# Department of the Navy SBIR/STTR Transition Program

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Topic # N131-005
Ultrasound Communications Systems for the Flight Deck
Creare LLC

## WHO

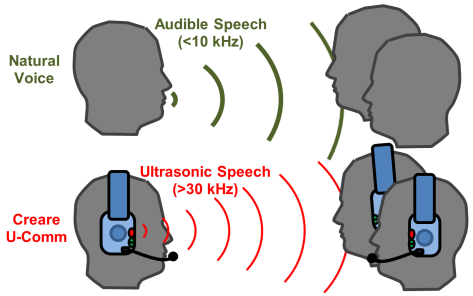
**SYSCOM:** NAVAIR

**Sponsoring Program:** PMA-202

**Transition Target:** Aircraft Carrier Flight Decks

**TPOC:** (732) 323-7884

**Other Transition Opportunities:** Creare's U-Comm system allows for Non-RF voice communications in any high noise environment and is designed for easy integration into existing Command and Control (C2) equipment configurations from a variety of manufacturers.




Creare LLC, 2024

**Notes:** Normal speech is conveyed as sound waves at audible frequencies ( 10 kHz) passing through the air. With the U-Comm system, speech is still conveyed through the air as sound waves, but now at ultrasonic frequencies ( 30 kHz).

## WHAT

**Operational Need and Improvement:** Hearing is critical to the warfighter: hazards must be heard, identified, and localized and voiced warnings and commands must be heard and acted upon. On the flight deck of an aircraft carrier, the extreme noise levels from nearby aircraft and other equipment make face-to-face voice communication especially challenging, if not impossible. Some positions on the flight deck are equipped with portable radios to help convey voice comms. However, most of the deck crew must function without such tools, relying instead on non-verbal comms (like hand signals) or attempting to shout over the noise or through their hearing protection.

**Specifications Required:** An innovative communication transmission technology is desired that can provide flight deck crews reliable wireless voice transmission with other personnel in high noise and high energy electromagnetic environments. These technologies should be capable of integration with existing manufacturer's communications equipment with minimal impact on space, weight, and power requirements, with consideration for EMCON and environmental factors in typical military air operations at sea. Potential future development that allows the technology to extend to all flight deck personnel, including aircrew, to allow constant communications even when operating outside of the aircraft.

**Technology Developed:** Creare has been developing its ultrasonic voice communication (“U-Comm”) technology to meet the Department of Defense’s (DoD) need for a non-radio voice communication system that functions in noisy environments. Our U-Comm system conveys a person’s voice using ultrasonic sound waves instead of radio.

**Warfighter Value:** Ultrasound is a form of sound; no radio waves are emitted. Equipping some or all flight deck personnel with U-Comm would enable improved communications in high noise and high energy environments, regardless of EMCON.

## WHEN

**Contract Number:** N68335-24-C-0481 **Ending on:** Jul 25, 2025

| Milestone | Risk Level | Measure of Success | Ending TRL | Date |
|---|---|---|---|---|
| Proof of Concept for USN | Medium | Wearable Ensemble | 4 | 3rd QTR FY22 |
| Application of U-Comm for US Army Infantry | Medium | Helmet Mounted Device for Situational Awareness | 4 | 4th QTR FY23 |
| Hardware Refinement for High Noise Environments Tested | Medium | Hear-Through-Noise Capability Demonstrated | 5 | 1st QTR FY24 |
| U-Comm Integrated With HGU-99 Flight Deck Helmet | Medium | Head Mounted Configuration Validated | 6 | 2nd QTR FY25 |

## HOW

**Projected Business Model:** The flight deck is the focus of the program goal and we understand the market and the market players well. On the HGU 99/P program, we teamed with a recognized acoustics electronics engineering firm to first harden and productize, and now to manufacture the electrical wiring harnesses and communications interfaces for the system. Our partner has an established business area in communications equipment for aerospace, military, and industrial customers. We plan the same approach for U-Comm. Creare, working with the Navy, will, during this Phase IIB, determine the system requirements, develop proof of concept prototypes, and demonstrate system performance and capabilities. We will then collaborate heavily with our partner on a follow-on effort to harden, productize, and formally qualify the system components.

**Company Objectives:** We plan to license the technology to our partner for sales outside of NAVAIR.

**Potential Commercial Applications:** Our U-Comm helmet sits within a broader product category of hearing protection devices that include electronic enhancements such as “hear-through.” We have noted that hear-through hearing protection devices are commanding an ever-growing proportion of the $3B annual global hearing protection market. There is a clear market opportunity for a hardened device that provides better voice clarity than hear-through, especially in noisy environments. These markets encompass users that include other warfighters, security forces, and first responders as well as construction, transportation, and heavy industry (e.g., mining, oil, and gas) personnel. We know these other markets exist because the civilian variant of Creare’s hearing protection helmet (without U-Comm) has been successful with the national and international oil and gas industry. The success of our helmet with the industrial market provides us an excellent entry point for transitioning our U-Comm system into the private sector.

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