DEPARTMENT OF THE NAVY **SBIR/STR BIR/STR BIR/STRONS** 

2021 SPRING



## FROM THE DIRECTOR Navy Continues to Lead the Way in Transitioning Technology



It's a new year. We're learning to deal with COVID-19. Our funding is secure. We are continuing to build upon greatness. So I am excited!

Bob Smith, Director DON SBIR/STTR

We've changed the ways we manage

our Navy SBIR/STTR proposals, contracts and payments. We're faster. We're accepting more risk. We're not waiting for the perfect solution. Even if we fail, we learn that sooner, and can move quickly on to other solutions with that knowledge.

We're pretty good at what we do, and we're looking at how to apply innovation within an innovative program to be even more effective. Our goal is to pivot even faster and get technology to our warfighters quickly and efficiently. While we are making the program better, one thing isn't changing: The Navy is and always will be a great partner. That's why companies love working with the Navy.

Our adversaries—peers, near peers and non-state actors—are moving fast and we can't wait so long to get tech into the hands of warfighters. As I said, by being willing to accept some risk, we can pivot faster to the next solution.

#### **Tibbetts Awards**

The Tibbets Awards have been released.

Named after Roland Tibbetts, the founder of the SBIR program, Tibbetts Awards recognize companies and individuals that exemplify the very best in SBIR/STTR achievements.

The Tibbetts winners are sterling examples of best practices and models to emulate, given recognition for years of dedication to creating the best the SBIR/STTR program can deliver. The companies and individuals singled out for recognition are not first-time participants. The Tibbetts Awards are for sustained performance.

The three Navy civilian employees honored with a Tibbetts Award this year share common characteristics of integrity, innovation, and a dedication to helping small companies grow their technologies and get those capabilities into the hands of warfighters. We salute Tony Brescia at Naval Air Warfare Center Aircraft Division in Patuxent River, Md.; Tom Hill at Naval Air Systems Command, Lakehurst, N.J.; and Dave Noel with Navy Expeditionary Combat Command, Virginia Beach, Va., for their long and steadfast support and service to the SBIR/STTR program, their companies, and our men and women in the fleet and force. See the article in this issue about these individuals.

The winning small companies also have a lot in common. They listen; they work closely with their TPOC and the customer; and they satisfy the customer's needs. The Navy had a problem; they answered the call; and they provided a solution to that problem. They've demonstrated perseverance. They've pushed on that door to finally get it open. And now that solution is part of the Navy system. The following Navy STP companies received a Tibbetts Award:

- ATA Engineering, San Diego
- Bascom Hunter Technologies, Inc., Baton Rouge, La.

- BlackBox Biometrics, Inc., Rochester, N.Y.
- Colorado Engineering, Inc., Colorado Springs, Colo.
- KCF Technologies, Inc., State College, Pa.
- Orbit Logic, Greenbelt, Md.
- SubUAS LLC, Hillsborough Township, N.J.

## Navy Forum for SBIR/STTR Transition (Navy FST)

We recently held our first Navy Forum for SBIR/STTR Transition (Navy FST) of the year remotely and it was a success. The NAVSEA FST Focused Technologies Event virtually brought together our innovative small companies and decisionmakers from industry and government.

Considering the COVID-19 constraints, our Navy FST did a phenomenal job showcasing our technologies. Our intent is to make future events even better. Despite the fact that the pandemic has limited our in-person opportunities, we created a hybrid model to get the best of virtual and in-person conferences, allowing the serendipitous connections we still need. While there is still the magic of being at a conference in person, overhearing a conversation, joining in a conversation in the coffee line in the morning, grabbing a sandwich at noon, or meeting over a cold beer at the end of the day, the virtual showcase allows more people to participate at less cost for the participants, creating different opportunities for connections. Please see

the articles about the NAVSEA FST Focused Technologies Event and upcoming Navy FST events in this issue.

#### Metaphorically speaking

Looking forward to the year ahead of us, we will keep focusing on continuous process improvement, and how we can capture what we've learned and inculcate it into the program, such as our simpler proposals, our faster payment cycles, and our broader topics seeking less connection to programs of record while showing us opportunities we didn't think of. As I think about what the Navy SBIR/STTR program will be doing differently in FY21, my mind flashes to a metaphor.

Picture a dapper fellow on a train. He's talking to people about the great new technology items on the train, like the telegraph and electric lights powered by a small generator that fits onboard, and what a marvel of technical prowess is involved to move that much metal at speed along the tracks. The people around him nod with approval. Just then, he looks out the window to see a plane fly overhead.

I don't want the Navy to be that guy talking on the train.

Sincerely,

Robert L. Smith Director DON SBIR/STTR

#### SBIR/STTR Generates High Returns on R&D Dollars

The Small Business Administration has just released its 2018 SBIR/STTR Program Annual Report. While it may sound dated, it was released in January 2021 and represents the latest program summary. "The SBIR/STTR program continues to evolve and remain the primary source of early funding to thousands of highly successful small businesses," the report said. "Many of these awardees leverage opportunities in the program to gradually become large businesses and some have become industry leaders. The recent economic impact studies developed by Air Force, Navy, DoD, and National Cancer Institute demonstrate that the program generates one of the highest returns on research and development (R&D) dollars for the Federal Government. These studies and much more can be found on SBIR.gov."

The report indicated the DoN met or exceeded the minimum SBIR/ STTR spending percentages and was the only DoD service to meet the minimum percentages requirement. DoN SBIR also exceeded overall DoN FY18 small business goals for socially and economically small disadvantaged businesses (SDB); women-owned small businesses (WOSB) and small businesses located in Historically Underutilized Business Zones (HUBZone). Perhaps most notable, DoN accounted for 70% of all DoD Phase III obligations in FY18.

### **Tibbetts Award Winners Exemplify Spirit, Intent of SBIR/STTR Program**

### Award-winning success: Helping small companies succeed and warfighters win

By Edward Lundquist

Three Department of the Navy employees have been recognized by the Small Business Administration (SBA) for their success with and support of the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs.

Department of the Navy winners were Anthony Brescia of the Naval Air Warfare Center Aircraft Division, Patuxent River, Md.; Thomas Hill of Naval Air Warfare Center Aircraft Division, Lakehurst, N.J.; and Dave Noel of the Navy Expeditionary Combat Command, Virginia Beach, Va.

The Tibbetts Awards are named after Roland Tibbetts, the founder of the SBIR Program.

According to Robert Smith, DoD SBIR/ STTR director, the Tibbetts Awards are for sustained performance. "These winners have been contributing to the program for a very long time."

"For nearly four decades, the SBIR and STTR programs have been assisting small businesses with launching ideas from conception to market. The Tibbetts Awards highlight our nation's next generation of competitive creators who help push the U.S. economy into the future," said SBA Administrator Jovita Carranza. "SBA continues to play a key role in administering these research and technology funding programs, providing 'seed money' to help our nation's greatest and most innovative research entrepreneurs start, grow and transition into high-growth companies. The companies and the technologies they create played a unique role in job creation, the building of new industries and communities and addressing the nation's most pressing challenges."

#### Dave Noel

Tibbetts Award winner Dave Noel is the

force maintenance director for the Navy Expeditionary Combat Command (NECC). Noel enlisted in the Navy in 1974, became a construction mechanic in the Seabees, and retired as a senior chief. He's been working for the Navy ever since. "Maintenance is my life," said Noel.



Dave Noel, force maintenance director for the Navy Expeditionary Combat Command

NECC operates hundreds of boats all the way from a seven-meter rigid-hulled inflatable boat (RHIB) to a 78-foot patrol boat, as well as construction equipment such as cranes, bulldozers, pumps, vehicles, chain saws and explosive ordinance disposal (EOD) equipment. "I'm the guy that fixes the equipment we buy," said Noel. "Once it's fielded, it's our job to keep it operational, and to do what it takes to support the warfighter."

Alan Cummings, assistant program manager for Life Cycle Management of U.S. Navy Combatant Craft and Boat Programs with Program Executive Office Ships said Noel brings 26 years of uniformed U.S. Naval Construction Forces expertise to his position, and leverages his 20-plus years

of civil service to aptly manage the life cycle support requirements of three sophisticated high operational tempo watercraft portfolios. "His experience in both ground and maritime systems maintenance management allows him to efficiently and effectively direct his teams to ensure mission

"Our warfighters should never be in a fair fight. They should always have the advantage! That advantage can come in many forms, including effective and efficient maintenance strategies and programs."

Alan Cummings, assistant program manager for Life Cycle Management of U.S. Navy Combatant Craft and Boat Programs

requirements are always met or exceeded.

"Our warfighters should never be in a fair fight," said Cummings. "They should always have the advantage! That advantage can come in many forms, including effective and efficient maintenance strategies and programs."

Having worked with Noel for nearly 15 years, Gary A. Weaver, deputy division head & deputy site director at NSWC Carderock, Combatant Craft Division, said that Noel deals with some of the most difficult operational requirements that any Navy command can demand of a "type desk," a term for the team that manages maintenance and readiness of certain types of equipment.

"As the maintenance director, Dave's determination to maintain the operational availability of hundreds of combatant craft and thousands of civil engineering support equipment while working with various Naval System Commands and industry to exploit the very best technology available continually advances the mission

capabilities of the NECC," said Weaver.

For Noel, the measurable output is maintenance, but desired outcome is readiness. "We've established metrics and can analyze and predict how effectively a system or piece of equipment performs. We've been working with an SBIR company, Frontier

Technology Inc. (FTI), to develop a readiness assessment engine."

Noel was looking for a way to track effectiveness. FTI already had a Phase II when Noel found out about them. "I 'knew a guy who knew a guy,' and I found out about this tool. It was what I had been looking for. We started working with FTI with me as the technical point of contact [TPOC]."

Since its inception back in the 1980s, FTI has pursued SBIR opportunities with the Navy, as well as other services and federal agencies, and has been able to build upon those successes.

"We've won more than 160 Phase I and

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Phase II SBIRs, and we currently have several active Phase IIIs across DoD and other government agencies," said FTI's senior vice president of operations, Jeremy Andrews.

According to Andrews, FTI had a Phase I and Phase II SBIR contract through MDA that led to a series of Phase III SBIR contracts with Missile Defense Agency (MDA), the Army, and then the Navy. "Dave Noel found out about our technology because he was looking for a tool to take in disparate data and analyze the best way to manage storage, maintenance, and repair of combat equipment. Our first task order with NECC was through the MDA Phase III SBIR."

"Not all program managers fully understand SBIR and what these technologies have to offer," said FTI's vice president of operations James Kirkpatrick. "Sometimes it helps to have your TPOC or a PM who has used our SBIR technologies and contracting solutions to talk to other government people to assure them that this technology really works and how to take advantage of the benefits of SBIR sole-source contracts. For us, Dave has been that champion."

Noel has used FTI's technology to best predict when maintenance is required rather than react when something breaks. Noel said that fixing things is important, but the most challenging part of his job is trying to prevent things from breaking. "Anytime we can make it better, that's my goal. I don't want to fail the warfighter."

#### Tom Hill

The procurement division at Naval Air Warfare Center Aircraft Division (NAWCAD) at Lakehurst, N.J., was recognized with the Tibbetts Award for excellence in support of the SBIR/STTR program. NAWCAD Lakehurst established a dedicated SBIR/ STTR contracting team with standardized procedures to meet a growing workload and accelerate the processing time.



Thomas Hill, former director of procurement with the Naval Air Warfare Center Aircraft Division at Lakehurst

Their experience and expertise have paid off.

While the number of SBIR/STTR contracts increased dramatically, the team managed to reduce the time to process those contracts. That got people's attention.

"We got to be pretty good at doing the contracting for those SBIR and STTR programs," said Tom Hill, who recently retired as NAWCAD Lakehurst procurement division director. "ONR took a look at our process and after conducting a pilot, began to send all of their Phase I and II contracts to us.

Because of their effectiveness, quality and processing times for contracts, ONR, NAVSEA and NAVAIR—the top three activities in the Navy SBIR/STTR world—are now sending their SBIR/STTR contracting work to NAWCAD Lakehurst's contracting shop.

Hill took it upon himself to mentor small companies unfamiliar with the Navy and DoD's acquisition process. He helped them understand the Navy's contracting and accounting rules, and shared best business practices to help them be successful. "If they're successful, and we've solved a problem for the Navy, then we've helped the warfighter."

Hill is proud of his team and their accomplishments and said they're a huge part of the Tibbetts Award success. "I had the privilege of working with the team here at Lakehurst since 1987. It's nice for the team to be recognized for their efforts that they have expended over a long period of time."

#### **Anthony Brescia**

Anthony Brescia has been involved in the SBIR/STTR program since the beginning, bringing warfighters capability via small business solutions for nearly 40 years. A systems engineer with the Naval Air Warfare Center Aircraft Division, his first involvement



Anthony Brescia, systems engineer with the Naval Air Warfare Center Aircraft Division

with SBIR was back in 1985, when he was working at the Naval Air Development Center in Warminster, Pa. "Just like today, we were looking to deliver technology to the warfighter, and also help the small companies find success as businesses."

Brescia was recognized for his work on advanced unmanned technologies including Silver Fox, an aerial system deployed in Iraq and Afghanistan, and EMILY, a surface rescue and recovery vessel employed by first responders in and out of the DoD.

Brescia said the good ideas developed through the SBIR/STTR program keep evolving into more and better ideas.

"About 18 years ago I worked on STTRs and SBIRs with a small company, Advanced Ceramic Research (ACR), which made unmanned aircraft that were used in Iraq and Afghanistan," Brescia said. "Some of the aircraft systems and technologies we developed together are still flying with the Air Force and NOAA."

That small business was sold to a prime, and the founder, Tony Mulligan, had a non-compete agreement that kept him out of UAVs, so Mulligan started another company that focused on unmanned surface vehicles (USVs).

Through the SBIR process of "extend derive and complete," a number of the technologies that started out when Mulligan ran ACR continued to evolve and transition into work he was performing with his new company, Hydronalix.

"Tony wants us to succeed," said Mulligan. "He puts the Navy and the warfighter first, but he sees that value in having us grow, create jobs, and create technologies here in the USA."

Mulligan said Brescia is like a government entrepreneur. "He has vision and passion. When he helps small companies like ours, he's creating high tech jobs. There's a lot of value in that job base, and that helps the Navy and the warfighter. Imagine if every SBIR coordinator was like him; we'd have thousands more tech jobs in this country, maybe hundreds of thousands."

That philosophy is working. When Mulligan started his new company in 2010, he had one employee, and one Phase I SBIR. Today Hydronalix has a staff of 28. "The SBIR investments help us generate new technologies that create more growth on the commercial side."

Eventually, the Hydronalix USVs transitioned to support expeditionary EOD divers and Marines, serve as gateway buoys to connect underwater systems to above-water networks, and even

penetrate hurricanes to report data back to the National Oceanic and Atmospheric Administration (NOAA). That technology became the very successful EMILY series of boats used for rescue, surveying and reconnaissance around the world.

"Tony was our original TPOC," Mulligan said. "He demanded a lot from us, but also knew how to help us get more funding. When our SBIR transitioned to a Phase III, he became our program manager."

Brescia was able to connect Hydronalix with the Domestic Preparedness Support Initiative, which provided either EMILY, Swiftwater EMILY or Sonar EMILY to first responders in New York, New Orleans, Honolulu, Kauai, Houston, Denver, Washington, D.C., and Norfolk. "The Los

"The Tibbetts Awards highlight our nation's next generation of competitive creators who help push the U.S. economy into the future."

SBA Administrator Jovita Carranza

Angeles County Fire Department lifeguards have been our main testing group since around the 2011-2012 timeframe," said Brescia.

He said SBIR is an excellent opportunity to explore the art of the possible. "If you don't participate you can't gain anything from it."

Evaluating proposals is a big job, he said. "You have to be technology-astute. I want to be sure I'm picking the right choice." But, he said, it's fascinating to see how

> the companies take markedly different approaches to solve the same problem.

As Brescia helps his SBIR companies align their efforts to the Navy, he's also learning about their perspectives,

including their challenges and constraints. That helps him better support the next round of SBIR companies. "In each case, we were pushing the boundaries of the state of the art. That's what I find most intriguing about working with SBIR/STTR projects. With these new technology areas, I'm stretching myself, but also helping the small companies. I have always given them as much help as possible. I can help them understand what the Navy is looking for, translate some of the jargon, and maybe offer them a little encouragement from time to time."

"With Tony's knowledge of the Navy, the acquisition process and the needs of the warfighter, we're able to transition things faster," Mulligan said.

## SBIR Center of Excellence at UMass Lowell Helps Small Businesses with SBIR Efforts

By Jennifer Reisch, Navy STP Managing Editor

"It is a privilege to work with entrepreneurs. Definitely. They are very organized, smart, and motivated people, and they're optimists. Plus, I feel like I'm getting a first look at cutting edge technology every day, which suits my inner nerd. So I



Photo Courtesy of Stacy Swide

Stacy Swider, Director, SBIR Center of Excellence at UML

am very fond of the teams I work with," said Stacy Swider, director of the SBIR Center of Excellence at UMass Lowell Research Institute (UML SBIR COE).

The UML SBIR COE supports SBIR teams, helping them write winning proposals and then providing operational support post-award. Since October 2018 the center has worked with over 100 startups with a wide variety of technologies. Swider coaches SBIR teams one-on-one through the SBIR proposal process. "There is nontrivial strategy up front. We discuss if the timing, the award size, and their idea for a project is responsive and aligned. Not only should the company have novel technology to develop, but the project should be congruent with their overall strategy—stay focused! Then we hone the proposal," she explained.

"I always say, 'If you're not excited, the

reviewer won't be excited.' It can be hard to keep the energy up when the application process is bureaucratic. I make sure their message comes through! And that the budget is compliant, etc. My teams enjoy a 55% win rate, which is almost four times the average Phase I rate of 15%."

When Swider isn't working directly with a small business, she stays abreast of solicitations, checks in with coworkers, performs outreach, and builds her own operational support. After spending over 25 years in industry and startups, Swider is well positioned to help small companies navigate the SBIR/STTR process.

Swider came to the UML SBIR COE from industry, where she won, executed, and commercialized multiple SBIR/STTR awards. She had a career in materials science and applied physics in the arena of crystalline materials for semiconductors, optics, and sensors. "My background is in business and science, which makes me a good fit for this post. I got my BS in Materials Science at MIT in 1989. After I graduated, I moved to Silicon Valley and worked at a startup making diamond films from the vapor phase. Then I worked in semiconductor equipment, and later at another startup doing chip design. In those roles I supported technical marketing to Fortune 500 customers, led outsourcing projects, wrote business plans, etc. Then I went back into research and worked at AFRL (gallium nitride, nonlinear optics) until they BRAC'd that lab to Wright Patterson AFB. I switched to a small company in the Boston

area that makes semiconductor and optical materials for nuclear detection. In that role I was trained to write SBIRs and was successful with it. We got multiple awards for scintillator development and, with an amazing team, brought it to commercialization within four years. That's pretty fast for new materials, but I should note we leveraged previous research done at national labs," she said.

"The Navy SBIR program is impressive, as they have a 65% commercialization rate. It shows the TLC that they put into their topics and their teams. Topics are pulled from programs. And they understand how to extend funding runways, and how to avoid mission creep," Swider said.

She offered the following advice to company founders and leaders participating in the SBIR/STTR process:

Plan for the pace of the SBIR process. It can take six to 12 months to get the first award. The Phase I and II process takes three years. "The average time to Phase III is seven years. There is a cautionary tale in there. The technology has to get through test and evaluation and become integrated into a larger system. Meanwhile, priorities can change," she warned.

Do anything you can do to do testing and evaluation early. CRADAs and other cooperative vehicles can save a lot of time. If your technology is good you can find other customers even if the Navy doesn't buy it.

**Take small early sales.** "Sometimes early sales are tiny and profitless—just one or two parts

to a university researcher, say. Take them because you'll learn something about pricing and operational support," she advised. "When the big sales come you'll know how to execute the basics."

Know your market size. You can get away with being in a small market only if you are very special. Figure out how your technology is going to play. "There's so much in just being honest with yourself—in all aspects of life but especially in entrepreneurship," Swider said. "It's just statistics. The bigger your market, the more likely you are to succeed."

**Entrepreneurs need to be aware of their own competition.** "Take it seriously! People will come out of the woodwork and surprise you. It's a big nation," she said. "And listen carefully to what TPOCs and PMs say. They are looking at a lot of emerging technology."

At some point you need to stop innovating and make the product, and that may require some different expertise. "The minute you commit to implementing your innovation you need to make it repeatable. Succeeding at this step may require you to hire people who aren't like you—people who are good at setting up and executing repetitive things. It's a real challenge. By the same token, it can be hard for technologists to hire salespeople. Technical teams also underestimate the level of effort for marketing and sales," Swider said.

Pay attention to compliance, accounting, and cyber maturity models certification. Growing a business is hard. "People joke about wearing a lot of hats. But truly, the depth of knowledge you need in different arenas is pretty astounding. However, you don't have to learn it all in one day. Take half an hour or an afternoon here and there, perhaps a business accounting class online. Then you can talk to your accountant intelligently," Swider advised. Help is available to small businesses working on SBIR/STTR proposals and projects. For more information, reach out to the center or to Swider directly at stacy\_swider@uml.edu.

#### **UMass Small Business Innovation Research Center of Excellence**

The UMass Small Business Innovation Research Center of Excellence (UML SBIR COE) is located in the UMass Lowell Research Institute (UMLRI) Northstar Campus.

The center helps high-tech startups and other small businesses by coaching them through SBIR/STTR applications and awards and then continues to offer guidance and other support, including technical and business assistance (TABA) for small companies as they execute the SBIR/STTR programs. The center can connect STTR teams to potential research partners in the UMass system, as well as to corporate partners such as primes and investors. In addition, the Northstar Campus offers hot desks, office space, meeting space, and events space.

The center supports companies pursuing all types of SBIR/STTRs in Massachusetts and nationally.

#### The UML SBIR COE:

- Mentors and helps guide businesses through the SBIR process;
- Offers access to an inner circle of SBIR process experts and subject matter experts;
- Helps small businesses find a good topic and agency match;
- Provides experts to explore technological potential;
- Reviews and edits proposals for content, clarity, and cost;
- Offers in-reach to scientists at all UMass campuses who can enhance proposing teams;
- Has a contracts specialist on board for post-award questions; and
- Offers business assistance in market research and capture.

"During COVID-19, we quietly built out a brand new 19,000 square foot incubator called Northstar Campus with offices, hot desks, meeting space, and event space. It's near Hanscom AFB. We are starting to onboard members and there is a lot to do!" shared Stacy Swider, the UML SBIR COE director.

UMLRI is leading an initiative linking core competencies, academics, labs, resources, and institutions to DoD requirements, working to bridge the gap between cutting-edge research and its commercial implementation, and helping to provide world-class technology to warfighters. Located in Lincoln, Mass., the Institute is founded on four foundational divisions: Defense Acquisition and Procurement R&D Programs, Additive Manufacturing, Academic Offerings with DoD focus, and the SBIR Center of Excellence.

Information about the center is available on its website: <u>https://www.uml.edu/Research-Institute/Work-with-UML/SBIR.aspx.</u> The Northstar campus website is available at the following link: <u>https://northstarcampus.org/</u>. Swider can be reached at <u>stacy\_swider@uml.edu</u>.

## Moving Leading Edge Tech from Military to Mainstream

By Kimberly Brady and Karen Pfautz, Charles River Analytics

Charles River Analytics (Charles River) has been pushing at the edge of science and technology with Navy-funded SBIR projects for almost 30 years, winning their first in 1993, and over a hundred since. From the seeds planted with this funding, a variety of novel technology and products have grown, bearing cyber-physical systems fruit not just for the Navy, but for other government customers and within the commercial realm as well.

"Our Navy funding has allowed us to exercise our full range of science and tech expertise," said Rob Hyland, Director of Technology Transition at Charles River. "The Navy's investment in both near- and far-future tech has created some seemingly impossible breakthroughs, from human performance to sensor and autonomous vehicle intelligence."



The location of Charles River's Cambridge headquartersclose to the Atlantic Ocean and Boston Harbor-and their Marine Systems Test Facility on Block Island Sound provide immediate, year-round access to Navy-approved littoral testing waters, making them particularly well-suited for research in uncrewed underwater vehicles (UUVs).

As Charles River scientists and engineers pursued their work in autonomy, they found that to be truly autonomous UUVs need precise object detection-they must not only accurately identify an object, but also be able to precisely locate that object on the seafloor or within the water column. The unstructured and often-changing underwater environment makes this a challenge-GPS drops out, and the most commonly used sensors (sonar) deliver low-resolution images adversely affected by ocean currents as well as inhomogeneous distribution of pressure, noise, and reflections off both the water's surface and the seafloor.

Through their Phase I and Phase II Navy-funded SBIR efforts, Charles River has developed novel technology that overcomes these challenges, delivering precise underwater detection using an array of sonar and electro-optics sensors coupled with algorithms that integrate motion data from dead-reckoning sensors to provide accurate localization in real time.

Part of this technology underpins a new commercial product, AutoTRap Onboard<sup>™</sup>, which was developed in partnership with Teledyne Gavia. AutoTRap Onboard applies advances in deep learning object detection and representation to locate and classify objects in side-scan sonar data and can be

trained to detect a wide range of other objects, including shipping containers, pipelines, hull defects, and more.



A Teledyne Gavia prepared for testing with AutoTRap Onboard<sup>™</sup> at Ashumet Pond in North Falmouth, Mass.

Dr. Arjuna Balasuriya, a senior autonomous marine sensing scientist at Charles River, heard that Teledyne was interested in finding solutions to the problem of underwater image processing, and recognized that his team could apply their deep expertise from work on numerous Navy contracts.

"When AutoTRap Onboard recognizes objects on the seafloor, it alerts the UUV, so it can investigate further on its own—eliminating the need for any human intervention," Balasuriya described. He went on to explain how, without an automated system, human analysts must painstakingly inspect survey data to find objects of interest. This process can be difficult, error prone, and dangerous.

"The sea state can be really choppy," Balasuriya said, recalling his cruises on the North Sea. "You have to tie your laptop down onto a pole or some structure, and you have to tie yourself down or you will be rolled and thrown out."

AutoTRap Onboard has demonstrated excellent detection and false positive rates on test targets in the North Sea and in other marine environments, such as the North Atlantic off Iceland, where it has identified truncated conical objects on a rocky volcanic seafloor at depths of 10-30 meters with 90% accuracy.

Another at-sea product emerging from Charles River is Awarion<sup>™</sup>, an autonomous lookout system that uses a smart camera coupled with image processing and control software to deliver situational awareness at the sea surface. It detects and classifies ships and obstacles, and performs threat assessment. Charles River's work with the Navy SBIR/STTR Transition Program (Navy STP) has been a large contributor to the company's success developing and marketing this new system. As part of the Navy STP, they demonstrated their progress on the system at the Naval League's Sea-Air-Space 2020 Exposition.

Charles River's Navy project work has also yielded many interesting and useful technologies away from the sea; for example, the DATEM Cable Calibration Tool (CCT), which uses machine learning, probabilistic programming, and visualization to pinpoint component failures. The DATEM CCT is currently deployed at NIWC LANT; however, this technology can be adapted to any system where fault



Prototype Awarion smart camera, part of the autonomous lookout system that delivers situational awareness at the sea surface.

identification and repair can be accelerated by understanding system health and status data.

Charles River is already looking for the next big transition effort beyond AutoTRap

Onboard and the CCT. "Our work with the Navy through their STP has been instrumental for us as we discover possibilities for projects similar to AutoTrap Onboard—getting innovative technology established in Phase II into the hands of operational users," said Hyland. "We've got an endless pipeline of innovation here. We want to get more of these great ideas and prototypes pressed into service."

## charles river analytics

For more information on Charles Rivers' innovative work, visit its website at https://www.cra.com/.

## **Acquired Navy STP Companies**

The following Navy STP participants have been acquired, partially acquired, or merged into a new company since 2015.

Adaptive Methods, Inc. was acquired by L3Harris in 2017.

**DECISIVE ANALYTICS Corporation** was acquired by WBB in 2020.

**EOS Photonics** merged with Pendar Medical to form Pendar Technologies in 2015.

Fidelity Comtech, Inc. was acquired by Trimble Navigation in 2015.

Imaging Systems Technology was acquired by Trelleborg in 2019.

Nuvotronics was acquired by Cubic Corporation in 2019.

Physical Optics Corporation was acquired by Mercury Systems in 2020.

Radio Frequency Simulation Systems, Inc. was acquired by VadaTech in 2016.

**Response Technologies, LLC** was acquired by Bell in 2020.

**Spatial Integrated Systems, Inc.'s autonomy business** was acquired by Huntington Ingalls Industries in 2021.

TeraDiode, Inc. was acquired by Panasonic in 2017.

## Mercury, Physical Optics are a Natural Fit: "We're Better Together"

By Edward Lundquist



A company that once benefited from SBIR investments just acquired another company with a strong SBIR pedigree.

Mercury Systems of Andover, Mass., announced its \$310 million purchase of Torrance, Calif.-based Physical Optics Corporation (POC) on Dec. 30, 2020. "The acquisition is directly aligned with our strategy and will enable us to deliver more complete, pre-integrated avionics subsystems to our customers," said Mark Aslett, Mercury's president and chief executive officer.

"The acquisition of Physical Optics Corporation adds important capabilities on new and existing airborne programs in the platform and mission management market," Aslett continued. "The combination of Mercury's safety-certifiable and secure avionics processing solutions with POC's deep portfolio of data storage, transfer, and encryption technologies will enable us to deliver more complete, pre-integrated avionics subsystems to our customers. POC has a similar growth profile to Mercury, supported by several key design wins that are transitioning into production."

#### A lot in common

The two companies have a lot in common. Both took advantage of and benefited from SBIR investments.

Back in 1985, POC founder Dr. Joanna

Jannson wrote out her first SBIR proposals in long-hand at her kitchen table. "Because of those initial SBIR investments, and, more importantly, the commercialization of those technologies, POC grew to be a



Kevin Walter, VP, Mission Division, Mercury Systems, former CEO of Physical Optics

\$100-million company," said Kevin Walter,

VP, Mission Division, Mercury Systems (and former CEO of POC).

At the time of the acquisition, POC was an employee-owned company of about 350 people, including more than 160 highly skilled engineers with more than \$120 million in revenue for 2020. The company held more than 160 patents worldwide, covering 60 technologies.

POC received a Phase I SBIR in 2000 to develop a crash-survivable video recorder for naval aircraft. According to Walter, the resulting Phase III awards led to 11 product lines being put aboard about 7,500 aircraft.

Other POC SBIR-to-transition successes include the Joint Avionics Reconfigurable Virtual Information System (JARVIS) mission computer and the Digital Data Set (DDS) Systems for the Navy's T-45 trainer aircraft.

"SBIR has not only been good for POC, where we grew from two people to more than 300 people, and from a few hundred thousand dollars a year to \$100 million, but it's also been good for our DoD customers," Walter said. "And that's particularly true for the Navy, which has told us that our technologies have saved more than \$800 million in lifecycle costs based on the SBIR-developed products we've delivered."

Walter said that POC became a one-stop shop for research, development and production for systems developed under the SBIR program.

The Navy posts a list of topics describing specific technology needs that small companies are invited to address and solve. "We don't have to guess what the Navy wants," said Walter. "They tell us what they want. And we take our shot—we propose the best technologies we think we can develop to solve those problems."

#### Acquisition philosophy

Over the past five years, Mercury has acquired 11 other companies. Dr. Amela Wilson, Mercury Systems senior vice president and general manager for the Mission Division, said that Mercury's merger and acquisition



Amela Wilson, SVP & GM, Mission Division, Mercury Systems

(M&A) strategy is helping to drive its rapid growth. The company's M&A philosophy has been two-pronged. "We want to expand our capability set; and we want access to new markets and to continuously penetrate some of those markets over time. We are also looking for companies similar to us in terms of how we approach markets, of cultures and values, and of how we innovate."

But, she said, "Our position was to broaden our avionics product line and technology portfolio to help our prime customers as well as the military services. As we looked at our own organic growth, we could see that POC has a very important capability for new and existing airborne platforms and in the mission management market just as we did. We want to help develop, produce and deploy the next generation open architecture mission computing subsystems, ready to receive applications from our customers."

According to Wilson, "This acquisition broadens our avionics product and technology portfolio to help our defense prime customers, the U.S. Navy, Army and Air Force to deploy next-generation open-architecture mission computing solutions. Similar to Mercury, POC is well-positioned in fastergrowing segments of the defense market and benefits from secular growth drivers, such as supply chain delayering. Together, Mercury and POC can provide customers new capabilities and subsystem solutions."

Wilson said Mercury was impressed with POC's innovation. "They had a great reputation of rapidly solving technology problems for their customers. We were really impressed with their proven track record of starting and incubating new technologies and transitioning them through SBIR. We analyzed the innovation that came through their SBIRs, their engineering talent and the business they have established; it became a very synergetic acquisition for us," Wilson said.

"We liked the innovation, and how POC's approach to the market was complementary to our way of thinking. When we compared our ethos of innovation—ours is 'Innovation that Matters By and For People Who Matter'—we realized they shared the very same vision," she said. "It was the continuum of technological promise that resonated with us."

#### Lessons learned

Over the years, POC gained a lot of insight about leveraging the SBIR program for success, said Walter. "If you are a Phase II SBIR company, and you want to continue and grow success, it's about customer satisfaction and engagement. Sometimes people working on SBIRs get enamored with their own technology—and it's important to be dedicated to the completion of that technology—but they really need to listen to the customers and give them what they need. Our founder told us, 'Never leave the customer with a problem.' Trying to live up to that standard has really served us well. I think that's our secret."

Finding partners for collaboration takes some effort, Walter said. But, he said, there are many different ways to find out that there could be a mutual benefit from working with someone else.

Events such as the DoN Forum for SBIR/ STTR Transition (Navy FST) have been good opportunities for POC to find new customers for technologies and new places to apply what the company had learned under Phase Is and Phase IIs. "That was our goal. We didn't necessarily go to those events to find business partners; we went to expand our customer base."

Walter said POC leadership had been interested in exploring possibilities to add liquidity and equity. "What we found was a very receptive market. From our point of view, we believed we would be attractive for an acquisition to a larger company because of our reputation and strong relationship with our customers. It worked out well for everyone."

Mercury and POC became aware of each other when they found themselves competing for some of the same opportunities, said Walter. "That evolved into conversations about how we could collaborate, and this goes back years before the acquisition."

Among the services, Walter said the Navy is most successful in transitioning technologies from the SBIR program, and there's a reason for that. "The Navy infrastructure supports their TPOCs, and is in favor of transitioning and commercializing SBIR-developed technologies. That's not equally true for every

#### agency."

From a small company perspective, Walter said the key to being successful is not giving up. "There is a tremendous number of opportunities, and a lot of people who are interested in working with small companies. And if you don't succeed first time, just keep trying."

Wilson added that Mercury was established in 1981 as an embedded computing company. "Earlier in our history, we did take advantage of SBIR-funded development ourselves. Through development and acquisitions of companies that have specialized in RF, security, mission computing and other technologies, we now span more of the sensor chain, from the antenna, and what's behind it, all the way to the end user."

Wilson said small, agile and innovative companies can complement the big primes.

Mercury is a commercial, high technology company whose end-market is defense, Wilson said. "A lot of our technologies come directly from the commercial sector, and then we modify them and adapt them for defense needs. Looking at POC, it was a natural fit."

Walter agrees. "It's been a great experience for Physical Optics. We think we're 'better together' since we joined Mercury."

## **Transition from DUNS Number to UEI Extended**

By April of 2022, the federal government will stop using the DUNS number to uniquely identify entities registered in the System for Award Management (SAM). At that point, entities doing business with the federal government will use a unique entity identifier (UEI) created in SAM.gov. They will no longer have to go to a third-party website to obtain their identifier. Active registrants will have their UEI assigned and viewable within SAM.gov; there is no action for registered entities to take at this time. This transition allows GSA to streamline the entity identification and validation process, making it easier and less burdensome for entities to do business with the federal government.

Buying & Selling -	Real Estate ~	Policy & Regulations ~	Small Business ~	Travel ~	Shared Services ~	Technology ~	About Us ~
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Common Acquisition Distriction (CAR) streamline the entity identification and validation process, making it easier and less burdensome for entities							
Integrated Award Envir	coment (IAE)	to do business with the h	ederal government.				
IAE Information Kit		To learn more about this Interact or to be notified	transition, please see th about the latest news an	e information b d information a	elow. Join and follow ou bout the IAE and upcom	r community on ing UEI changes.	
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About beta.SAM.gov		specifications for interfa-	cing systems and sample	data extracts.			
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To learn more about this transition, please visit <u>www.gsa.gov/entityid</u> or see the article in the <u>fall issue of *Transitions*</u>.

## **Small Sensor has Big Impact**

By Jennifer Reisch, Navy STP Managing Editor

While proximity sensors and switches have been around for decades, BH Technology has taken a fresh look at these commodity devices and, through the SBIR program and the company's patented technology, developed a new family of proximity sensors that are more capable, highly accurate, lower cost and better performing in harsh Naval environments. These proximity sensors will initially go on aircraft carrier weapons elevators, although they have many other possible applications throughout the Navy. Proximity sensors and switches are found in virtually every Navy platform. As well, these proximity devices can replace mechanical limit switches-eliminating mechanical wear and tear-while providing the same spatial awareness functionality in a matching form, fit and enhanced function package.

After successful SBIR research, development and qualification testing, proximity sensor production has been licensed to Eaton Corporation, which will be able to manufacture large quantities of the sensors and will be able to support the technology for the foreseeable future.

A proximity sensor literally detects something that is in the proximity of (or close to) the sensor, allowing for precise control of the position of one item relative to another. "You can imagine that if you have a weapons elevator that's



SBIR Proximity Switch Evolution

carrying 10,000-pound bombs that are ready to go up to the flight deck for aircraft deployment, you want the floor of the elevator to exactly match the floor these bombs are being delivered to. You don't want the floor of the elevator stopping at a point where you've got a 6-inch drop to the flight deck. This is particularly true with bombs, but even with a human being, you don't want to step up or down when you get off an elevator. A proximity sensor is what allows you to stop the elevator exactly to match the floor," explained Dr. Aron Kain, senior vice president of engineering at BH Technology. "Equally as important, you need the proximity sensor to work even if there is a fire, or if bombs have exploded, under war conditions, under terrible EMI conditions, during jamming of radar. It absolutely has to work in the worst environment imaginable at the worst possible time."

The new sensors will replace technology

that is over 30 years old with a form, fit, and enhanced function one-for-one replacement. "So literally you can take our sensors and replace the old technology with better performance devices, and not sacrifice time and effort and even save on the cost of the device," said Kain. The sensors can be used in new Navy vessel design as well as to replace existing sensors. "There are areas of the ship that are extremely difficult to access that also require an awareness of where items are in relationship to each other. In

these cases, reliability is as important as the measurement of proximity. The sensor needs to last 30 years without maintenance, without calibration, without cleaning. Set it and forget it for 30 years.

"Successfully navigating and graduating from the SBIR program to transition to the fleet is not for the faint of heart."

Dr. Aron Kain, senior vice president of engineering at BH Technology

and associated iterations. The SBIR program is not designed for qual testing. We were fortunate in the way that we did our design that we had first pass qualification testing success, so the expense to BH Technology was at a bare minimum," said Kain.

"The next hurdle after qual for the small business is, who's going to manufacture this in the expected quantities that the Navy anticipates? Certainly not us; otherwise all we'd be doing is building these sensors, and would not be able

> to use our sensor technology in the many other application areas we have and would like to explore. Fortunately, during the Phase II effort, anticipating the volume of devices that would be needed and could be expected, we

"Successfully navigating and graduating from the SBIR program to transition to the fleet is not for the faint of heart. To get from a successful phase II to the potential of having the fleet acquire the SBIR product, you have two hurdles: one is the transition from a research project to a manufacturable device and then two, qualification testing of the device to make sure it can go on a ship. There can be any number of product iterations required while testing. If you haven't done it right, the expense of iterations is on the small business, unless an acquisition program picks up the cost of qualification testing

teamed with Eaton Corp. and licensed the device manufacturing and sales to them. This frees us up to further integrate the technology into other areas that may benefit the Navy. We already see the payoff in this approach as we are currently doing a Rapid Innovation Fund project for netted proximity sensors as well as another SBIR Phase II for a planar conductivity, temperature, and depth sensor for PEO submarines, all based on our patented technology.

"There is a tremendous amount of embedded goodwill and good technology and proper programmatics for rolling something out from a concept on a blackboard all the way to getting it out to the actual fleet on a ship. The SBIR program allowed us to develop the technology beyond where it was to satisfy a particular Navy need; transition the device to the fleet, and now explore new opportunities based on what was developed," Kain explained.

BH Technology's proximity sensor technology has many other applica-

tions beyond the weapons elevators. "For example, a crane derrick on a ship moves and rotates. You want to make sure it doesn't hit a part of the ship, and doesn't interfere with something else, so you could put a sensor on there. You really want to know that the

hatch of a submarine is closed before going under the water. Someone might even want to put a proximity sensor on the front of a washing machine that does heavy loads of laundry on a ship because you want to be sure that door is closed and not flooding the compartment of the ship with soap suds. The potential applicability of this is staggering," said Kain. "The technology goes well beyond proximity sensing. Using the same core technology, we have developed pressure, temperature, force, torque, flow, and displacement sensors, both linear and

"There is a tremendous amount of embedded goodwill and good technology and proper programmatics for rolling something out from a concept on a blackboard all the way to getting it out to the actual fleet on a ship."

Dr. Aron Kain, senior vice president of engineering at BH Technology

rotational, all tracing their origins back to the original SBIR effort. The technology is such that it can easily be customized. If there is an application that needs a change in form and fit, it can be readily accommodated."

The proximity sensor is an enabling component. "Not only will the sensor get the elevator to stop in the right place, but being a smart technology, it allows you to better control the elevator; it allows

> the elevator to do other things than simply stop at a floor. You can now, for example, control the speed of the elevator; you can look at built-in testing and maintenance. The sensor can allow the elevator itself to be smart and tell you 'I might have a problem here,' or 'You

should look at this and change this out.' There is great value-added potential," described Kain.

BH Technology develops disruptive technology sensors and sensor systems across a wide range of applications and industries for government and commercial clients. Advanced accurate, cost effective, highly reliable and robust sensors and sensor systems allow customers to advance and enhance current product lines and new emerging markets. For more information, visit the company's website at <u>https://www.bhsensors.com/</u>.

## **Upcoming Navy FST Events**

#### **Two Navy FST Events Postponed**

Department of the Navy (DoN) Forum for SBIR/STTR Transition (Navy FST) focused technology events are now "on the road," showcasing DoN SBIR/STTR Transition Program (Navy STP) Phase Il companies' technologies at multiple events throughout the year. Focused technology events that showcase Navy STP participants' technologies provide a more precise way to connect the small business innovators with Navy decisionmakers and industry across the country in order to identify transition possibilities and to facilitate transition. Attending more localized events focused on specific technologies provides increased opportunities for exposure of small businesses with promising SBIR developed technologies to Navy acquisition decision makers and primes.

The Navy FST focused technology events promote companies participating in the Navy STP based on their Navy/Marine Corps sponsored SBIR/STTR Phase II awards. Navy FST events connect these small businesses with government and industry personnel through Tech Talks, Meet the Experts one-on-one meetings, and an enhanced online presence via the Virtual Transition Marketplace (VTM). All events provide exposure of promising SBIR-developed technologies to Navy acquisition decision makers and primes to facilitate transition.

#### WEST 2021

The next Navy FST focused technology event will be held at WEST 2021 on 29-30 June 2021 in San Diego. There will be a Navy FST booth with a presentation area for Tech Talks, and a booth for Meet the Experts one-on-one meetings after each Tech Talk for additional discussions and interaction with those interested in learning more about small businesses and their technologies.

Technology categories include:

- Advanced Electronics
- Air Platforms
- Autonomy
- Command, Control, Communications, Computers, & Intelligence (C4I)
- Cyber
- Electronic Warfare (EW)
- Energy & Power Technologies
- Sensors

#### Sea-Air-Space (SAS)

The final Navy FST focused technology event for the current class will be held at SAS on 1-4 August 2021 in National Harbor, Md.

There will be a presentation area for Tech Talks, and a booth for Meet the Experts one-on-one meetings after each Tech Talk for additional discussions and interaction with those interested in learning more about small businesses and their technologies.

Technology categories include:

- Advanced Electronics
- Air Platforms
- Autonomy
- Biomedical
- Command, Control, Communications, Computers, & Intelligence (C4I)

- Energy & Power Technologies
- Engineered Resilient Systems (ERS)
- Ground and Sea Platforms
- Human Systems
- Materials & Manufacturing Processes
- Sensors

Sea-Air-Space is sponsored by the Navy League of the United States, which brings U.S. defense industry and key military decision-makers together. The Navy FST portion of the Marine Corps Limited Military Utility Assessment (LMUA) and Demo Week was canceled by the Marine Corps due to COVID-19. Navy STP companies originally scheduled to attend the LMUA will attend other Navy FST focused technology events.

For updates on showcased technologies, upcoming opportunities, and newly scheduled Navy FST events, visit www.NavyFST.com.

## **NAVSEA FST Focused Technologies Event Goes Virtual**

By Jennifer Reisch, Navy STP Managing Editor

The Department of Navy SBIR/STTR Transition Program (Navy STP) promoted several innovative Navy SBIR/STTR projects via the NAVSEA Forum for SBIR/ STTR Transition Focused Technologies Event (NAVSEA FST Days). This event was originally scheduled to be held live at NAVSEA headquarters; however, due to the COVID-19 pandemic it was unable to happen in person as scheduled. The pandemic did not stop the Navy STP from moving forward virtually to highlight our small businesses.

The event showcased 34 technologies advancing maritime systems and warfighting capabilities in the following areas: Advanced Electronics, Air Platforms, Autonomy, C4I, Electronic Warfare, Energy & Power Technologies, Engineered Resilient Systems, Ground and Sea Platforms, Sensors, and Weapons Technology. Over 250 attendees included representation from all major Navy SYSCOMs and all the NAVSEA PEOs and Warfare Centers, as well as the Army, the Air Force, and DARPA. Several primes participated, including Lockheed Martin, Huntington Ingalls Industries, L3Harris, Raytheon, and BAE Systems. The Mississippi Enterprise for Technology and Arizona Commerce Authority were also in attendance. NAVSEA FST Days was the first focused technology event for the current Navy STP cycle.

Links to the Tech Talks can be found on the Navy Virtual Transition Marketplace website: https://vtm.navyfst.com/.

While Navy STP was unable to bring our innovative companies face-to-face with potential partners and customers, the companies still had a platform to share how their Navy-funded developments can meet the current and emerging technology needs of warfighters. Interested customers can reach out to Navy STP at <u>navystp@atsicorp</u>. <u>com</u> to request an opportunity to "Meet the Expert" behind the SBIR/STTR-supported technologies. Despite the challenges created by COVID-19, these experts are adapting and still delivering tomorrow's technology today.

# Small Businesses Develop Innovative Navy Technologies for Warfighters

By Jennifer Reisch, Navy STP Managing Editor

"We are fortunate to have the best trained. best equipped and readied Sailors and Marines on the planet. The very fact that we have a freely volunteer force-that they've all freely volunteered for service-is incredible testimony to the unwavering



James Kenny, executive director of NAVSEA Engineering Directorate (SEA 05)

commitment of our young Sailors and Marines to preserve and defend our constitution and, thus, our way of life," said James Kenny, executive director of NAVSEA Engineering Directorate (SEA 05), at the NAVSEA Forum for SBIR/STTR Transition Focused Technologies Event (NAVSEA FST Days), held virtually in January. "Our adversaries recognize this strength and they are aggressively pursuing and exploiting all means of technology to achieve the upper hand and to eliminate our strategic advantage."

Last year's NAVSEA FST Day was held in person at NAVSEA headquarters, but COVID-19 forced this year's event online. Several speakers addressed the important role small businesses have in helping to meet the needs of the Navy and its warfighters.

Jimmy Smith, director of the Navy's Office of Small Business Programs, asked all SBIR/ STTR Phase II companies to deliver the technology they have promised. "The warfighter needs it and we would love for all of them to be able to come back to their families after going into harm's way because of the capability that you provide.

"We need you to move forward to Phase III. Don't do it recklessly,

Jimmy Smith, director of the Navy's Office of Small Business Programs

but delivering capability in the desired time frames is really what we're asking for."

Throughout his career, Jimmy Smith has worked with small businesses that make "sure that they're meeting the customer's needs; they're changing and being agile for the opportunities that are presented before them and they're delivering the capability that the warfighter needs. Look for those opportunities to make this enterprise better.

"Requirements are set very early on, threats change and we need the innovation that small businesses bring to that arena to make sure we stay in front of the threat and we counter those oppositions and meet them head on and bring people back from harm's way in a victorious way."

Dean Putnam, NAVSEA SBIR/STTR program manager, addressed the ways SBIR/STTR technology can get to warfighters. "There are two routes for technology markets: One is via DoD and Navy markets, which we often call transition. The other is through commercialization. The technology is bought and used in the commercial markets. Not only should small businesses be marketing their technologies to the DoD and Navy, but many technologies have dual use and small businesses should be seeking commercial markets as well.



Dean Putnam, NAVSEA SBIR/STTR program manager

"Not all transitions are via direct contracts with the SBIR/STTR company that developed the technology. Many technology transitions are via subcontract to a larger Navy prime contractor. These subcontracts are also phase IIIs and have data rights protections. Small businesses will sometimes license a technology to a third party for production and the revenue to the developer is via licensing and royalties. The Navy has the biggest SBIR/STTR transitions in the DoD and NAVSEA is the transition leader in the Navy. We are working with an excellent Navy team."

In FY18 the Navy accounted for over 70 percent of all phase III awards within the DoD. In FY19 the Navy set out to make that process even better, said Robert Smith, director of DoN SBIR/STTR.

According to Robert Smith, companies that win an SBIR/STTR Phase II award have a lot to do. "You need to have a successful Phase II and one of the things that helps you move along with that is the STP program.

"What happens if you succeed? It's not just good enough to get that Phase II award. We want to get you to commercialization; to transition that technology into a Navy program of record, into the hands of a Naval warfighter—Marine or Sailor. That doesn't happen just by doing good research. That happens by doing good research that we need and can use. So you should be asking yourself that question today. 'What happens if we succeed?'"

Robert Smith said there are several other questions small businesses need to ask while looking ahead: Does your technical point of contact understand what the next steps are? Is funding lined up for that transition? Is the schedule established? Is it clear where the tech insertion is going to happen? "Do we need to accelerate? Or maybe slow down a little bit? Do we know who those other customers may be? Because in three to five years there's always the challenge that maybe the program you're intended for won't be there. Who might be my other customers? Who can I adapt this technology for, and can they use it?"

Putnam pointed out that program office representatives also need to plan ahead for successful SBIR/STTR transition. "Sometimes we're surprised by success, we don't have funding in place or we don't have plans in place for testing and so on. So we ask that you plan ahead for SBIR/STTR transition."

Kenny emphasized that businesses and the Navy need to "commit to work together to continue to build effective and lasting partnerships that identify, promote and deliver key innovations to our warfighters." The SBIR/STTR program effectively leverages the intellectual capacity, the intuition and the innovation of small businesses to bring technology to Sailors and Marines, enabling them to win the fight when called upon.

## **NAVSEA OSBP Assists Small Businesses with Transition**

By Jonathan Leggett, Navy STP Events Team Lead

"NAVSEA is definitely open for small business" was the message Anne Bannister, director of the Naval Sea Systems Command's (NAVSEA's) Office of Small Business Programs (OSBP), delivered during the NAVSEA Forum for SBIR/ STTR Transition to small businesses



Anne Bannister, director of the Naval Sea Systems Command's (NAVSEA's) Office of Small Business Programs (OSBP)

with Navy SBIR and STTR contracts. For FY20, Bannister's office oversaw \$3.87B in small business prime obligations at NAVSEA, up from \$3.34B in FY19.

During her presentation at the virtual event, Bannister announced that the NAVSEA OSBP is offering virtual "meet and greet" sessions with small businesses, allowing them to introduce their companies and their SBIR/STTR technology capabilities that could benefit any of the NAVSEA program offices. Small businesses can learn more about their target program offices and find information about that program's long range acquisition forecasts.

Currently, the NAVSEA OSBP meets with small businesses every Thursday in 30-minute blocks and an appointment can be made by sending an email to <u>NAVSEA\_</u> <u>SMALL\_BIZ.fct@navy.mil</u>. These meetings also help the NAVSEA OSBP become aware of emerging technologies and help ensure that the program office's acquisition plans properly take into account technologies being developed as an SBIR or STTR.

Bannister recommends that small businesses do their homework prior to coming in to talk with her office. Small businesses need to educate themselves on NAVSEA's mission and the target platforms their technologies can benefit. Small businesses should bring in a company capabilities presentation and be prepared to talk through it. If small businesses know the program office that their target platform falls under, they should come prepared to discuss their transition strategy. If the program office is unknown, the NAVSEA OSBP can assist in making that determination and make introductions.

The role of the NAVSEA OSBP is to ensure that NAVSEA is in full compliance with the small business act as well as other related public laws and executive orders. NAVSEA is the largest of the Navy's system commands and is comprised of command staff, headquarters and directors, affiliated Program Executive Offices and 21 field activities. The NAVSEA OSBP also advises over 100 supporting acquisition program offices in how to contract with small businesses.

Bannister went on to clarify that NAVSEA OSBP does not align with the Small Business Administration, but rather aligns directly to the commander of NAVSEA, VADM William Galinis. This allows her office to focus on NAVSEA's mission to buy, build, deliver, and maintain the nation's fleet and to assist small businesses in navigating the numerous NAVSEA program offices.

Additionally, Bannister noted that while the deputy program managers (DPMs) are the designated small business advocates for their acquisition programs at NAVSEA, they might not always have time to immediately meet with small businesses. This is where the NAVSEA OSBP could assist with an introduction to the DPM and other program stakeholders to help small businesses' transition efforts.

Other ways that NAVSEA OSBP ensures successful Phase III transitions include:

- Providing guidance to small businesses seeking information on how to enter NAVSEA's marketplace
- Reviewing acquisition strategies for compliance to SBIR Phase III policies
- Educating requirement holders and

the contracting community on how to conduct Phase III awards

- Reviewing small business Coordination Records (DD 2579s) submitted for review for SBIR/STTR compliance
- Checking that program offices properly record SBIR Phase III awards
- Ensuring that capabilities and technologies developed by SBIR firms are considered as part of market research

Each of the Navy's 10 buying system commands have their own office of small business programs, with their own director. These OSBPs align to the mission of their specific command. The full list of Navy System Command OSBPs and directors' contact information can be found in the table accompanying and at <u>https://www. secnav.navy.mil/smallbusiness/Pages/</u> default.aspx.

System Command	SYSCOM OSBP Director	Email	Website
HQ/ Marine Corps I&L	Mr. Carlton Hagan	<u>carlton.hagans@usmc.mil</u>	https://www.secnav.navy.mil/ smallbusiness/Pages/hqmc.aspx
Marine Corps System Command	Mr. Kyle Beagle	kyle.beagle@usmc.mil	https://www.secnav.navy.mil/ smallbusiness/Pages/mcsc.aspx
Military Sealift Command	Ms. Leah Baker	leah.baker@navy.mil	https://www.secnav.navy.mil/ smallbusiness/Pages/msc.aspx
Naval Air Systems Command	Mr. Shelby Butler	<u>shelby.butler@navy.mil</u>	https://www.secnav.navy.mil/ smallbusiness/Pages/navair.aspx
Naval Facilities Engineering Command	Ms. Bianca Henderson	bianca.d.henderson@navy.mil	https://www.secnav.navy.mil/ smallbusiness/Pages/navfac.aspx
Naval Sea Systems Command	Ms. Anne Bannister	patricia.bannister@navy.mil	https://www.secnav.navy.mil/ smallbusiness/Pages/navsea.aspx
Naval Supply Systems Command	Mr. Chris Espenshade	christpher.m.espens@navy. mil	https://www.secnav.navy.mil/ smallbusiness/Pages/navsup.aspx
Naval Information Warfare Systems Command	Mr. Daniel Deconzo	daniel.deconzo@navy.mil	https://www.secnav.navy.mil/ smallbusiness/Pages/navwar.aspx
Office of Naval Research	Ms. Ellen Simonoff (acting)	ellen.simonoff@navy.mil	https://www.secnav.navy.mil/ smallbusiness/Pages/onr.aspx

### NAVSEA Helps SBIR/STTR Companies Transition Technologies to Fleet

By Jennifer Reisch, Navy STP Managing Editor

"There's nothing clean about transition. You can't develop a one-size-fits-all transition template because each program office goes about their business differently," said Bob Mitchell, SBIR/STTR program manager for Team Ships during a panel at the NAVSEA Forum for SBIR/STTR Transition Focused Technologies Event (NAVSEA FST Days), held virtually in January.

While panel members could not provide a single, concrete, multi-step path to transition, they did share many tips and best practices to help companies increase the likelihood of commercializing their technologies. "In practice no two SBIR efforts or technology development efforts will follow the same path, but in principle there are some key attributes or things that need to be done to be ultimately successful," said Elizabeth Madden, director of science and technology at Program Executive Office Unmanned and Small Combatants (PEO USC).

Make sure your company is clear on what the Navy is interested in. Madden said the Navy wants "Innovative ideas and solutions with an overall focus on reducing lifecycle costs and improving or maximizing operational availability. So the old RMA—reliability, maintainability, availability—are really key focus areas for our PEO."

Be sure you understand where government is coming from, the government program and what's driving them, said Douglas Marker, technology manager for the Navy Program Executive Office Integrated Warfare Systems (PEO IWS). "Make sure you come up with a product that will be very beneficial and will meet the requirements of the program manager. "Make sure that your product will meet the costs of what it's replacing—make sure it's not too expensive to build," said Marker. "Technology has to be ready on time."





Douglas Marker, technology manager for the Navy Program Executive Office Integrated Warfare Systems (PEO IWS)

power considerations or cost savings while making sure that you meet those form, fit and function system requirements all at the right time within the actual program office acquisition schedule. You need to work with all these entities equally to ensure the transition is being aligned properly and you're allowing the transition target's deputy program manager to be your advocate as

you align those funds, contract, schedule and the performance of your technology," detailed Ryan Blondino, technology manager for NAVSEA headquarters.

There are several key stakeholders that small



Ryan Blondino, technology manager for NAVSEA headquarters

businesses should be working with very closely to help ensure technology reaches Phase III. These include deputy program managers, TPOCs, contracting officers, members of the sponsoring program management office, the technical warrant holder, and SBIR/STTR managers in the PEO and SYSCOM.

It is important to build strong relationships and work with all your stakeholders. "Understand their perspective. Understand what's motivating them to be interested in your technology and what they need to see to determine that next step. Be responsive. If they call pick up the phone. If they need something, answer. You want to be there. Develop a transition plan early with a sound business case. Begin with the end in mind.

SBIR efforts span a significant period of time, so sometimes where you thought you might go when you started might be a little bit different when you get there," said Madden.

"One of the things that successful companies do is they ask questions. Where does this ship? What is your vision of how this thing works? What is your

expectation? What are the guidelines? What is the form, fit and function? All those kinds of questions need to be asked and you need to ask them early in your project. Continue asking questions to be sure you are going to hit the mark as far as what's needed," advised Marker.

Be sure you are always working toward transition. Small businesses need to understand how important it is to plan for transition early, said Mitchell. Sometimes small businesses will need to team with a prime contractor to get a contract. Some items, such as paints or retrofit kits, need to get on a qualified products list with a national stock number assigned. Things need to be approved far ahead of schedule and must meet the availability of the ship. "It is absolutely critical that you are planning to move toward transition throughout the entire project. Beyond helping you technically, your TPOC can be your conduit to your true customers," Blondino said. "One of the things we like to stress is that you work with your TPOC and your technology manager to identify invested transition targets or even backup ones in case something should fall through."

"When you get your contract and you're developing your product you know where we want it to land. But things happen," said Marker. "The landing place may have disappeared or become very weak. When

that happens in IWS we strive to work with the companies to see if we can't find another way to help the company get something transitioned. But the companies need to be self-advocates; they need to market their products. It could be within the PEO, within the same SYSCOM, within the Navy. But there's no reason you can't go to the Army or

the Air Force or Marine Corps or the private sector."

While small businesses have a lot to do to keep their SBIR/STTR technologies moving forward, there are several advantages to working with SBIR/STTR companies for the Navy.

Blondino explained that Phase III contracts don't require justification and approval (J&A). They also don't require advanced publication or notice. This makes it easier and faster for the Navy to contract with SBIR/STTR companies than other organizations. The government can reach back to past projects to solve current problems. Offices can come back and make a Phase III award for further research and development or implementation of previously developed SBIR/STTR

"It is absolutely critical that you are planning to move toward transition throughout the entire project."

Ryan Blondino, technology manager for NAVSEA headquarters technology, even across agencies.

Do not hesitate to promote your own technology and capability. "No one is a better advocate for your ideas than you. No one understands it more and certainly no one is as passionate about it as you are," Madden said.

According to Blondino, "In your efforts to transition your technology you need to be your own biggest advocate. When you're talking to your TPOC or your transition target or technical warrant holder you'll increase the likelihood of success if you come equipped with reasons why you're beneficial to them. One thing to always keep pushing is that you're an affordable and innovative asset to solve a number of their unsolved problems. You also provide them exponentially faster contracting avenues."

"Take responsibility to market your product in other places. Don't forget that you have a responsibility to the organization that established the topic. That's your first focus but you also have a responsibility to yourself and to the Navy to market your wares somewhere else because they can be used someplace else," Marker explained.

"You can only help yourself by bragging about success," Mitchell advised.

#### **Resources Available for SBIR/STTR Transition**

Ryan Blondino, technology manager for NAVSEA headquarters, shared several resources for small businesses to download and study. "Seriously consider some of the recommendations that they make because it can help you align a lot of your resources, and align your contracts, the funding and the desire for the technology into a coherent timeline that will enable your transition target to execute that phase III contract on a timeline that fits their needs and your technology development schedule. It's all about working cohesively with all of your key stakeholders and utilizing these guidebooks and recommendations to their maximal effects."

#### DON SBIR/STTR Phase III Guidebook Ver 2.0 - March 2020

This guidebook increases awareness, understanding, and compliance with government requirements on the part of SBCs, PMs/DPMs, acquisition personnel, KOs, Program Executive Offices (PEOs), and prime contractors. This document details the path to transitioning SBIR/STTR technologies into government programs and industry.

https://www.navysbir.com/docs/DON-SBIR\_STTR\_Phase-III\_Guidebook\_V2-2020.pdf

#### Power of the Reachback

A guide to mining the SBIR/STTR inventory for solutions to technical challenges. Reachbacks contribute technologies of value to the fleet and force with efficiencies of cost, schedule, and performance. This guide details SBIR program rules and procedures specific to reachback opportunities.

https://www.navysbir.com/presentations/Reachback\_Tutorial-4-29-16.pdf

#### Defense Contractors SBIR Partnering Manual

This tool's goal is to facilitate small/large business partnering, reduce technology transition risks, and improve timely and cost-effective technology insertions in Navy and DoD programs. This manual, written with industry business models in mind and based on extensive interviews, offers a tool suite for strengthening internal SBIR/STTR efforts.

https://www.navysbir.com/docs/Navy\_Partnering\_Manual\_public\_release.pdf

Other resources are also located at https://www.navysbir.com/



## Lockheed Martin Works with Small Businesses to Advance Technology

By Orysia Buchan and Craig Owens, Lockheed Martin

The Small Business Innovation Research / Small Business Technology Transfer (SBIR/ STTR) program has always been a balancing act between the highly technical technology maturation



Craig Owens, Small Business Innovation Research Program Manager at Lockheed Martin

effort of the projects originated in it and the small businesses charged with executing these projects. "In a perfect world, a successful project will transition a technology to a program of record at the conclusion of the phase II effort. But if 2020 proved anything, it's that we don't live in a perfect world and usually more diligent work needs to be done to ensure the intended successful transition of a technology from SBIR/STTR to support the warfighter. Collaborating with a partner that has a vested interest in the ability of an innovative technology to make their product more affordable, perform better, weigh less, etc., is a way to increase the opportunities for an SBIR project to succeed," said Craig Owens, Small Business Innovation Research

program manager at Lockheed Martin.

Partnering with Lockheed Martin on an SBIR/STTR project has proven very successful for many small businesses during the past few years, as the company has a



Orysia Buchan, Corporate Supplier Diversity Government Programs Manager at Lockheed Martin

dedicated SBIR team that is made up of the right people with the necessary skillset to collaborate and lead a small business through some of the difficulties of transitioning technology within the DoD, explained Orysia Buchan, Lockheed Martin's corporate supplier diversity government programs manager. "Lockheed Martin's SBIR team is made up of technical leads that work at the business area level and understand the wide range of technology disciplines and have also built relationships within the SBIR/STTR customer community. These business area technical SBIR leads are complemented by a team of small business professionals that possess an understanding of how to work most effectively with small business."

Whether working as a subcontractor or a technology mentor, Lockheed Martin provides small businesses with various assistance during different phases of their SBIR/STTR projects, including supporting technology requirements, evaluation, co-development, and insertion into larger systems.

Lockheed Martin engages with small businesses through the SBIR/STTR programs to assist small businesses in the development of novel and innovative technologies to bring these emerging technologies to the company's products and services. The company benefits from SBIR/STTR partnerships by leveraging

federal agency research and development funding to assist with the advancement of novel technologies that align with current and future program needs. Small businesses obtain technical guidance and mentoring from Lockheed Martin to assist in maturing and commercializing their technologies with the small business community.

Companies interested in partnering with Lockheed Martin can follow these simple steps:

 Click <u>https://www.lockheedmartin.</u> <u>com/en-us/suppliers/sbir/sbir-</u> <u>contact.html</u> to self-register your company-tell us about your strengths and capabilities.

Lockheed Martin will add your company to its internal SBIR distribution list to receive information on the latest solicitation topics of interest. The purpose of this listing is to help connect small business

"Lockheed Martin's SBIR team is made up of technical leads that work at the business area level and understand the wide range of technology disciplines and have also built relationships within the SBIR/STTR customer community."

Orysia Buchan, Lockheed Martin's corporate supplier diversity government programs manager. companies with the appropriate Lockheed Martin technical point of contact to explore opportunities for partnership and innovation.

If your firm has interest in a specific topic and is considering submitting a proposal and would like to seek Lockheed

for business growth. Lockheed Martin's participation in the programs introduces cost savings and innovation through advanced research techniques, refines and retools products using cutting-edge technology, and increases supplier diversity through strong working relations

Martin's support through a letter of support and/or other collaborative opportunity, Lockheed Martin then asks each company to send one email with a completed quad chart addressed to all the points of contact listed on that particular topic.

- 2. If your firm gualifies for the Federal program, has an SBIR/STTR technology project or concept that is compatible with Lockheed Martin technologies and is interested in partnering with Lockheed Martin on the project, let the company know by completing the Lockheed Martin SBIR/STTR chart located at the following link https://www. lockheedmartin.com/content/dam/ lockheed-martin/eo/documents/ suppliers/programs-sbir-sttr-chart. docx and send it to sbir.fc-lmc@lmco. com. Do not send proprietary, export controlled, confidential or classified information.
- For firms that may be interested in other technical, non-SBIR ways to partner with Lockheed Martin, please see the "Avenues for High Tech Firms" document located at <u>https://</u> www.lockheedmartin.com/content/ dam/lockheed-martin/eo/documents/ suppliers/programs-sbir-avenues-htfirms.pdf.

Lockheed Martin has had a lasting and beneficial relationship with the Navy SBIR program. "The Navy is not only an important customer, but in pursuing SBIR collaboration between Lockheed Martin and small business, they are very much an active teammate as well. Our SBIR team recently attended the first 2021 Navy Forum for SBIR Transition, and it was an excellent virtual event that allowed us to identify relevant technologies and make the connections necessary to continue the goal of transitioning technology to the warfighter," Owens said. Buchan added, "The Navy SBIR team is always willing to assist us and help with our collaboration efforts with the small businesses. Whether it's Bob Smith, a lead at one of the Navy SYSCOMs, or someone on the FST transition team, the Navy SBIR community is and always has been a great teammate to us in the SBIR program."

Moving forward, Lockheed Martin will continue to augment its research and development program needs by leveraging small business innovations to stay on the cutting edge of innovation. Demonstrated through previous and current work with small businesses, the company's innovation and expertise help keep Lockheed Martin at the forefront of industry.



www.lockheedmartin.com

## **Accelerating Innovation Through Supplier Diversity**

By Raytheon Missiles & Defense Supplier Innovation Team

At Raytheon Missiles & Defense (RMD), a business of Raytheon Technologies, we provide the industry's most advanced end-to-end solutions to detect, track and engage threats. We never stop innovating; our broad portfolio of advanced technologies makes us uniquely equipped to support the needs of our customers and partners around the globe. In order to deliver these solutions, we rely heavily on our diverse supply base.

Supplier diversity is embedded in how we do strategic sourcing and identify emerging technology partners. We work with small and diverse partners who are often lean, agile, and offer innovative ways to develop and produce our technologies. Having a diverse supply base enables innovation and allows for diversity of thought. To meet the challenges faced by our men and women of the armed services, we must foster an environment of diversity, equity and inclusion. This is more than a goal to do what is right; it is a business imperative.

"Developing relationships with small minority businesses is considered a competitive advantage, not a mandate or requirement. It's a strategic imperative, which leverages our DE&I principals to enable diversity of thought and



John Lozano, Executive Director, Global Supply Chain Management at Raytheon

experience to facilitate cooperative R&D, resulting in accelerated technology insertion," said John Lozano, executive director, Global Supply Chain Management.

In addition to our supplier diversity initiatives, our Supplier Innovation and Mentor-Protégé programs enable us to attract, develop and retain a diverse supply base. Proactive outreach to small business is one of the ways we expand our partner database. Through Small Business Innovation Research (SBIR) events, the Supplier Innovation team connects with small business innovators, which then leads to technical exchanges between the small business subject matter experts (SMEs) and their counterparts at RMD.

Outreach, mentor-protégé and SBIR initiatives are a joint journey between the Department of Defense customer, Raytheon Technologies programs, engineers and supply chain professionals, and small businesses. RMD's role in this journey leads to supporting more than 80 successful SBIR topic engagements each year. RMD technical SMEs evaluate SBIR Broad Agency Announcements (BAAs) to identify those that align with product technology needs. SMEs then identify topics of interest and circulate them within the RMD small business innovation community to identify synergy and opportunities for collaboration. In turn, we consider small businesses' proposed solution's potential benefit and viability in our roadmap of known product or system applications that may result in prospective innovation partnerships. (Small businesses interested in joining this community should reach out to us through our representatives at rmd. supplier.innovation@rtx.com.)

Our U.S. Navy customer helps lead us through this joint journey of innovation. Navy SBIR/STTR Transition Program (Navy STP) provides matchmaking opportunities through Forum for SBIR/ STTR Transition (Navy FST) focused technology events. These events provide increased interaction to identify new potential SBIR research applications. This results in increased insertion opportunities and program reach-back



Bob Smith (left), Director DoN SBIR/STTR programs, talking with small businesses at Raytheon SBIR/STTR Commercial Readiness Program Technology Interchange Meeting (2019) alongside Air Force SBIR colleague Jim Sweeney III

that leverages previously funded efforts. The Navy approach to SBIR BAA inputs and its efficiency in awarding SBIR projects rapidly has kept pace with the speed of innovation needed. Access to information on Navy websites and personnel facilitate an efficient process. Navy efforts in SBIR education through Navy League and the various SBIR center managers, even during the pandemic, have helped make engagements effective.

"As a Mission Capabilities provider, RMD values and respects the Navy SBIR-enabled partnerships with small businesses in a significant way. We view it as a natural extension of our engineering teams' bench strength. It is also an important element of our ability to innovate and address evolving threats and expanding mission requirements. A key contributor is the inherent diversity of thought, cultures and unique methods and experience that the Navy and small business teams bring to our development process," said Jim Barry, RMD technology director.

RMD also helped initiate a best practice with Navy SBIR and program teammates, seeking to advance new capabilities exponentially via collaboration across technology domains. Combining separate SBIR efforts in concert can yield advances in the way the Navy conducts missions. By addressing a range of technical risks funded by a portfolio of SBIR and RIF projects (Sailor-safe power/ energy, undersea image processing, new munitions, and machine learning) we've been able to evolve effectiveness and affordability of mission CONOPS in synch with Navy stakeholders and warfighters. Thanks to NavalX, and its outstanding 401 TechBridge, RMD's SBIR leaders discovered in 2020: 1) new technology/

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capabilities of an SBIR partner and 2) an emerging small business that RMD then mentored toward receiving their first Phase II Navy SBIR win.

RMD is a fully engaged industry partner with the Navy's SBIR and STP teams. Our recent engagements have included sponsorship of the 2019 Navy FST event at UMass Lowell, the 2019 and 2020 NAVSEA SBIR Topics Workshops, as well as presenting on the Navy FST's Business Development Webinar Series. In addition, RMD has been a core industry participant in the NavalX 401 Tech Bridge startup in the Northeast as well as a regular sponsor of TechConnect Innovation Conferences.

## Raytheon Missiles & Defense

https://www.raytheonmissilesanddefense.com/



## Upcoming Events

Date	Event & Link	Location		
May 12-13	Unmanned Maritime Systems Technology 2021 Conference	Virtual		
	https://www.asdevents.com/event.asp?id=22074			
May 17-21	SOFIC (Special Operations Forces Industry Conference)	Tampa, Fla.		
	https://www.sofic.org/			
May 25-27	14th International Mine Technology Symposium	Virtual		
	https://minwara.org/symposium/			
June 7-10	CLEANPOWER 2021 Conference & Exhibition	Indianapolis		
	https://www.cleanpowerexpo.org/			
June 7-11	2021 AIAA Aviation and Aeronautics Forum and Exposition (2021 AIAA Aviation Forum)	Washington, DC		
	https://www.aiaa.org/aviation			
June 15-16	World Aviation Training Summit	Orlando, Fla.		
	https://www.wats-event.com/			
July 19-22	2021 Annual Modeling and Simulation Conference	Fairfax, Va. And		
	https://scs.org/annsim/	Virtual		
July 20-21	Submarine Technology Symposium	Johns Hopkins		
	https://www.navalsubleague.org/events/submarine-technology-symposium/	APL, Md.		
July 18-21	IEEE International Conference on DC Microgrids	Virtual		
	https://attend.ieee.org/icdcm-2021/			
July. 27-28	Border Security Expo	San Antonio		
	https://www.bordersecurityexpo.com/			
July 27-30	Conference on Uncertainty in Artificial Intelligence (UAI)	Virtual		
	https://auai.org/uai2021/			
July 28-31	Marine Corps Aviation Association (MCAA) Annual Symposium	San Diego		
	https://www.flymcaa.org/annualsymposium			
Aug. 1-4	Sea-Air-Space Maritime Expo	National		
	https://seaairspace.org/	Harbor, Md.		
Aug. 12-13	2020 Joint Composite & Advanced Materials Sustainment Annual Meeting	Virtual		
	https://www.ncms.org/events/jcams/			
Aug. 12-13	Electric Vehicles Battery Tech USA 2021	Long Beach,		
	https://usa.battery-technology-conference.com/	Calif.		
Sept. 20-23	3 Global OCEANS 2021			
	https://www.oceansconference.org/			

## Phase III Navy Contracts

The following table, provided by the Office of Naval Research, reports federal FY20 Phase III awards that originated from U.S. Navy SBIR/STTR topics. Small businesses may also receive many Phase III awards directly from state governments, DoD prime contractors and others in the private sector, which are not reported below.

				1	No.N
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~	AF192-001 (AFWERX)	ANSOL INC.	47QFLA-20-F-0322	\$1,456,730.77	USAF Topic
	Multiple	APTIMA, INC.	47QFLA-20-F-0101	\$1,028,846.15	USAF Topic
	N06-106	FIRST RF CORPORATION	N68335-17-G-0050	\$28,699.51	MARCOR
Ю.	N05-039	FRONTIER TECHNOLOGY INC.	M67854-20-D-6517	\$5,000.00	NAVSEA
RC	N142-086	HYPERION TECHNOLOGY GROUP INC.	M67854-20-C-6702	\$2,961,330.00	MARCOR
M	AF 183-005 (AFWERX)	SABEL SYSTEMS TECHNOLOGY SOLUTIONS, LLC	47QFLA-19-F-0212	\$2,819,640.00	USAF Topic
	AF191-005 & AF103-054	SEHLKE CONSULTING LLC	47QFLA-20-F-0054	\$5,879,729.60	USAF Topic
	N153-129	WINDLIFT LLC	N00173-20-C-2026	\$2,896,059.00	MARCOR
MCS	SC Count		8		
MCS	SC Total			\$17,076,035.03	
	AF071-320	(ES3) ENGINEERING & SOFTWARE SYSTEM SOLUTION, INC.	N68335-20-C-0315	\$5,768,554.14	NAVAIR
	N03-074	ADVANCED ACOUSTIC CONCEPTS LLC	N61340-20-C-0028	\$9,599,727.00	NAVSEA
	N093-164	AEROSPACE MASS PROPERTIES ANALYSIS INC	N68335-18-C-0180	\$2,286,369.60	NAVAIR
	N00-123	AMERICAN SYSTEMS CORPORATION	N68335-14-G-0057	\$10,486,372.81	NAVSEA
	N08-T004	APTIMA, INC.	N61340-18-C-0020	\$1,352,636.00	NAVAIR
	N08-T004	APTIMA, INC.	N61340-20-C-0017	\$729,206.00	NAVAIR
	N091-037	ARCHITECTURE TECHNOLOGY CORPORATION	N68335-20-C-0542	\$79,982.67	NAVAIR
	N132-099	ARCHITECTURE TECHNOLOGY CORPORATION	N68335-20-G-1044	\$549,972.13	NAVAIR
	N151-022	ATMOSPHERIC PLASMA SOLUTIONS, INC.	SPMYM2-20-P-2620	\$214,040.00	NAVAIR
	N151-021	CHESAPEAKE TECHNOLOGY INTERNATIONAL CORP.	N68936-18-G-0006	\$2,734,831.51	NAVAIR
	N121-045	CHESAPEAKE TECHNOLOGY INTERNATIONAL CORP.	N68335-18-C-0003	\$498,369.00	NAVAIR
	N101-018	CORNERTURN LLC	N68335-18-D-0002	\$456,000.00	NAVAIR
¥	N06-T023?	CREARE INCORPORATED	N68335-18-D-0067	\$12,965,603.91	NAVAIR
AN	N04-225	CREARE INCORPORATED	N68335-18-G-0020	\$1,797,982.32	NAVAIR
A	OSD14.1-AU4	EDGE CASE RESEARCH, INC.	N68335-20-C-0160	\$1,100,320.07	NAVAIR
	AF071-059	FIRST RF CORPORATION	FA8750-17-F-0134	\$491,623.00	USAF Topic
	Multiple	FRONTIER TECHNOLOGY INC.	GSQ051-6B-M-0040	\$3,816,690.47	USAF Topic
	N132-096	FRONTIER TECHNOLOGY INC.	N68335-16-G-0014	\$2,915,830.03	NAVAIR
	OSD08-CR3	FRONTIER TECHNOLOGY INC.	N68335-17-G-0024	\$1,490,126.00	NAVAIR
	MDA09-021	FRONTIER TECHNOLOGY INC.	N68335-17-G-0025	\$2,237,040.00	NAVAIR
	N151-015	FUSE INTEGRATION INC.	N68335-17-G-0055	\$4,966,911.35	NAVAIR
	N04-174	GBL SYSTEMS CORPORATION	N68335-15-G-0026	\$5,468,198.00	NAVAIR
	N102-182	HYDRONALIX INC.	N68335-14-G-0039	\$78,318.00	NAVAIR
	AF112-144	IMSAR LLC	N68335-18-G-0015	\$29,100,477.40	NAVAIR
	N07-034	INNOVATIVE DEFENSE TECHNOLOGIES LLC	N68335-15-G-0039	\$6,279,525.87	NAVAIR
	N171-012	INNOVATIVE DEFENSE TECHNOLOGIES LLC	N68335-19-G-0036	\$9,403,719.00	NAVAIR
	N07-122	INOVATI	N68335-20-C-0364	\$1,592,442.00	NAVAIR

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	N121-061	JARDON & HOWARD TECHNOLOGIES INCORPORATED	N61340-19-C-0030	\$5,800.00	NAVSEA
	N02-152	L3 ADAPTIVE METHODS INC.	N68335-15-G-0018	\$2,600,000.00	NAVAIR
	NOAA172-832	L3 LATITUDE LLC	N68335-19-G-0060	\$855,113.00	NOAA
	N131-065	LAMBDA SCIENCE INC.	N68335-15-G-0033	\$388,510.00	ONR
	N132-093	LYNNTECH, INC.	N61340-20-C-0043	\$2,780,605.00	NAVAIR
	AF151-023	MAKEL ENGINEERING, INC.	N68335-20-C-0612	\$2,824,727.00	NAVAIR
	N06-036	MERCURY COMPUTER SYSTEMS INC.	N68335-17-G-0017	\$16,505,285.12	NAVAIR
	N141-019	MONTEREY TECHNOLOGIES INC.	N68335-18-G-0034	\$1,194,728.50	NAVAIR
	N04-266	NAVMAR APPLIED SCIENCES CORPORATION	N68335-14-G-0040	\$3,948,841.65	NAVAIR
	N101-042	NAVMAR APPLIED SCIENCES CORPORATION	N68335-15-G-0013	\$3,133,380.49	NAVAIR
	N06-125	NORTH STAR SCIENTIFIC CORPORATION	N68335-18-C-0021	\$351,855.54	NAVWAR
	N06-125	NORTH STAR SCIENTIFIC CORPORATION	N68335-19-G-0037	\$25,166,999.44	NAVAIR
	N94-024	NORTHROP GRUMMAN CORPORATION	N00019-17-C-0005	\$133,752.78	NAVAIR
	N94-024	NORTHROP GRUMMAN CORPORATION	N00019-17-G-0011	\$523,835.00	NAVAIR
	N94-024	NORTHROP GRUMMAN CORPORATION	N00019-19-C-0050	\$112,588,028.47	NAVAIR
	N103-205	OCEANIT LABORATORIES INC.	N68335-16-G-0028	\$8,900,000.00	NAVAIR
	N102-1229	PHYSICAL OPTICS CORPORATION	N68335-16-D-0027	\$18,318,025.24	NAVAIR
	N152-096	PHYSICAL OPTICS CORPORATION	N68335-17-G-0032	\$22,913,312.06	NAVAIR
	N091-003	PHYSICAL OPTICS CORPORATION	N68335-19-G-0041	\$17,783,583.00	MARCOR
~	N102-129	PHYSICAL OPTICS CORPORATION	N68335-20-D-0032	\$3,677,536.08	NAVAIR
A	N121-045	PROGENY SYSTEMS CORPORATION	N68335-17-G-0054	\$4,498,726.80	NAVAIR
<b>A</b>	N98-035	R D A INC	N68335-14-G-0003	\$2,629,095.00	NAVAIR
Ż	N98-035	R D A INC	N68335-20-G-3039	\$1,002,864.07	NAVAIR
	N131-017	RAM PHOTONICS LLC	N68936-18-G-0005	\$1,902,000.00	NAVAIR
	N96-061	REYNOLDS SYSTEMS INC.	N68936-18-G-0004	\$129,064.29	NAVAIR
	N101-026	SAFE, INC.	N68335-20-C-0220	\$2,980,000.00	NAVAIR
	N112-127	SCIENTIFIC SYSTEMS COMPANY INC.	N68335-15-G-0030	\$50,000.00	NAVAIR
	N101-014	SEALANDAIRE TECHNOLOGIES INC.	N68335-20-G-1049	\$370,770.00	NAVAIR
	N101-014	SEALANDAIRE TECHNOLOGIES INC.	N68335-20-C-0221	\$2,932,004.00	NAVAIR
	N121-044	SENSORMETRIX	N68335-20-C-0198	\$2,600,000.00	NAVAIR
	N101-005	SIGNAL SYSTEMS CORPORATION	N68335-15-G-0032	\$1,481,396.00	NAVAIR
	N04-007	SIGNAL SYSTEMS CORPORATION	N68335-20-G-1062	\$743,000.00	NAVAIR
	SB162-004	SIMBA CHAIN INC.	N68335-19-G-0045	\$109,679.00	NAVAIR
	N142-090	SOAR TECHNOLOGY, INC.	N61340-19-C-0015	\$153,737.06	NAVAIR
	N142-090	SOAR TECHNOLOGY, INC.	N68335-20-C-0201	\$2,999,988.00	NAVAIR
	N08-006	TECHNICAL DATA ANALYSIS INC.	N68335-16-G-0009	\$227,992.71	NAVAIR
	AF083-139	TECHNOLOGY SERVICE CORPORATION	N68335-20-C-0535	\$2,982,366.00	USAF Topic
	Multiple	TECHNOLOGY SERVICE CORPORATION	N68335-20-C-1002	\$2,940,092.00	USAF Topic
	AF141-253	TECHNOLOGY SERVICE CORPORATION	N68335-20-G-1045	\$1.355.433.00	NAVAIR
	N111-016	TOYON RESEARCH CORPORATION	N68335-17-G-0026	\$750,000.00	NAVAIR
	N131-016	TRITON SYSTEMS INC.	N68335-15-G-0031	\$243,420.96	NAVAIR
	N02-079	TRIVERUS LLC	N00019-19-C-0064	\$1,721,513.81	ONR
NAV	AIR Count		69		
NAV	AIR Total			\$397,857,929.35	

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	Multiple	ADVANCED ACOUSTIC CONCEPTS LLC	N00024-19-C-6311	\$21,358,399.48	NAVSEA
	N03-074	ADVANCED ACOUSTIC CONCEPTS LLC	N61340-16-C-0004	\$184,473.36	NAVSEA
	N05-149	ASSET INC.	N00024-16-C-6421	\$2,387,477.16	NAVSEA
	AF192-001 (AFWERX)	ANSOL INC.	47QFLA-20-F-0269	\$820,192.31	USAF Topic
	N08-111	APTIMA INC.	N00178-18-D-9003	\$3,212,056.00	ONR
	N06-013	ARETE ASSOCIATES	N61331-18-D-0012	\$27,381,796.02	NAVSEA
	N122-141	ARETE ASSOCIATES	N66001-20-C-0025	\$7,926,627.78	ONR
	N07-108	BEACON INTERACTIVE SYSTEMS	N00039-18-C-0034	\$3,144,985.00	NAVSEA
	N121-046	BEAM-WAVE RESEARCH INC	N00173-18-C-2013	\$150,000.00	NAVSEA
	AF193-CSO1	BILT INCORPORATED	47QFLA-20-P-0008	\$190,000.00	USAF Topic
	N04-081	C3I INC	N68335-17-G-0011	\$4,828,022.57	NAVSEA
	N181-059	CORVID TECHNOLOGIES INC.	N00173-20-C-2023	\$500,000.00	NAVSEA
	N00-123	DDL OMNI ENGINEERING, LLC	N61340-20-C-0018	\$2,969,459.60	NAVSEA
	N02-133	ELECTRO STANDARDS LABORATORIES	N68335-20-C-0223	\$2,938,331.00	NAVSEA
	N05-039	FRONTIER TECHNOLOGY INC.	N00174-19-D-0006	\$1,248,017.00	NAVSEA
	N04-091, N07-010	FRONTIER TECHNOLOGY INC.	N63394-17-D-0003	\$5,552,188.63	NAVSEA
	N05-039	FRONTIER TECHNOLOGY INC.	N64267-20-D-0041	\$11,007,817.47	NAVSEA
	A13-058	GOMEZ RESEARCH ASSOCIATES INC.	N00174-19-C-0021	\$10,000,000.00	Army
	N161-043	INNOVATIVE DEFENSE TECHNOLOGIES LLC	N00014-19-C-1054	\$28,115,601.00	NAVSEA
	N05-163	INNOVATIVE DEFENSE TECHNOLOGIES LLC	N00024-17-G-4115	\$185,877.83	ONR
4	N01-137	ITA INTERNATIONAL LLC	N50054-19-P-1061	\$542,512.72	ONR
SE	N06-109	L3 ADAPTIVE METHODS INC.	N00024-15-C-5220	\$1,539,396.28	NAVSEA
A	N03-146	L3 ADAPTIVE METHODS INC.	N00024-15-C-5252	\$1,391,818.07	NAVSEA
Z	Multiple	L3 ADAPTIVE METHODS INC.	N00024-20-C-5211	\$8,065,148.09	NAVSEA
	N03-146	L3 ADAPTIVE METHODS INC.	N00039-17-C-0043	\$3,312,687.96	NAVSEA
	N03-146	L-3 CHESAPEAKE SCIENCES CORPORATION (L3HARRIS)	N00039-18-C-0024	\$1,690,019.91	NAVSEA
	N11A-T017	MAKAI OCEAN ENGINEERING INC.	N00039-18-C-0016	\$811,650.00	NAVSEA
	N05-054	MATERIALS SCIENCES LLC	N65540-15-D-0011	\$4,546,674.49	NAVSEA
	N121-92	MI TECHNICAL SOLUTIONS, INC.	47QFLA-19-C-0009	\$11,308,251.11	ONR
	N04-073	MIDE TECHNOLOGY CORPORATION	N64498-16-P-5041	\$86,896.91	NAVSEA
	N04-073	MIDE TECHNOLOGY CORPORATION	N64498-17-D-0013	\$79,510.67	NAVSEA
	Multiple	MIKEL INC.	N66604-20-D-H001	\$8,921,373.61	NAVSEA
	N02-039	MIKROS SYSTEMS CORPORATION	N63394-16-D-0018	\$8,734,198.00	NAVSEA
	A03-070	MONTEREY TECHNOLOGIES INC.	N00024-17-C-5244	\$303,920.23	NAVAIR
	N04-091	NEXGEN COMPOSITES LLC	N61331-16-C-0008	\$1,828,125.57	NAVSEA
	DLA171-002	ORBIS SIBRO, INC.	47QFLA-20-F-0280	\$203,365.38	DLA Topic
	N96-278	PROGENY SYSTEMS CORPORATION	N00024-14-C-5209	\$505.67	NAVSEA
	N98-115	PROGENY SYSTEMS CORPORATION	N00024-15-C-4050	\$348,210.00	NAVSEA
	N98-115	PROGENY SYSTEMS CORPORATION	N00024-16-C-4021	\$1,961,907.00	NAVSEA
	N96-278	PROGENY SYSTEMS CORPORATION	N00024-18-C-6265	\$2,637,309.00	NAVSEA
	N96-278	PROGENY SYSTEMS CORPORATION	N00024-18-C-6410	\$37,758,627.80	NAVSEA
	N96-278	PROGENY SYSTEMS CORPORATION	N00024-19-C-6108	\$922,700.00	NAVSEA
	N96-278, N98-115	PROGENY SYSTEMS CORPORATION	N00024-19-C-6115	\$11,947,058.39	NAVSEA
	N02-024, N98-122	PROGENY SYSTEMS CORPORATION	N00024-19-C-6118	\$8,347,597.74	NAVSEA

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	NOO 040		N00024-19-C-6201	\$15,325,990.00	NAVSEA
	N06-278		N00024-19-C-0207	\$30,001,943.00	
	N08 115/N171 050		N00024-20-C-5215	\$9,490,000.30	
	N05 140		N00004 46 C 6400	\$2,935,957.00	
	Nu0-149 Multiple	RITE-SOLUTIONS INC.	N00024-10-C-0422	\$1,131,338.22	
		SCIENTIFIC SOLUTIONS INC.	N00039-19-C-0062	\$427,000.00	
	NO5 050		N00024-18-C-4006	\$781,203.32	
	NU0-009	SEDNA DIGITAL SOLUTIONS LLC	NUUU24-18-C-6264	\$8,595,494.00	NAVSEA
4	NTTZ-142		N00024-20-C-2410	\$6,306,589.00	NAVSEA
С Ш С	SOCOM96-002		N00167-19-D-0002	\$9,277,989.57	NAVSEA
Å	SUCUM90-002		N65540-15-D-0015	\$687,040.20	NAVSEA
Ż	N004.04C	SIMVENTIONS INC.	N00178-15-D-3001	\$2,831,455.00	NAVSEA
	N05 209		N66001-20-C-0008	\$52,725.00	NAVSEA
	N93-200	SYSTEMS ENGINEERING ASSOCIATES CORPORATION	N66604-11-D-0558	\$110,000.00	NAVSEA
	N03-010	SYSTEMS ENGINEERING ASSOCIATES CORPORATION	N66604-20-D-L000	\$955,488.00	NAVAIR
	NU2-UO2		N00253-19-D-0005	\$511,219.00	
	Nultinle		N00024-19-C-5228	\$1,484,000.00	NAVSEA
		ULI RA ELECTRONICS HOLDINGS PLC	N00024-19-C-6207	\$1,250,000.00	NAVSEA
	NU4-138	ULIRA ELECTRONICS HOLDINGS PLC	N00024-20-D-6202	\$3,365,000.00	ONR
	N98-114	ULIRA ELECTRONICS HOLDINGS PLC	N00174-16-C-0046	\$976,409.29	NAVSEA
	N121-076	ULIRA ELECTRONICS HOLDINGS PLC	N63394-19-C-0007	\$31,601,350.00	NAVSEA
NAV NAV	'SEA Count 'SEA Total		00	\$380 357 725 76	
٩.	N171-077	PREMIER SOLUTIONS HILLC	N00604-20-C-4007	\$459.332.74	NAVSUP
SU				+,	
A					
NAV	SUP Count		1		
NAV	SUP Total			\$459,332.74	
	N06-091	ARETE ASSOCIATES	N66001-19-C-4001	\$632,465.00	NAVWAR
	N112-170	BASCOM HUNTER TECHNOLOGIES INC.	N00039-19-C-0020	\$698,701.44	NAVWAR
۲	N121-106	FUSE INTEGRATION INC.	N00039-20-D-0008	\$811,871.05	NAVWAR
N N	N05-163	INNOVATIVE DEFENSE TECHNOLOGIES LLC	N00039-19-C-0011	\$1,087,814.65	ONR
۲.	N121-103	PROGENY SYSTEMS CORPORATION	N00039-16-D-0006	\$7,609,402.00	NAVWAR
Ż	A04-132	SCALABLE NETWORK TECHNOLOGIES INC.	N66001-17-D-5201	\$2,205,133.36	NAVWAR
	N093-196	SOLUTE	N00039-19-D-0002	\$1,826,629.37	NAVWAR
	AF05-034	VULCAN WIRELESS INC.	N00039-20-C-0009	\$2,955,147.00	NAVWAR
NAV	WAR Count		8		
NAV	WAR Total			\$17,827,163.87	
	N141-U/4	ADVANCED CERAMIC FIBERS, LLC	NNNU6AA01C	\$100,000.00	ONR
	N1/1-U8U	APPLIED RESEARCH IN ACOUSTICS LLC	N00014-20-C-2050	\$85,700.00	ONR
۲ ۲	N141-065	AZURE SUMMIT TECHNOLOGY INC.	N00164-17-D-JT09	\$6,028,953.00	ONR
ō	NU6-072	BASIC COMMERCE & INDUSTRIES INC	N66001-15-D-0061	\$660,586.29	ONR
	NU8-1030	BOSTON ENGINEERING CORPORATION	N00014-19-C-2013	\$470,061.00	ONR
	AF161-91	ECHO RIDGE LLC	N00014-20-C-1002	\$502,975.00	USAF Topic

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	A15A-T010	ELECTRO STANDARDS LABORATORY, INC.	W911NF-18-C-0018	\$48,544.00	Army
	N07-139	H S OWEN LLC	N00014-20-C-2008	\$663,000.00	NAVWAR
	N09-T026	HEAT LIGHT AND SOUND RESEARCH INC.	N00014-17-C-7041	\$132,251.00	ONR
	N121-082	KNEXUS RESEARCH CORP.	N00014-20-C-2007	\$1,290,265.00	ONR
	N131-039	LASERMOTIVE	N00014-19-C-2006	\$5,100,000.00	NAVSEA
N N	N141-072	MATSYS CORPORATION	N00174-18-D-0015	\$1,306,234.63	ONR
ō	DOE 24b	MUONS INC	N00173-20-C-2006	\$322,000.00	DOE
	N152-101	PACIFIC MARINE & SUPPLY CO LTD	N00014-17-C-2035	\$2,968,055.00	NAVSEA
	N151-075	PACIFIC MARINE & SUPPLY CO LTD	N68335-20-C-0002	\$4,806,764.00	ONR
	N07-110	S2 CORPORATION	N65236-20-C-8019	\$4,501,840.00	NAVWAR
	N03-138	THE BOEING COMPANY	N68335-16-G-0046	\$9,397,219.38	ONR
	N01-139	ZIVKO AERONAUTICS INC.	N00421-15-C-0051	\$1,740,015.42	ONR
ONF	R Count		18		
ONF	R Total			\$40,124,463.72	
SN	AF06-016	FRONTIER TECHNOLOGY INC.	GSQ051-7B-M-0245	\$8,962,334.85	USAF Topic
Ő	AF06-016	FRONTIER TECHNOLOGY INC.	GSQ051-7B-M-0271	\$5,024,655.90	USAF Topic
Other	AF112-153	PRETALEN LTD	47QFLA-20-F-0169	\$1,270,294.68	USAF Topic
Oth	er USN Count		3		
Oth	er USN Total			\$15,257,285.43	
Gra	nd Count		172		
Gra	Grand Total \$868,959,935.90				

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