

SOCOM213-004: Electronics Embedded Glass

MODERNIZATION PRIORITIES:

Control and Communications, Directed Energy, Microelectronics, Network Command

TECHNOLOGY AREA(S):

Electronics, Ground Sea, Human Systems, Information Systems

OBJECTIVE:

The objective of this topic is to develop applied research toward an innovative capability to allow transparent armor to be adapted, modified or fabricated in a way so it can also function as an in-vehicle display screen.

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:

As a part of this feasibility study, the proposers shall address all viable overall system design options with a focus on developing a means of displaying imagery from digital signal onto or into vehicle borne transparent armor for the purpose of providing an alternative to tablet viewing or for overlaying situational awareness information.

The resultant solution must consider that the prime purpose of the transparent armor is to be seen through, so the ability to use the transparent armor as a display screen must not degrade from this. Meaning, the see-through capability must be present full time, or it must be quickly re-accessible by an Operator. Similarly, as the co-related primary purpose of transparent armor is to stop ballistic threats, no reduction of the expected ballistic performance should be considered acceptable even with the integration of the SBIR developed transparent armor display solution.

Night vision capability will be assessed to ensure no degradation occurs based on the process used to make the transparent armor function as a display. The feasibility study should consider whether the transparent armor would need to be fully, electronically, occluded to function as a display, or whether augmented reality overlays are possible while still allowing some transparency. If semi transparency is determined possible, any augmented reality overlays in this manner should be assessed for their potential capability to enhance crew situational awareness by, for example, including object or threat detection and tracking for passengers; or points of interest, obstacles awareness, and navigation aid for a driver.

Transparent armor that is determined to be required to be fully electrically occluded or semi transparent must be able to accept and address signals being received from multiple in-vehicle sources, of which ATAK would be a key consideration. The feasibility study will also address the capability of providing laser protection to the crew via the projected or embedded display solution.

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 an M-ATV that enable enhanced crew SA and/or driver cognitive workload reduction.

PHASE III DUAL USE APPLICATIONS:

This system could be used in a broad range of military applications where a reduction of in-vehicle (portable or hard mounted) display screens is desired (reduced volume, weight and secondary projectile risk in a rollover or improvised explosive device (IED) event). It could also increase the survivability and safety of the crew by incorporating object and threat detection and tracking. The driver's cognitive workload could be reduced by the inclusion of heads up, on windshield, route guidance, waypoints, or terrain/obstacle highlighting.

This technology is applicable to the commercial sector primarily in regard to a transparent overlay mode which would include route guidance, key points of interest and potentially for safety in terms of object detection/prediction (kid running towards the street who may not stop).

REFERENCES:

1) ATPD 2352T - Purchase Description, Transparent Armor 8 May 201 Available publicly at <https://govtribe.com/file/government-file/w56hzv16r0216-atpd-2352t-transparent-armor-8may2013-dot-pdf>

KEYWORDS:

transparent overlay; augmented reality; transparent armor; embedded electronics; situational awareness; SA; drivers aid

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