

ARMY APPLICATIONS LABORATORY (AAL)

# SBIR 20.2 TOPIC #A20-D01

# PORTABLE ATOMIC CLOCK

## BACKGROUND ON THE PROBLEM

Precise timing is critical for numerous Army applications, including navigation, communications, surveillance, and synchronization of sensors and systems. Current assured positioning, navigation, and timing solutions rely on acquiring GPS signals, but those signals may not hold precise time for minutes to hours in increasingly contested environments.

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in long-term performance due to various drift mechanisms. Optical atomic clocks have shown superior stability performance but face challenges when used in dynamic environments.

For these reasons, we are looking for development and demonstration of an optical clock that provides a combination of performance and CSWaP that currently deployed atomic clocks cannot offer.

The Army is investigating ways to use advances in portable timing during the past 10-15 years, and wants to enable mission-critical functions by incorporating long-holdover clocks that meet various cost, size, weight, and power (CSWaP) requirements.

Existing technologies have limitations. Chip-scale atomic clocks have impressive stability performance at their current CSWaP, but limitations

## DETAILS ON THE OPPORTUNITY

This is an opportunity of U.S. small businesses to develop a portable (rack-mounted) optical atomic clock that could be used by Army systems.

The clock should feature:

- A volume of < 20 L
- A weight of < 30 kg
- A power rating of < 100 W
- A stability factor of  $< 3 \times 10^{-13}$  at 1 second

This Direct to Phase II SBIR will provide a up to \$1.1M contract to deliver a prototype clock within 24 months. If selected, you will have the option to participate in quarterly Soldier touchpoints with service members who could use what you create.

## BENEFITS OF THIS DIRECT TO PHASE II SBIR

- ✓ Designed for U.S. small businesses (<500 employees)
- ✓ Up to \$1.1M in non-dilutive funding to develop a prototype
- ✓ Relevant Army stakeholder feedback and support
- ✓ Designed for companies with more mature technology
- ✓ Receive robust data rights protections
- ✓ Sole source eligible for potential follow-on awards
- ✓ Participate while maintaining other sources of revenue

# AAL is sponsoring three 20.2 SBIR topics to provide new innovators with up to \$1.1m and a contract with the Army.

## TAPPING AMERICA'S SEED FUND

The Army SBIR program provides federal funding to ensure American small businesses are part of Army research and development. Through SBIR, qualified small businesses can receive non-dilutive capital to produce concepts or solutions that may be too high risk for private investors.

SBIR is designed for companies with fewer than 500 employees that have technology — ranging from idea to prototype — with potential commercial applications. This competitive awards-based program helps businesses with relevant dual-use tech explore their potential while supporting Army priorities. And you only need a DUNS number and the right ideas to get started.

### How it works:

- Three times each year, the Army puts out SBIR topics to help solvers refine their technology and solve our problems.
- We call these three periods "releases," and each release features new and focused challenges.
- There are a range of requirements (and funding) associated with each topic, which come from across the Army.
- The topics for each release are open to the public online, where you can search for and dive into areas of interest.
- Companies that are interested in a specific topic can ask questions during defined periods and apply directly online.

## AAL + ARMY SBIR

AAL uses the Army SBIR program as part of our integrated Solution Design approach. That means each topic we sponsor is tied to a priority problem we're working to solve. What's more, we include Soldier touch points in every topic we release, so companies can design solutions with feedback from end-users and inform development based on what will work in the real world.

Our approach provides an unprecedented level of access to Army problem owners, Cross-Functional Teams, program managers, and technical experts. Personal interactions with key Army stakeholders provide SBIR recipients transparency from people who could use what you create.

### A NEW DIRECT TO PHASE 2 OPTION

Last year, working with key partners, AAL championed use of the Direct to Phase 2 (DP2) SBIR option for the Army. DP2 reduces barriers for small businesses while helping us connect with untapped solvers, expedite capabilities to the field, and drive new partnerships with the national industrial base.

AAL is the only Army organization currently using the DP2 option, with the first contracts awarded on March 20, 2020.

Learn more about how AAL works with the Army SBIR program and our current SBIR topics at [www.aal.army/spartn](http://www.aal.army/spartn)

## SBIR BY THE NUMBERS



HISTORICALLY, 1/4 OF FIRMS THAT RECEIVE SBIR AWARDS ARE GETTING THEM FOR THE FIRST TIME.



1/3 OF SBIR AWARDS FROM THE DOD GO TO COMPANIES WITH FEWER THAN 10 EMPLOYEES.



MORE THAN 1/2 OF SBIR AWARDS FROM THE DOD ARE TO BUSINESSES WITH FEWER THAN 25 PEOPLE.

# \$2.5 BILLION

APPROXIMATELY \$2.5B IS AWARDED THROUGH SBIR EACH YEAR, WITH \$1B ANNUALLY AWARDED BY THE DOD.

## ABOUT THE ARMY APPLICATIONS LABORATORY

We're not a laboratory in the traditional sense of the word. As the U.S. Army's innovation unit, we don't make things — we make things possible. The Army Applications Laboratory (AAL) is fundamentally reshaping how the Army works with industry to reunite American innovation and national security. Together, we question *why* and deliver *what if*. Learn how we do it at [aal.army](http://aal.army).



[WWW.AAL.ARMY](http://WWW.AAL.ARMY)