



QUARTERLY REPORT

FY 2018 // QUARTER 1



WRIGHT BROTHERS INSTITUTE

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<http://www.wbi-innovates.com/>



LES MCFAWN
WBI DIRECTOR

EXECUTIVE SUMMARY

As the Air Force Research Laboratory looks to accelerate innovation in response to the Air Force 2030 Initiative, announced in September of 2017, Wright Brothers Institute continues its focus on collaboration as a way to achieve transformative innovation for the Air Force. A study prepared for Google and conducted by Deloitte “found that around 60% of respondents said that collaboration had in some way changed their way of thinking, of which 27% said collaboration had either had a great impact in the way they work or completely transformed their processes.” This quarter **over 4,000 collaborators** from the Air Force Research Laboratory (AFRL), academia, business, and federal, state, community and international agencies used our unique innovation capabilities. Transformative innovation is happening because of these collaborations.

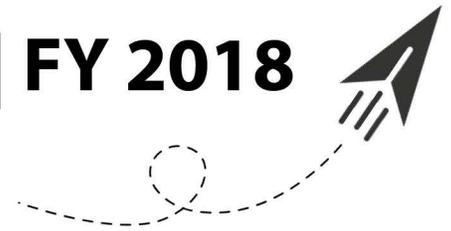
Innovating the way research happens. WBI facilities and expertise, combined with collaborative curiosity, creates innovation that takes flight. A prototype, made in the Maker Hub, resulted in a toxin testing air sampler that saves time (from days of testing, to hours), saves money (from \$150,000 to \$.75 each), and allows for more test samples (from 8 samples at a time to stackable samples that are limitless). Better still is the fact that field testing is now much easier, thanks to a transport-friendly weight (ounces versus 50lbs).

Innovating ways to share and access technology. Commercialization collaborations push Air Force tech out, but also bring new tech in. A four-week technology commercialization boot camp for SBIR awardees pulls together experts in market validation, customer segmentation, competitive analysis and value proposition development, helping each small business build upon the work they are doing for the Air Force.

I invite you to scan the rest of this report to see why the Wright Brothers Institute is the “**Innovation Runway**” for the Air Force Research Laboratory.



WHAT'S TO COME | FY 2018



SMALL BUSINESS HUB

POINTS OF CONTACT

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WWW.WBI-INNOVATES.COM

30+ COLLIDERS

to connect AFRL, the Small Business Community & Commercialization partners.

INNOVATION DISTRICT TECH SHOWCASE

to introduce neighbors, market capabilities and develop partnerships.

PROTOTYPING

10+ PROJECTS TRANSITIONED TO THE WARFIGHTER

via our support to the Center for Rapid Innovation.

GRAND RE-OPENING MAKER HUB

will demonstrate new capabilities in our professional prototyping lab.

TECH WARRIOR PROTOTYPING SUPPORT

for collaborative teams including small businesses, manufacturers and end users.

IP-TO-PROTOTYPE PILOT

to build case studies on how a prototype can elevate market research and speed up the commercialization process.

INNOVATION

5+ INNOVATION SPRINTS

to provide insights, develop concepts & energize innovative solutions, FASTER.

ACT 3 - COLOCATED TEAM SUPPORT

to position AFRL as the thought leaders in autonomy research.

COMMERCIALIZATION

3 ACCELERATORS

with the potential to produce 30 commercialization projects.

COMMERCIALIZATION SPRINT PILOT

could fast track AFRL technology from patent to Kickstarter campaign in one week!

3+ BUSINESS & TECH SHOWCASES

to increase partnerships between AFRL & business, as well as attract investment to the region.

COLLABORATIVE ENVIRONMENTS

WBI SPRINGFIELD STREET



COLLABORATIVE
EVENTS **167**



THROUGH THE DOORS THIS QUARTER:
3,600 PEOPLE FROM AFRL, BUSINESS & ACADEMIA

AFRL CO-LOCATED TEAMS - **3**
GRILL USERS - **16**
AFRL MAKER HUB USERS - **220**

SCIENCE & TECHNOLOGY
PRODUCTS PRODUCED **2**

WBI SECOND STREET



“BENCH TO BUSINESS” EVENT INSPIRES AFRL WORKFORCE, ENGAGES BUSINESS COMMUNITY

Wright Brothers Institute – 2nd St. facility proved to be the ideal location for 100 attendees across AFRL and the Dayton community in the first-ever AFRL “Bench to Business” event. Commercialization partners from Air Force and industry found common ground at the downtown Dayton facility. The large conference room situated exhibitors from the Air Force next to local venture firms like SPGlobal, increasing connectivity for attendees. Close proximity to community partners like The Entrepreneurs Center, allowed for easy networking, immediately following the event, and increased connections between attendees.



COLLABORATIVE EVENTS - **29**

SCIENCE & TECHNOLOGY
PRODUCTS PRODUCED **2**



WBI WORKS



NUMBER OF
PROJECTS **14**

DIRECTORATES SERVED - **6**

COLLABORATIVE
PARTNERS **10**

WBI SMALL BUSINESS SERVICES

COLLIDER EVENT EDUCATES SMALL BUSINESSES AND AFRL CONTRACTING PERSONNEL ON THE BENEFITS, OPPORTUNITIES ASSOCIATED WITH OTHER TRANSACTION AUTHORITY (OTA)

Federal News Radio author Scott Maucione describes OTAs -

“ OTAs give DoD and the military services a work around for the traditional acquisition process. OTAs can take many forms, but are typically used to build prototypes of systems outside of the Federal Acquisition Regulations. Prototype contracts can be up to \$250 million and must use a nontraditional defense contractor, have all of its participants be small businesses or have at least a third of its total cost paid by parties other than the government. Industry typically creates consortia around certain acquisition areas. Each consortium is built of businesses of all sizes who wants to participate. ”

SOSSEC, Inc. teamed with Wright Brothers Institute in early 2017 to discuss a rapid prototyping solution for the Air Force. SOSSEC is a systems of systems consortium that has performed on numerous OTAs supporting AFRL/RI, AFLCMC, AFSOC, Army, Navy and Homeland Defense customers. Curiosity and interest from the small business community made OTAs an ideal topic for a Collider event hosted by the Small Business Hub at the Wright Brothers Institute – 2nd St. location.

Speeding up the acquisition process is critical for small businesses. Traditional contracts can take months to be awarded. Small businesses are often cash-strapped and need a faster acquisition process.

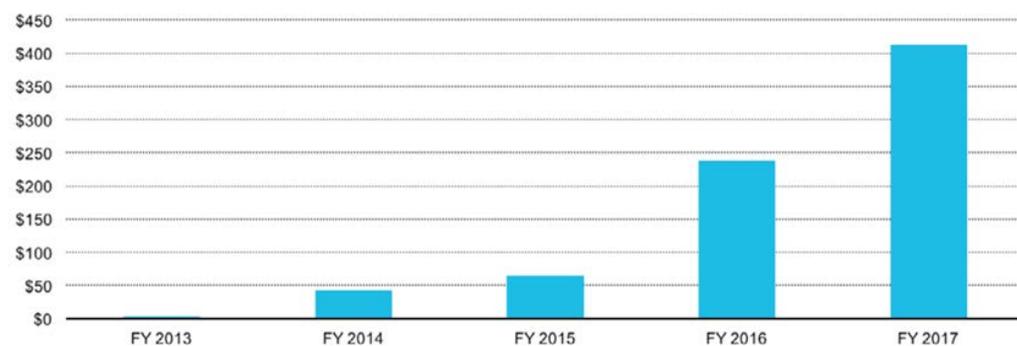
SOSSEC presented the history of Other Transaction Authority (OTAs) and the benefits of OTAs for rapidly contracting prototype

development with both non-traditional and traditional performers. 28 small businesses participated and seven AFRL contracting personnel also attended. Both communities learned more about the OTA process and can now consider how they can implement OTAs to acquire technology at a much faster pace.

Providing this information could change the contracting landscape for small businesses. According to Bloomberg Government, "In fiscal 2017, the Defense Department set a record high of \$412 million in spending obligations through the use of Other Transaction Authority contracting, according to Bloomberg Government data. That's a significant surge compared with the Pentagon's reported OTA obligations of \$3.5 million in fiscal 2013." ¹

DOD 'Other Transaction Authority' Obligations

Dollars obligated in millions



Notes: OTA spending based on government definition of "other transaction IDV"
Source: Bloomberg Government data

It's a trend that's likely to intensify into 2018. Bloomberg further states, "The National Defense Authorization Act for fiscal 2018 included several provisions encouraging the DOD to use OTA more extensively, raising the threshold for use in prototype projects from \$250 million to \$500 million.

There is some risk with using OTA, since the process bypasses many of the contracting safeguards built into regulations and laws. But barring the emergence of a major setback, the use of OTA is likely to increase in fiscal 2018 and beyond."

It's also encouraging for small businesses hoping to prototype a technology for commercial markets. OTAs may serve as a promising procurement tool to combat the "valley of death" that many Small Business Innovation Research (SBIR) projects experience.

Wright Brothers Institute will continue to provide collaborative opportunities that support education of OTAs and other rapid acquisition models.

FOCUSED COLLIDERS
06

PROGRAMMING
10 **13**
AFRL EVENTS **COMMUNITY EVENTS**

WBI PROTOTYPING SERVICES

PROTOTYPE FOR RELIABLE, NON-INVASIVE PILOT BLOOD OXIMETER CREATED IN AFRL MAKER HUB

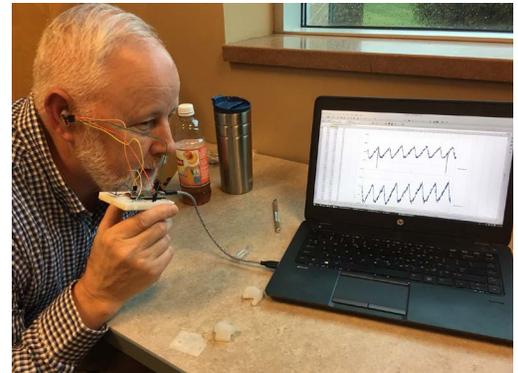
In June of 2017, many F-35 fleets were grounded, due to increased physiological episodes in pilots, triggering concerns about the functionality of the onboard oxygen generation system (OBOGS). That system serves as the oxygen supply line for pilots during rigorous missions. Under these circumstances, pilots may experience Hypoxia, a condition that limits oxygen to the body. Hypoxia can cause pilots to lose consciousness, putting themselves and the aircraft at great risk. Hypoxia was suspected for the majority of physiological episodes, grounding the fleet until a cause could be determined. When the Navy tested OBOGS systems in 2016 to determine if a lack of oxygen was the culprit, approximately 39% of evaluations yielded inconclusive results.² Additionally, real-time measurements, acquired from a blood oxygen monitoring system mounted in the pilots' helmets were yielding unreliable data.³ With hypoxia affecting pilots of F-22, F/A-18, and T-45 aircraft in recent years, the Air Force needed a better way to monitor pilot health and get to the root of the problem.⁴

Air Force Research Laboratory's Mike Moulton, working with Bob Lee from Wright Brothers Institute and Adam Renner, a former AFRL/RH employee, collaborated to build a physiological monitoring system that could be incorporated with a communication earplug for pilot health monitoring. This system uses a dual infrared light source to pick up the signal from the inner ear and would remain stable under rigorous conditions, such as high G loading. This system is designed to also collect six degree of freedom acceleration levels, heart rate, and core body temperature. This gives the pilot freedom to move without sacrificing the quality of the data.

To advance this concept toward transition to the warfighter, WBI researched technology acceleration programs and identified the DoD Rapid Innovation Fund (RIF) as a good match. After discussing the AFRL developed concept of an in-ear physiological

monitor with the F-22 Human Factors lead engineer, AFRL researchers, and the RIF program manager, WBI submitted a RIF topic suggestion that, when endorsed, will be on the DoD RIF BAA coming out in March 2018. The F-22 SPO indicated that they will endorse this topic that will allow for up to \$3M in funding for AFRL to further develop the system.

In conjunction with a number of solutions being vetted by the Air Force, including revamping the OBOGs system, this health monitoring technology will give reliable data and insight into the Air Force's two largest investments; the \$30M aircraft and the \$6M pilot.



Bob Lee demonstrates the physiological monitoring system.

C-130 OPERATIONAL SOLUTION QUICKLY PROTOTYPED AT WBI WORKS

19 PROJECTS YTD

Today, a C-130 can load Abrams Tanks, vehicles and other multi-ton payloads necessary for warfighters to successfully complete their missions. This capability comes at a cost. In 2016, the Office of the Under Secretary of Defense (Comptroller) reported that the C-130J Hercules costs an average \$6900 per flight HOUR! Naturally, the Air Force is interested in trimming that number whenever possible. That means that features such as the system used by the Air Mobility Command to safely load tanks on the C-130 ramp, which must support up to 100,00 lbs, are under scrutiny. Each of these systems weighs 65lbs and each C-130 requires a minimum of two, totaling 130 lbs of equipment required for each mission. The Air Force wanted to reduce the weight of these systems, but higher-priority research pushed development of a low-weight system to the backburner.

In December of 2017, Capt Jason Goins of the Air Force Research Laboratory's Materials and Manufacturing Directorate, Bob Lee and the team at Wright Brothers Institute – WORKS became aware of the challenge and quickly built a "Milkstool" concept design. The team went from concept, to ideation and finally to 3D prototype in two hours. This new system weighs a mere 9 lbs and can maintain the 100,000 lb support requirement. Accessibility to the facility and team members trained to use the equipment prior to use, made the project move at lightening speed.

Testing the prototype on operational aircraft will prove the validity of their concept. If successful, the team estimates that the Air Force will save \$25,000 per year, per aircraft.⁵ With approximately 330+ C-130 operational aircraft in today's Air Force, the potential cost savings are immense!



The "Milkstool" team with prototype.

WBI WORKS WARFIGHTER NEEDS ADDRESSED
13

AFRL MAKER HUB S&T PRODUCTS
05

WBI INNOVATION SERVICES



CAPTURING OPPORTUNITIES TO REVOLUTIONIZE PILOT TRAINING

The challenge sounded insurmountable. Could you train a recent high school graduate to fly an F-35 in six months?

As of 2015, the cost to train a fighter pilot was approximately \$6 million and it took three years to complete before they receive their first assignment.⁶ Undergraduate pilot training, fighter fundamentals, water & land survival training may take many years and multiple assignments to meet readiness requirements. So it's no surprise that there are serious concerns about the amount of pilots ready for battle. Some estimates say the Air Force is 600 pilots short of desired readiness levels.⁷ Getting ahead of this problem, before a major conflict should arise, is crucial.

Lt. Col. Robert Vicars, AETC Action Officer was working hard to fulfill the request of Gen Kwast, the Commander, Air Education and Training Command, Joint Base San Antonio-Randolph, Texas. Vicars and Henke were tasked with investigating the General's Hunch. Kwast's strongly believed that a solution would include Artificial Intelligence (AI), Augmented Reality (AR), Virtual Reality (VR), or some combination to reduce the time and cost of pilot training. Vicars reached out to Mr. Richard Henke of the Air Force Strategic Development Planning & Experimentation Office, for innovative support.

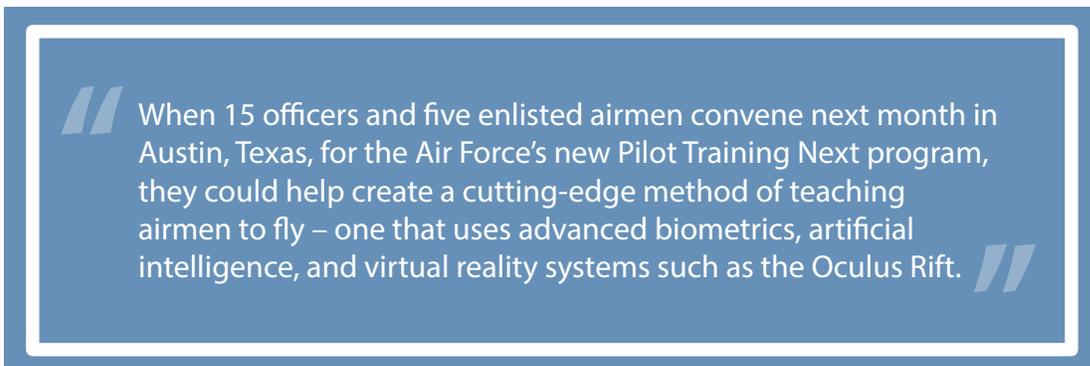
Henke and Vicars needed expert collaborators to build concepts that drastically reduce training time, while ensuring that pilots were expertly trained to meet high standards. Henke reached out to Dr. Bart Barthelemy and the team at Wright Brothers Institute for insights to possible solutions.

A NEW KIND OF COLLABORATIVE WORKSHOP

Wright Brothers Institute, using their Divergent Collaboration problem-solving model, developed and facilitated a “Capturing Opportunities” workshop. This two-day, collaborative process moves from Hunches (emerging technology that may meet a user need) to Ideation (possible concepts). WBI leveraged its network of experts to find 16 participants from a variety of organizations such as Carnegie Melon, Immersive Wisdom, Perduco and others. Participants that specialized in VR/ AI/AR, pilot training, Air Force requirements and cognitive science began mapping the current training ecosystem. This exercise evolved into a concept tree to visualize current methods and future concepts. The workshop educated the VR/AI/AR experts on the unique challenges facing pilots and their trainers, creating a mutual understanding that solving this challenge would not include a “one-size fits-all” approach. Professors shared best practices for measuring VR/AI/AR outcomes, while AETC and USAF operators looked for ways to integrate those practices. User experiences and the way that a younger generation is learning also became key points for discussion.

Lt. Col Vicars left the workshop with several concepts to present to Gen Kwast.

A January 2018 article on AirForceTimes.com, written by Stephen Losey, discusses the implementation of the concepts born at the workshop.⁸



A study will follow the results of these first 20 participants to help the Air Force determine which parts of pilot training can be done virtually and which need to take place in a real aircraft. As the study proceeds, Wright Brothers Institute is ready to support pilot training efforts with workshops and collaborative activities to stay ahead of the challenge and enable air readiness for the Air Force.

AFRL PROJECTS PROVIDED
WITH INNOVATIVE INSIGHTS
OR SOLUTIONS
06

35
INNOVATION
PROJECTS YTD

FEATURED STORY:

WBI TECH TRANSFER AND COMMERCIALIZATION

INVESTOR ADVANCES AFRL TECHNOLOGY, LOOKS FOR ADDITIONAL OPPORTUNITY FROM REGIONAL STARTUPS

Wright Brothers Institute partner SPGlobal is making big strides, bringing AFRL technology into commercial markets and investing in the Dayton region with confidence.

WBI and SPGlobal began their partnership in 2014 with the purpose of commercializing technology produced at AFRL and invigorating the regional startup ecosystem. According to a CB Insights study, 42% of tech startups fail because there is no market need or pull.⁹ WBI's competitive intelligence team, alongside SPGlobal experts, provided market analysis to find the right markets faster and commercialize with confidence.

GET THE TRIPLE WIN, FASTER

In 2016, the White House added the term "triple win", defined as a technology that provides numerous benefits for the individual, the Federal government, and the home or host organizations. SaWyze, a company licensing materials technology developed at AFRL, and connected by Wright Brothers Institute to SPGlobal, has set course for "triple win" status.

Win #1 - HUMANITARIAN - SaWyze antibody stabilization technology will save lives. Eliminating the need to refrigerate certain medications means that there is now a safe way to extend the life of drugs that will save lives in underdeveloped countries.

Win #2 - WARFIGHTER SAFETY - Reduced mortality rates for Air Force personnel, where doctors treating wounded airmen need maximum flexibility to save lives in the field.

Win #3 - REGIONAL ECONOMY - SaWyze is a Dayton, Ohio-based company, adding to the vibrant startup community and leveraging federal research and development dollars.

SPGlobal was able to raise \$2.5M in funding, infusing SaWyze with the capital it needs to begin prototyping and expand their technological portfolio.



We are providing humanitarian technology innovation to transform field healthcare for the 65M+ refugees and internally displaced persons, those affected by the 300+ disasters per year, and the 1.3 billion people living in extreme poverty.



GLOBALFLYTE

Another “triple win”? GlobalFlyte. SPGlobal, connected to AFRL through a partnership with Wright Brothers Institute, was able to raise \$2.5M in funding. GlobalFlyte uses Multimodal Communications Technology developed in AFRL/RH (human performance directorate) to complete a suite of technologies for first responders.

Win #1 - COMMUNITY - GlobalFlyte was first adopted by the City of Fairborn, near Dayton, Ohio by it’s first responders. The system is expected to reduce injuries and improve safety for responders and the community they serve.

Win #2 - FUNDING - AFRL/RH will receive licensing royalties and is benefiting from a \$600K Cooperative Research and Development Agreement with GlobalFlyte

Win #3 - REGIONAL ECONOMY - GlobalFlyte is a Dayton, Ohio-based company, adding to the vibrant startup community and leveraging federal research and development dollars.



Air Force Research Laboratory project researchers Dr. Joseph Slocik (left), Dr. Rajesh Naik and Dr. Patrick Dennis review the recently signed licensing agreement that grants locally based innovators S.A.Wyze exclusive rights to use AFRL-developed ultra-stable antibody liquids technology for human diagnostic work. (U.S. Air Force photo/Kristi Singh)



BOOST IN CONFIDENCE

These investments, with Wright Brothers Institute’s commercialization support and market research, created confidence for SPGlobal. In December, at the Dayton Catalyst Event, they announced a new \$10M venture fund for Dayton-area technology companies. The fund will invest in start-up companies that are ready to move from prototyping to going to market with viable products. This is huge for the region and AFRL as it will greatly accelerate the transition of AFRL technologies to commercial products.

SPGlobal’s commitment to the region did not happen overnight. WBI has partnered with them since 2014 on multiple start-up companies that integrate AFRL technology. SPGlobal’s investment in the region means that Dayton, AFRL, Ohio and the world can expect more “triple wins”.

TECHNOLOGIES MOVED
TOWARD COMMERCIALIZATION

07

COMMERCIALIZATION
SHOWCASES

01

AFRL SCIENTISTS
SUPPORTED

63

WORKFORCE DEVELOPMENT

30 NEW MAKERS BEGIN 3D PRINTER BUILD

Following the example of businesses like Ford Motor Company, AFRL's Maker Hub, located at Wright Brothers Institute - Springfield Street is building the innovative workforce of future, one lunch hour at a time.



There are some really interesting things that happen when you allow anybody to innovate, rather than just the six guys in a cube in the corner who happen to be working on a thing," Hatch says. "If you can engage your employees and give them access to the tools of innovation, they can innovate.



- Mark Hatch, former Green Beret and Maker Movement advocate

In late October, 30 people began a 6 week 3D printer build at Maker Hub. Participants came from a wide swath of Air Force enclaves including five Air Force Research Laboratory directorates, the Air Force Institute of Technology and NASIC. Capt Chris McGaw from NASIC agreed to lead the team build and put together one system for AFRL/RH as a demo system for the participants to check their work against.

Wright Brothers Institute's Bob Lee used the Maker Hub 3D printers to build the 32 sets of parts for these systems, ordered all the individual components, and fabricated the frames.

HERE'S WHAT THE WORKFORCE IS LEARNING:

- How to use the equipment in the Maker Hub
- How to assemble their own 3D printer system
- How to use AFRL/RX ICE Maker software and use it to collaborate with other participants on upgrades and enhancements in the future

HERE'S WHAT AFRL IS GETTING:

- Cross-directorate collaboration
- Employees ready to innovate
- Use of collaborative software
- Shared 3D designs and the ability to replace their own parts

All the files for the 3D printed parts were made available on ICE Maker for each participant to download and print their own replacement parts. All of the participants were very excited to participate with one exclaiming

“This is awesome. I am so glad that we get to learn how to do this”; and another stating “We would never have tried to do this ourselves without this kind of a team behind us”.

Projects like this, with the encouragement of AFRL leadership, can bring big returns. When Ford added their makerspace to the Dearborn facility in 2013, they saw a dramatic increase in innovation.¹⁰

“Within the first year, he says the company registered a 200 percent increase in intellectual property development, and since 2013, he says it’s doubled yet again.” – Mark Hatch¹¹

Life gets in the way; many of the participants are still working on their printers. However, Wright Brothers Institute is committed to seeing each participant become an innovative maker for the Air Force.



WFD PRODUCTS
PRODUCED

02

EMPLOYEES BENEFITING FROM UNIQUE
DEVELOPMENT OPPORTUNITIES

120

PARTNERSHIPS WITH STATE AND FEDERAL AGENCIES

DoD Rapid Innovation Fund.

Earlier this year WBI assisted AFRL researchers in demonstrating an in-ear physiological monitor. To advance this concept toward transition to the warfighter, WBI researched technology acceleration programs and identified the DoD Rapid Innovation Fund (RIF) as a good match. After discussing the AFRL developed concept with the F-22 Human Factors lead engineer, AFRL researchers, and the DoD RIF program manager, WBI submitted a topic suggestion that, when endorsed, will be on the DoD RIF BAA coming out in March 2018. The F-22 SPO indicated that they will endorse this topic that will allow for up to \$3M in funding for AFRL to further develop the system.

Defense Manufacturer Assistance Program

WBI presented on commercialization and working with AFRL at the Defense Manufacturer Assistance Program (DMAP) Council meeting in Columbus, OH. DMAP is a tri-state collaboration between economic developers at University of Michigan, Purdue University, and Ohio State University. There are several promising opportunities to partner either on specific projects or for larger programs. For example, the University of Michigan is interested in opportunities to connect federal lab commercialization opportunities with the industry supply chain subject matter experts that they have recruited while performing work for NIST.

Ohio Technology Validation and Startup Fund

WBI met with Mile2, a local startup company, to advise them on an Ohio Third Frontier, Technology Validation and Startup Fund application. Mile2 is applying for \$100,000 in grants to support development of a fitness training mobile application based on Adam Strang's (711th HPW) algorithms.

WBI is also working with the University of Dayton and Miami University of Ohio on a collaborative effort to apply for a Ohio Third Frontier Technology Validation and Startup Fund (TVSF) grant. If successful, the effort will make \$400K available to further development of AFRL, University of Dayton and Miami of Ohio technologies that have high commercialization potential.

Dayton Metro Plan for Economic Diversity

WBI continued work on The Dayton Metro Plan for Economic Diversity (also called the OEA Grant). The effort seeks to diversify the economy of the Dayton Region by leveraging its research and development capabilities, including those of AFRL, to develop and produce market ready technologies. This is being done by conducting a holistic assessment of the regional ecosystem; and developing pilot programs to fill gaps identified in the assessment. The regional effort is being led by Wright State University/ Wright State Research Institute with funding provided by a grant from the DoD Office of Economic Development (OEA). As part of the regional effort, WBI has a key project for "Technology Development-Commercialization". The objective of the project is to test a market-driven commercialization model that supports successful development of new, high-tech products, services and businesses.

During this quarter, work continued on commercialization projects in Electric Energy, Human Performance Enhancement and Precision Livestock Farming. An additional commercialization project in Drones for Humanitarian Support Operations was initiated.

Appendix

// SMALL BUSINESS SERVICES

Downtown Collider Event Identifies Small Business Concerns and Opportunities. Valerie Muck, Director of Air Force Small Business Programs, and senior small business leaders from WPAFB held a panel session with Dayton small businesses at WBI 2nd Street. Over 30 small businesses attended the Collider and used the opportunity to ask the panel tough questions. Ms. Muck will consider the results of the Collider as she addresses AF Small Business contracting issues.

Collider Event Updates Small Businesses and AFRL Contracting Personnel on Other Transaction Authority. The Wright Brothers Institute Small Business Hub teamed with SOSSEC, Inc. to present a very successful Collider event on Other Transaction Authority (OTAs) at WBI 2nd Street. SOSSEC is a systems of systems consortium that has performed on numerous OTAs supporting AFRL/RI, AFLCMC, AFSOC, Army, Navy and Homeland Defense customers. SOSSEC presented the history of Other Transaction Authority (OTAs) and the benefits of OTAs in rapidly contracting for prototype development with both non-traditional and traditional performers. 28 small businesses participated. 7 AFRL contracting personnel also attended to educate themselves on the OTA process and consider how they could start implementing OTAs to acquire technology at a much faster pace.

Cyber Security Solution for Small Businesses Completes First Milestone. FlowVU™ software is a secured cloud service for workflow management that replaces emails for teams working from anywhere using Microsoft Office. WBI is supporting the AF SBIR Office in evaluating the tool for use by SBIR contractors and AFRL TPOCs. The initial software configuration and SBIR TAP training phase is now complete. Implementation for up to 100 users across SBIR TAP contractors and AFRL TPOCs is progressing with the standup of Impact Level 2 (IL-2) accredited servers. IL-4 authorization is scheduled for early 2018.

32 SBIR Companies Complete TAP Commercialization Training. The Entrepreneur's Center, who is partnering with AFRL and WBI to execute the SBIR Technology Acceleration Program (TAP), completed its four week training cycle for all participating companies. 32 Phase 1 SBIR awardees participated in various sites around the US. The training provides a foundation into areas of commercialization – market validation, customer segmentation, competitive analysis and value proposition development – that can help SBIR awardees to identify alternative business opportunities that build upon the work they are doing for the AF under the SBIR. Each company will now develop an action plan to follow up on discovered opportunities. TEC and WBI will work with each company to present technologies in the AFRL IP portfolio that align with the company's capabilities and interests.

Maker Hub Project Demonstrates Blood Oximeter Reading from an Earplug. AFRL Researcher Mike Moulton, working with Bob Lee from WBI and Adam Renner, former AFRL/RH employee, have demonstrated a physiological monitoring system that could be incorporated with a communication earplug for pilot health monitoring. This system uses a dual IR light source to pick up the signal from the inner ear. This location would be stable under high G loading. This system is designed to also collect 6 degree of freedom acceleration levels, heart rate, and core body temperature. WBI has already found interest from the Deputy Director of the F-22 SPO in having the system developed further. The current helmet mounted blood oxygen monitoring system is not reliable.

WBI Assists the 2017 WPAFB Commanders Challenge Team: The staff at WBI's Works facility continues to provide Team WP with valuable support. WBI assisted during Team WP's ground testing executed on the Area B runway; provided fabrication training which allowed Team WP members to modify and reassemble their flight vehicle quickly; and provided expert mechanical engineering inputs which allowed Team WP to analyze new features for their flight vehicle.

C-130 Operational Solution Rapidly Prototyped by AFRL/RX Team. An AFRL/RX team led by Capt Jason Goins built a "Milkstool" concept design in less than 2 hours at the WBI Works facility. The "Milkstool" was designed to support up to 100,000 lb. load on the C-130 ramp for loading heavy equipment like the Abrams Tank. The current system in use widely by Air Mobility Command weighs 65 lbs. This system weighs 9 lbs. The weight savings equates to \$25,000 per year per aircraft in reduced fuel cost since each aircraft must carry 2 on board. The team will now work to test the prototype on an operational aircraft.

Prototyping Accelerates AFRL/RH Research. Cayley Dymond studies the molecular bio-effects of toxins such as nanoparticles on human organs. She uses a "portable" aerosol sampler called the "spaceship" that weighs 50 lbs., making it difficult to transport for field sampling. It costs \$150,000 and can only process 8 samples every 2 days. She recently designed and built small sample holders at the Maker Hub. Each holder is the size of a tea light, weighs next to nothing, costs 75 cents, and holds 4 samples. She can now test as many samples as she wants in a single field test over a period of just hours by using multiple "tea light" sample holders. No need to clean the sample holders afterward, they are disposable. In addition, the "tea light" sample holders can be stacked to simulate multiple organ systems. This will allow Cayley to extend her research to model full body response to toxins.

Wright State Research Institute Begins Two UAS Prototyping Projects. The first project will integrate software with single-operator control of multiple larger UAS. The second project will integrate on-board high graphics software packages allowing multiple UAS to make their own in flight decisions on command.

Tactical Operations Resupply Kit (STORK) Successfully Tested. The first drop test was completed in mid-December. Pull behind ground testing verified flight attitude operation and the experimental wing deployment mechanism. STORK will be deployable from C-17 and C-130 aircraft.

Remote Airfield Zone Tarmac Evaluation Kit (RAZTEC) for AFSOC. The RAZTEK vehicle was returned to Works for new coatings requirements and some new minor modification requirements. During this quarter all the coatings have been applied and the modification requirements have been designed and fabricated and are currently being installed. After installation is complete the asset will be sent back to the customer.

Global Photovoltaic Power Potential Laboratory for AFIT. Continued to successfully collect data at all 37 world-wide sites including the WBI Works facility.

UAS Integrated Control and Evaluation Technologies (ICET) Capabilities Expanded by AFRL/RH/RQ/WSRI. A new flying platform was added to ICET to expand capability from one centralized Ground Unit to Multiple Ground Units.

Counter UAS (C-UAS). Continued development of advanced computer vision targeting and tracking algorithms.

5-Country TTCP (The Technical Cooperation Program) UAS Testing. Coordinate 5 Country cooperative effort to test a software package allowing multiple UAS to make their own flight decisions based on pilot commands. Initial "run thru" testing will occur in late June/July before live testing at Jarvis Bay, Australia in late 2018.

30 New Makers begin 3D Printer Build. 30 people began the 6 week 3D printer build at Maker Hub. Participants came from AFRL/EN/711 HPW/RQ/RX/RV, AFRL/EN, AFIT and NASIC. Capt Chris McGaw from NASIC agreed to lead the team build and has put together one system for AFRL/RH as a demo system for the participants to check their work against. WBI used the Maker Hub 3D printers to build the 32 sets of parts for these systems, ordered all the individual components, and fabricated the frames. Each participant is learning how to use the equipment and assemble their own system. Each person is registered into the AFRL/RX ICE Maker software and can use it to collaborate with other participants on upgrades and enhancements in the future. All the files for the 3D printed parts are now available on ICE Maker for each participant to download and print their own replacement parts. All of the participants were very excited to participate with one exclaiming "This is awesome. I am so glad that we get to learn how to do this"; and another stating "We would never have tried to do this ourselves without this kind of a team behind us".

Novel Solutions to Critical AFSOC Need Identified via World-Wide Prize Challenge. WBI is assisting the AFRL/RX Advanced Power Technology Office (APTO) in addressing a critical AFSOC need for a man portable, cheap, clandestine weather system that can collect data from ground level to 10,000' AGL. WBI ran a world-wide challenge for a Mobile Weather Station Design that resulted in 28 entries from 10 different countries. Prizes were awarded for three diverse solutions from the US and Canada. The APTO team is now challenging the JFWORX junior force team to prototype the winning concepts in the Maker Hub at WBI Springfield Street. The best system will be field tested.

WBI Capabilities Used in all Phases of AFRL Commander's Challenge 2017. This is the fifth year that WBI has supported the WPAFB team participating in the AFRL Commander's Challenge. WBI capabilities are being used in all phases of the project. WBI led the WPAFB team through a functional deconstruction process that helped them organize and methodically explore their problem space. Currently the team is using the new WBI 2nd Street facility and its open environment for brainstorming and networking. They will complete their design and build their prototype at WBI Works. In addition to mentoring the WPAFB team, the WBI Works team saved AFRL over \$20,000 by repurposing several major items in inventory for use by the WPAFB team.

University of Dayton Students Develop Unique Approaches to AFRL Challenges. Over the summer, twelve University of Dayton students developed unique approaches to three challenge problems identified by AFRL and the Dayton community. The students applied the University's Institute for Applied Creativity (IACT) "collaboration accelerator" process and reported their results using novel graphical and experiential presentations to over 100 stakeholders from AFRL, WBI, UD and the Dayton community. In addition, several members from AFRL and WBI received IACT training. WBI will incorporate aspects of the IACT process in our innovation practices and AFRL is assessing how the IACT process can be applied internally. This activity started in 2015 when WBI first collaborated with Reid Melville, AFRL/RQ Program Manager, and UD on the IACT process.

USAFSAM Develops Strategies for Using 60 Years of Medical Data. A workshop was held at WBI to develop requirements for an updated database of all Air Force medical records and the various ways that the database could be used. The workshop was led by Col Niraj Godhi and facilitated by WBI. Two pathways were developed to transform paper and microfilm data to digital data to capture 60 years of accumulated Air Force medical data. In addition, ten key vectors to utilize the data were developed, including: 1) to update USAF medical standards, 2) to inform USAF waiver policy, 3) to determine medical trends, and 4) to guide future USAF medical data collection.

Low Cost Sonic Boom Monitor Being Developed. WBI is assisting the 711 HPW Battlespace Acoustics Branch in engaging a University of Dayton student team to build a miniature Sonic Boom Monitor. The goal is to reduce the cost of a sonic boom monitor from \$15,000 to \$200. WBI is assisting the UD Senior Capstone Design Project team in problem deconstruction and has identified two promising approaches to tackle the biggest technical issue for the team. If successful, the new design concept could be used for operational monitoring at all AF test ranges.

AFRL/RQV Processes Assessed. Dr. Bart Barthelemy and Chris Remillard out briefed the leadership team from AFRL/RQV on the results of the RQV Process Assessment Pilot Project. Six focus groups were conducted by WBI in September to assess opportunities for RQV to improve their processes and practices. Key findings and recommendations for workforce development, efficiency, and management were highlighted, allowing the team to determine which of the various issues identified will be addressed first and how they might approach them. RQV may engage WBI to assist with the design and implementation of selected recommendations.

AFRL Innovation Institutes to Strengthen Collaboration. The AFRL Innovation Institutes converged at Wright Brothers Institute November 8-9 to discuss the work they are doing in the following areas: collaboration, innovation, tech transfer/transition/commercialization, environments, rapid prototyping and STEM. An "Institute Ecosystem Map" was developed to better identify unique service offerings and promote connectivity across the Institutes and the Tech Directorates they support. Ultimately, a strengthened Institute network will increase the diversity of thought for solving Air Force problems.

UAS Runway Inspection Assessment Conducted for AFRL/RQ. WBI has been supporting Dr. Reid Melville, AFRL/RQ, in the examination of a potential opportunity to engage UAS development companies for military runway inspection. The initial activity was to determine how and if commercial airports utilize UAS systems for runway inspection. A

comprehensive research intelligence study of small, medium and large US commercial airports was conducted over the past months and briefed to his team this week. In summary, UASs are not used for commercial runway inspection, but there may be unique future commercial airport applications that do. The WBI/RQ team will continue to explore the potential of catalyzing a collaborative commercial-military initiative to develop UASs for military and commercial runway inspection.

WBI Assists JFWORX Team with SPRINT Process to Solve Operational Need. RX's JFWORX (Junior Force Warfighter Operations in RX) program experimented with the weeklong SPRINT process to rapidly design and prototype a new tactical, medical supply bag for Guardian Angel teams. These teams rescue NASA astronauts in water/high seas, but do not have a waterproof bag to transport their medical supplies that can go into the water with them. The JFWORX team consisted of material scientists and engineers from RX, as well as active involvement from the 103rd Rescue Squadron led by Captain Jason Goins. The JFWORX team nailed down requirements on Monday, and with assistance from WBI, came up with 5 concepts on Tuesday, vetted them with the users on Wednesday, finalized 2 designs and developed concept prototypes on Thursday, and tested the concept prototypes on Friday. The JFWORX team is now going to develop a full-up prototype for the preferred concept. Capt. Goins used this process to train John Bales to lead the next JFWORX team in this process. Team members indicated this was a very exciting and fulfilling week and loved the experience. "It was great to interact with the end user and creatively try to bring the concept into reality" and "This is a great model to energize the workforce" were comments from the team.

WBI Connects AFRL to \$3M Tech Transition Opportunity. Earlier this year WBI assisted AFRL researchers in demonstrating an in-ear physiological monitor. This location would be stable under high G loading and could collect reliable data (blood oxygen levels, 6 degree of freedom acceleration levels, heart rate, and core body temperature) for the F-22 and other high performance aircraft. To advance this concept toward transition to the warfighter, WBI researched technology acceleration programs and identified the DoD Rapid Innovation Fund (RIF) as a good match. After discussing the AFRL developed concept of an in-ear physiological monitor with the F-22 Human Factors lead engineer, AFRL researchers, and the RIF program manager, WBI submitted a RIF topic suggestion that, when endorsed, will be on the DoD RIF BAA coming out in March 2018. The F-22 SPO indicated that they will endorse this topic that will allow for up to \$3M in funding for AFRL to further develop the system.

Publication Benchmarking Data Identified for AFRL/RX Data Warehouse Initiative. WBI performed several data searches focusing on publication activity over the last several years for RX as well as the DOE Labs, Navy, Army and NASA. WBI's work contributes to Jeffrey Haines' initiative of building a data warehouse that enables the use of analytics and data visualizations that are traceable back to AFRL strategic objectives. WBI's work impacted analytics built around personnel and publication benchmarking data used to support Science Advisory Boards asks and multiple Lab studies.

WBI Presents “The Magic of Market Intelligence” Presented to UD Class. WBI presented the “Magic of Market Intelligence” to a University of Dayton Entrepreneurship class. Knowledge gained by the students will help them as they work with an AFRL researcher to identify commercialization opportunities for the researcher’s technology.

AFRL Experts Connect with Companies and Dayton Community During “Fourth Fridays at 444” Event. AFRL/RQ’s Derek Kingston presented the Air Force Autonomy Strategy during the “Trustworthy Systems” portion of a day-long event held at Wright Brothers Institute - 2nd Street. Dubbed “Fourth Fridays at 444”, a variety of talks were given by local businesses, economic developers and researchers hoping to collaborate in new ways. Approximately 125 individuals attended during the day. Galois, a Portland-based cybersecurity firm with an office upstairs from the Wright Brothers Institute - 2nd Street led the “Trustworthy Systems” portion of event. One attendee commented, “I really like the variety of talks. One speaker discusses social media and the next features hard science.” The day concluded with the 4th Friday Speaker Series, which matches an AFRL speaker with a speaker from the Dayton region. AFRL/RX’s Matt Jacobsen presented “Making Connections: a dialogue on force multipliers” alongside Emily Fehrman Cory, professor at the University of Dayton. Matt’s desire to turn mind mapping exercises into searchable data could be a potential solution to AFRL’s knowledge management and retirement challenge. “Sit down, have a cup of tea and think about your connections. Who you know. How you’ve worked with them. Parsing this data with a simple algorithm coded in Python means results are searchable and consumable. New program managers spend 3-6 months getting up to speed on their technology portfolios. Imagine reducing that to a few hours.”

WBI Connects to Regional and International Best Practices and Potential Non-Traditional Partners in Meetings Focused on Technology and Patent Licensing. Jim Heitner attended the Licensing Executive Society (LES) Annual Meeting in Chicago. LES is the leading association for intellectual property professionals. The meeting featured best practices in intellectual property capture and technology transfer. Jim also met patent licensing and collaborative research deal makers from over two dozen companies including Boeing, GE Healthcare, Uber, Dow Chemicals, and Lilly Pharmaceuticals; there are many follow-up opportunities. The networking function is an important component in learning what types of technologies and problems companies are seeking; and to share AFRL’s technology capabilities and intellectual property assets. Meghan Sheehan, Wright Brothers Institute, and Stefan Susta, Technology Transfer Specialist in RQ, attended the Technology Transfer Officer’s Council meeting. The Council meets regularly to distribute technology transfer related information, insight, best practices and experiences between all of Ohio’s academic, medical and government research institutions. Following presentations at this meeting, WBI plans to collaborate with I-Corps@ Ohio to create and offer education opportunities for AFRL S&Es on commercialization and technology innovation.

WBI Working with University of Dayton’s Alumni and Entrepreneurs. WBI hosted and participated in the University of Dayton Crotty Center for Entrepreneurial Leadership’s Advisory Board Meeting at 444 Second Street. The advisory board features UD Alumni and successful business leaders and investors, many of which were seeing the downtown facility for the first time. Jim Heitner gave an introduction and encouraged them to approach WBI and AFRL with opportunities to collaborate with the regional business community. In a separate meeting, on Saturday 10/21, Jim Heitner participated as a judge in the Crotty Center’s Flyer Pitch, a global business pitch competition. Over 40 entrepreneurs competed in a “Shark Tank” style contest for prizes including \$2,500 in venture support and opportunities to advance to subsequent venture development and competition rounds. The event is a great opportunity to support a regional partner with expertise, to find opportunities to partner startups with AFRL capabilities and technology, and to source talent for WBI commercialization internships.

711th Air Base Wing Inspires Workforce, Engages Business Community at “Bench to Business” Event. Researchers who’ve successfully commercialized their technologies were on hand Wednesday, November 1 at Wright Brothers Institute - 2nd St. to share their stories with the Wing during the “711th HPW Bench to Business” event. The morning agenda, exclusive to Wing employees, featured an introduction from Chief Scientist Rajesh Naik. Presentations from researchers who’ve navigated the tech transfer process to create successful CRADA, SBIR and licensing agreements took questions from the 40+ employees in attendance. The afternoon agenda was open to the public and featured presentations from 711th commercialization partners, including SBIR III company Etegent, from the Cincinnati area. Presentations were given by companies, such as SPGlobal, that are investing in 711th technologies, as well as entrepreneurial organizations, like The Entrepreneurs Center, that explained state funding options with attendees. Approximately 100 attendees across AFRL and the Dayton community attended the event during the course of the day.

One participant said, "I learned so much about tech transfer at this single event!" WBI's goal is to host subsequent events for the different directorates and with focus on particular industries.

32 SBIR Companies Complete TAP Commercialization Training. The Entrepreneur's Center, who is partnering with AFRL and WBI to execute the SBIR Technology Acceleration Program (TAP), completed its four week training cycle for all participating companies. 32 Phase 1 SBIR awardees participated in various sites around the US. The training provides a foundation into areas of commercialization – market validation, customer segmentation, competitive analysis and value proposition development – that can help SBIR awardees to identify alternative business opportunities that build upon the work they are doing for the AF under the SBIR. Each company will now develop an action plan to follow up on discovered opportunities. TEC and WBI will work with each company to present technologies in the AFRL IP portfolio that align with the company's capabilities and interests.

WBI Supporting AFRL EOP Program. Jim Heitner and Larisa Dimitrienko, WBI head of Competitive Intelligence, visited with AJ Rolling (RQ), who is currently participating in the EOP program. The meeting was a starting point for assisting with AJ's need for market research and analysis on his hand truck product innovation. WBI will spend the next few weeks helping AJ to understand and validate the market opportunity. Jim also met with Ryan Jankord (RH) who is approaching the 6 month point of his EOP experience. Finally, Jim provided guidance and comments to Joe Diemunsch (RY), who recently completed his EOP experience, to help Joe develop his final report.

New Tool to Support AF Patent Attorneys. Meghan Sheehan, WBI's head of IP Services, hosted a training seminar at WBI for AFMCLO/JAZ attorneys on the use of Patent Optimizer for streamlining patent prosecution. Patent Optimizer is a LexisNexis IP Solutions tool designed to optimize the patent application drafting and prosecution processes. By using Patent Optimizer, conservative estimates predict that AFMCLO/JAZ attorneys may be able to save between two and four hours per month per attorney, with increased potential for more time savings as the attorneys become accustomed to the tool. WBI is hosting Patent Optimizer for AFMCLO/JAZ at a workstation at its Springfield Street location, and anticipates hosting more training sessions in the future to meet attorney needs.

Exploring Collaboration Opportunities with P&G's Open Innovation Group. WBI along with AFRL/SB met with managers of P&G's Open Innovation Group which focuses on partnering P&G R&D capabilities with other collaborators. The two parties discussed research focus areas, motivations and mechanisms for doing business with AFRL, and areas of interest for P&G. There were several areas of overlapping interest. Next steps include a narrowing down of a problem area to focus on to identify collaboration opportunities, which will lead to an AFRL visit, showcase of researchers, and discussions on potential work plans.

Intellectual Property Seminar Educates AFRL S&Es. Wright Brothers Institute held an all-day intellectual property training seminar titled "Protecting Your AFRL Inventions and Their Value: Use IP to Improve, Add Value, and Change the World." The seminar was created through a collaboration between WBI, the University of Dayton and AFRL, and featured speaker Michael Baniak. Mr. Baniak is a professor of IP law at Northwestern University and an accomplished practicing patent attorney who is currently Chief IP Counsel for EOS, a global provider of additive manufacturing systems. Stefan Susta (RQ Tech Transfer Specialist), Sunita Chavan (RX Tech Transfer Specialist), and Jeff Moore (AFMCLO/JAZ) contributed in planning the event. Over thirty S&Es from the 711 HPW, RQ, RX, and RY learned strategies to help them write value proposition focused invention disclosures, and learned more about the intricacies of intellectual property in general. WBI received great feedback from the S&Es in attendance, and plans to offer similar training sessions in the future, as well as designing a new training session focused on protecting, developing, and promoting software based inventions and products.

Technology Acceleration Program Kicks Off. Jim Heitner and Rob Klees held a kickoff discussion with The Entrepreneur's Center (TEC) for a new Technology Acceleration Program – a partnership between WBI, TEC, and AFRL to increase the number of AFRL technologies advancing towards products. The program plan features the placement of an experienced commercialization project manager to work closely between AFRL, WBI and pools of companies, entrepreneurs, and innovators. TEC's role is to down select companies and entrepreneurs from these pools that are promising candidates for AFRL technology. WBI will then match AFRL technology and IP to those companies and entrepreneurs. WBI will work with AFRL technology transfer specialists and innovators to support and prioritize the opportunities to transfer technologies.

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Defense Manufacturer Assistance Program Partnering Opportunities. Jim Heitner presented on commercialization and working with AFRL at the Defense Manufacturer Assistance Program (DMAP) Council meeting in Columbus, OH. DMAP is a tri-state collaboration between economic developers at University of Michigan, Purdue University, and Ohio State University. There are several promising opportunities to partner either on specific projects or for larger programs. For example, University of Michigan is interested in opportunities to connect federal lab commercialization opportunities with the industry supply chain subject matter experts that they have recruited while performing work for NIST.

New Project Manager at WBI: Nikki Krebs joined Wright Brothers Institute as a Project Manager. She received her B.S. in chemical engineering from the University of Arkansas. After her seven-year career in technical sales for Ashland Chemical, she worked as Sr. Process Engineer for WestRock. She then transitioned into a role of capital driven project management where she coordinated and contributed to a two-year upgrade installation valued at over \$150MM. Before becoming a Corporate Project Manager for Kaiser Aluminum, she obtained a Project Management Professionals Certification. Nikki will now be working on projects for the Commercialization and Tech Transfer group at WBI.

WBI Supports Mile2 Commercialization of 711th HPW Fitness Training Technology: Jim Heitner met with Mile2, a local startup company, to advise them on an Ohio Third Frontier, Technology Validation and Startup Fund application due December 28th. Mile2 is applying for \$100,000 in grants to support development of a fitness training mobile application based on Adam Strang's (711th HPW) algorithms. Mile2 and the 711th HPW are already working together on a CRADA.

WBI Assisting AFRL/RX and UES in Commercialization of ARES Technology: Jim Heitner, Meghan Sheehan, Heidi Longaberger and Bob Lee met with members of UES, Inc. and RX to discuss commercialization of ARES (Autonomous Research and Experimentation System), which was created in a technical collaboration between UES and RX. WBI will spend the next couple of months assessing: 1) the legal "packaging" of the software assets to enable technology transfer to other entities; and 2) the market landscape for an autonomous experimentation system to guide the next steps in the commercialization process.

SBIR Companies Connected to Competition for \$50,000 Accelerator Awards: Jim Heitner met with representatives from AlphaLab Gear (www.alphalabgear.org), a national hardware technology accelerator based in Pittsburgh. AlphaLab is hosting a business pitch competition with \$50,000 available to winners. We shared the opportunity with SBIR companies and companies working with Dayton's Entrepreneur's Center (TEC) who may have interest.

Space Technology Commercialization Opportunities Identified: Jim Heitner attended a meeting with AFRL/SB and Allied Minds (www.alliedminds.com), a Boston-based IP commercialization company focused on technologies sourced from universities and federal laboratories. Allied Minds shared their investment targets and focused the conversation on opportunities in satellite communications and free space optical networking. AFRL/SB connected Allied Minds with the space technology-based accelerator (www.catalystaccelerator.space) that AFRL is a partner in. WBI circulated their wish list with local contacts working with SBIR companies and young companies that fit the investment profile.

International Technology Companies Engaged: Jim Heitner and Jim Masonbrink supported two separate meetings hosted at our WBI 2nd Street center with a focus on driving international technology based companies to the Dayton area. Both meetings were organized by the Dayton Development Coalition. OCO is a major economic developer from Germany (www.ocoglobal.com) that is looking at Dayton for investment opportunities. Two companies from Brazil are interested in offering professional services in commercializing technology in aerospace and partnering with Dayton companies. All three companies are very intrigued by the technology capabilities at AFRL, WPAFB and the Dayton area.

Commercialization of AFRL/RX and AFRL/RH Technologies Gets \$5M Boost. One of WBI's commercialization partners, SPGlobal, just completed successful fundraising for SaWyzé (\$2.5M) and GlobalFlyte (\$2.5M) – two commercial ventures featuring technologies from AFRL/RX (Stabilized Antibody Technology) and AFRL/RH (Multimodal Communications Technology). The investments will accelerate the transition of the AFRL technologies to commercial products.

WBI Commercialization Partner Announces \$10M Venture Fund for Tech Start-ups. SPGlobal also announced a new \$10M venture fund for Dayton-area technology companies. The fund will invest in start-up companies that

are ready to move from prototyping to going to market with viable products. This is huge for the region and AFRL as it will greatly accelerate the transition of AFRL technologies to commercial products. SPGlobal's commitment to the region did not happen overnight. WBI has partnered with them since 2014 on multiple start-up companies that integrate AFRL technology, including CoreSyte (AFRL/RH/RX Bio-Sensing Technology), GlobalFlyte (AFRL/RH Multimodal Communications Technology) and SaWyze (AFRL/RX Stabilized Antibody Technology).

WBI and AFRL Recognized at Dayton Catalyst Event. The Annual Dayton Catalyst event was hosted at Sinclair Community College by The Dayton Entrepreneurs Center (TEC) on December 8th. The event included a MedTech Opportunity Session where 8 medical and healthcare oriented ventures presented to investors. WBI supported development of the presentation format and recruiting of regional investors. The main Catalyst event featured 8 start-up company presentations mixed with "TED-like" talks on topics like Risk and Diversity. The event had more than 300 attendees. WBI and AFRL were prominently acknowledged for their roles in advancing start-up development in Dayton over the past 2 years through initiatives such as the WBI-SPGlobal Commercialization Partnership, WBI-TEC Technology Accelerator Program, AFRL Entrepreneurial Opportunities Program and the AFRL Summer of Innovation research program conducted at WBI 2nd Street downtown.

WBI to Team with Miami University Entrepreneurship Program. WBI and Miami University completed an agreement to team on advancement and commercialization of AFRL technologies. The Research Technology Commercialization Accelerator Program will match AFRL intellectual property with Miami entrepreneurship programming, research faculty, and alumni networks. We hope to advance 10 AFRL technologies towards commercialization over the next 18 months.

30 New Makers begin 3D Printer Build. This week 30 people began the 6 week 3D printer build at Maker Hub. Participants came from AFRL/EN/711 HPW/RQ/RX/RY, AFRL/EN, AFIT and NASIC. Capt Chris McGaw from NASIC agreed to lead the team build and has put together one system for AFRL/RH as a demo system for the participants to check their work against. WBI used the Maker Hub 3D printers to build the 32 sets of parts for these systems, ordered all the individual components, and fabricated the frames. Each participant is learning how to use the equipment and assemble their own system. Each person is registered into the AFRL/RX ICE Maker software and can use it to collaborate with other participants on upgrades and enhancements in the future. All the files for the 3D printed parts are now available on ICE Maker for each participant to download and print their own replacement parts. All of the participants were very excited to participate with one exclaiming “This is awesome. I am so glad that we get to learn how to do this”; and another stating “We would never have tried to do this ourselves without this kind of a team behind us”.

WBI Supports AFRL Supervisory Development. The AFRL Supervisory Acculturation Program is a sixteen-day leadership development program tailored specifically to AFRL. It is one of the significant outcomes of the WBI-led Workforce Development Initiative conducted in 2014. Mr. Chris Remillard of WBI led a four-hour session at Eglin AFB on the Contribution-based Compensation System (CCS) in which five WBI-developed detailed Meeting-of-Manager scenarios were explored with the 24 AFRL participants. The scenarios highlight many of the nuances of the CCS system along with the flexibilities available to AFRL supervisors.

Workforce Development Events Sponsored by AFRL/DP and 711 HPW/RH. 21 leaders from all TDs participated in intensive 3-day workshop at WBI 2nd Street to develop their Innovation, Leadership and Problem Solving skills. Sherry Gevedon, PhD with Professional Education Services, and Rob De La Espriella with DLA Technical Services, led the workshop and provided team building exercises, many inspiring videos, leadership talks, strategic planning analysis, and many other inspirational exercises. The workshop was sponsored by AFRL/DP with AFRL ELO support. 45 711HPW/RH employees attended a workforce development event at WBI Springfield Street that featured speakers on 8 topics – AFIT educational resources, Medical Civilian Advisory Council, Civilian Development Programs, Journey to and experience as an SES (Mr. Ricky Peters), Supervisor Workshop and Roadmap, and ended with BGen Mark Koeniger, HPW/CC speaking on ‘How Should the 711th Develop Exceptional Leaders.’

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200 AFRL Employees Receive Specialized Training. WBI hosted 13 Training Events for 200 AFRL participants at our Springfield Street Innovation and Collaboration Center. A broad spectrum of topics was covered including Aircraft Engine Systems Design by Practical Aero, Oxidation/Lifing Model by the Institute for Computational and Mathematical Engineering, and Appian Code Development Platform by Appian.

WBI SMALL BUSINESS SERVICES

¹ <https://www.bna.com/federal-contracts-report-p6016/>

WBI PROTOTYPING SERVICES

² data supplied during Navy/Air Force 2016 Wright Brothers Institute Hypoxia Workshop.

³ "Report to Congress: Out of Breath – Military Aircraft Oxygen Issues" United States Naval Institute, June 28, 2017 <https://news.usni.org/2017/06/28/report-congress-breath-military-aircraft-oxygen-issues>

⁴ "USAF Grounds T-6 Trainers After Hypoxia-Like Events" by Lara Seligman, November 29, 2017 Aviation Week Network <http://aviationweek.com/military-trainers-light-attack/usaf-grounds-t-6-trainers-after-hypoxia-events>

⁵ <http://www.businessinsider.com/price-military-aircraft-per-flight-hour-2016-8/#c-130j-2>

WBI INNOVATION SERVICES

⁶ "Why the Air Force Is Paying Big Bonuses To Some Pilots And Forcing Others Out" by Matthew Gjersten, January 6, 2015 <https://taskandpurpose.com/air-force-paying-big-bonuses-pilots-forcing-others/>

⁷ "Air Force Warns: We Could Run Out of Pilots" by Gordon Lubold, December 26, 2013 <http://foreignpolicy.com/2013/12/26/air-force-warns-we-could-run-out-of-pilots/>

⁸ "Virtual skies: Air Force hopes 'fun' tech transforms pilot learning" by Stephen Losey, January 16, 2018 <https://www.airforcetimes.com/news/your-air-force/2018/01/16/virtual-skies-air-force-hopes-fun-tech-transforms-pilot-learning/>

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⁹ <https://www.cbinsights.com/research-reports/The-20-Reasons-Startups-Fail.pdf>

WORKFORCE DEVELOPMENT

¹⁰ "Makerspaces Building a Hands-on Workforce Revolution" By Dusty Weis, Association of Equipment Manufacturers October 31, 2017

¹¹ Mark Hatch via Association of Equipment Manufacturers <https://www.aem.org/news/october-2017/makerspaces-building-a-hands-on-workforce-revolution/>