

SOCOM232-D004: Digital Augmentation for Analog Systems

ADDITIONAL INFORMATION

N/A

TECHNOLOGY AREAS:

Electronics | Sensors

MODERNIZATION PRIORITIES:

Microelectronics

KEYWORDS:

Transparent Display; Analog Optics, Rifle scope, Night Vision Goggles, HUD

OBJECTIVE:

The objective of this topic is to develop applied research toward an innovative capability to augment existing analog expeditionary optical systems with a see-through display capable of displaying text and imagery. Existing analog devices that could be augmented with this display capability include rifle scopes, red dot/holographic sights, and night vision goggles. This capability would hyper-enable SOF users by merging digital battlefield data with high-performance analog optical systems in a way that does not degrade baseline functionality/capability of the optic. In addition, such transparent display technology could be leveraged to create a tactical Heads-Up Display in the future.

IMPORTANT: For SOCOM instructions: please visit: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>. Go to the bottom of the page and click the "DoD SBIR 23.2" tab. Once there, go to the SOCOM SBIR 23.2 Direct to Phase II document.

ITAR:

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), 22 CFR Parts 120-130, which controls the export and import of defense-related material and services, including export of sensitive technical data, or the Export Administration Regulation (EAR), 15 CFR Parts 730-774, which controls dual use items. Offerors must disclose any proposed use of foreign nationals (FNs), their country(ies) of origin, the type of visa or work permit possessed, and the statement of work (SOW) tasks intended for accomplishment by the FN(s) in accordance with section 3.5 of the Announcement. Offerors are advised foreign nationals proposed to perform on this topic may be restricted due to the technical data under US Export Control Laws.

DESCRIPTION:

The Digital Augmentation to Analog Systems (DAAS) feasibility study should examine currently available research and techniques for creating a see-through display capable of forming high-resolution digital imagery, while still maintaining a high level of visible light transmission from the "outside world" through the display substrate. The DAAS should be capable of mounting on the eyepiece of the SU-295 (5-25x), SU-296 (7-35x), and SU-303 (4-20x) riflescopes, and should display data overlaid with the image projected by the riflescope. The DAAS should be capable of receiving ballistic data (range to target, elevation/azimuth holds) from a LA-24/PEQ laser range finder, and displaying this information to the operator.

As a part of this feasibility study, the proposers shall address all viable overall system design options with respective specifications on display resolution, display focus distance, display brightness, substrate light transmission, and overall system size/weight.

PHASE I:

Conduct a feasibility study to assess what is in the art of the possible that satisfies the requirements specified in the above paragraphs entitled "Objective" and "Description."

The objective of this USSOCOM Phase I SBIR effort is to conduct and document the results of a thorough feasibility study ("Technology Readiness Level 3") to investigate what is in the art of the possible within the given trade space that will satisfy a needed technology. The feasibility study should investigate all options that meet or

exceed the minimum performance parameters specified in this write up. It should also address the risks and potential payoffs of the innovative technology options that are investigated and recommend the option that best achieves the objective of this technology pursuit. The funds obligated on the resulting Phase I SBIR contracts are to be used for the sole purpose of conducting a thorough feasibility study using scientific experiments and laboratory studies as necessary. Operational prototypes will not be developed with USSOCOM SBIR funds during Phase I feasibility studies. Operational prototypes developed with other than SBIR funds that are provided at the end of Phase I feasibility studies will not be considered in deciding what firm(s) will be selected for Phase II.

PHASE II:

Develop, install, and demonstrate a prototype system determined to be the most feasible solution during the Phase I feasibility study on Digital Augmentation for Analog Systems.

PHASE III DUAL USE APPLICATIONS:

This system could be used in a broad range of military applications where analog optical systems still provide a distinct performance advantage over fully digital systems (for example: aiming optics for small arms, night vision goggles, but could benefit from a digital overlay. Furthermore, this technology could also be applied towards a stand-alone Heads-Up Display in future developments.

There is a large market for see-through optical displays – from “Google Glass” type Heads Up Display products that apply to the broad commercial market, to the same type of riflescope overlay being proposed for this effort that applies to the civilian sport shooting market.

REFERENCES:

1. Transparent Screen Market is Anticipated to Progress, 2/19/23
<https://www.globenewswire.com/news-release/2023/02/19/2611067/0/en/Transparent-Screen-Market-is-anticipated-to-progress-at-a-CAGR-of-45-0-from-2023-to-2030-Contrive-Datum-Insights.html>; Pros and Cons of Four different Transparent Display Technologies, 9/9/2019
<https://www.lumineq.com/blog/pros-and-cons-four-transparent-display-technologies-video-included>

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