Department of Defense

Small Business Innovation Research

&

Small Business Technology Transfer Programs

Fiscal Year 2018 Annual Report Submission

on

Commercialization Readiness Program (CRP)

March 2019

1.0 Commercialization Readiness Program FY18 Report

The Commercialization Readiness Program (CRP) is part of the SBIR and STTR Reauthorization Act of 2012 (P. L. 112-81, Section 5001) which extends the program through September 30, 2017. The purpose of the Commercialization Readiness Program (CRP) is to accelerate the transition of SBIR and STTR funded technologies to Phase III, especially those that lead to programs of record and fielded systems. This can be done through activities that enhance the connectivity among SBIR and STTR firms, prime contractors, and DoD science & technology and acquisition communities. It can also be accomplished by improving a SBIR or STTR firm's capability to provide the identified technology to the Department, directly or as a subcontractor.

2.0 Air Force Commercialization Readiness Program (CRP)

2.1 Air Force CRP Accounting of Funds

SBIR FY17 Budget	FY17 CRP Budget (1% of Total SBIR Budget)	FY17 CRP Obligations Made in FY17	FY17 CRP Obligations Made in FY18
$356.34M	$3.56M	$3.56M	$0M
SBIR FY18 Budget	FY18 CRP Budget (1% of Total SBIR Budget)	FY18 CRP Obligations Made in FY18	FY18 CRP Commitments Planned in FY19
$ 580.2M	$ 5.80M	$ 3.03M	$2.77M

2.2 Air Force CRP Funding Narrative

Air Force (AF) FY17 SBIR/STTR CRP funds were obligated to continue the Small Business Innovation Research (SBIR) Transition Support Contract with Peerless Technologies Corporation ($3.0M). FY18 Air Force SBIR/STTR CRP funds were expended for Government personnel travel to support outreach, Air Force SBIR/STTR CRP meetings and other transition activities ($30.7K). The remainder of the FY18 funding will be obligated in FY19.

2.3 Air Force CRP Program Initiatives and Activities

The Air Force SBIR/STTR CRP provides a strategically driven process that directly links Air Force Centers to Air Force Research Laboratory (AFRL) Technical Points-of-Contact (TPOCs) to identify and evaluate Air Force needs and innovative solutions. Initiatives include boots on the ground SBIR Acquisition R&D Technology Analysts (TAs) supporting Air Force, DoD and Industry partners in the transition of SBIR/STTR technologies, outreach to industry, in-reach to AF PEOs to educate potential stakeholders on the SBIR and STTR programs and promoting successful technology transitions and small business successes.

Since its inception in 2006, the program has been improving technology transition outcomes by accelerating the transition of SBIR/STTR-developed technologies into real-world military and commercial applications. The Air Force SBIR/STTR CRP approach brings together key stakeholders utilizing SBIR Acquisition R&D Technology Analysts (TAs) on location at various Air Force bases to 1) help focus SBIR/STTR topics on high-priority technology needs, and 2) work with small businesses, System Program Offices (SPOs), SBIR/STTR Program Managers, Technical Points of Contact (TPOCs), and industry technology integrators to identify and document transition objectives, tasks, timing, responsibilities, and funding sources in non-binding Technology Transition Plans. The Air Force TAs are fully engaged supporting the Air Force Life Cycle Management Center (AFLCMC), Air Force Sustainment Center, Space and Missile Systems Center, Nuclear Weapons Center, and the Air Force Test Center. Air Force TAs also support the Joint Strike Fighter program as well as the nine technology directorates (TD) within the Air Force Research Laboratory (AFRL). The TAs work closely with these organizations to help implement the entire SBIR/STTR process, from topic generation to facilitating the transition of resulting technologies. This close working environment allows the TA to have a better understanding of the customer and their needs.

The Air Force SBIR/STTR CRP continues execution of it is one of a kind Air Force Small Business Industry Days (SBIDs). The Air Force SBIR/STTR CRP team leveraged their experience, continued to refine the process, and successfully executed another event co-hosted by the Air Force Sustainment Center. This event had 235 attendees from small businesses, MDCs, and multiple government organizations. Of the attendees, approximately 14% of the small business represented had never before worked with the Air Force. Also, at the Sustainment SBID, 11 small businesses were selected by the Air Force to brief their capabilities, as well as 27 exhibitors (22 small business and 5 government), and 16 educational briefings covering various Air Force and Small Business topics. In addition, 36 one-on-one meetings were conducted regarding upcoming BAAs and potential SBIR/STTR projects that could be transitioned into programs of record. A unique meeting with Navy and AF SBIR/STTR leadership was held to discuss potential collaborations between the programs. The success and support for these events is evident as they are tailored for each PEO/Center, in fact the Air Force Test Center has already requested that they co-host another SBID.

Since the 2018 Sustainment SBID had attendees from the Air Force as well as other DoD SBIR agencies and Major Defense Contractors (MDC), it was the perfect environment to hold a kickoff meeting for a new collaboration initiative between the Air Force and Navy to work together to solve the biggest sustainment challenges. In a three-hour brainstorming meeting, key Air Force and Navy stakeholders shared their significant sustainment needs, discussed technologies that might meet both Agency needs, and identified ways to join forces by pooling resources together to more rapidly transition technologies to meet critical needs. To date, 12 projects have been identified and are continuing to be evaluated as potential solutions to take advantage of this new initiative.

The Air Force SBIR/STTR CRP team also supports numerous outreach events to meet program goals, promote the Air Force SBIR/STTR CRP mission, provide assistance, and conduct one-on-one meetings with current and potential SBIR/STTR companies. In FY18, the AF SBIR/STTR

CRP team participated in the AF SBIR/STTR sponsored Operation Tech Warrior event. This 10-day, 24-hour immersion event was held at the National Center for Medical Readiness in Fairborn, OH from 18-28 September 2018 and provides small businesses with a unique opportunity to bring their various warfighting technologies for field testing in instructor-led operations and scenarios designed for military training. Small Business engineers are provided the opportunity to see how their technologies fit into the warfighter experience providing them with an understanding of end-user limitations and advantages, allowing for customization and improvements. Data collected and experiments with end-users can provide valuable information, improving technologies for use in the field, and allowing the small business to develop a marketable product. The Air Force SBIR/STTR CRP team also participated in over 12 national, regional, and local events, conducting nearly 131 one-on-one engagements with current and potential SBIR/STTR firms.

The Air Force SBIR/STTR CRP leveraged these various opportunities throughout the year to continue the development and marketing of program opportunities and successes through printed publications like the Annual Achievements book, Year-in-Review, and highly touted Phase III Desk Reference, as well as social media outlets like Facebook, Twitter, and video testimonials by small businesses and Air Force stakeholders. In FY18 the Air Force SBIR/STTR CRP team produced 31 videos promoting the goals of the program from Innovation to Transition and demonstrating economic impact as a result of participation in the SBIR/STTR program. In addition, in order to ensure program successes are regularly and consistently being captured, we initiated a SharePoint Phase III portal for internal Air Force stakeholder reporting and a small business success story submission page on the Air Force SBIR/STTR homepage.

The Air Force SBIR/STTR CRP continues to see the benefit of building relationships with Major Defense Contractors and utilizing tailored and unique technology meetings hosted at MDC facilities, to bring together key MDC technologists to assess small business partnerships and capabilities to be integrated into defense solutions, assisting small businesses with visibility into new markets, and increasing return on investment opportunities for the Air Force. In FY18, Air Force SBIR/STTR CRP Technology Interchange Meetings (TIMs) were conducted with 5 MDCs, Northrop Grumman, The Boeing Company, Harris Corporation, Raytheon SAS, and Rolls Royce, which allowed for active engagement between 47 SBIR/STTR companies and these MDC partners. Through these events, the Air Force SBIR/STTR CRP team facilitated over 46 one-on-ones, targeting over 67 different SBIR/STTR projects. **3.2.3 Air Force CRP 2017**

2.4 Achievements and Results

This year, 83 projects were approved for Air Force SBIR/STTR CRP (i.e. funded) - see Appendix A. Since inception of the pilot, 849 projects have been initiated and of those 468 have been approved for AF SBIR/STTR CRP funding. The total Air Force SBIR/STTR CRP funding put on projects since inception of pilot is $415.9M and the total non-SBIR/STTR funding on Air Force SBIR/STTR CRP projects since inception is $1,524.9M. Air Force SBIR/STTR CRP funding includes all Phase II+ funds added to Air Force SBIR/STTR CRP approved projects. Non-SBIR/STTR funding sources include industry's Independent Research and Development (IR&D), SBIR/STTR firm investment, Air Force Programs of Record, AFRL core budget, DoD transition funds, and state small business funds.

Since the inception of the program, 172 Air Force SBIR/STTR CRP projects have been considered transition successes and are providing significant benefit to the nation's warfighters in improved performance, new capabilities, increased reliability, and cost savings well exceeding the investment. Each project meets the technology needs of at least one Air Force system with total cost savings estimated at over $1B. 143 projects have been reported as successes in the Annual Reports through FY17 and these continued to mature and yield benefits. During FY18, the following 29 were identified as successes using the DoD SBIR/STTR transition definition - *For purposes of SBIR and STTR, Technology transition is any process that results in the use of a SBIR/STTR funded technology in a DOD program, platform, system, product, or service. For reporting purposes, technology transition includes: direct sale of SBIR/STTR technologies to the Federal Government or commercial entities supporting DOD and Phase III awards.* Each transition success and its benefits are briefly described here:

STTP 2007-03, ODIS, Inc., A Novel Long-wavelength Infrared (LWIR/UV) Sensor with Integrated Detector Multiplexing, AF05-029. Multi-access capability for laser communication while providing use across multiple communication satellite platforms. This system enables classified military and federal platforms the ability to increase miniaturization, allowing for decreased power requirements, reduced circuit design complexity, and saved circuit space.

STTP 2008-62, CAP Wireless, Inc., Efficient High Frequency Electromagnetic Source for Communication Devices, AF04-218. Provides more reliable power supplies and amplifiers for Band 6 and 7 of the AN/ALQ-161A Defensive Avionics Subsystem. With this innovation, the AF is able to reduce operating costs and provide longer service/fewer repairs to the system. The technology is also available for federal and commercial use.

STTP 2009-30, ODIS, Inc., Monolithic Infrared Pixel Structures Enabled by Thyristor-HFET EO Logic, AF083-207. Using a new wafer manufacturing process, both optical and electrical devices are being integrated on the same wafer, while still providing the required isolation specifications of each device. This allows multiple access capability for laser communication across several communication satellite platforms, increased miniaturization, reduction in power requirements, and decreased circuit design complexity.

STTP 2009-31, Nokomis, Inc., Remote-Controlled IED Detection Identification & Classification Algorithms (RADICAL), AF071-219. Provides the capability to detect, identify, and geo-locate IED threats, thus reducing the threat to warfighters significantly by making the use of electronics a severe liability for the adversary. This technology is integrated into the Hiawatha I and Hiawatha II, both currently commercially available to the federal and commercial communities.

STTP 2012-21, Pointwise, Inc., Integrated Overset Meshing and Grid Assembly Capability, AF083-259. This effort matured the integrated overset meshing and grid assembly software tool through the addition of component body management tools designed for complex configuration analysis. This tool enables Modeling and Simulation (M&S) engineers to quickly

and efficiently setup the simulations and greatly improves the productivity of M&S engineers overall.

STTP 2013-22, Vulcan Wireless, Modular Cubesats and Component, AF093-088. Provides low-power software defined radios for small spacecrafts. The Modular Cubesats and Component technology has been integrated into a launch vehicle designated by Space Test Program (SMC/AD), into the Swedish Government via AAC Microtec's Hyperion SSA Camera, power supplies, and software monitors, and is also commercially available.

STTP 2014-23, DragoonITCN, Bus Characterization and Integrity Toolset (BCIT) enhancement to add Digital Video Interface (DVI) cable testing capabilities, AF03-094. Expands capability of current BCIT test tool to encompass DVI cable characterization specifically tailored to the B-1B Integrated Battle Station (IBS) requirements. The technology miniaturizes the network analyzer functionality and provides a reliable test tool that can be employed in almost any platform, cockpit, lab, or shelter. This new capability fully characterizes connectorized cable sets and the cost savings realized by implementing a cable set that is free of defects is significant.

STTP 2014-25, Busek Co., Inc., Compact Low Mass Propulsion for Responsive Space, AF093-070. Allows high magnitude change in velocity primary propulsion for volume constrained spacecrafts and improves SmallSats maneuverability, to include both responsive orbit transfer and de-orbit compliance. Technology has also resulted in a significant reduction in the power processing unit (PPU) mass and volume when compared to other state-of-the-art PPUs.

STTP 2014-26, CFD Research Corporation (CFD), Multi-Fueled Enzymatic Fuel Cell, AF121-131. A low-signature, high-energy density, battery recharging system which uses a unique enzymatic fuel cell that can be instantly powered by diverse and readily available fuel sources. This system significantly reduces the number of batteries needed and provides flexibility by bringing battery charging to the individual soldiers. This technology has been integrated into new applications such as Miniaturized Biological Fuel Cell on a Beetle and has gotten the attention of Army Special Operations.

STTP 2014-35, Energy Quest Technologies, Inc., Energy Efficient Mobile Air Conditioner, AF112-219. This technology provides an effective supply of power and air conditioning, but is also being considered by other potential users for the dehumidification capability for mitigating corrosion caused failures in airframes and avionics failures, which are accelerated by aircraft washes and operations in humid climates. New air and power system which improves efficiency and reduces fuel consumption by 66%.

STTP 2014-44, Opto-Knowledge Systems, Inc. (OKSI), Quantum Cascade Laser for Gas Diagnostics, AF073-134. Enables improved combustion and flow-field diagnostic capabilities for AF Test Center applications, to include providing relevant information for the development and qualification of next-generation aircraft, missiles, and rockets.

STTP 2014-48, Clear Science Corp, Virtual Flight Testing with DoD CREATE-AV Software, AF073-142. This software builds accurate models allowing analysts to determine areas of concern and focus flight test resources accordingly. Facilitates better analyses of military aircrafts, higher performance, more reliable Modeling and Simulation (M&S) operations, and reduced program costs through shortened T&E cycles. This technology is being implemented into the DoD High Performance Computing Modernization Program (HPCMP) CREATE-AV.

STTP 2014-53, MMA Design, LLC, Multi-functional Membrane De-Orbit Module and Deployable High Gain Reflectarray (DaHGR), AF083-198. Incorporates an additional structure and Radio Frequency (RF) capabilities into the heritage deployment system which also function as a dragnet De-orbit System. This technology enables missions to be executed on smaller satellites and launched in small launch vehicles, supports higher frequencies without significant increase in labor, utilizes 33% of the number of parts needed in previous systems, and decreases costs to the AF by 50%. The DaHGR system is commercially available for federal and commercial use.

STTP 2014-55, Space Micro, Inc., Modular, Advanced Rad Hard Avionics for Integrated Vehicle Fluids (IVF) Enhanced Launch Vehicles, AF081-094. Modular, advanced rad hard avionics used for launch vehicles to enable avionics for the development of IVF and supply an IVF Controller. IVF is a fully block redundant system without high pressures or toxic materials, functions for maximized redundancies, incorporates an active temperature stabilization for the controller and integral battery, eliminates the principle causes of electronic hardware and battery failure, and has a lower cost. The technology has transitioned to TACSAT 2, ORS-1, NASA MISSE-X, classified operations, payload sequencers, and other uses within the commercial space.

STMP 2014-AA, Matsys, Inc., Novel Hybrid Structural Reactive Composites, AF112-108. Consolidated metal reactive materials with mechanical properties comparable to inert materials. Provides additional capability for enhanced blast and impulse for warhead development and induces selectable effects in support of Guided Bomb by adding reactive materials for the secondary blast to increase pressure.

STMP 2014-AE, L-3 Mustang Technology, L.P., Affordable High Performance Millimeter Wave (MMW) Seeker Technology, AF083-093. A mature automatic target acquisition approach that allows the AF Guided Smart Seeker to enter into closed loop tracking without a human in the loop, intelligent target clustering giving the seeker more robust target tracking and false alert rejection and provides a more affordable and higher performance solution.

STMP 2014-AG, Intrinsix, Readout Integrated Circuit (ROIC) Technology for Strained Layer Superlattice Photodetectors, AF093-160. New ROIC technology with a system-ready design, higher performance, reduced power requirement, and is highly configurable depending on the needs of the application.

STTP 2015-14, Mainstream Engineering Corporation, Transportable, Pyrolytic Waste-to-Fuel (WTF) Converter, OSD12-EP2. Transportable WFC for the conversion of waste biomass to renewable fuel oil for heat and power applications. This technology eliminates waste, generates on-site renewable energy at installations, minimizes fuel convoys to expeditionary bases, and improves soldier safety and operational effectiveness by simplifying waste management logistics, and helping mitigate the risk of power outages.

STTP 2015-28, Valley Tech Systems, Inc., Affordable Solid Propellant Post Boost Propulsion System (PBPS) for a Future Intercontinental Ballistic Missile (ICBM) Weapon System, AF141-086. The new PBPS technology provides the AF with a non-toxic solid propellant alternative to liquid propulsion systems, improved affordability, accurate targeting performance and technology commonality with Navy technologies, and delivers affordable, long duration storage and a modularized PBPS for the future Ground Based Strategic Deterrent (GBSD) flight system.

STTP 2015-30, Active Signal Technologies, Inc., High Power Density Transducer for Frequency Agile Extended Range Pyrophoric Flow Control Valve (ERPV), N97T-003. New wide flow range enabled by the ERPV improves temporal infrared (IR) target acquisition of enemy missiles by enhancing the capability of the AF Towed Airborne Plume Simulator (TAPS). Improved control at lower flow rates translates to the ability to station TAPS closer to the aircraft under test while still providing the correct irradiance signature, and the time reduction allows for more TAPS simulations to be performed during a single sortie and greatly increasing test tempo and efficiency. This technology is used operationally with Allied Forces, but is currently a classified effort.

STTP 2015-33, nGimat, Manufacturing Scale-up of High-purity Optical Ceramics, OSD04-L01. High-quality optical ceramic nanopowder materials for laser weapon systems and transparent missile domes for use by the Air Force and in other defense applications. New technology is of higher quality, has improved performance, and is being used in state-of-the-art weapons and missile defense systems with higher power outputs at lower costs.

STTP 2015-63, Securboration, Inc., Annotated Semantic Engine for Information Retrieval (AnSER), AF13-AT14. Dynamic search engine that significantly enhances AF and Defense Technical Information Center (DTIC) users ability to discover, analyze, and retrieve highly relevant scientific and technical materials from DTIC's vast S&T information collections while also significantly reducing the omission of relevant research information due to terminology differences.

STMP 2015-BG, Ascendant Engineering Solutions, LLC, Miniature Stabilized Gimbal Laser Pointing System (MSGLPS), AF141-130. Technology enables hand-launched Unmanned Aerial Systems (UAS) to have precision laser targeting capability and confirmation of laser spot on target. This provides an enhanced Find, Fix, Finish, Exploit, Analyze and Disseminate (F3EAD) capability when only small hand-launched UAS assets are available, effectively increasing battle space awareness and improving pursuit and denial capability for the warfighter.

STMP 2015-J, Performance Polymer Solutions, Inc., Fabrication and Process Optimization of Thick Laminates from Carbon FiberPolyimide Composites, AF121-115. High-temperature polymer matrix composites that can be used as a replacement for titanium. These advanced materials trim the weight of some parts and systems in aircrafts by as much as 40%, resulting in annual fuel savings of hundreds of dollars per kilogram of titanium replaced, while also offering increased service life and improved fatigue resistance.

STMP 2015-W, First RF Corporation, High-Speed Weapon Radomes, AF121-092. Seeker antenna for the High-Speed Strike Weapon (HSSW) Boost Glide flight profile can endure harsh environmental factors and meet electrical requirements, with improved performance and greater reliability.

STTP 2016-09, LSP Technologies, Inc., Laser Bond Inspection (LBI) for Composite Aircraft, AF071-126. Used in the inspection of thick multilayer composite structures, bonded structures with non-parallel surfaces, and the accessibility of inspection of mixed material joints. Provides new capability to implement LBI in Original Equipment Manufacturer (OEM) facility, the elimination of recurring structural proof-load tests, a manufacturing cost reduction for composite aircrafts, and an increase in manufacturing robustness, reliability, and inspection capability.

STTP 2016-10, ROCCOR, LLC, Deployable Structural Booms for Small Satellite (SmallSat) Antennas, NASA12-1 S2.02-8990. Low-cost, compact, high-precision deployable boom provides the capability to access "Wi-Fi" data rates for tactical communications using SmallSat platforms. ROCCOR's deployable boom supports other key Air Force Service Core Function (AFSCF) initiatives under the Space and Nuclear Deterrence technologies and is commercially available.

STTP 2016-17, Defense Research Associates, Inc., Missile Warning Technology Maturation, AF071-213. Advanced missile warning sensors (MWS) provide enhanced detection and identification of targets at long standoff ranges and help protect valuable airborne assets against a variety of air threats. With this new technology, unit costs have drastically reduced by using low-cost optical sensors with high resolution detector arrays, performance of angular accuracy has improved, and there is greater reliability.

STTP 2017-21, Voss Scientific, LLC, Simulation Software for Strongly Coupled Plasma, AF11-BT23. Next generation plasma physics modeling tools allow engineers to design robust commercial systems operating in extraordinary temperature, density, and charge-state environments supporting spacecraft and nuclear fusion programs. Technology allows for more robust spacecraft component designs and the ability to analyze a vast array of experimental devices, representing a significant savings compared to a build-test-redesign iterative process.

Small Business Innovation Research Commercialization Readiness Program
FY18 Air Force Companies Approved for CRP

STTP/ STMP[1]	Company Name	Project Title	Contract #	Topic #	Investor, Customer, or Fielded System[2]
STTP 2016-31	UES, Inc.	Non-Silicon and Non-Boron based Leading Edges for Hypersonic	HQ0006-07-C-7663	AF141-001	MDA
STTP 2016-33	The Design Knowledge Company, Inc.	Aircraft Ramp Realocation and Visualization with Unanticipated Events (ARRVUE)	FA8501-15-C-0010	AF131-204	AFMC
STTP 2017-06	(ES3) Engineering & Software System Solutions, Inc.	Demonstration and Validation of Cadmium and Chrome VI Elimination Technologies for Aircraft Components Using Multiple Advanced Coatings and Auxiliary Processes	FA8501-13-C-0019	AF081-101	AFMC
STTP 2017-09	Trident Systems, Inc.	Cross-Domain Full Motion Video (CDFMV)	FA8750-18-C-0085	AF05-093	NORAD
STTP 2017-11	Systems & Technology Research, LLC	Multi-Stage Multiple Hypothesis Tracker (MS-MHT) for Real Sensor Data	FA8650-18-C-1646	AF131-131	NASIC
STTP 2017-12	Optical Sciences Corporation	Dynamic Optical Coupler for HWIL Simulations	FA9101-11-C-0002	AF083-255	AFMC
STTP 2017-13	CFD Research Corporation	Laser Ignition for Large Scale Combustion Air Heaters	FA9101-16-C-0001	AF141-230	AFMC
EXTS 2017-14	Surface Optics Corp	MWIR Seeker-Sensor for Strap Down Weapons Application	FA8651-16-C-0173	AF141-139	AFLCMC/XZW
STTP 2017-15	Spectral Energies, Inc.	Short-Pulse, High-Speed Laser Platform for Temperature Measurements and Chemical Species Imaging at 100 kHz for Combustor/Augmenter Stability	FA9101-09-C-0031	AF073-134	AFMC

STTP 2017-17	Kitware, Inc.	Kitware Image and Video Retrieval (KWIVER) Large Volume Motion Imagery (LVMI) Analytics	FA8650-18-C-1647	AF131-151	NGA
EXTS 2017-18	Science & Technology Associates (STA)	Lowest Lifecycle Cost (LLC) Propulsion System	FA9300-15-C-2003	AF141-088	SMC
STTP 2017-18A	Creare, Inc.	Passive Optical Sensor for Real Engine Diagnostics	FA9101-12-C-0008	AF103-219	AFMC
STTP 2017-19	SI2 Technologies, Inc.	Direct Write Printed Resistive Films	FA9550-12-C-0083	OSD10-T005	ACC
ENHS 2017-21	Engineering and Software System Solutions, Inc.	Dimensional Restoration of Aircraft Components Damaged by Corrosion	FA8117-15-C-0006	AF131-190	AFSC
STTP 2017-21	Voss Scientific, LLC	Electromagnetic Simulation Software for Strongly Coupled Plasmas	FA9550-14-C-0043	AF11-BT23	AFRL
ENHS 2017-22	SciTec, Inc.	Advanced Algorithms for Next Generation Wide Field-of-View (WFOV) Electro-Optic Infrared (EO/IR) Staring Sensor Exploitation	FA9453-13-C-0044	AF112-077	SMC
STTP 2017-22	Charles River Analytics, Inc.	Adaptive Defense using Linguistic Inference of Behaviors (AD-LIB)	FA8650-14-C-1704	OSD11-IA2	SAF/AAZ
ENHS 2017-23	Milanowski and Associates, Inc. (M&A)	EDA for Strategic Radiation Hardened Precision Analog IC Obsolescence Mitigation	FA9453-15-C-0411	AF131-057	AFRL
STTP 2017-23	Galois, Inc.	Adversarial Detection, Inference, and Defensive Response (ADIDRUS)	FA8650-14-C-1703	OSD11-IA2	SAF/AAZ
STTP 2017-24	(ES3) Engineering & Software System	Dipsol of America IZ-C17 + LHE Zn-Ni and SIFCO Performance Characteristic Testing	FA8222-11-C-0007	AF071-320	AFMC

	Solutions, Inc.				
ENHS 2017-25	IJK Controls LLC	Laser for Airborne Communications (LAC)	FA8750-15-C-0165	AF141-037	AFLCMC
STTP 2017-25	LoadPath, LLC	Thermal Control for Operationally Responsive Space (ORS) Satellites	FA9453-18-C-0239	AF103-107	RV/ORS
EXTS 2017-26	Creare, LLC	A Novel Smart Installation System for Airframe Production	FA8650-15-C-5084	AF141-166	AFRL/RX
ENHS 2017-26	Physical Sciences, Inc.	Ceramic Technologies for Shape Stable Hypersonic Monocoque Aeroshells	FA8650-16-C-5016	AF151-192	AFRL
ENHS 2017-27	Polymer Plus	Fabrication of aberration-free gradient index nonlinear optical materials	FA8650-15-C-5071	AF141-163	AFLCMC
ENHS 2017-28	PC Krause and Associates, Inc.	Modular Motor Drive With Programming and Configuration Tools For The Development Of Small Aircraft Electric Power and Propulsion Systems	FA8650-16-C-2729	AF151-070	AFRL
ENHS 2017-29	M4 Engineering Inc.	Evaluation of Unsteady Loading on Store Trajectories	FA8650-14-C-2527	AF131-003	AFRL
ENHS 2017-30	The Design Knowledge Company, Inc.	Design and Implement Airfield Weapon System Module for ARViSS Data System	FA8501-14-C-0009	AF071-040	AFSC
ENHS 2017-31	ADA Technologies, Inc.	F-35 Lithium-Ion Battery Thermal Failure Protection	FA8650-15-C-2554	AF141-071	JSF
ENHS 2017-32	VEXTEC Corporation	Improved Small Flaw Fracture Mechanics (SFFM) Analysis for Aircraft Structures	FA8650-15-C-2569	AF141-075	JSF
ENHS 2017-33	Grier Forensics	SilentWeb for OSINT	FA8750-16-C-0262	AF141-058	AFRL

ENHS 2017-34	Physical Sciences, Inc.	High Performance, Nonflammable IL Electrolyte	FA8650-15-C-2553	AF141-070	JSF
EXTS 2017-36	Boulder Non-Linear Systems	Non-mechanical beam control for synthetic aperture LADAR	FA8650-16-C-1750	AF151-143	AFLCMC
EXTS 2017-37	RJ Lee Group, Inc.	An Engineering Notes Collection Capability Using a Semantic Web Technology for Materials Design and Development	FA9101-17-C-0006	OSD13-C02	AEDC
EXTS 2017-38	METSS, Inc.	Substitute for Methylene Chloride in Depaint Operations at Hill AFB	FA8222-15-C-0002	AF131-198	SCMG
STTP 2018-001	Frontier Technology, Inc.	Base Resiliency Assessment Tool (BRAT)	FA8650-06-C-6636	AF05-070	AFMC
STTP 2018-002	Creare, LLC	Integrated, Laser-Assisted Consolidation (ILACS™) for Future Air Force Programs	FA8650-14-C-5210	AF083C-068	AFMC
STTP 2018-003	The Design Knowledge Company, Inc.	Air, Space and Cyber User-Definable Operational Picture/ Common Operational Picture (ASC&UC)-- Common Operating Picture for Event Response Situation Awareness (COPERS)	FA8650-18-C-1147	AF093-025	SAD/AZZ
ENHS 2018-004	Trident Systems, Inc.	Multi-Level Voice Over IP (VOIP) Security	FA8750-16-C-0064	OSD06-IA4	AFRL
ENHS 2018-005	Knowledge Based Systems, Inc.	Avionics Systems Susceptibility and Risk Analysis Toolkit (ASSURANT)	FA8650-16-C-1749	AF151-142	AFLCMC/WWB
ENHS 2018-009	Plasma TEC, Inc.	Non-Intrusive, Seedless Global Velocimetry for Large-Scale Hypersonic Wind Tunnels	FA9101-16-C-0023	AF141-229	AEDC Tunnel 9
ENHS 2018-010	Spectral Energies, LLC	Novel Laser-Based Diagnostics and 3D Numerical Modeling	FA8650-12-C-2236	AF103-200	AFRL/RQ

		for Quantitative Characterization of Burning Phenomenon			
ENHS 2018-014	Reaction Systems, LLC	An Advanced Endothermic Fuel System for Hypersonic Propulsion	FA8650-14-C-2526	AF131-171	AFRL
STTP 2018-015	Etegent Technologies, LLC	Improving NLign Data Capture Process	FA8100-17-C-0010	AF151-162	AFMC
STTP 2018-016A	Mitek Analytics, LLC	Reliability Digital Twin (RDT)	FA8222-16-C-0001	AF141-206	AFMC
STTP 2018-020	Figure Engineering	Advanced Continuous-Time Adaptive Ventilation (ACTAV)	FA8222-15-C-0003	AF131-197	AFMC
EXTS 2018-021	NextGen Aeronautics	TWINES adaption to Omega Pressure transducer	FA9550-16-C-0019	AF14-AT01	AFTC
STTP 2018-022	SciTec, Inc.	Weapons Typing Assessment via Spectrally Diverse sensors and Air Sample	HQ0006-07-C-7660	MDA06-T010	AFTC
STTP 2018-023	GasTOPs	Re-evaluation of Oil Analysis Program	FA8117-14-C-0018	AF121-212	AFLCMC
ENHS 2018-025	Anyar, Inc.	Data Analysis and Mining for Penetration Environment Dynamics (DAMPED)	FA8651-16-C-0176	AF141-143	AFRL
STTP 2018-031	Integra Technologies, Inc.	High Efficiency Solid State Power Module for Early Warning Radar	NNX14CP07C	S1.02	AFLCMC/HBQ
ENHS 2018-032	Oewaves, Inc.	Spectrally Pure Stable Ruggedized Master Oscillator for Airborne Coherent Ladar	FA8650-16-C-1759	AF151-152	AFRL
STTP 2018-033	Florida Turbine Technologies (FTT)	Air Riding Thrust Balance System for Reliable Highly Efficient Small Turbine Engines	FA8650-18-C-2825	DoE Topic 18b	AFLCMC
STTP 2018-034	Frontier Technology, Inc.	Testing Methodologies for Large Format Imaging Sensors	FA9453-11-C-0185	AF093-090	AFMC

STTP 2018-035	Physical Optics Corporation	F-35 Display Improvement	FA8650-16-C-6716	AF151-020	USSOCOM
ENHS 2018-036	Valley Tech Systems, Inc.	Affordable Solid Post Boost (ASPB)	FA9300-16-C-2002	AF141-086	AFNWC
ENHS 2018-038	Physical Sciences, Inc.	Ultra-Bright Single Photon Source Based on Cavity-Coupled Diamond Color Center	FA9451-16-C-0403	AF141-009	SMC
ENHS 2018-039	AdvR, Inc.	High Fidelity Heralded on Demand Single Photon Source	FA9451-16-C-0402	AF141-009	SMC
STTP 2018-042	Generation Orbit Launch Services, Inc.	Flight Testing of an Air Launch Testbed for Endoatmospheric Hypersonic Trajectories	FA8650-17-C-2414	AF141-081	AFMC
ENHS 2018-043	CFD Research Corporation	Ram Spurt Modeling	FA2487-16-C-0327	AF141-224	AEDC
ENHS 2018-044	(ES3) Engineering & Software System Solutions, Inc.	Thermal Spray Dashboard	FA8100-17-C-0005	AF151-166	AFSC
ENHS 2018-045	AURA Technologies LLC	Multi-material Additive Manufacturing for Advanced Space Systems	FA9453-18-C-0218	AF161-093	AFRL
STTP 2018-047	Luna Innovations, Inc.	Advanced Coating Evaluation Metrics (ACEM)	FA8650-17-C-5057	AF161-113	AFMC
STTP 2018-048	Physical Sciences, Inc.	Spectral Path Atmospheric Transmittance System (SPATS) for the Joint Standard Instrumentation System (JSIS)	DE-FG02-06ER84427	DE-FG01-05ER05-28 Topic 9	AEDC
ENHS 2018-049	Spectral Energies, LLC	Burst-mode-laser-based sensor suite for high-speed 2D fuel-air ratio and heat-release rate measurement for combustor/augmenter instability	FA8650-16-C-2725	AF151-063	JSF

ENHS 2018-050	Space Information Laboratories, LLC	Advanced Electrochemical Power Sources and Lithium-Ion Batteries for Space-Launch Vehicles	FA8650-16-C-2727	AF151-067	SMC
ENHS 2018-051	EDAptive Computing, Inc.	Development and Verification Tools/Processes for ASICs and FPGAs	FA9453-15-C-0448	AF141-093	AFRL
STTP 2018-053A	Innoveering, LLC	High Pressure Delta-P Sensor	70NANB17H233	NIST 9.01.05	AEDC
ENHS 2018-056	SPIRITECH Advanced Products, Inc.	Structurally Embedded Heat Exchanger	FA8650-18-C-2030	AF161-072	JSF
ENHS 2018-057	Mainstream Engineering Corporation	Fast Pyrolytic Solid Waste Remediation for Small Contingency Base Camps	FA9302-16-C-0003	OSD12-EP2	AFTC
ENHS 2018-059	Physical Sciences, Inc.	Compact Efficient Emitter System for the Towed Optical Plume Simulator (TOPS)	FA9101-16-C-0030	A09-004	AEDC
ENHS 2018-061	Applied Signals Intelligence	Small Unmanned Aerial System (SUAS) HFVHFUHF Radio Frequency Direction Finding	FA8650-18-C-1177	N142-114	AFRL
STTP 2018-062A	Engineering Research and Analysis Co.	Integrated Predictive and Analysis Computational Technology (IPACT) for Screech Instability Elimination	FA8650-09-C-2916	AF073-055	AEDC
STTP 2018-063A	Global Neighbor, Inc.	Directed Energy Floral Disruptor	FA9302-14-C-0008	AF121-207	AFCEC
STTP 2018-064A	Conductive Composites	Lightweight Structural Materials for Broadband Electromagnetic Hardening	FA8650-17-C-5262	AF121-111	Classified
STTP 2018-065A	Aerodyne Research, Inc.	Field-Deployable nvPM Mass Calibration System	NNX15CL18C	S1.07 - 9074	AFTC
STTP 2018-066A	Advanced Fuel	Benchtop Instrument for Measuring High	F40600-09-C-0022	AF88-022	AFTC

	Research, Inc.	Temperature Surface Emissivity			
ENHS 2018-068	Figure Engineering	Automated Analysis and Control for Inorganic Stripping Processes	FA8100-17-C-0016	AF151-168	AFSC
ENHS 2018-070	Imaginistics	AMAS	FA8100-16-C-0008	AF141-213	AFSC
ENHS 2018-072	Plasma TEC, Inc.	Non-Intrusive, Seedless Global Velocimetry for Large-Scale Hypersonic Wind Tunnels	FA9101-16-C-0023	AF141-229	AFTC
ENHS 2018-075	ReliaCoat Technologies, LLC	Thermal Spray Material and Process Specification Optimization	FA8100-16-C-0014	AF141-208	AFSC
STTP 2018-079A	Spectral Sciences, Inc.	Fusion Engine for Atmospheric Data (FEAD) for the Joint Standard Instrumentation System (JSIS)	W9113M-09-C-0186	MDA07-017	AFTC
ENHS 2018-083	Energy Quest Technologies, Inc.	High Efficiency Flight Line Cooling and Power System	FA8501-17-C-0018	AF112-219	AFSC

Notes: [1] Order listed is in numerical order by STTP/STMP Number and does not convey any prioritization of CRP projects.
[2] Additional information about Investor, Customer, or Fielded System is available on request.

3.0 Army Commercialization Readiness Program (CRP)

3.1 Army CRP Accounting of Funds

SBIR FY17 Budget	FY17 CRP Budget (1% of Total SBIR Budget)	FY17 CRP Obligations Made in FY17	FY17 CRP Obligations Made in FY18
$202,182,126.54	$2,021,182.13	$87,045.00	$102,729.00
SBIR FY18 Budget	FY18 CRP Budget (1% of Total SBIR Budget)	FY18 CRP Obligations Made in FY18	FY18 CRP Commitments Planned in FY19
$248,451,983.37	$2,484,519.83	$96,913.00	$119,821.00

3.2 Army CRP Funding Narrative

Under the Army's CRP approach, technical points of contact for all Phase II efforts are encouraged to work with relevant PEOs and the small businesses to identify opportunities where a promising technology has a strong transition potential if technical barriers to PEO adoption are met. Examples of such barriers are need for higher technical maturity, need for additional test articles, and minor specification changes to prototypes to meet PEO designs. These opportunities are vetted by the sponsoring organization and PM SBIR and must include: Technical Director concurrence, tangible investment from the transitioning PEO or other transition partner(s), Statement of Work and Cost Proposal. These requirements ensure that there is real transition opportunity, all stakeholders are in agreement with the approach and investments, and the opportunity can be addressed in a timely manner.

3.3 Army CRP Program Initiatives and Activities

At the conclusion of the Army's CPP support contract, it was decided to combine CRP support into the overall SBIR support contract. Administration of CRP has been managed within the provisions of the SBIR support contract effort since 2013.

3.4 Army CRP 2017 Achievements and Results

In FY18, 17 companies were provided additional funding to address the technical barriers slowing adoption of their technologies by acquisition programs. They were provided a total of $7.9M above the approximately $18.7M provided under Phase I and Phase II funding for these efforts. An additional $5.5M was provided from outside (i.e., non-SBIR) sources as initial investments in these CRP efforts. Since the initiation of the Army CRP approach, 115 companies have been

provided additional funding. Overall the Army SBIR has provided $77.6M toward CRP efforts with an additional outside investment of $62.1M. While too early to provide specifics of success, Army SBIR expects at least a 5:1 return on investment (~$250M) within the next five years.

Appendix A: Army
Small Business Innovation Research Commercialization Pilot Program

FY 2018 Companies Approved for CRP

Company Name[1]	Project Title	Contract #	Topic #	PEO	Investor, Customer, or Fielded System[2]
Arcarithms Inc.	Innovative Situational Awareness and Decision Making Algorithms on Open Architecture System-on-Module	W15QKN-16-C-0028	A14-081	ARDEC	Lockheed Martin
Arete Associates	Bio-Inspired Battlefield Environmental Situation Awareness	W911SR-17-C-0053	A08-056	ECBC	JPEO CBRND
Carbon Solutions, Inc. (CSI)	All-solid-state Battery-Ultracapacitor Hybrid Devices Based on Nanostructured Materials	W31P4Q-15-C-0005	A13-008	AMRDEC(M)	
Innovative Defense Technologies	Automated Assessment Technology for CMDS and IAMD	W9113M-17-C-0023	N07-137	PEO Missiles & Space	IAMD
Mesh, Inc.	Distributed Thermal Imaging Spectrometer for Force Protection	W911SR-16-C-0028	CBD09-108	ECBC	JPEO CBRND
Nalas Engineering	Environmentally Friendly Alternative Synthesis and Process to Manufacture Cost-Effective Hexanitrohexaazaisowurtzitane (CL-20)	N00174-15-C-0023	N141-017	ARDEC	JIMTP
Newport Sensors	Flexible, high-frequency, high-durability, and multifunctional sensor film	W911QX-16-C-0002	A14-017	ARL	Gentex/TenCate
Nu-Trek	Digital Readout Integrated Circuit for Infrared Focal Plane Array	W909MY-15-C-0032	A14-037	CERDEC	

Pacific Advanced Technology	Wide area standoff hyperspectral-imaging sensor for chemical and biological early warning	W911SR-16-C-0033	A11-101	JPEO CBRND	SOCOM
Phase Sensitive Innovations	Dense Arrays for High-Fidelity, Optically-Sampled Passive Millimeter-wave Imaging	W911SR-17-C-0022	A13-040	JPEO CBRND	DTRA JIEDDO
Precision Combustion	Sulfur Tolerant JP-8 Reformer	W56HZV-16-C-0055	A14-076	TARDEC	OECIF
Quantum Signal, LLC.	VSS+: A Next-Generation Predictive Vehicle Stability System	W56HZV-14-C-0052	A12-073	TARDEC	ERDC
Sciperio	Printed Low Voltage Munition Ignition Bridge	W15QKN-15-C-0113	A14-059	PEO AMMO	ARDEC
SDPhotonics	Tactical Engagement Simulation System (TESS) Improved Laser Encoding and Decoding	W900KK-15-C-0014	A13-057	PEO STRI	PDM LTS
Shear Form Inc.	Tungsten with improved ductility	W15QKN-15-C-0031	A13-010	ARDEC	
Spectrum Photonics	Hybrid Active/Passive Remote Sensor System	W911SR-18-C-0016	CBD09-108	ECBC	JPEO CBRND
Vecna Technologies, Inc.	Hemispheric Imaging System	W15QKN-16-C-0034	A14-085	ARDEC	Air Force Civil Engineering Center

4.0 Navy Commercialization Readiness Program (CRP)

4.1 Navy CRP Accounting of Funds

SBIR FY17 Budget	FY17 CRP Budget (1% of Total SBIR Budget)	FY17 CRP Obligations Made in FY17	FY17 CRP Obligations Made in FY18
$310,677	$3,107	$0	$3,107
SBIR FY18 Budget	**FY18 CRP Budget (1% of Total SBIR Budget)**	**FY18 CRP Obligations Made in FY18**	**FY18 CRP Commitments Planned in FY19**
$336,617	$3,400	$159	$3,241

4.2 Navy CRP Funding Narrative

A total of $3.407 million in administrative funds were expended by the Department of Navy (DON) in support of its Commercialization Readiness Program (CRP) activities. These activities varied and included DON-wide initiatives such as the SBIR/STTR Transition Program (STP) activities for firms with new or more advanced prototypes and transition needs that varied from their initial Phase II attendance to targeted activities directed by individual System Command's (DON sponsor's) based on individual project and transition target needs. At the larger DON level we provide management oversight, sponsor DON-wide initiatives (like STP, the Primes Initiative and the Forum for SBIR/STTR Transition (FST)) and provide consolidated program reporting. In FY18, the FST showcased 112 projects represented by 86 different companies. At the various individual DON commands where two-thirds of the funding is spent, the vast majority of funding is for either government or contractor support staff directly involved in the transition efforts. The government and contractor staff are identifying projects that meet the high priority needs of the DON and have the greatest potential for transition, working with transition program staff to plan the transition and secure needed documentation and funding, assisting the small businesses in navigating the path to transition including identifying risks and opportunities while securing all available sources of assistance.

4.3 Navy CRP Program Initiatives and Activities

The DON SBIR office provides more generalized support initiatives than the individual program or project sponsors usually provide. During FY18, renewed effort was placed on improving the DON's ability to provide the tools necessary for potential transition partners to quickly and easily find technologies capable of meeting their needs. We are revamping our online information tools to provide easier to locate and more current information, expanding our outreach to more non-traditional venues to reach a broader audience, and working more with our acquisition managers to help them to understand their roles and responsibilities and the opportunities that SBIR provides.

From the CRP participant perspective, some small businesses need assistance in working with Prime Contractor's for major systems; so, their assistance is directed towards holding integration meetings to help CRP project firms develop relationships with the Primes. This was also an opportunity for the small businesses to learn what risk factors the Primes were considering when deciding on whether or not to implement small business technology. There are expert teams contracted by the DON to perform independent assessments of CRP technologies and companies to assist in transition. These assessments address not only the technical capabilities of the technology; but also, the ability of the firm to produce the technology to standards and if hardware the firm's ability to maintain that technology providing necessary support for training, logistics, and fielding. Once an assessment was completed the experts would provide recommendations to the firm on areas for improvement as well as lists of resources and processes for achieving those improvements. From the other direction, the DON participated in several outreach events and provided several training events to help provide awareness of the opportunities available through use of CRP both by small businesses in the SBIR/STTR programs and for others who could utilize their technologies. During events sponsored by various technology groups and trade associations, support staff and government personnel took the opportunity to explain the programs and the benefits of using technologies that have already benefited from numerous risk reduction efforts.

4.4 Navy CRP 2017 Achievements and Results

The DON approved a total of 25 CRP projects in FY 2018 (see Appendix A), increasing the number of CRP projects to 350 since the inception of the program. During FY18 DON added an additional $9 million in SBIR funds to its previous years' CRP projects. Cumulatively, the DON has invested almost $635 million in SBIR funding and received almost $114 million in concurrent matching funds to CRP projects. Navy CRP Projects have received more than $1.4 billion in Phase III government and non-government funding as reported in the DOD SBIR/STTR Company Commercialization Report and Federal Procurement Database System. The average transition amount for all CRP projects FY06-17 is $3.85 million.

Appendix A: NAVY
Small Business Innovation Research Commercialization Readiness Program

FY 2018 Companies Approved for CRP

Company Name[1]	Project Title	Contract #	Topic #	PEO	Investor, Customer, or Fielded System[2]
Area I, Inc	Integration of ALTIUS-ASW Avionics Architecture into USVs Enabling Heterogeneous Manned-Unmanned Teaming (MUM-T)	N68335-18-C-0004	N141-014	PEO (A)	UAV/USV Manned and Unmanned Systems Teaming

AVID LLC	Tank Integrated Drone Systems	N68335-18-C-0594	AF083-097	PEO (U&W)	UAV Platforms
Azure Summit Technology, Inc.	Low Size Weight and Power (SWaP) wideband Digital Receiver Exciters (DREX) technologies for Radar and Communication Systems	N68335-18-C-0053	N131-009	PEO (U&W)	Sense and Avoid & Autonomous Collision Avoidance Radar Systems
BGI LLC	Analysis and Reporting Capability for Smart Aircraft Data	N68335-18-C-0209	N112-111	PEO (U&W)	Aircraft Condition Based Maintenance Data Analysis & Reporting (H-1Y/Z, V-22, MQ-4C)
Charles River Analytics Inc.	Distributed Analysis Tool for Enterprise Monitoring (DATEM)	N68335-18-C-0358	N132-139	PMW-120	Distributed Analysis Tool for Enterprise Management of status monitoring and failure prediction of data/information driven systems

Notes: [1] Order listed is alphabetical and does not convey any prioritization of CRP projects.
[2] Additional information about Investor, Customer, or Fielded System is available on request or Fielded System is available on request.