

Topic: N161-014

## BHTechnology LLC

### Robust Electronics for Aircraft End Speed Indicator

BH Technology is a sensing technology products and systems based solutions company. Using our patented sensing technology we have created a novel Digital End Speed Indicator (DESI) system for Steam Catapult aircraft launch systems. Our system consists of updated form, fit, and function enhancements that eliminate current system obsolescence; end of life, and performance issues while reducing total cost of ownership of the system over its expected lifetime and ensures safety of both aircraft and personnel handling the equipment. Our technology, components, and designs used in our DESI system are leveraged from our current NAVY qualified sensor systems used on aircraft carrier elevators so that first pass qualification testing of the DESI system has a very high probability of success. The DESI system represents the 2nd insertion platform of our qualified sensing technology. Implementing our sensor technology enables system enhanced functionality, robustness, and reliability in harsh environments. These enhancements include built in system diagnostics, health monitoring, autonomous calibration, data retention, and intuitive user interface via touchscreen versatility.

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**SYSCOM:** NAVAIR

**Contract:** N68335-18-C-0055

 Corporate Brochure: [https://navystp.com/vtm/open\\_file?type=brochure&id=N68335-18-C-0055](https://navystp.com/vtm/open_file?type=brochure&id=N68335-18-C-0055)

# Department of the Navy SBIR/STTR Transition Program

Pending SYSCOM Review

Topic # N161-014

Robust Electronics for Aircraft End Speed Indicator

BHTechnology, LLC

## WHO

**SYSCOM:** NAVAIR

**Sponsoring Program:** PMA-251

**Transition Target:** Aircraft Carrier Catapult Digital End Speed Indicator (DESI) system

**TPOC:**

(732)323-2825

**Other transition opportunities:** Other launch platforms for both weapons and aircraft that require the situational awareness of the launch characteristics such as speed, force, position. These systems can range from flight deck UAV launching to guided missile launching from Arleigh-Burke class destroyers, to munitions firing from wheel and track artillery and tanks, to torpedo launching systems.

**Notes:** The DESI system is comprised of Sensors and Electronics. Our patented sensor technology has been qualified so far for Navy use as proximity sensors and switches for ship's new construction and retro fitting. The technology lends itself to other form, fit, and function devices such as pressure, force, flow, level, torque, and displacement sensors. We have been awarded both SBIR Phase II and Rapid Innovation Fund contracts to bring this technology along for multiple field deployment of our sensor technology across the DoD. The DESI SBIR represents one such vital system application of our technology.



<http://www.navy.mil/management/photodb/photos/080324-N-4995K-007.jpg>

## WHAT

**Operational Need and Improvement:** High accuracy and reliable Air vehicle launch speed measurement is a critical parameter used to optimize flight deck operations. Our enhanced DESI system allows for solid state capture and retention of up to 1 million launches, includes a touch screen interface, and uses MIL qualified above deck positional and speed sensors. This DESI system provides a high reliability, high accuracy critical mission system that requires minimal maintenance, no field calibration, is highly intuitive, and substantially reduces total cost of ownership over the expected lifetime of the system.

**Specifications Required:** The new DESI system shall operate under shock, vibration, electromagnetic compatibility, and temperature extremes and meet MIL-STD-167-1, Type I Vibration, MIL-STD-461 Class A4 EMI: CE101, CE102, CS101, RE101, RE102, RS101 & RS103, MIL-STD-810 Method 507 Procedure 1 Humidity & MIL-S-901 Grade A, Class I, Type A Shock, with continuous operation at an ambient operating temperature of 135 F. In addition to the aforementioned requirements, the sensors used to measure the speed, operate continuously at an ambient temperature well above the boiling point of water under above deck (200V/m) EMI conditions as well.

**Technology Developed:** The application of our patented sensor technology has allowed us to develop robust, reliable, and highly accurate sensors that operate under the extreme conditions found in carrier based steam catapult launch systems. These sensors enable the development of robust system electronics, built in calibration and test before and after every launch cycle, reduce the number of system components as well as utilize existing cabling and connector structures. The advanced functionality, capability, and reliability are specifically due to our patented sensor technology.

**Warfighter Value:** The new DESI system brings legacy end speed measurement systems into the 21st century and beyond. Buttons, switches, and thumbwheels are replaced with touchscreen interface, captures and stores information for up to 1 million launch cycles, has authorized access to built-in test and calibration functions and monitors the health of the system on every launch cycle. The system is form, fit, and enhanced function so that total cost of ownership is greatly reduced. The electronics, firmware, and sensors are so advanced that as the system is deployed mission profiles can be updated without the need for system redesign allowing this system to organically grow with navy needs far out into the future.

## WHEN

**Contract Number:** N68335-18-C-0055 **Ending on:** February 20, 2021

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Sensor and Electronics design complete	Low	breadboard validation in relevant environment	5	December 2018
DESI system Hardware tested	Low	validation of subsystem hardware prototype in relevant environment	6	June 2019
DESI system tested (hardware, software, firmware)	Med	validation of system hardware prototype in relevant environment	7	January 2020
DESI system qualification testing complete	Med	successfully passing qualification testing	8	January 2021

## HOW

**Projected Business Model:** BH Technology will manufacture the new DESI system. We will be production ready 3-4 months after qualification testing completes and can deliver the initial system 8-10 weeks after receipt of order.

**Company Objectives:** Our company objectives are to define and connect with different tier one department of defense contractors, program executive office decision makers, weapons and operational platform managers and primes for the development of sensors and sensor platforms using our uniform sensor platform technology.

**Potential Commercial Applications:** Some areas of application where we see use for our technology are within industries that use rapid displacement and rotating machinery such as car wheel rotation, washing and drying machine rotation, piston actuators, conveyor systems, combustion engine valve positioning and safety applications for excess speed of material handling and cargo transportation equipment. However, our sensor technology allows for much more diverse sensors and sensor system development by having a uniform sensing technology that allows for the rapid development of form, fit, and enhanced function force, pressure, flow, torque, proximity, temperature, velocity, load, and accelerometer measurement devices that are applicable to broad ranging industries from oil & gas exploration, mining safety, food processing, cargo transportation, medical devices & renewable energy.

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