of proposed Research Development Test Evaluation for the DAF. Moreover, the Augmentee program acts as a flywheel and

natural on-ramp for other AFWERX programs, since it is open to all DAF members and offers scalable levels of involvement based on a member’s available bandwidth.

The **AFWERX Fellowship** is a four-month experiential innovation training program that immerses Airmen and Guardians into the innovation ecosystem. During this time, fellows take on key responsibilities within the AFWERX team and receive structured curriculum on such innovation topics as design thinking, agile acquisitions, and emerging collaboration tools. Fellows return to their units armed with the tools and network necessary to accelerate change. In the past year, AFWERX has run two cohorts hosting a total of 164 fellows from every MAJCOM and a diverse range of educational backgrounds, skills and ranks. Participants ranged in education from those holding GED certificates to Ph.D.s and ranks from O1-O5, E4-E9 and GS8-GS15. Their professional backgrounds also varied, hailing from such professions as engineers, program managers, pilots, flight line operators, maintainers and others.



United States Air Force Staff Sgt. Troy Dela Cueva, a water and fuel systems maintenance craftsman from the 30th Civil Engineer Squadron, recently participated in an AFWERX fellowship.

Staff Sgt. Dela Cueva's team brought down a prototype for a self-driving street sweeper, designed to cut down on hours in his shop.

Still images from video by AIC Ryan Quijas



Photo by Staff Sgt. Chad Trujillo

Spark Tank finalists present their projects to Air Force senior leaders and other judges during the Air and Space Forces Association 2023 Warfare Symposium in Aurora, Colo., March 8, 2023.

The **Defense Ventures Program (DVP)** was an industry immersion program that was launched in 2020. The program, administered by Shift, a Silicon Valley tech startup, identified emerging innovators from across the DOD through a competitive-application process and placed them into short-term industry immersions within organizations across the United States. The program allowed individuals to gain industry experience with new technologies and management styles, to develop professional relationships throughout the industries and to bring innovation back to the DOD and their home units.

The **Decentralized Fellows (D-Fellows) PILOT program** took place in 2022 and 2023. D-Fellows extends the existing DVP model to place Airmen from the military installation level within local business in short-term externships to facilitate knowledge and best-practices. In 2023, 111 DVP and 33 D-Fellows participated across 10 Cohorts. Participants hailed from the Air Force, Air Force Reserves, Air National Guard, Army, Army Reserves, Army National Guard, Space Force, Navy, Navy Reserve, Marine Corps, Coast Guard and National Geospatial-Intelligence Agency. Each fellow logged more than 240 hours of industry immersion with our industry partners. In 2023, 48 host organizations, including 14 venture capital, 41 startups, one accelerator, four government agencies, one academic institution and one Fortune 100 company, hosted those fellows.

Innovation Training - Through the facilitation of non-traditional Design Thinking curriculums, installations across the Air and Space Forces are succeeding at igniting an innovation culture and equipping Airmen and Guardians with the tools

and mindsets they need to successfully validate, implement and scale ideas. The flagship one-month course, Design Warfare, and one-week condensed course, Spartan-V, were developed by Airmen at Global Strike Command and AFWERX Spark has helped to scale the course throughout the DAF. During the past year, two Design Warfare courses were conducted, three Spark Lab courses, training 176 personnel across five MAJCOMs, two Services, and 628 Customer Discovery Interviews. Additionally, in 2023, AFWERX partnered with Arizona State University to roll out a pilot program for a master's degree in Innovation. Twenty-five individuals participated in the inaugural cohort.

The **Spark Tank** competition, first launched in 2018, identifies, supports, and celebrates high-performing DAF innovators. Every Airman and Guardian has the opportunity to submit ideas through a force-wide crowdsourcing platform. The top teams have the opportunity to pitch their ideas to senior DAF leaders and industry experts on stage during the annual Air Force Association Warfare Symposium. Spark Tank has reached impressive levels, with 235 ideas submitted in 2023, ranging from improving maintenance capabilities to improved operations and communication via more than 22,367 votes and 174 crowdsourced comments from the innovation community. The 2023 Spark Tank Trophy was awarded to Lt. Col. Mark Wagner, 374th Contracting Squadron; Master Sgt. Sarah Hubert, 374th Airlift Wing; and Tech. Sgt. Raymond Zgoda, 353rd Special Operations Wing and 374th Civil Engineer Squadron, of the Yokota Air Base, Japan, Pacific Air Forces, for the winning idea, "Infrastructure in an Augmented Reality World."

Imagine a scanning device that can attach to a truck and detect infrastructure issues below the surface before issues are visible (at speeds of up to 60 km per hour). This vehicle can scan the ground beneath it using microwaves and AR technology, mapping areas with potential sinkholes, and check piping for corrosion and other potential hazards beneath the surface. These maps are then transferred through AR technology to provide civil engineers with a real-time underground map of an air base. This can easily save millions of dollars and possibly more each year when applied in conjunction with runway maintenance and personnel hours saved both pre- and post-dig. These AR data images can be seen through a tablet or Augmented Reality Glasses, giving the user true X-ray vision. With this technology, civil engineers can pinpoint issues before they arise and no longer have to live in a preventative and reactive cycle regarding ground maintenance. Instead, engineers can use pinpoint precision mapping to find and fix issues. Runways, roads, sinkholes, pipes, and natural disaster (earthquake) recovery sites can all be scanned for issues without ever needing to break ground. It saves time, money, hours, and resources and completely reinvents how we look at base infrastructure.

The **Refinery** connects Airman and Guardian innovators with relevant stakeholders and resources in the larger DOD ecosystem to develop their grassroots projects. The principal objective is to

further develop tactical project prototypes and adopt the right operational capabilities into the larger force. This is made possible through the Refinery using a curated process, partnerships, and refinement of the ecosystem is an acquisition pipeline. Criteria for projects that can enter the Refinery dictate that it must be a grassroots project (originated by Airmen and Guardians) at the minimum viable product, or MVP, stage or later with a potential user pool larger than one unit or base. Projects must have the potential to either influence the institution or gain institutional adoption.

Championed by AFIMSC and designed by a small business (Mobilize), **VISION** is a collaboration and project-management tool that was developed with input from hundreds of DAF stakeholders across the innovation ecosystem. The platform enables innovators at the tactical level to collaborate by deploying a matching algorithm that connects innovators to similar projects based on key words and themes. Each new submission funnels up to a Spark Cell, or manager, to help coach the innovator and push the project from idea to operational capability. This IL4 capability was developed in under seven months and now boasts over 3,627 projects and 5,573 users. The platform is available to all Department of the Air Force members today and has scaled to the Space Force, Army and Navy, enabling unprecedented Joint collaboration and unlocking invaluable data insights for DOD.



Six Airmen from the Refinery's Cohort 8 met with organic Air Force software development organization, BESPIN, created to build and deliver mission ready, accredited software for Airmen by Airmen.

While many of the Refinery projects were at different milestones along their software journey, the teams at BESPIN were able to rapidly identify and assist to unblock many barriers. The Cohort projects offered viable ways forward to include design and wireframing, a pathway to production, identity management solutions, and cloud hosting options for scaling.

Photo by Michael Madero

Spark Arc

The **Spark Arc Team** was created in the spring of 2023 to help AFWERX partners transition across the so-called “valley of death,” the time between prototype development and full-scale production. Arc aims to do this by analyzing the largest barriers to transition that its customers face and building a plan to mitigate or eliminate those barriers. Spark Arc will initially focus on the AFWERX STRATFI and TACFI partners. The first of many barriers Spark Arc plans to tackle is the Risk Management Framework, which describes the process for obtaining a cybersecurity authority to operate on the DAF network. Over time, as resources and billeting allow, other barriers to transition will be tackled: Frequency Spectrum Management, Airworthiness Certification and Human Subject Research. Spark Arc plans to overcome each barrier by developing “tools in a toolkit” that are applicable to a partner’s specific acquisition journey. Starting with RMF, the tools that Spark Arc has begun developing aim to build muscle memory for proven solutions for common problems, thus creating a toolkit that can support the larger AFWERX portfolio at scale. Once these tools are developed, Arc plans to transition into more of an advisory role for its partners where Spark Arc helps

to create a tailored transition strategy early on and then give its partners the tools and DAF connections necessary to achieve their goals.

Project Arc launched in July 2020 as a grassroots movement to address limitations highlighted in the Air Force’s Science and Technology 2030 Strategy and the 2019 National Defense Strategy. Its goal is to embed scientists, technologists and engineers inside operational units to solve technical problems and practice the teaming necessary to execute rapid technology adaptation, and exploitation required to win in a future near-peer or peer conflict.

In September 2023, in coordination with the Chief Scientist of the United States Air Force, Project Arc was officially transferred under AFWERX. There were two cohorts in 2023, embedding 41 Airmen and Guardian engineers across 18 operational bases in two cohorts. These engineers demonstrated the asymmetrical, non-linear impact that on-site scientists, technologists and engineers can have on the department’s ability to accelerate change at tactical, operational, and strategic levels. As with the Design Warfare and Spartan-V courses, AFWERX supports the implementation and scaling of Project Arc; however, AFWERX cannot take credit for the visionary leadership and founding of the program.



Photo by Dennis Stewart

Fighter Aircraft Adaptive Basing Agile Combat Employment Trailer

After igniting a spark at the 2019 United States Air Force Spark Tank competition, Tech. Sgt. Matt Steht and Master Sgt. Sarah Carden of the 144th Fighter Wing, Air National Guard, Fresno, California, transitioned the “Fighter Aircraft Adaptive Basing (FAAB) Agile Combat Employment (ACE) Trailer” from a sketch to an operational prototype and complete adaptive basing unit to launch and recover aircraft in remote agile operations. The FAAB ACE Trailer team has engineered an ACE-purpose built and modular common support equipment solution, achieving a 90 percent reduction in personnel, time and airlift. Rapid deployment of four fighter aircraft can take many hours with a full unit of personnel to get off the ground, allowing adversaries more time to prepare for an attack. With just one FAAB ACE trailer, airlifted in a C-5 or C-17, deployment is streamlined to just a few hours and requires only a handful of personnel.

During their time at the Spark Refinery, the team was able to connect with various ACE Working groups, ACC, HAF/A4, the AGE SPO, and even identified additional testing partners. “We’ve made more progress in one day [with the Refinery] than in the last two years,” Steht said.

Additionally, the F-15 SPO has agreed to accomplish further load testing on their revolutionary common support equipment cart design. If successful, this would lead to further testing at the AMXG F-15 Functional Test Unit. Finally, in terms of potential sustainment and adoption, the team received interest from the Air Force Life Cycle Management Center Support Equipment SPO modernization team and chief engineer due to the potential ACE and modernization implications associated with the design.



Photos by TSgt Matthew K Steht, USAF ANG 144 AMXS/MXAAA

Fighter Aircraft Adaptive Basing Agile Combat Employment Trailer

JetDash

AMC Spark Tank Finalist

TECHNOLOGY

AMC SPARK TANK Finalist, JetDash, is a secure flightline mobile ordering, delivery and tracking tool developed to improve communications and visibility of flightline operations. The project leveraged a Phase III IDIQ for the development and extension of a transaction platform to support digital commerce.

OPERATIONAL IMPACT

JetDash streamlined critical processes and revolutionized maintenance operations for flightline command and control.

COLLABORATION ORGANIZATIONS

AFWERX, Project Arc, A4L Tesseract

“Why can't Airmen order equipment and tools like they order a ride or food from their phone?”

- TSgt Jacob Sullivan
62nd Maintenance Group, McChord AFB



Photos by Matthew C Clouse

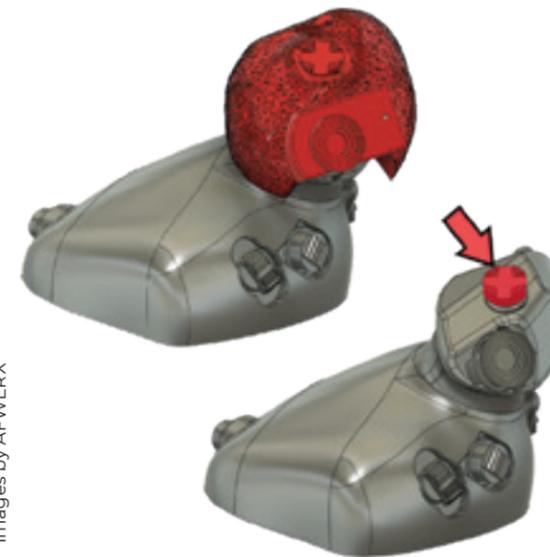
TOTAL FUNDING \$700K in AMC funding

F-35 Weapons Management System Switch Protective Cover

Repairing an F-35's weapons management switch damaged during routine maintenance can take between five and 18 hours. When a maintainer or pilot accidentally kicks off the switch, it leaves the aircraft out of commission for the day or until someone repairs it.

Tech. Sgts. Emil Wodicka and Kalib McBride, Airmen with the 48th Fighter Wing, Royal Air Force Lakenheath station, tackled the problem. The pair designed and improved a cover to help protect the switch, mitigating aircraft damage and downtime. Currently, they are manufacturing a limited run to field and test locally at their unit.

While at the Refinery, the team made tremendous progress. They connected with key stakeholders, filed their patent and developed multiple alternatives for long-term manufacturing. At the same time, the Refinery team was able to help secure an invitation to the F-35 Joint Service Product Improvement Working Group, where they presented their solution and engaged with F-35 Program Office engineers. As a result, the team was also invited to the European user conference to present their project in October 2023 to allied and NATO partners who also fly the F-35.



Images by AFWERX

A 3D printed cover using flexible material prevents accidental damage during maintenance in the F-35 cockpit.

Project Cyclops

The Refinery innovation accelerator, an initiative of AFWERX's Spark division, is helping to bring Airmen and Guardian projects to life across the DAF.

One such effort, The Cyclops Project, is focused on enabling Extended Reality (XR) technology throughout the DOD. The Cyclops Project team consists of Refinery Cohort 6 alumni Tech. Sgts. Matthew Byous and Zane Narrow, as well as civilians Rudy Baisa, Adam Nollinger, Dan Dijamco and Charles Ivory. Their efforts highlighted a crucial component to modernize operational capability.

A policy was needed to solidify the integration of this technology within military operations. While at the Refinery, the team connected with DOD stakeholders such as HAF/A4LM's Advanced Concept Team, HAF/A4L's Tesseract, Logistics Office of Innovation, and Air Force Life Cycle Management Center's Rapid Sustainment Office AR/VR division on XR policy development for aircraft maintenance as a use case.

The work on this project has allowed the team to utilize their expertise with the Defense Innovation Unit (DIU) on the Tactical Augmented Reality (TAR) project to develop aircraft maintenance designed to enhance situational awareness as a use case, potentially saving hours, improving aircraft availability and positively affecting Airmen with enhanced capabilities for combat mission effectiveness.

While the TAR project is in development, the team anticipates that the XR framework will be defined in time to support the "Flightline of the Future" strategy throughout the Air Force.

The AFWERX Refinery facilitated The Cyclops Project by connecting grass-roots level innovation to the policy makers and working with partners like DIU to influence the end-state, breaking down barriers to support the warfighter at the speed of relevancy.



The Cyclops Project team

Photo by Mike Madero

EOD Robot Depth Perception Sensor Kit

Explosive Ordnance Disposal team members, Tech. Sgt. Daniel Trombone and Staff Sgt. Matthew Ruben, from the 99th Civil Engineer Squadron in Las Vegas, successfully defused all obstacles in their way during their time with the Refinery's eighth cohort.

The team designed and engineered a revolutionary device which enables operators to sense the depth between an EOD robot's gripper and an object of interest, enhancing the driver's spatial awareness and accelerating counter-IED operations overall. The team used their electrical engineering skills to build the initial prototype sensor with easily available hobbyist-grade electronics.

While at the Refinery, the team was introduced to Air Force Research Laboratory - AFRL's Tech Connect database and connected with an expert in Distributed RF Imaging. Dr. Robert Ewing and his team offered a dedicated engineering research team to develop a more robust and scalable solution.

The team was also connected with the Air Force Life Cycle Management Center's Patent Office, where they could pursue a patent of this new and revolutionary technology. Once developed and tested, the end goal is to make these sensors available across DAF ordnance disposal installations, impacting precision and enhancing Airmen readiness.



Photo by MSgt. Thomas Johnson



Photo by MSgt. Thomas Johnson

The team designed and engineered a revolutionary device which enables operators to sense the depth between an EOD robot's gripper and an object of interest, enhancing the driver's spatial awareness and accelerating counter-IED operations overall.



AFWERX
PRIME

OVERVIEW

MISSION

Prime expands technology transition paths to accelerate emerging dual-use technology markets by leveraging government resources for rapid and affordable fielding, attracting and optimizing external funding and talent.

STRATEGIC CONTEXT

Prime aims to accelerate "prime" emerging commercial markets, bringing military interests that leverage nascent technologies within the commercial market, benefiting the commercial industrial base and overall military capabilities. In addition to funding, Prime leverages other unique Department of the Air Force resources, like test infrastructure, certification authorities, interagency relationships and early operational use cases, bringing the DAF's full value proposition to bear as an early adopter buying down risk to emerging commercial technologies.



Photo courtesy of Elroy Air

OVERVIEW

The Prime division specifically addresses the threat posed by the nation's competitors gaining dominance and leverage over an emerging technology sector. The Prime division's focus is to identify and accelerate emerging dual-use technology markets that are critical to future U.S. and Department of Defense strategic capabilities. Many times, the nation's high technical maturity in an emerging sector is still insufficient to drive adoption based on regulatory, financial, supply chain,

infrastructure or even cultural hurdles. Removing these hurdles could be the difference between the emerging sector being captured by an adversary or creating a game-changing U.S. advantage. Traditional acquisition approaches often have difficulty adopting radically new technologies with rapid design and product-release cycles, particularly when they require new concepts of operation and career fields. The Prime division's work in overcoming bureaucratic barriers is key in protecting the DAF's technology markets and investing in the future of the U.S.

BRANCHES

 <p>AFWERX AGILITY PRIME</p>	<p>FOCUS</p> <ul style="list-style-type: none"> • Transformative vertical lift • Hybrid and Electric Vertical Take-Off and Landing (eVTOL) aircraft • Distributed propulsion • Increased autonomy • Advanced manufacturing • Agile Combat Employment support 		<p>Photo courtesy of Archer Aviation Inc.</p>
 <p>AFWERX AUTONOMY PRIME</p>	<p>FOCUS</p> <ul style="list-style-type: none"> • DevSecOps transition pipeline for flight autonomy into fielded capes • AFWERX Proving Ground • Leverage increased industry capes • Bolster industrial base flight autonomy with commercial funding and interagency collaboration • Novel Solutions for Autonomous Flight 		<p>Photo courtesy of XWING</p>
 <p>AFWERX INTEGRATION PRIME</p>	<p>FOCUS</p> <ul style="list-style-type: none"> • Rapid mission thread integration of capabilities and data streams • Increased industry engagement • ID alternate business models pathfinder for integrating capes • Multi-Level and Cross Domain Solutions 		<p>Image by Motion Array</p>



Photo by Jennifer B Bryant

Col. Elliott Leigh, AFWERX director and chief communication officer for the Department of the Air Force, shakes the hand of Kyle Clark, founder and CEO of BETA Technologies, to celebrate the delivery of BETA's ALIA electric aircraft to the Air Force for testing at Duke Field, Florida, Oct., 26, 2023.

Agility Prime

Agility Prime, the first AFWERX Prime program, was structured to accelerate the transformative vertical flight market and electric vertical takeoff and landing, or eVTOL, emerging industry more commonly known as Advanced Air Mobility, or AAM. The program began in April 2020 with the goal of accelerating civilian and military dual-use technology development in the industry and rapidly fielding an operational capability. By providing collaborative risk reduction on technical, regulatory, and financial areas, Agility Prime intends to provide focus and support to increase opportunities and likelihood of commercial viability for this emerging market sector while simultaneously advancing military capability.

Agility Prime takes an iterative approach to use case evaluation and eventual validation, starting with analytics and user input to identify and focus on promising near-term utility, including military mission sets with similar parameters as commercial logistics and personnel movement. Focusing on high return-on-investment, near-term utility provides the framework for use case validation through the planned beddown and piloted operations. Primary government test locations for Agility Prime piloted

operations in 2023 included Edwards Air Force Base, California, and Eglin Air Force Base Test and Training Ranges, Florida.

The program fosters diverse relationships across several sectors, including academia, industry, investors and the interagency, to enable government exploration of this sector. With Agility Prime, the collaboration with the Federal Aviation Administration is critical to the success of the commercial market and continued industry innovation. The Agility Prime program's collaboration with the FAA informs key areas of aircraft certification, airspace integration, operator, and maintenance training.

The AFWERX Prime program model provides a framework for future exploration and acceleration of emerging technology sectors. By facilitating initial industry development and providing paths for operations, Agility Prime provides the structure to build U.S. leadership in the AAM industry across the joint services and coordinates with the Department of Transportation led Interagency Working Group established under public law 117-203, AAM Coordination and Leadership Act.

Autonomy Prime

The Autonomy Prime Branch seeks to collaborate with vendors and accelerate the commercial market for autonomous/automated capabilities. Autonomy Prime focuses on the acceleration of software and/or hardware systems capable of completing tasks with minimal to no human interaction.

Technological dominance in autonomy and associated subtechnologies will be critical to the future success of the Air Force and the United States as a whole by multiplying the ratio of task completion to human productivity. The DAF Acquisition and Test enterprise is and will continue to face challenges regarding the resources, expertise and experience developing and fielding autonomous capabilities to match the expected future demand or needed pace of development. There exists outside of the traditional DOD industrial base and DAF investment or R&D portfolios an enormous quantity of valuable

existing autonomy technologies as well as expertise and resources to develop additional technologies.

Autonomy Prime will initially focus on purpose-built low-cost UAVs and autonomous platforms for early operational adoption and rapid fielding. Focus will continue with maturing prototypes, data pipelines, airworthiness and iteration for reducing technical risk to follow-on programs of record. Ultimately, Autonomy Prime seeks to transition meaningful technologies to larger programs and operations.

Autonomy Prime is leveraging unique testing resources and revenue-generating government mission sets for a variety of potential use-cases. Autonomy Prime continues to collaborate with and leverage autonomy program progress across DARPA, DAF, OSD, other joint organizations, and industry to establish infrastructure, expertise, process, and data for rapid autonomous capability realization.



Photo courtesy of Reliable Robotics

Reliable Robotics advances autonomy solutions for U.S. Air Force large aircraft automation study.



Photo courtesy of Anduril Industries

U.S. Air Force selects Anduril's Ghost and Ghost-X to enhance autonomy capabilities.

Integration Prime

Newly created Integration Prime focuses on finding and leveraging commercial technologies and solutions to manage and integrate Air Force and Combined Forces mission threads. Integration Prime is initially focused on identifying commercial technologies that would aid in the integration of the JADC2 Domain. The branch is working with non-traditional company-integration stacks, commercial software intensive industries (e.g., data distribution,

financial sector, trading platforms) to implement software delivery models, rapid data source integration and industry best cybersecurity practices. Integration Prime will utilize short capability sprints with commercial companies to identify and link mission-thread gaps. Integration Prime is aiming to enable rapid adaptability and scalability of mission threads as well as identify reusable alternative business models aligned to mission thread to managing investment and risk.

Autonomous Test Capabilities and the Autonomy, Data, and AI Experimentation Proving Ground effort

In July 2023, the Autonomy Prime Environment for Experimentation, or APEX, runtime assurance system flew successfully on the Osprey MK III uncrewed aircraft at Duke Field, Florida. This flight marked the first sortie of the Autonomy, Data and AI Experimentation (ADAx) Proving Ground. It paves the way for the Autonomy Prime Proving Ground effort, which offers runtime assurance, ready-flight capabilities for the testing and rapid iteration of autonomy algorithms as well as a series of competitions for various autonomy use cases. These unique capabilities will ensure safety and mission assurance of early-stage autonomy development, allowing for rapid iteration, experimentation and acceleration of airborne autonomy in a variety of applications. APEX also provides a software-in-the-loop, hardware-in-the-loop, and an LVC environment, further enriching the autonomy test capabilities by enabling live flights of complex scenarios and high-risk events.

The successful flight demonstrated the capabilities of APEX, which acts as a “watchdog” for the autonomy-under-test. The watchdog features ensure any command the autonomous pilot issues to the aircraft will not violate safety, operational or other restrictions. APEX incorporates a turnkey, modular open system computer and sensing system to host autonomy-under-test, dramatically reducing the burden and time to prepare for a test event. This system was accomplished through a highly effective partnership between AFWERX Autonomy Prime, the 413th Flight Test Squadron and the 96th Test Wing and will be the first of many groundbreaking events in the coming year. ADAx is a partnership between AFWERX, the 96th TW and the Air Force Chief Data and AI Office.



The Osprey MK III

Photo By Jaime Bishop

Archer Aviation Program Ramp

In July 2023, AFWERX awarded Archer Aviation two contracts to significantly advance Archer’s contribution to the defense space. A Strategic Funding Increase SBIR contract awarded to Archer extends the development of the company’s flagship Midnight aircraft that was performed under the prior SBIR Phase II contract. The STRATFI contract also will enable a much greater volume of design, operations, maintenance and aircraft performance data to flow to Agility Prime and the federal government for evaluation of eVTOL and hybrid-electric transformative vertical lift aircraft, including up to 24 months of contractor-owned aircraft operations on U.S. military bases. A second Indefinite Delivery, Indefinite Quantity (IDIQ) SBIR Phase III agreement will extend development of autonomous capabilities for dual-use cases while also providing a vehicle for the engineering and prototyping of military-specific variants and advanced capabilities of Midnight.

The increased partnership with Archer, which totals a potential \$142 million of support over five years, reflects the significant accomplishments in development and testing of Archer’s commercial offering and the demonstrable value and acceleration that Prime’s support has added to their program. The development of a Government Advisory Board and Archer’s increased focus on increasing military utility and developing open-system autonomous behaviors and subsystems as well as the impact Agility Prime has had on the commercial landscape represents a compelling success story about the value of dual-use concepts and partnerships.



Archer's Midnight aircraft

Photo courtesy of Archer Aviation Inc.

eVTOL

Joby Aviation

TECHNOLOGY

Joby Aviation produces an electric Vertical Take-off and Landing (eVTOL) aircraft that uses six vector thrust propellers on a fixed wing and stabilizer. The piloted aircraft can achieve 200 mph in cruise, has an approximate range of 100 miles plus reserves and is 100x quieter than a helicopter.

OPERATIONAL IMPACT

Joby delivered its first experimental eVTOL to the Air Force in September 2023. Joby is contracted to deliver up to nine of its low acoustic signature, zero-operating emissions aircraft to the Air Force and other government partners.

FUNDING ORGANIZATIONS

AFWERX Agility Prime, DIU

“ This new technology is brought to the world in rapid fashion by the convergence of commercial industry and our American Airmen working shoulder-to-shoulder. ”
- Col Grant Mizell
412th Test Wing Operations Group commander



Photo by Richard Gonzales



Photo by Harlan Huntington

TOTAL FUNDING \$50K SBIR | Up to \$131M Phase III Gov't Funding

Electra Full-Scale ultra-STOL First Flight

Electra’s “Goldfinch” aircraft completed a successful first flight in October 2023. The flight marked the culmination of numerous lines of effort and partnership with AFWERX and Agility Prime, particularly the development of both a novel power plant/propulsion system and of a groundbreaking blown-lift flight control system, which enabled the aircraft’s exceptional short-field performance.

Electra’s electric short takeoff and landing, or eSTOL, technology allows operations on an area of 300 feet by 100 feet, while also maintaining or exceeding traditional fixed-wing aircraft payload and range capabilities. Such capabilities unlock

previously unachievable performance with value in numerous theaters and Concepts of Operations, or CONOPS. Following the successful flight of Goldfinch, Electra’s full-scale proof of concept/tech demonstrator, the flight-test campaign will continue as part of the partnership with Agility Prime into development of the production aircraft design. The STRATFI agreement with Electra, which includes up to \$30 Million of government funding and \$30 Million of private investment matching over two years of development, will culminate with the operational experimentation of a full-scale pre-production eSTOL aircraft. DAF will test the aircraft to validate requirements and operational use cases.

Project Fox takes Flight

Project Fighter Optimization eXperiment, or Project FOX, flew its first sorties on the F-22 and F-35 at Edwards Air Force Base, California, in June 2023. Initially a 2021 SparkTank runner-up, the team has partnered with AFWERX Prime to continue developing the capability to bring non-traditional business softwares to the F-22 and F-35 platforms. Project FOX innovations include: the ability to use the same software across different military aircraft; the ability to source that software from a diverse set of suppliers, including software-industry leaders and government labs; and the ability to update software in less than a day, between 30 to 60 times faster than previously possible. Together these improvements should deliver cutting-edge technology to fifth-generation fighters at a fraction of the current time and cost.

AFWERX is leading the charge to accelerate the hardware and software knowledge and capabilities of the government through sponsorship of test organizations and test education centers. By ensuring our test organizations and workforce are on parity with the industry's cutting-edge technology, AFWERX directly accelerates combat

capabilities to the warfighter while shifting the global strategic narrative.

Project FOX allows every software depot and test organization to become a direct test arm of AFWERX to rapidly integrate, test and field cutting-edge technology by crowdsourcing the best the government and industry have to offer. AFWERX promotes healthy organizational and industry competition to accelerate change. A significant source of Airman and Guardian talent comes from DAF Reservists. Our full- and part-time 370 FLTS reservists under the 413th Flight Test Group, along with support from the 412th Test Wing, have played a critical role in ensuring the transition of these emerging technologies.



Photo by William Lewis

Project FOX flew its first sorties on the F-35 at Edwards Air Force Base, California.



AFWERX
CAPITAL INITIATIVES

OVERVIEW

MISSION

The AFWERX Capital Initiatives (RGI) division possesses a dual mission set:

- *Representatives of Risk:* Execute a scalable due diligence program that identifies, defines, and mitigates risk at every phase.
- *Capital as Capability:* Leverage private capital and market insights to increase investment in DAF critical and emerging technologies.

VISION

Become the instrument for smart investment decisions within AFWERX and the DAF innovation space.



CAPITAL INITIATIVES

OVERVIEW

The United States is in a global competition for leadership in critical technologies. American capital markets – valued at more than \$50 trillion – represent a strategic advantage in our ability to identify, develop and field new capabilities. However, new and critical technologies often require long-term financing to bridge the gap between laboratory and full-scale production. AFWERX and others in the innovation community refer to this period as the “valley of death,” and the Small Business Innovation Research and Small Business Technology Transfer programs are critical tools to address this issue.

The SBIR and STTR programs are widely regarded as a success, and AFWERX is the face of that success. This growth in SBIR and STTR, and its place in the larger U.S. capital markets and innovation ecosystem, present both risks and opportunities. The risks come from foreign adversaries looking to exploit these programs, while the opportunities allow AFWERX to expand private investment in support of these programs via our current and future portfolio efforts.

Currently, adversarial nation states are targeting companies funded by SBIR and STTR. They look to exert influence and control on fund recipients to gain access to, or outright steal, intellectual property. Due to SBIR/STTR’s focus on innovative and critical technologies, this IP is extremely valuable both financially and from a strategic competition perspective. The Commission of the Theft of American Intellectual Property estimates Chinese IP theft costs the United States at least \$225 billion annually.

In addition to the largest capital market in the world, the American private enterprise and entities are the largest source of R&D, illustrating a willingness to invest in early stage companies and innovative technologies. In 2020, U.S. businesses spent \$538 billion on R&D, accounting for 75 percent of total R&D expenditures. The federal government, on the other hand, made up only 9 percent of total R&D outlays. Further, private capital markets possess knowledge and expertise which can inform and drive our own investment strategies.

The success of AFWERX and the SBIR and STTR programs as a whole presents opportunities to expand and further incorporate private capital as AFWERX is increasingly known and trusted. The Capital Initiatives division (RGI) seeks to build these relationships and mechanisms to leverage these aforementioned national assets, as well as protect them from foreign adversarial exploitation.

RGI is uniquely positioned to address these challenges and opportunities to protect and increase the transition of American dual-use technologies. By conducting risk-based analysis of all SBIR and STTR applications, as well as increasing U.S. private capital into AFWERX portfolio companies, RGI will reduce the threat, attractiveness and necessity of foreign advisory capital within these funding programs.

ORGANIZATION

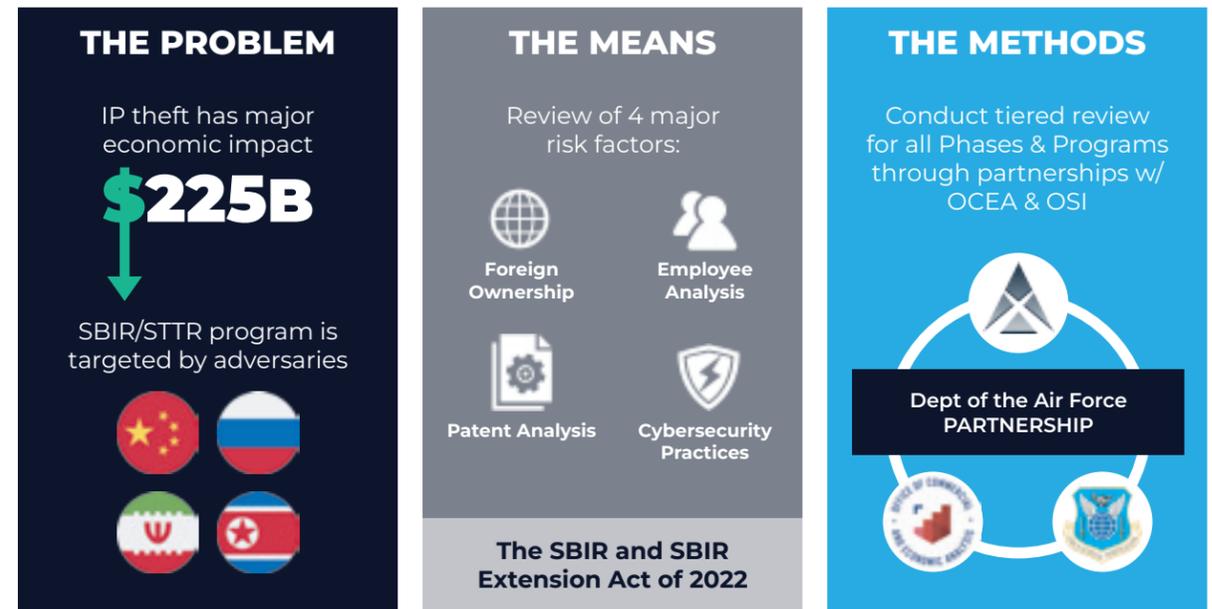
The RGI division operates two primary programs/projects:

- **The Risk-Analysis Program (aka Due Diligence):** responsible for the review of SBIR and STTR applications for connections to foreign adversaries and capital.
- **Project Vanguard:** responsible for increasing private capital into the AFWERX portfolio to increase transitions and commercialization opportunities.

The Risk-Analysis Program

The Risk Analysis Program is responsible for evaluating SBIR and STTR proposals for connections to foreign adversaries by evaluating a company’s cybersecurity practices, patents, employee affiliations, and foreign ownership and funding. Formally established to meet the congressional requirements established by the SBIR and STTR Extension Act, the AFWERX risk-analysis program is widely regarded as the best among the SBIR and STTR community. Leveraging existing capabilities within the DAF, namely the Office of Commercial and Economic Analysis (OCEA) and Office of Special Investigation (OSI), AFWERX is able to review all applications of small business concerns seeking SBIR and STTR funds.

CAPITAL INITIATIVES



Overview of the problem, means, and methods of AFWERX’s Risk Analysis Program

Since RGI’s re-establishment in February 2023, the Risk-Analysis Program, in partnership with OCEA and OSI have reviewed the following:



FY23 Proposals reviewed metrics

DUE DILIGENCE

A Capital Initiative Success Story

In 2022, Congress passed Public Law 117-183, the “SBIR and STTR Extension Act of 2022.” This law mandated all federal agencies awarding SBIR and STTR funds to create and execute a risk-based due diligence program for all applicants. This mandate posed a distinct challenge for AFWERX. Among the agencies affected by this law, none handled the same scale of funds or volume of requests per year as AFWERX, which accounts for \$1.356 billion of award funding, more than 65 percent of the total under the Under Secretary of Defense for Research and Engineering oversight. Addressing such a challenge demanded thoughtful analysis and creative solutions. Over the course of several months, AFWERX conducted a thorough analysis of the problem, identified best practices and implemented a first-in-class, risk-based analysis process months ahead of schedule and under budget. By the time of the congressionally mandated deadline of June 27, 2023, AFWERX had already conducted 3,925 risk-based reviews. By the end of FY23, the organization had reviewed a total of 7,940 applications, nearly triple the screenings of any other SBIR program participant.

Project Vanguard

Project Vanguard, a partnership with the Defense Innovation Unit’s (DIU) National Security Innovation Network (NSIN), was formed to create pathways to increase private capital investment into AFWERX-funded companies. Defense investing is gaining traction with an expected 15.9% CAGR, but has undergone turbulence to get where it is today. The traditional “Aerospace and Defense” vertical is one that is woefully underrepresented in private markets. According to Pitchbook and the National

Venture Capital Association, of the roughly \$12 trillion private-investment market, defense technology investment represents roughly \$5.5 billion, or only 2.2 percent, of the total 2022 U.S. venture capital investment space.

To combat those factors, Project Vanguard seeks to create a controlled outlet through which private capital will interact with AFWERX-funded companies. Using a multi-pronged approach, Project Vanguard will increase private investment by releasing data products to enable investors to understand the

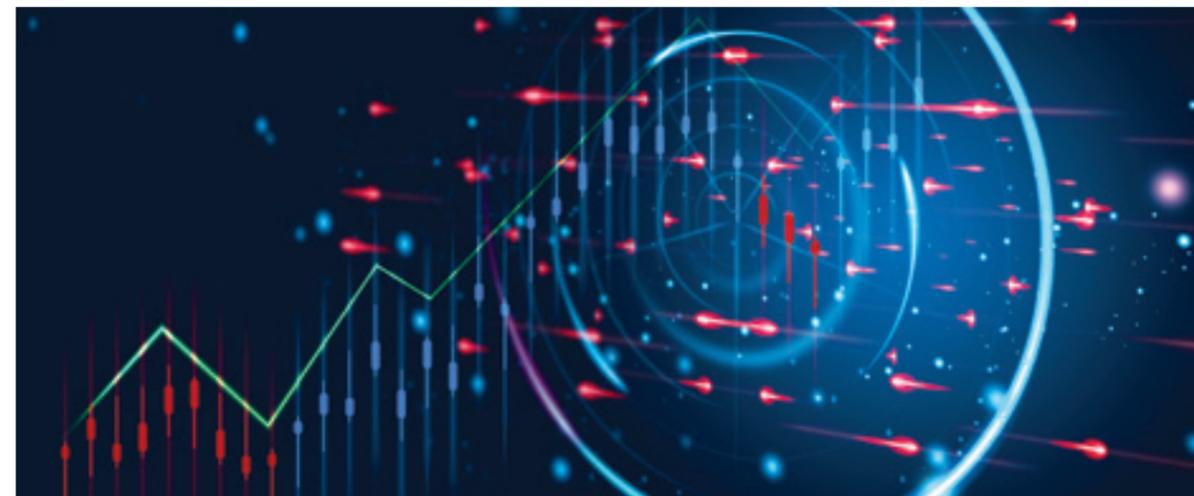


Image by Motion Array

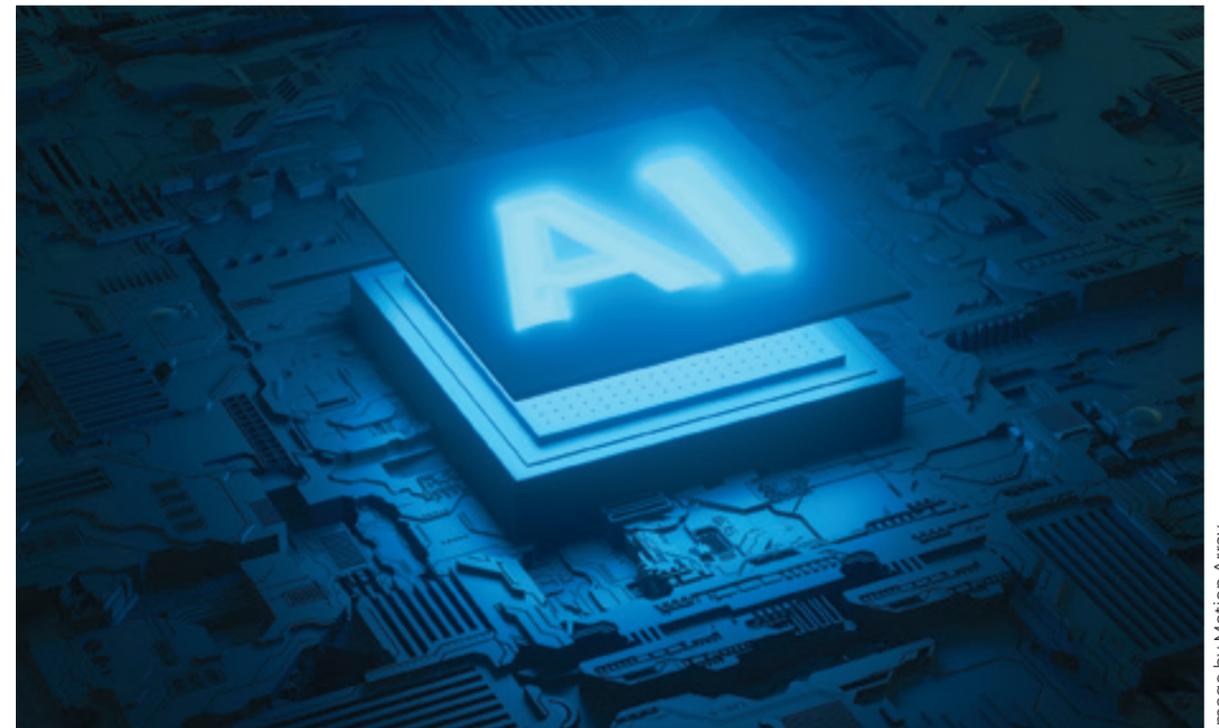


Image by Motion Array

In early 2024, RGI, with the AFWERX Operations division, will officially release TurboInnovate for DAF program offices, acquisition officials and contracting officers. TurboInnovate uses advanced AI to streamline market research, analyze military use cases, and match problem statements to comparable innovations within the AFWERX portfolio, innovations which are eligible for sole source contracts.

DAF capital and portfolio landscape, share deal-flow opportunities with industry, and seek to better communicate component requirements.

The AFWERX Portfolio

Additionally, RGI is addressing significant data problems facing the AFWERX portfolio. As a result of federal acquisition regulations on data rights and the typical problems facing private and public sector organizations alike, AFWERX possesses large amounts of data which provides an historical archive of proposals and awards, but lacks fidelity needed to drive smarter investment decisions.

To address this issue, RGI, in partnership with the AFWERX Operations division (RCO), Spark, and third-party vendors, is testing the use of large language models to apply and award data to create technology and use-case ontologies, advanced search functionality, and bespoke data categorizations. The ability to break free from the limitations of historical poor government data policies and collection,

and apply analytical rigor to current and historical data will allow AFWERX to make smarter decisions regarding allocation of funds across solicitation types, phases, and technology areas; prioritize investments across commercially viable technologies; and identify those investments which will likely transition to Phase III government contracts.

In 2024, AFWERX, will officially release TurboInnovate for DAF program offices, acquisition officials and contracting officers. TurboInnovate uses advanced AI to streamline market research, analyze military use cases, and match problem statements to comparable innovations within the AFWERX portfolio, innovations which are eligible for sole source contracts. RGI not only sees this as an incredible tool to facilitate transition to Phase III contracts, but is seeking to leverage the underlying AI capabilities for customizable data solutions for greater understanding of our investments.



IGNITE TOOL

A Capital Initiative Success Story

AFWERX launched the IGNITE platform in August 2023. The tool provides a platform where defense users can search for and easily interact with thousands of companies that have received funding contracts from the DAF Small Business Innovation Research and Small Business Technology Transfer programs.

IGNITE serves as a controlled line of communication connecting technology developers with end users. This capability strengthens the integration and adoption of SBIR/STTR technologies and drives greater government-industry collaboration.

The new module was built on VISION, a platform launched in October 2021

and already used by thousands in the Department of Defense. VISION has been used in the secured IL4 environment by government users to streamline and crowdsource innovation process improvements, or initiatives, and see what projects are in the works in the ecosystem.

With IGNITE, AFWERX has developed the capability to search solutions already vetted by the SBIR/STTR program and apply them to problems warfighters encounter in the field. Additionally, IGNITE connects the ecosystem by helping to introduce validated small businesses to new potential customers and end users across the government, increasing the number of found connections and facilitating increased Phase II and Phase III contracts.



AFWERX launched a robust social media campaign and conducted webinars to highlight benefits and educate stakeholders on how to navigate the platform to connect and collaborate with each other.



OVERVIEW

MISSION

Empower the AFWERX ecosystem through technology, talent, resource management, infrastructure and information protection to ensure strategic alignment and innovatively accelerate change across the Department of the Air Force.

VISION

Community of professionals that anticipates and provides dynamic and agile capabilities to ensure AFWERX's ability to transition commercial technologies to the hands of the warfighter.

OVERVIEW

AFWERX Operations (RGO) anticipates and provides the dynamic and agile capabilities necessary to ensure the DAF's ability to transition commercial technologies to the hands of the warfighter.

RGO provides a support system that strengthens AFWERX, allowing it to work effectively with stakeholders and industry. In order to accomplish this, RGO leverages multiple communications channels, employs innovative workflow technologies, draws upon the talents of Airmen and Guardians, and creates an infrastructure that maximizes operational efficiencies.

BRANCHES

Technology Operations

The AFWERX Technology Operations Branch (RGOT) is a critical part of AFRL's digital transformation efforts and ensures the secure and efficient operation of digital systems for the DAF. As such, RGOT is a specialized unit within AFWERX responsible for overseeing and maintaining IT infrastructure, the data pipeline, and enterprise platform tools critical to AFWERX performing its mission.

AFRL/RGOT's primary lines of effort include:

- **IT Portfolio Management:** Develops and implements policies and procedures for the secure and efficient operation of digital systems. Plans and programs for AFWERX's expanding portfolio of IT services supporting AFWERX divisions and the DODx ecosystem.
- **IT End-User Experience:** Provides AFWERX employees, contractors and partners with the information technology hardware, software, services, training and support they need to connect with each other and the innovation ecosystem.
- **Cloud Services Management:** Plans, designs, implements and manages AFWERX's cloud services. Oversees the development and maintenance of critical IT infrastructure supporting AFWERX ecosystem engagement and connectivity.
- **Data Pipeline Operations:** Develops, implements and maintains AFWERX's data pipelines and digital infrastructure integration.

- **Data Analytics and Business Intelligence:** Develops and uses data analytics and business intelligence tools to support AFWERX decision-making and stakeholder reporting. Conducts research and development in support of data analysis and AI/ML operations supporting AFWERX's strategic goals.
- **Cybersecurity and Compliance:** Ensures that AFWERX's IT systems are resilient and compliant with all applicable laws and regulations.



Images by Google

OPERATIONS SUCCESS

Published the first-ever signed authorization for the AFWERX-owned Google Workspace SaaS solution, AFWERX's primary collaboration and productivity suite, allowing for greater integration with the DAF/DOD Information Networks (AFIN/DODIN) while also preserving access and capabilities for the external AFWERX stakeholders and partners key to the success and evolution of the DAF's \$1.4 billion SBIR/STTR mission portfolio. This authorization paves the way for additional integrations with the DAF's Microsoft Office 365, AFWERX's Salesforce platform, and any future IT solutions, while allowing the AFWERX Technology Operations branch the flexibilities to integrate with existing DAF/DoD security-solutions to safeguard approximately 700 users, 15TB of data, 9K daily emails, and 3K active chat spaces.

Manpower and Personnel

Human Resources and Workforce Management Branch (AFRL/RGOM) is an integral part of the organization, working tirelessly to empower a diverse and highly remote/geographically distributed workforce, while enhancing their capabilities and creating an inclusive work environment. By efficiently managing the various aspects of personnel administration and development, this branch contributes to the organization's overall success and mission fulfillment.

AFRL/RGOM's primary lines of effort include:

- **Civilian and military personnel**
- **Onboarding** and in/out processing
- **Awards**, training, Acquisition Professional Development Program (APDP), and Office of Government Ethics Program (OGE-450)
- **Performance management** and appraisals (Lab Demonstration and DPMAP)
- **Workforce development**, recruiting/hiring events and retention initiatives
- **Telework**, remote work, flex work schedules and employee relations

OPERATIONS SUCCESS

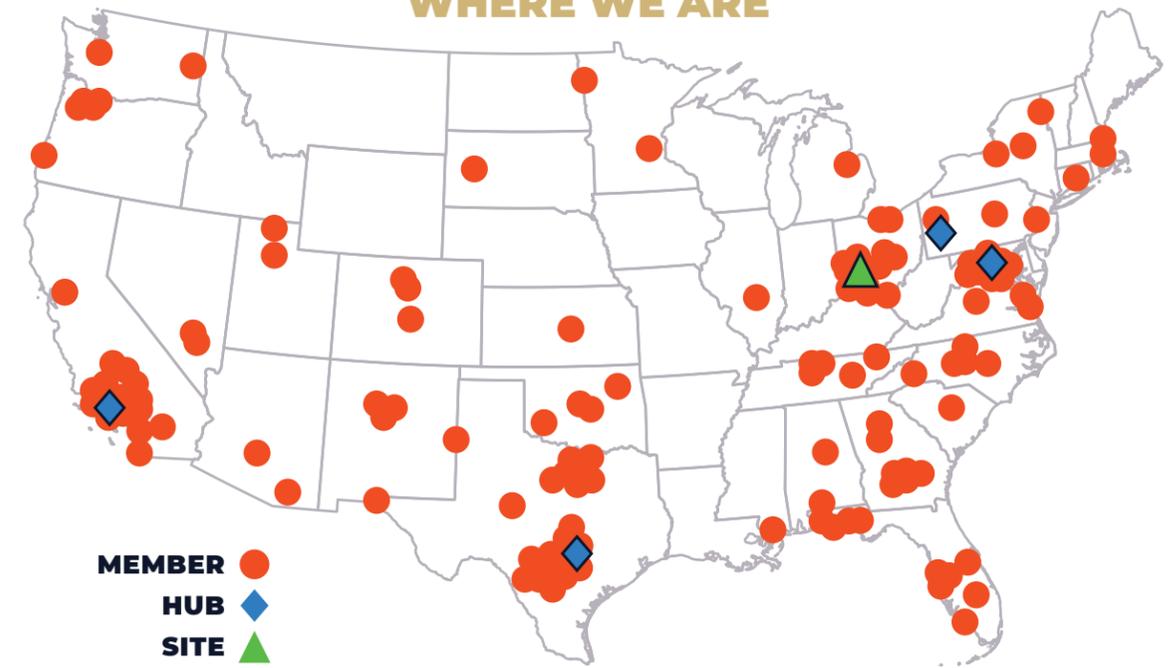
In 2023, the Manpower & Personnel Branch handled more than 180 personnel actions, to include pay adjustments, new hires, conversions, internal realignments, awards & remote telework packages. The team demonstrated full support and successful execution of the Commander's intent of cultivating the world's leading Science and Technology workforce.

The Manpower & Personnel Branch collaborated with 20+ key stakeholders to facilitate the transition from a five-letter construct to a three-letter construct.

By utilizing various personnel systems & gleaning expertise from multiple functional areas, the team postured the directorate for optimal organizational alignment and effective command across a widely distributed workforce. The new construct went into effect early 2024.

The Manpower & Personnel Branch surmounted a 50 percent personnel turnover rate by providing critical training, support and oversight to its developmental and journeyman level HR professionals. The branch remains fully staffed with a team of customer-focused HR liaisons skilled in navigating complex programs and unique hiring strategies.

WHERE WE ARE



Plans and Programs

The AFWERX Plans and Programs Branch (AFRL/RGOX) leads the organization's planning, programming, budgeting and execution process. Moreover, it coordinates with key stakeholders such as the assistant secretary of the Air Force for acquisition, technology and logistics to ensure organizational alignment with DOD and Air Force priorities while AFWERX executes the \$1.4 billion SBIR/STTR program according to Secretary Frank Kendall's seven operational imperatives. Furthermore, RGOX serves as the central hub for cross divisional strategic planning and resource management within AFWERX. Its responsibilities encompass shaping the future of AFWERX, ensuring fiscal responsibility and aligning it with national defense goals. Through these efforts, the branch contributes significantly to DAF readiness, modernization, and overall mission success.

AFRL/RGOX's primary lines of effort include:

- **Strategic** planning
- **Budget** management
- **Program** development
- **Force structure** planning
- **Policy** development

- Acquisition and procurement oversight
- Performance metrics and evaluation
- Congressional and stakeholder relations
- Readiness and contingency planning

OPERATIONS SUCCESS

AFWERX established a formalized Plans and Programs Branch, with a dedicated Senior Planner, to serve as the central hub for strategic planning and resource management to ensure the successful execution of the \$1.4B SBIR/STTR Program IAW SECAF OI's. Its responsibilities encompass shaping the future of core AFWERX processes, ensuring fiscal responsibility, and aligning the organization with national defense goals. In the establishment of the Plans and Programs Branch, AFWERX forged a cross-divisional/cross-functional Planning Group that will drive the fight and reimagine resource allocation to enable the expansion of the innovation ecosystem within the great power competition.



Image by Motion Array

In the establishment of the Plans and Programs Branch, AFWERX forged a cross-divisional/cross-functional Planning Group that will drive the fight and reimagine resource allocation to enable the expansion of the innovation ecosystem within the great power competition.



Photos by AFWERX

Changes instituted by the newly created AFWERX Business Operations Branch allowed for the seamless execution of the Fall AFWERX Program Management Review event at Eglin Air Force Base, Florida.

Business Operations

The AFWERX Business Operations Branch (AFRL/RGOI) is a vital element within the AFWERX structure, responsible for managing and optimizing various business-related functions that are essential to the efficient and cost-effective operation of the organization. This branch plays a pivotal role in supporting AFWERX's mission by overseeing a range of business activities.

AFRL/RGOI's primary lines of effort (LOEs) include:

- **Contracting** and procurement
- **Facilities** and infrastructure management
- **Defense Travel System (DTS)** oversight
- **Government Procurement Card (GPC)** oversight
- **Government Travel Card (GTC)** oversight
- **Knowledge** management

OPERATIONS SUCCESS

RGOI established a DTS Organizational Program run by AFWERX, migrating oversight responsibilities for more than 130 travelers and associated resource costs from AFRL/DS to AFWERX, reducing the overall corporate burden. Additionally, unique sub-organization travel lines were crafted and a dedicated review process was established to streamline travel processing and requests while ensuring compliance with the Joint Travel Regulations prior to final AO approval. The newly created branch allowed for the seamless execution of the Fall AFWERX Program Management Review event at Eglin Air Force Base, Florida, and countless other travel activities ISO of the \$1.4 billion AFWERX mission and DAF priorities.

Enabling Operations

The Enabling Operations Branch (AFRL/RGOE) encompasses the AFWERX Challenge, which is an expanded market research and prototyping program that helps to rapidly identify and deploy solutions to Air Force problems in collaboration with industry and academia. The multi-month process is designed to bring together government, industry, and academia, to adopt cutting edge dual-use technology

and advance operational readiness within the Department of the Air Force and the Department of Defense. This process encourages transparency, networking, and collaboration at every stage through design thinking workshops, interactive networking colliders, webinars, transparent crowdsourcing, and showcases, to ensure the best possible solution or combination of solutions can be leveraged.

OPERATIONS SUCCESS

IN 2023

AFWERX LAUNCHED

12

CHALLENGES

COLLECTING OVER

800

SOLUTIONS SUBMITTED

RECEIVED

\$111M

IN PLANNED COMMITMENTS FOR FUNDING

AWARDED

153

CONTRACTS SINCE PROGRAM LAUNCH

Additionally, the Challenge Program facilitated two Showcases with more than **100** attendees and **39** proposed solutions, resulting in the anticipated award of **\$13.5** million towards **18** contracts with selected industry partners.

These partnerships and the associated selected solutions led to integration efforts/outcomes between AF Futures, AFMC, and AMC that informed and drove future force design and posture plans.

In a first-ever proof of concept, the AFWERX Challenge, in collaboration with SpaceWERX and SSC/ USSF, launched three Challenges: Tactically Responsive Space, SpacePort of the Future and Alt-PNT. This venture leveraged traditional SBIR/STTR solicitation cycles and unlocked \$91 million in planned funding for rapid Operational Imperative focused solicitations. Furthermore, it provided an unprecedented alternative funding/contracting pathway, via the newly established AFWERX Challenge CSO, allowing SpaceWERX to engage with small, medium and large businesses.

In a collaboration effort between AFWERX and the Armament Directorate PEO, the AFWERX Challenge program led the way in facilitating, designing, and executing an Enterprise Test Vehicle Design Sprint. The purpose of the 40-person Government Design Sprint was to work to build weapons capacity and deliver affordable mass that can be replenished faster than the rate of expenditure to posture the DAF and the DOD to compete strategically with China. The collaboration resulted in the development of a finalized execution plan that DIU could leverage to develop standoff capabilities to generate mass required for the high-end fight while respecting fiscal limitations.



OVERVIEW

MISSION

Provide accurate and timely financial information and decision support through strategic partnership, excellence, integration, and continuous improvement of personnel, processes, and systems while ensuring responsible stewardship and public accountability of resources.

VISION

Model for AFWERX in organizational efficiency and effectiveness, setting the standard on accountability, transparency, and performance.

OVERVIEW

The AFWERX Financial Division provides the highest quality financial services and products supporting small businesses, Defense Department customers and AFWERX while also maximizing the effectiveness and efficiency of multiple program elements. Additionally, the division ensures responsible stewardship and public accountability of resources and provides decision-makers with accurate and timely financial information and decision support through strategic partnership, excellence, integration and continuous improvement of personnel, processes and systems.

The AFWERX Financial Division is a model for AFWERX in both organizational efficiency and effectiveness, setting the standard on accountability, transparency and performance. The AFWERX Chief Financial Officer is the financial authority for the Department of the Air Force (DAF) Small Business Innovation Research (SBIR), Small Business Technology Transfer (STTR), Prime, Squadron Innovation, and Technology Transfer programs.

The AFWERX Finance Division centrally manages about \$1.4 billion annually within multiple program elements across the DAF to include planning, programming, financial reporting and analyzing program resources to support innovation and build the United States industrial base through small business.

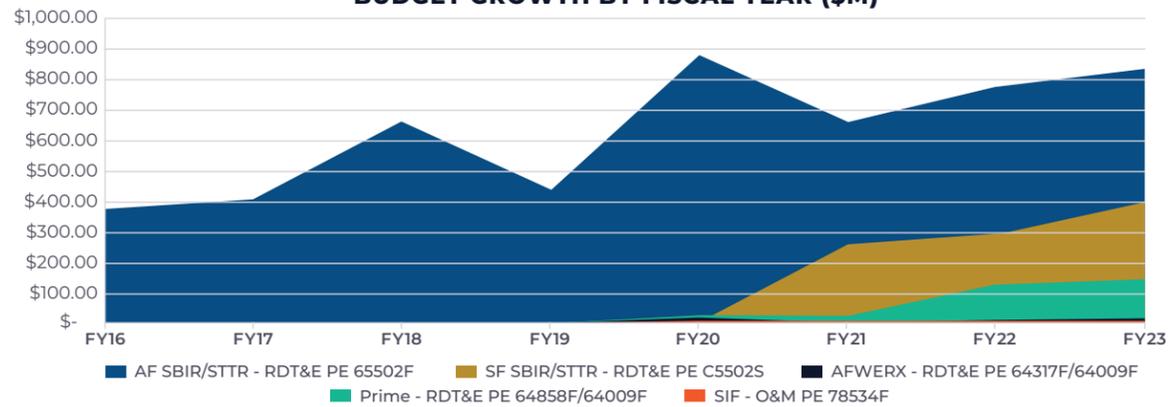
The Financial Division executes more than 25 percent of the Air Force Research Laboratory's total obligation authority, seamlessly working across

the DoD to fund more than 2,000 efforts annually. AFWERX Financial Management achieves its mission by focusing on people, hiring character and training skills. The financial management team is made up of positive attitudes, motivated and innovative thinkers, self-starters, accountable team players, and self-confidence of work. AFWERX FM retains and grows its team by creating a positive and rewarding environment.

MILESTONES/SUCCESSSES

- Assumed Prime funds execution from AFLCMC, adding \$103 million to AFWERX's FY23 portfolio and \$94 million to the FYDP.
- Provided efficient and accurate automation solutions to multiple contracting offices to execute contracts and realign funding in a timely manner, reducing delays and speeding up the execution of funds to support the mission and small businesses.
- Executed \$1.2 billion for the FY22 USAF and USSF SBIR/STTR, Squadron Innovation Funds (SIF) and Tech Transfer programs; \$0 expired.
- Accomplished four virtual Sprints, reviewed more than 1,200 proposals for propriety of funds and automated more than 1,200 purchase requests through innovative processes, resulting in approximately \$575 million in awards to US small businesses, which boosted economic growth and partnerships within the USAF and USSF.

BUDGET GROWTH BY FISCAL YEAR (\$M)



	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23
AF SBIR/STTR - RDT&E PE 65502F	\$373.60	\$406.50	\$663.30	\$441.00	\$884.05	\$662.29	\$779.50	\$836.70
SF SBIR/STTR - RDT&E PE C5502S	\$ -	\$ -	\$ -	\$ -	\$ -	\$256.92	\$290.49	\$394.30
AFWERX - RDT&E PE 64317F/64009F	\$ -	\$ -	\$ -	\$ -	\$17.35	\$2.95	\$9.89	\$13.22
Prime - RDT&E PE 64858F/64009F	\$ -	\$ -	\$ -	\$ -	\$24.12	\$24.12	\$127.35	\$145.63
SIF - O&M PE 78534F	\$ -	\$ -	\$ -	\$ -	\$5.20	\$5.20	\$5.20	\$5.70
TOTAL	\$373.60	\$406.50	\$663.30	\$441.00	\$930.72	\$951.48	\$1,212.43	\$1,395.55



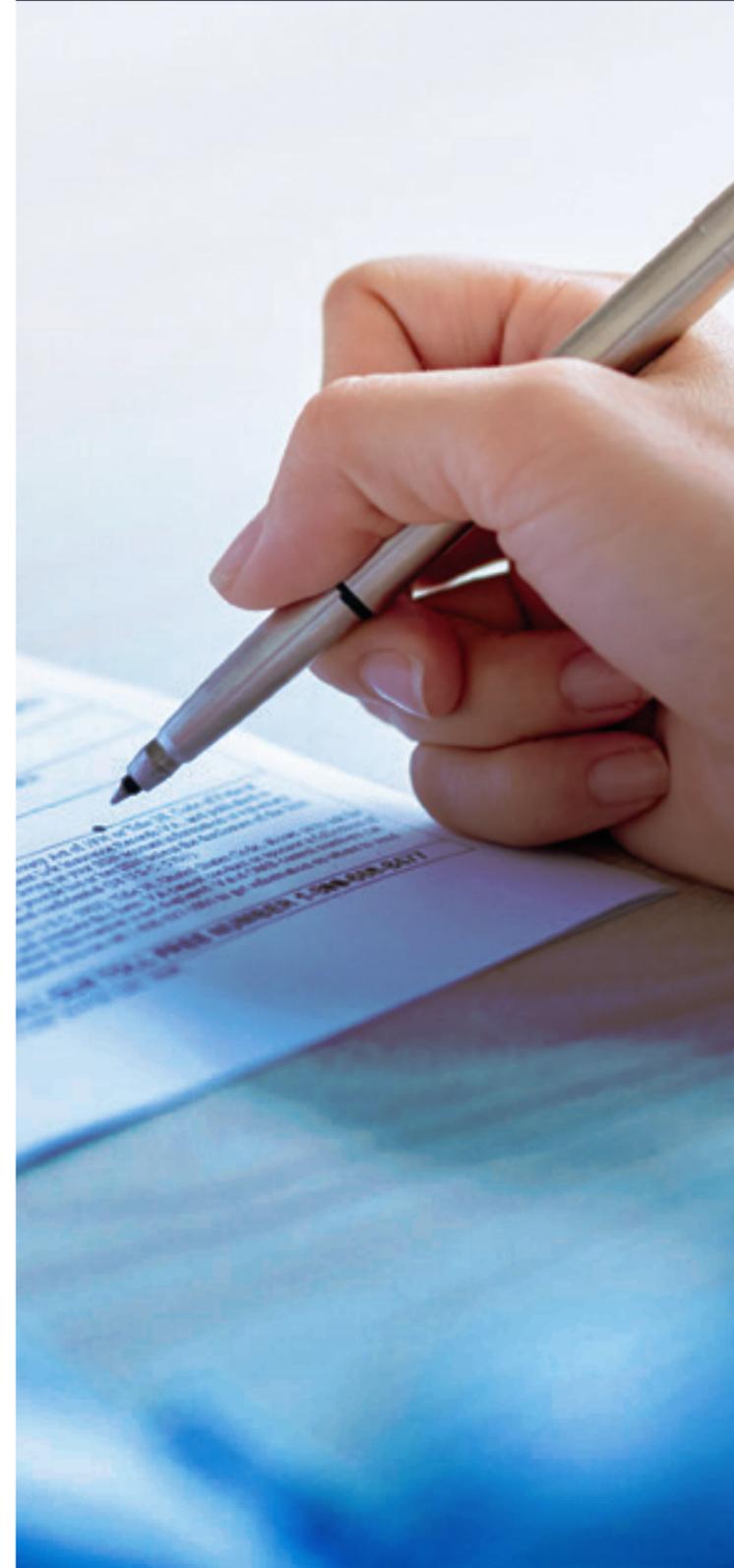
OVERVIEW

MISSION

Provide Contracting solutions that enable AFWERX to accelerate agile and affordable capability transitions by teaming leaders in innovative technology with Airman and Guardian talent.

VISION

Mission-focused business leaders and change agents forging an innovation ecosystem that delivers disruptive Air & Space capabilities.



CONTRACTING

OVERVIEW

The AFWERX Contracting Division (RGK) is a driving force behind the rapidly evolving industrial defense base. The division provides the Department of the Air Force and the broader Department of Defense with access to a portfolio of small businesses engaged in some of the most novel, innovative defense activity in the United States. Executing a budget of approximately \$700 million annually, RGK delivers critical research and development, products and services to AFWERX and the DAF, with an emphasis on next-generation dual-use and commercial technologies to help close gaps and satisfy mission requirements. Through a combination of Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) awards and core-funded requirements, the RGK team is continuously posturing and refining its mission to deliver and scale sought-after defense capabilities.

BRANCHES

Enterprise Contracting

Enterprise Contracting (RGKA) delivers a variety of capabilities across the AFWERX organization. This branch provides support that scales the entire spectrum. The support ranges from providing the organization with day-to-day operational tools, developing and scaling the current and future Prime programs, issuing Challenge programs, or executing STRATFI/TACFI for partnering organizations. RGKA also provides various opportunities to deliver capabilities using innovative approaches, as well as experimenting with new authorities and collaborating with innovation partners from all over the ecosystem.

SBIR/STTR Contracting

SBIR/STTR Contracting (RGKB) supports the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) program contracting efforts under the AFWERX Open Topics. This branch applies innovative acquisition processes, executing high volumes of Phase I and Phase II awards on a repeatable annual cycle. Executing more than 1,100 contracts annually, this branch is an exciting and fast-paced organization, which provides opportunities to experiment and learn for both new and seasoned acquisition professionals. RGKB awards predominantly fixed-priced contracts or Other Transaction Agreements through

Contracting Sprints, a rapid-paced execution model piloted by AFWERX. Applying streamlined methods and processes for all aspects of the SBIR/STTR contracting process is a staple of this team-while also providing a forum to collaborate with contracting professionals throughout the DAF by way of the Contracting Sprints. Experimentation and collaboration are core principles of this branch. RGKB works continuously to accelerate Open Topic execution and acquire next-generation dual-use technologies for the DAF.

Innovation Contracting

Innovation Contracting (RGKP) provides overarching contracting, personnel and related activities within AFWERX, while also operating as an incubator for external mission partners. RGKP operates as an innovation accelerator – employing new authorities and exploring collaboration opportunities for AFWERX. The branch operates as the functional OPR for various matters, including providing policy reviews and clearance, contract closeout, and various other processes for the organization. Additionally, RGKP also operates and maintains the warrant process for AFWERX, working to foster and develop the next generation of Mission Focused Business Leaders. Moreover, the branch provides subject matter expertise to the field, advising mission partners on various matters relating to the AFWERX mission, including SBIR/STTR Specific Topics, STRATFI/TACFI activities, Phase III awards and other transition opportunities. RGKP also provides personnel with an opportunity to apply contracting expertise in innumerable ways, while also affording an opportunity to be engaged directly in activities and processes with a departmental-level reach/impact.

FY23 Milestones & Successes

- ▶ Conducted four (4) SBIR/STTR Open Topic Contracting Sprints; awarding approximately **1,100** Phase I and Phase II contracts and other transactions totaling more than **\$510M**
- ▶ Partnered with Army Futures and Army Contracting Commands for the **FIRST-EVER** Joint Contracting Sprint
- ▶ Executed nearly **\$150M** in SBIR Phase III awards - advancing development in key technology areas to include electric vertical take-off and landing (eVTOL), Innovation Refinery, Machine Interfacing and Digital Ethnography

- ▶ Leveraged automation and efficiencies throughout multiple solicitations to consistently deliver Phase I awards **WITHIN 70 DAYS** of solicitation closing and Phase II awards **WITHIN 90 DAYS** of solicitation closing, all well below the U.S. Small Business Administration's timeliness standards of 180 days
- ▶ **CHAMPIONED MORE THAN 10 AFWERX CHALLENGE PROGRAMS** - including design thinking workshops, crowdsourcing, and collaboration showcases; culminating in innovative contracting pathways via Commercial Solutions Opening and SBIR/STTR Specific Topic solicitations
- ▶ Provided program training and engagement activities for **MORE THAN 2000 DEFENSE DEPARTMENT AND DEFENSE INDUSTRIAL BASE PERSONNEL** at numerous innovation and contracting events, including Innovation Industry Days, Contracting Roadshows, Future of Air & Space Conference, Fed Supernova and South by Southwest

CONTRACTS AWARDED TO DISADVANTAGED SMALL BUSINESSES

- ▶ Women Owned **161**
- ▶ Veteran Owned **185**
- ▶ Black Owned **33**
- ▶ Hispanic Owned **53**

UNLEASHING AMERICAN INGENUITY: The Importance of Outreach and Strategic Communications

AFWERX and SpaceWERX recognize the importance of outreach and strategic communications to achieve our mission of harnessing American ingenuity for enduring military and economic strength. By reaching out to innovators, entrepreneurs, and researchers, we attract a diverse range of talent and expertise to drive innovation and maintain a competitive edge. Our strategic communications efforts aim to raise awareness of the AFWERX and SpaceWERX mission and showcase collaboration benefits. Investing in these activities allows us to expand our network, foster innovation, and attract the best minds to contribute to our mission. This approach enhances defense capabilities, expands the industrial base,



AFWERX Director Col Elliott Leigh addresses attendees during FedSupernova in 2023.

and ensures the United States remains a leader in technological advancement and maintains military and economic strength in global competition.

Fostering Innovation and Diversity in our Ecosystem

AFWERX launched our HBCU Talent Tour, in September 2023 which aims to reach out to and educate individuals at Historically Black Colleges and Universities (HBCUs) on AFWERX. In FY23, AFWERX visited Florida Agricultural & Mechanical University and North Carolina Agricultural & Technological State University where students were introduced to real-world Department of the Air Force problem sets and offered an innovation model/mapping exercise.



Photo by Mary Alice McMorrow

AFWERX stopped at Florida Agricultural and Mechanical University during its inaugural HBCU Talent Tour in September 2023.

Creating Public Awareness

AFWERX and SpaceWERX use several methods to reach interested stakeholders, small businesses, government leaders, and the general public. The Directorate has eight social media accounts and two websites, hosts and attends numerous events and webinars, distributes press releases and coordinates media responses with AFRL Public Affairs. These efforts are critical to our mission and allow us to engage with small businesses, connect with end-users, capture successes, and communicate how AFWERX and SpaceWERX foster innovation.

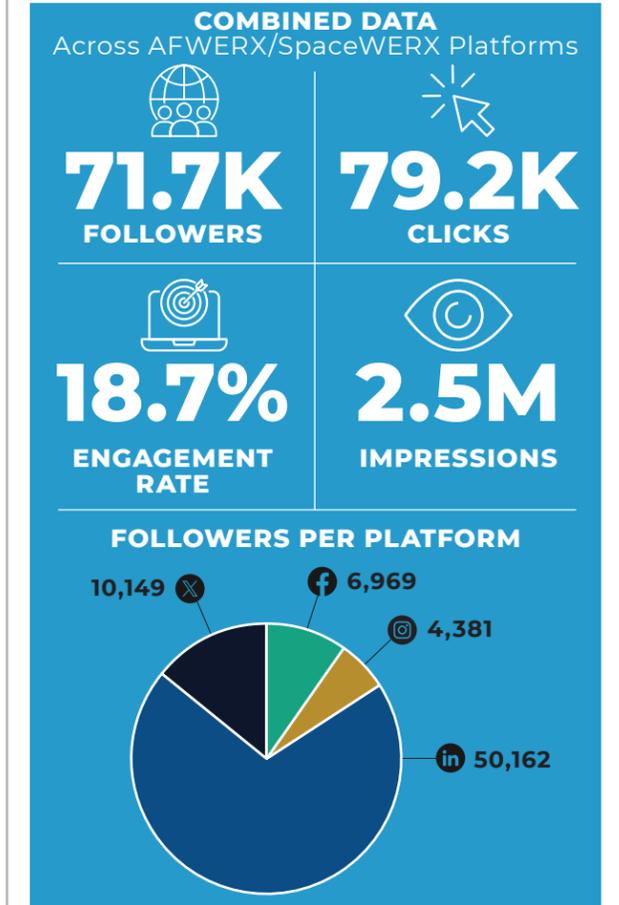
EVENTS



Photo by Michael Madero Photos by Dennis Stewart

AFWERX and SpaceWERX host and attend numerous events throughout the year.

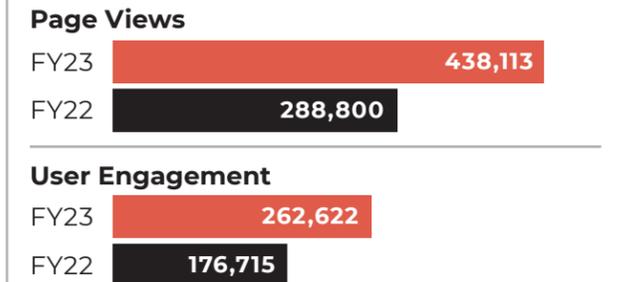
SOCIAL MEDIA



MEDIA COVERAGE



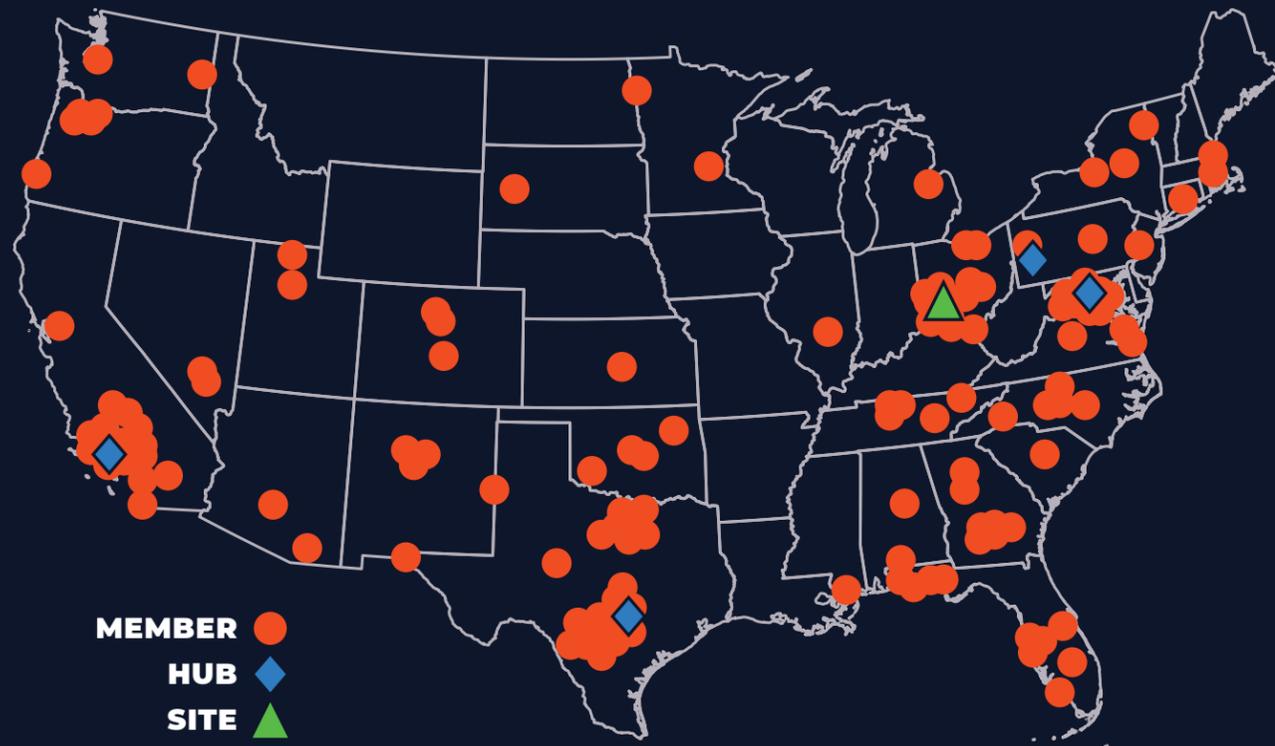
WEBSITES



PART 3: HUBS/SITES

As a catalyst for innovation and collaboration, AFWERX has strategically positioned itself to have a physical presence that spans the United States. With a visionary approach, AFWERX has established a network of regional innovation centers that serve as focal points for building meaningful relationships and promoting partnerships with academia, industry and investors, as well as interagency and international collaborators. These hubs and sites serve as vibrant systems where diverse stakeholders converge to exchange ideas, share expertise and foster groundbreaking initiatives. AFWERX's location-agnostic posture enables the enterprise to expand and contract with ever-changing technology movements/cycles and our largely remote workforce.

WHERE WE ARE



MEMBER ●
HUB ◆
SITE ▲

25 STATES	◆ AUSTIN, TX HUB
1 U.S. TERRITORY	▲ DAYTON, OH SITE
4 HUBS	◆ LOS ANGELES, CA HUB
1 SITE	◆ PITTSBURGH, PA HUB
	◆ WASHINGTON, DC HUB

HUBS/SITES



Photo by Matthew C. Clouse

The AFWERX Hub in downtown Austin, Texas, is located in the Capital Factory.

HUBS

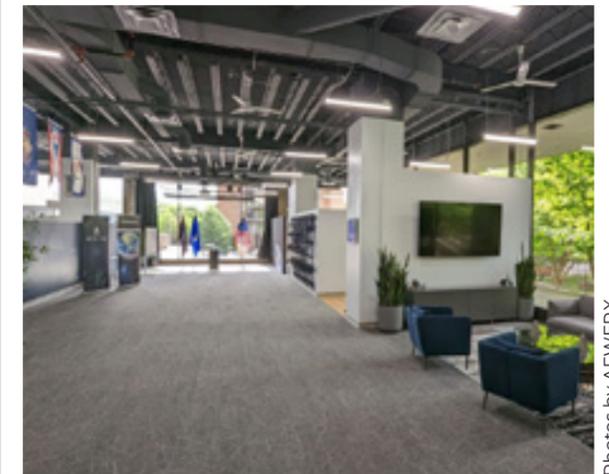
Austin, TX CAPITAL FACTORY

AFWERX's Austin hub, situated in the Capital Factory small business incubator in downtown Austin, stands as a dynamic epicenter for innovation and collaboration within the broader Innovation Ecosystem. The hub provides a unique environment for briefings, AFWERX off-sites and collaborative workspaces. It also fosters collaboration among academic, investment, government and industrial sectors. The proven success of these collaborations makes the Austin hub a magnet for visits from leaders and groups, both civilian and military.

Pittsburgh, PA A/I & SPACE

The AFWERX Pittsburgh hub represents a strategic partnership with the Keystone Space Collaborative, a nonprofit dedicated to fostering and serving the burgeoning space industry in Ohio, Pennsylvania, and West Virginia. The hub is rooted in Pittsburgh's storied manufacturing history, particularly in Artificial Intelligence, Machine Learning, Robotics, and Space and Infrastructure Technology. Beyond these cutting-edge sectors, this hub serves as a regional conduit, offering conference

and co-working spaces, enhancing collaboration and advancing technological frontiers.



Photos by AFWERX

AFWERX Pittsburgh Hub at Keystone Space Innovation Center

Washington DC JOINT INNOVATION LAB (JIL)

Having a robust presence in the National Capital Region is vital for AFWERX's success. AFWERX has partnered with the National Security Innovation Network to establish a location at NSIN's Joint Innovation Lab. Innovators from across the Defense

Department have access to the lab, giving them a place to work, collaborate and host events. AFWERX is dedicated to collaborative technology adoption that not only nurtures thriving commercial markets but also ensures accessibility to the DOD, fostering greater affordability and expanding national industrial capacity. This collaborative approach also contributes to developing a well-balanced regulatory framework that safeguards innovation without stifling progress. The proximity of AFWERX innovators to the interagency partners based in the nation's capital is imperative for achieving mission success.

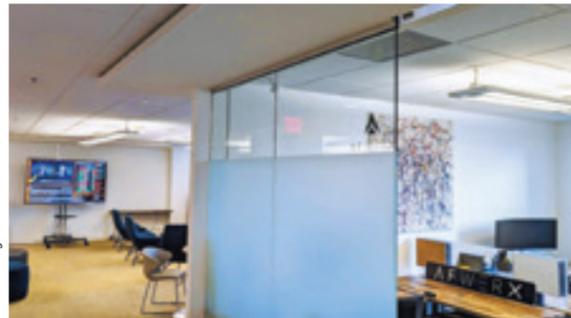


Photo by AFWERX

Washington DC's Joint Innovation Lab (JIL)

Los Angeles, CA SPACEWERX

The SpaceWERX hub in Los Angeles capitalizes on the region's extensive aerospace ecosystem, rooted in a history dating back to the early 1900s. Home to a deeply knowledgeable aerospace workforce, Southern California has been a cornerstone in space exploration, with major contributions to NASA missions and the construction of iconic space vehicles. Los Angeles, with its pivotal role in national space objectives and a thriving aerospace heritage, serves as the ideal location for SpaceWERX. With its blend of established and emerging space companies, the city offers a prime environment for pushing the boundaries of space industry technology and business models. The SpaceWERX hub maintains close ties with the Space Systems Command, ensuring proximity to top talent, technology, and experts in space acquisitions. This strategic location also facilitates collaboration with federally-funded research centers like the Aerospace Corp. and Rand Corp., vital contributors to maintaining U.S. space superiority and providing critical space-policy analysis.

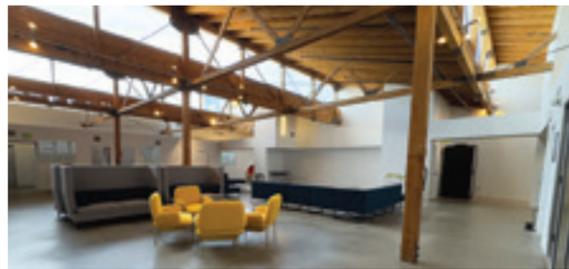


Photo by AFWERX

The SpaceWERX Hub, located within Space Systems Command

SITES

Dayton, OH

The Dayton site's strategic location fosters collaboration among business owners, local universities, research institutions, capital investors, and the Department of Defense to drive technological advancements. The close proximity to Wright-Patterson Air Force Base enhances outreach, connecting with Program Executive Offices, the Air Force Research Laboratory and AFWERX Enterprise support divisions. Dayton's adjacency to Springfield-Beckley Municipal Airport further positions it as an ideal AFWERX presence, vital for Agility Prime partnering companies engaged in airworthiness races and eVTOL cargo certification. The airport's role in critical testing activities aligns with AFWERX's mission, showcasing innovative solutions and fostering partnerships with military entities, such as the Air Force Mobility Command Life Cycle Management Center. This collaboration facilitated a groundbreaking eVTOL airworthiness evaluation, demonstrating the hub's operational significance in advancing cutting-edge technologies within the Dayton area.



Photo by Michael Madero

The Dayton, Ohio Site



The AFWERX patch holds layers of meaning that represent the transformative goals of the organization that are well beyond technology innovation. AFWERX seeks a cultural change in the Department of the Air Force that transforms national defense capabilities and processes.

The phrase arched across the top, "Hoc Faciendum Est," has two meanings, both significant to the AFWERX Mission: 1) the Latin equivalent of "Get Things Done", meaning that AFWERX is an action-based organization transitioning fielded solutions for the warfighter, and 2) "This Must Be Done," meaning that the Department of the Air Force must embrace a culture that attracts talent, capital, and technologies from a breadth of stakeholders to accelerate change.

The binary code on the patch's left side represents the AFWERX founding date: January 11, 2018 (or 11 0118, coded numerically). On this day, the Vice President of the United States and the Secretary of the Air Force publicly launched AFWERX at the Las Vegas Hub. Additionally, this binary code is a nod to the organization's duty to the cyberspace mission.

The four stars and the satellite on the right side of the emblem hold a twofold significance: 1) to symbolize the direct and public support AFWERX has received from the top 4-star leadership across the Department of the Air Force, and 2) to showcase AFWERX and SpaceWERX responsibility to the space mission, which is also represented by the satellite against a black background.

The triangular arrowhead-shape represents the support to the warfighter and the AFWERX mission of spearheading innovation for enduring strategic advantage. The gear surrounding the logo is similar to the logo of the Air Force Materiel Command, which is the machine that builds the tools used by the Department of the Air Force.

In the center of the patch is the AFWERX logo, a futuristic aerospace plane symbolic of AFWERX's support for the USAF and USSF air and space mission, as well as the three core divisions: Ventures, Spark, and Prime. The "X" in the center is indicative of the "X-planes" that propelled aerospace technology, as well as the crossroads where multiple stakeholders meet to collaborate in building the future. The AFWERX text across the bottom is divided with miniature AFWERX logos into "AF*WE*R*X," or "Department of the Air Force, We Are X," to communicate that the Department of the Air Force can be the "X factor" that revolutionizes transportation, transforms national defense, creates entirely new industries, and breaks bureaucracy for the good of the nation.



AFWERX

2023 ANNUAL REPORT