

WHO

**SYSCOM:** ONR  
**Sponsoring Program:** Office of Naval Research  
**Transition Target:** To be determined  
**TPOC:** Reggie Beach  
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**Other Transition Opportunities:**



**Notes:**

WHAT

**Operational Need and Improvement:** Divers lack detailed schematics, drawings, and plans in underwater environments requiring high cognition and memorization and while coupled with zero- to low-light visibility, manned underwater operations are complex and a major obstacle to overcome. TWIGIID is an integrated dive mask with a Heads-Up Display (HUD) that overcomes these obstacles by providing digital documentation, overlays, and sensory information directly to the diver.

**Specifications Required:** - Must be confined within dive mask (75 mm width)  
- Provide wide field-of-view (>40°) to enable divers ambient vision  
- High see-through clarity (>80%)

**Technology Developed:** The Transitional Wide Angle Integrated Illuminated Display (TWIGIID) is a wide field-of-view HUD system integrated within a Navy proven dive mask with the following capabilities:  
- Unobstructive see-through clarity at over 85% ambient light transmission  
- Wide field-of-view (>60°) to provide uncluttered digital imagery at the forefront and periphery view  
- High display resolution (>1500 horizontal pixels)  
- Stereoscopic (3D) imagery near an arm's length away  
- High visual acuity (20/20) to enable diver's the ability to discriminate even small text and image details

**Warfighter Value:** TWIGIID provides a wide field-of-view, high resolution display for manned diving operations in zero- to low-light visibility without burdening the diver with additional equipment and lessening their cognitive load so that they can focus on task at hand, thereby improving speed and quality of decision making.

WHEN

**Contract Number:** N68335-19-C-0552      **Ending on:** Jul 26, 2021

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Gen 2 submersible prototype	Low	Success in waterbed and hyperbaric test chambers	5	1st QTR FY24
Gen 2 prototype demonstration in water	N/A	Demonstrate operation in aquatic environment	6	1st QTR FY24

HOW

**Projected Business Model:** We plan to develop TWIGIID to TRL-7/8 and then transition to low-rate initial production, selling directly to Navy and DoD. Then, we will seek out partners in the commercial diving realm and license our integrated display per platform to dive systems. We plan to partner with Interspiro, DRASS, PonyPak, and Trident Training Solutions to directly transition the product towards the dive community.

**Company Objectives:** Intellisense intends to leverage the TWIGIID technology into a new family of advanced displays that be used to retrofit existing wearables and systems, thus bridging the capability gap between sensor-to-soldier loop.

**Potential Commercial Applications:** TWIGIID can be used for any of the following manned diving operations:  
- Public Safety Diving  
- Ship Husbandry  
- Underwater Salvaging  
- Explosive Ordnance Disposal  
- Battleship Damage Repair  
- Underwater maintenance (Oil Rigs, Dams, Telecommunication cables, etc.)  
- and many more