

**UNITED STATES SPECIAL OPERATIONS COMMAND  
SBIR FY07.1 Proposal Submission**

The United States Special Operations command (USSOCOM) is seeking small businesses with strong R&D capabilities to develop and commercialize technology to provide the Special Operations Forces enhanced training and equipment. Topics have been selected on their potential to transition to an acquisition program.

USSOCOM will only accept proposals for those topics stated in this solicitation. The USSOCOM Program Executive Officers (PEOs) responsible for the research and development in these specific areas initiated the topics and are responsible for the technical evaluation of the proposals. The Phase I and Phase II proposal evaluation factors are listed below. Each proposal must address each factor in order to be considered for an award. Phase I and Phase II funding is limited, therefore USSOCOM will select and fund only those proposals considered to be superior. USSOCOM may fund more than one proposal on a specific topic if the technical quality of the proposal is deemed superior, or it may fund no proposals on a topic.

**Proposal Submission**

Potential offerors must submit proposals in accordance with the DoD Program Solicitation at [www.dodsbir.net/solicitation](http://www.dodsbir.net/solicitation). A proposal must contain the following documents: a cover sheet, a technical proposal and a cost proposal. Offerors must complete the cost proposal using the cost proposal form posted on SOCOM section of the [www.dodsbir.net/solicitation](http://www.dodsbir.net/solicitation) site. All firms shall include as part of the Phase I proposal transportation costs to travel to Tampa, Florida for two separate meetings. The first travel requirement shall be the Phase I kick-off meeting and the second travel requirement shall be for the Phase I out brief. (Note: individual topics may require these meetings to occur at another location. Please refer to the topic write up for a change in location.) The meetings shall take less than four hours and at least the Principal Investigator is required to attend both meetings. Notwithstanding the requirement for the Principal Investigator to attend both meetings, any other individual needed to discuss all aspects of the firm's approach to address the SBIR topic shall also attend the meetings.

*All proposal information must be received electronically via the DOD SBIR/STTR Submission site. To submit, proceed to <http://www.dodsbir.net/submission>. Once registered, a firm must prepare (and update) Company Commercialization Report Data, prepare (and edit) Proposal Cover Sheets, complete the Cost Proposal form, and upload corresponding Technical Proposal(s). The proposal submission, exclusive of the cost proposal and the Company Commercialization Report, must not exceed 25 pages.*

*Paper copies will not be considered. A complete electronic submission is required for proposal evaluation. An electronic signature is not required on the proposal. The DoD SBIR/STTR Submission site will present a confirmation page when a technical proposal file upload has been received. The upload will be available for viewing on the site within an hour. It is in your best interest to review the upload to ensure the server received the complete, readable file.*

For additional information about electronic proposal submission, including uploading your technical proposal, refer to the instructions on the solicitation and the on-line help area of the DoD SBIR/STTR Submission site, or call the DoD SBIR/STTR Help Desk at 866-SBIRHLP (866-724-7457).

**Phase I**

The maximum amount of SBIR funding for a USSOCOM Phase I award is \$100,000 and the maximum time frame for a Phase I proposal is 6 months. A Phase I proposal for less than 6 months and/or less than \$100,000 is encouraged where low risk technologies are being proposed.

**Phase II**

USSOCOM may invite a Phase II proposal from any Phase I contractor, based on their performance during Phase I using the evaluation criteria below. A Phase II proposal is awarded with a period of performance of 24 months and for \$750,000. USSOCOM may elect to increase the Phase II award amount when it is deemed to be in its best interest. Proposals should be based on realistic cost and time estimates, not on the maximum time (months) and

dollars. In preparing the proposal, firms should consider that workload and operational tempo will preclude extensive access to government and military personnel beyond established periodic reviews.

USSOCOM does not participate in the Fast Track program and does not have a Phase II enhancement policy. In some cases, USSOCOM will assist the small business as necessary to further/transition the results of a Phase II.

### **Evaluation Criteria – Phase I & II**

- 1) The soundness, technical merit, and innovation of the proposed approach and its incremental progress toward topic or subtopic solution.
- 2) The qualifications of the proposed principal/key investigators supporting staff, and consultants. Qualifications include not only the ability to perform the research and development but also the ability to commercialize the results.
- 3) The potential for commercial (Government or private sector) application and the benefits expected to accrue from this commercialization.

The three evaluation criteria are listed in order of importance. Criterion 1 is weighted two times higher than criterion 2. Criterion 2 is weighted three times higher than criterion 3.

### **Site Visits**

Site visits will not be permitted during the pre-release stage of the solicitation.

### **Security**

All of the topics in the solicitation are UNCLASSIFIED and only UNCLASSIFIED proposals will be accepted.

### **Foreign Nationals**

Reference Section 3.5.b (7), if you plan to employ NON-US Citizens in the performance of a USSOCOM SBIR contract, identify those individuals in the appropriate section of your proposal.

### **Communications with USSOCOM**

During the pre-release period of this solicitation, any technical inquiries must be submitted in writing through [SOCOMSBIR@brtrc.com](mailto:SOCOMSBIR@brtrc.com). Questions submitted during the pre-release stage using any other method will not be answered. All requests must include the topic number, topic title, inquirer's name and inquirer's telephone number(s). Once the solicitation begins accepting proposals, communication through [SOCOMSBIR@brtrc.com](mailto:SOCOMSBIR@brtrc.com) will no longer be allowed. Instead, proposers with technical questions during the solicitation open period may submit written questions through the SBIR Interactive Topic Information System (SITIS) at [www.dodsbir.net/SITIS](http://www.dodsbir.net/SITIS) listed in section 1.5c of the program solicitation.

During source selection period e-mail is the only method of communication that will be used by the contracting officer to notify the submitter/proposer if they have or have not been selected for an award.

### **Source Selection**

NOTICE: The offeror's attention is directed to the fact that Contractor consultants/advisors to the Government may review and provide support in proposal evaluations during source selection. Non-government advisors may have access to the offeror's proposals, may be utilized to review proposals, and may provide comments and recommendations to the Government's decision makers. They would not establish final assessments of risk, rate, or rank offerors' proposals. These advisors would be expressly prohibited from competing for SBIR awards. All advisors would be required to comply with procurement Integrity Laws and would sign Non-Disclosure and Rules of Conduct/Conflict of Interest statements.

Inquiries concerning the SBIR program should be addressed to [Shawn.Martin@socom.mil](mailto:Shawn.Martin@socom.mil).

## **SOCOM SBIR 07.1 Topic Index**

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## SOCOM SBIR 07.1 Topic Descriptions

SOCOM07-001 TITLE: Advanced Lightweight Vehicle Components and Materials

TECHNOLOGY AREAS: Ground/Sea Vehicles, Materials/Processes

ACQUISITION PROGRAM: Family of Special Operations Vehicles

OBJECTIVE: Design, develop, fabricate and test structural driveline and chassis components to decrease the fixed mass of the Expanded Capacity Vehicle High-Mobility, Multi-Purpose Wheeled Vehicle (HMMWV) and increase the effective payload.

DESCRIPTION: Ground mobility forces are conducting increased mounted operations from armored HMMWV and modified HMMWV's. As additional armor and equipment continues to be added to the system, the performance of the existing power train, suspension, steering and chassis components are not sufficient. Alternate programs are focusing on an improved power train; therefore this effort will provide vehicle integration of improved components. Lightweight, high strength and cost effective solutions are required. Full mission payloads are currently yielding Gross Vehicle Weights (GVW) which are up to 2,400lbs in excess of rated GVW. This causes multiple vehicle issues ranging from high stress and wear to instability and undesirable center of masses.

PHASE I: Develop a parametric approach to component identification for defined weighting functions of mass reduction, durability, cost and integration of applicable components. This will identify and define the ranking of component severity. Based upon this matrix, develop conceptual designs for the ranked components. Conduct analysis and simulation on the designs for down selection for components for Phase II. This approach will highlight strengths and weaknesses with designs and will consider overall weight reduction, component and material cost, component complexity, strength, component life, and overall practicality of increasing the HMMWV's GVW. This effort will focus on modeling and simulation yielding cost effective solutions that suit the increased GVW directive while attempting to integrate as many solutions as possible to suit ground mobility requirements. Vendors shall submit a business plan for the commercialization of the technology developed under this topic. The Small Business Administration's web site [www.sba.gov](http://www.sba.gov) provides guidance, examples as well as contact information for assistance.

All firms shall include as part of the Phase I proposal transportation costs to travel to Tampa, Florida for two separate meetings. The first travel requirement shall be the Phase I kick-off meeting and the second travel requirement shall be for the Phase I out brief. The meetings shall take less than four hours and at least the Principal Investigator is required to attend both meetings. Notwithstanding the requirement for the Principal Investigator to attend both meetings, any other individual needed to discuss all aspects of the firm's approach to address the Small Business Innovation Research topic shall also attend the meetings.

PHASE II: Further refine and develop models generated in Phase I and a create Level 2 Technical Data Package. Develop, demonstrate and provide complete prototype and integration of components and systems for model validation, reliability testing and evaluation. Deliverables may be subject to several thousand miles of testing in realistic HMMWV mission profiles including courses and terrain that represent Aberdeen and Yuma Proving Grounds, Middle East, Afghanistan, embedded rock, and degraded pavement.

PHASE III: These increased component capabilities could be used in other military and civilian applications for increased payload and GVW capabilities.

REFERENCES: None.

KEYWORDS: Component Design, Lightweight Materials, Steering, Chassis, Driveline, Braking System, Expense, Weight, Logistical Resources and Combat Effectiveness.

SOCOM07-002 TITLE: Multi-Purpose, Field Expedient Engineering Composite Material

TECHNOLOGY AREAS: Materials/Processes

ACQUISITION PROGRAM: SOF Pad Eye Kit

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), which controls the export and import of defense-related material and services. Offerors must disclose any proposed use of foreign nationals, their country of origin, and what tasks each would accomplish in the statement of work in accordance with section 3.5.b.(7) of the solicitation.

**OBJECTIVE:** Develop a strong, fast cure engineering composite material that structurally bonds to and seals multiple materials with irregular surfaces for use in multiple field applications. This innovation would have a long shelf life and be used to improve lightweight armor material for protecting combat equipment and vehicles, secure armor plating to vehicles without welding requirement, produce a strong dry or underwater adhesive that would allow multiple uses with covert ability to secure devices to targets, would enable Radio Frequency (RF) compatible, insulating emergency repair capabilities.

**DESCRIPTION:** There is an ongoing requirement for lighter, strong armor material, long lasting field expedient repair capabilities, and covert attaching of insulated devices to land and water-based targets without inhibiting RF signals. Having a strong, safe, fast curing structural composite material that can be molded and combined with materials like Kevlar, used in the field to repair equipment and materials, secure armor plating to vehicles, be applied underwater without having to use ultraviolet to activate the adhesive could produce a dramatic increase in operational effectiveness. Current requirements to reduce land vehicles and aircraft weight, to quickly secure customized armor and/or to secure undetected devices to equipment and vehicles, to metals, plastics, fiberglass, gel coat, paint, concrete, dry wood, painted steel, stainless steel, aluminum, and environmental marine growth surfaces without blocking RF signals. This capability would be significantly enhanced if a fast curing, exothermic engineering compound existed that could be safely, quickly deployed and administered to a wide range of materials that support at least 40 lbs in varied dry and underwater conditions ranging from 28oF-105oF and up to 30kts, without compromising the activity. The issues to be researched are how to increase the strength, curing time (15-30 seconds), impact mitigation capabilities, adhesive strength, compatibility with RF signals and insulation capabilities of an existing exothermic engineering compound manufactured currently in the United States that has unique application and usage benefits without investing in technologies that are not currently ready for production. Logistical information includes shelf life up to two years at ambient temperatures and in weather conditions throughout the world. The adhesive must be transportable by sea (66ft of sea water), air (30,000ft Above Ground Level) and land (sand, mud, environmental elements both wet and dry).

**PHASE I:** Objectives are to:

- (1) Assess current performance of baseline material regarding ballistic impact resistance and mitigation for armor applications and underwater adhesive.
- (2) Through research and development determine the feasibility and propose formula redesign that will meet the above requirements and objectives, stressing the strength, impact mitigation, cure time and adhesion qualities needed for dry and underwater field applications on multiple types of materials with irregular surfaces.
- (3) Calculate strength and adhesive performance using current field requirements used by the DoD for structural fillers and adhesions.
- (4) Compare the theoretical performance of the engineering compound to standard structural filler, adhesive and sealant performance.
- (5) Develop material for broad based capability demonstrations.
- (6) Evaluate the degree to which Phase II results will be able to yield ongoing benefits and utility to the DoD and the private sector. Vendors shall submit a business plan for the commercialization of the technology developed under this topic. The Small Business Administration's web site [www.sba.gov](http://www.sba.gov) provides guidance, examples as well as contact information for assistance.

All firms shall include as part of the Phase I proposal transportation costs to travel to Tampa, Florida for two separate meetings. The first travel requirement shall be the Phase I kick-off meeting and the second travel requirement shall be for the Phase I out brief. The meetings shall take less than four hours and at least the Principal

Investigator is required to attend both meetings. Notwithstanding the requirement for the Principal Investigator to attend both meetings, any other individual needed to discuss all aspects of the firm's approach to address the SBIR topic shall also attend the meetings.

PHASE II: Objectives are to:

- (1) Develop and demonstrate target material in a realistic tactical environment. Conduct testing to prove feasibility over extended field conditions.
- (2) Interaction with tactical users will be required to ensure that the formulation being designed will meet their needs.
- (3) Customer interface will identify packaging and applicator requirements needed for tactical environments.
- (4) Evaluate the material's ability to meet stated goals and objectives.

PHASE III: Objectives are to:

- (1) Dual-use applications: This material could be used in a broad range of military and civilian security applications where structural repair, adhesion and sealing are necessary -- for example, in overseas pavement preservation projects or in enhancing maintenance in industrial facilities.
- (2) Address packaging and large volume applicator requirements.
- (3) Provide production quantities necessary to meet DoD requirements.

REFERENCES: None

KEYWORDS: Materials, processes, survivability, life extension, affordability, manufacturing technology, civil engineering, environmental quality, structural filler, adhesive, sealant, underwater, surveillance, tracking, armor, composite

SOCOM07-003 TITLE: Automated Vehicle Identification at a Distance

TECHNOLOGY AREAS: Sensors, Electronics

ACQUISITION PROGRAM: Tagging Tracking and Locating program

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), which controls the export and import of defense-related material and services. Offerors must disclose any proposed use of foreign nationals, their country of origin, and what tasks each would accomplish in the statement of work in accordance with section 3.5.b.(7) of the solicitation.

OBJECTIVE: The development of an innovative, inexpensive device that automatically differentiates between like vehicles at a standoff distance using light weight, low power, man portable technology.

DESCRIPTION: Automated Vehicle Identification at a Distance (AVID) could be utilized by both the military and law enforcement agencies and could be leveraged for wide-scale use by industry. The development of an AVID system would increase the precision with which identification is conducted while reducing the danger associated with identifying vehicles operated by hostile forces. Current automated vehicle identification relies on a signal being transmitted from inside the vehicle to a sensor (source: <http://www.transguide.dot.state.tx.us/mdi/AVI.html>). Commercial applications include, but are not limited to, the use by the automotive industry to enhance maintenance tracking, security applications such as the use by gated communities or vehicle identification by overhead doors. Any new technology should satisfy the following requirements:

- Vehicle identification should be feasible in all light/environmental conditions.
- System should be capable of differentiating vehicles of the same make, model, color and year.
- Any method used for vehicle identification must be visually undetectable.
- The identification must occur without physical contact with the vehicle to be monitored.
- Vehicle identification should occur at ranges greater than 500 meters.
- Should be ruggedized and have a small, lightweight form factor
- Should utilize Commercial Off-The-Shelf equipment to minimize follow-on production costs

- Should be low power with the ability to use Alternating Current or Direct Current power
- Should be designed with a network environment in mind to allow for unattended operation

Development of such a capability would satisfy aspects of Sensors, Electronics and Electronic Warfare a DoD Critical Technology Area.

PHASE I: Develop a proof of concept for the proposed method of identifying individuals at range. Vendors shall submit a business plan for the commercialization of the technology developed under this topic. The Small Business Administration's web site [www.sba.gov](http://www.sba.gov) provides guidance, examples as well as contact information for assistance.

All firms shall include as part of the Phase I proposal transportation costs to travel to Tampa, Florida for two separate meetings. The first travel requirement shall be the Phase I kick-off meeting and the second travel requirement shall be for the Phase I out brief. The meetings shall take less than four hours and at least the Principal Investigator is required to attend both meetings. Notwithstanding the requirement for the Principal Investigator to attend both meetings, any other individual needed to discuss all aspects of the firm's approach to address the SBIR topic shall also attend the meetings.

PHASE II: Develop a working prototype that can be tested by end users in a real life working environment that resembles the form factor of the final system.

PHASE III DUAL-USE APPLICATIONS: Produce operation units that can be employed by the military, law enforcement and the commercial market sector.

REFERENCES: None.

KEYWORDS: BIOMETRICS, SENSORS, TAGGING, TRACKING, LOCATING

SOCOM07-004 TITLE: 3-D Facial Imaging System

TECHNOLOGY AREAS: Sensors, Electronics

ACQUISITION PROGRAM: Special Operations Special Technology TTL

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), which controls the export and import of defense-related material and services. Offerors must disclose any proposed use of foreign nationals, their country of origin, and what tasks each would accomplish in the statement of work in accordance with section 3.5.b.(7) of the solicitation.

OBJECTIVE: The development of an innovative, inexpensive imaging system that allows the user to capture a person's face in three dimensions (3-D) and identify the individual based on two dimensions (2-D) or 3-D baseline imagery using lightweight, low power, man portable technology.

DESCRIPTION: Facial recognition software has been successfully developed over the past decade for security applications. While these systems have in large part been effective in controlled environments, lighting, weather and a person's pose prevent this technology from application in a greater range of scenarios. This effort is designed to overcome these limitations by scanning a person's face in three dimensions rather than the standard two dimensions. The addition of a third dimension will increase the probability of detection as well as allow for identification (ID) at a greater range of pose angles. Applications for this emerging technology include identification of persons of interest by the military, law enforcement or other security organizations as well enhancing current biometric capabilities for cooperative ID scenarios. Such scenarios include amusement park ID systems, Automated Teller Machines, airport security and mass transit systems. Any new technology should satisfy the following requirements:

- 3-D identification should be feasible in all environmental conditions
- System should be capable of identifying individuals at pose angles greater than  $\pm 15$  degrees
- 3-D identification must be conducted with imaging technology

- The identification must occur without physical contact with the individual of interest
- Individuals of interest are to be considered non-cooperative
- Should be capable of identifying individuals contained in a 2-D imagery database
- Should provide identification ranges comparable to state-of-the-art 2-D recognition systems
- Should be ruggedized and have a small, lightweight form factor
- Should utilize Commercial Off-The-Shelf equipment to minimize follow-on production costs
- Should be low power with the ability to use Alternating Current or Direct Current power
- Should be designed with a network environment in mind to allow for unattended operation

The development of such a capability would satisfy aspects of Sensors, Electronics and Electronic Warfare a DoD Critical Technology Area.

PHASE I: Develop a proof of concept for the proposed method of identifying individuals at range. Vendors shall submit a business plan for the commercialization of the technology developed on this topic. The Small Business Administration's web site [www.sba.gov](http://www.sba.gov) provides guidance, examples as well as contact information for assistance.

All firms shall include as part of the Phase I proposal transportation costs to travel to Tampa, Florida for two separate meetings. The first travel requirement shall be the Phase I kick-off meeting and the second travel requirement shall be for the Phase I out brief. The meetings shall take less than four hours and at least the Principal Investigator is required to attend both meetings. Notwithstanding the requirement for the Principal Investigator to attend both meetings, any other individual needed to discuss all aspects of the firm's approach to address the SBIR topic shall also attend the meetings.

PHASE II: Develop a working prototype that can be tested by end users in a real life working environment that resembles the form factor of the final system.

PHASE III DUAL-USE APPLICATIONS: Produce operation units that can be employed by the military, law enforcement and the commercial market sector.

REFERENCES: 1. References for 3-D Facial Imaging: <http://www.shef.ac.uk/assem/1/evison.html>, [http://www.a4vision.com/6\\_030705.html](http://www.a4vision.com/6_030705.html)

KEYWORDS: BIOMETRICS, SENSORS, TAGGING, TRACKING, LOCATING

SOCOM07-005 TITLE: High Resolution Long Wave Infrared Focal Plane Array Development

TECHNOLOGY AREAS: Materials/Processes, Sensors, Electronics

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), which controls the export and import of defense-related material and services. Offerors must disclose any proposed use of foreign nationals, their country of origin, and what tasks each would accomplish in the statement of work in accordance with section 3.5.b.(7) of the solicitation.

OBJECTIVE: Design, fabricate, test, and evaluate an uncooled, high resolution long wave Infrared (IR) Focal Plane Array (FPA) and associated read-out electronics to be used in a novel IR camera design for persistent ground based surveillance and targeting applications.

DESCRIPTION: The need for reliable long term ground intelligence has expanded due to the Global War On Terrorism. The requirements for 24 hour collection of imagery and target detection have increased the need for mobile low power IR cameras. The technology for IR FPA lags behind that of visible light FPA due to the explosion of the consumer digital camera market. This effort intends to develop a higher resolution IR FPA for the next generation of IR/Thermal cameras specifically for long term ground surveillance missions. An IR camera is preferred due to its ability to capture imagery at night and in totally dark areas such as cave interiors which terrorists use to cloak their activities. The technical goals for the FPA development are:

- a. The FPA must be uncooled, i.e. no cryogenics or thermo-electric cooling.
- b. The FPA size shall be 1280 x 960 pixels.
- c. The FPA spectral response shall be from 8 to 14  $\mu\text{m}$ .
- d. The Noise Effective Temperature Differential shall be  $\leq 50$  mK for F/1 optics.
- e. Pixel dynamic range shall be  $\geq 14$  bits grayscale.
- f. Pixel size shall be  $20 \mu\text{m} \times 26 \mu\text{m}$ .
- g. Image capture shall be accomplished by sampling all the pixels simultaneously rather than a scanning or rolling shutter type of approach.
- h. Output shall have both manual and automatic level and contrast control.
- i. The read-out electronics shall support a frame rate of at least 30 frames per second.
- j. Frame read out shall be Low Voltage Differential Signaling compatible.
- k. Power consumption for the FPA and read out electronics shall be  $\leq 1.5$  W at 30 frames per second.
- l. Turn on time from a power off state shall be  $\leq 4$  seconds.
- m. Operating temperature range is  $-20$  to  $+65^\circ\text{C}$ .
- n. The manufacturing technique shall be compatible with standard Integrated Circuits (IC) and/or Micro – Electromechanical systems (MEMs) processes.

Proposals should reflect the vendor's expertise, especially in IR FPA design, small package mechanical design, and the advantages of their technical approach. The proposal should concentrate on FPA design characteristics, size, weight, and power requirements, and proposed investigation into FPA manufacturing technologies. Phase I companies will discuss their proposed research in detail and propose in general what they would continue in Phase II.

Successful proposals will use novel ideas to improve military utility, create future commercial markets, and increase functional capability. Pluses include:

- Fully demonstrating the company's past and present experience;
- Supplying references on proposing company's products/programs (particularly government program managers);
- Giving detail on its proposed technologies to show expertise;
- Showing detailed expertise in technologies related to this Small Business Innovation Research (SBIR) topic;
- Experience designing products for use by commercial or military customers.

The proposing company should be prepared to deliver products in accordance with the general information outlined in each of the phases as listed below:

**PHASE I:** Investigate current IR FPA design and manufacturing limitations for keys to what areas need to be improved to achieve the SBIR goals. Develop the FPA and Read Out Integrated Circuitry (ROIC) designs and perform analysis and simulation to optimize the FPA size and power requirements. Provide a final technical report which will be evaluated to determine which Phase I company will be selected to continue development in Phase II. The final technical report shall contain FPA and ROIC design, projected performance against the requirements and identification of IC/MEMs manufacturing processes required to produce the devices. Vendors shall submit a business plan for the commercialization of the technology developed under this topic. The Small Business Administration's web site [www.sba.gov](http://www.sba.gov) provides guidance, examples as well as contact information for assistance.

All firms shall include as part of the Phase I proposal transportation costs to travel to Tampa, Florida for two separate meetings. The first travel requirement shall be the Phase I kick-off meeting and the second travel requirement shall be for the Phase I out brief. The meetings shall take less than four hours and at least the Principal Investigator is required to attend both meetings. Notwithstanding the requirement for the Principal Investigator to attend both meetings, any other individual needed to discuss all aspects of the firm's approach to address the SBIR topic shall also attend the meetings.

**PHASE II:** Develop the detailed design and processes for manufacturing the devices. Provide modeling and simulation results verifying design performance and manufacturability. If possible within funding constraints, manufacture a prototype of the FPA and ROIC for test and verification of design. Creation of a smaller array, i.e.;  $64 \times 64$  pixels is allowable to hold down costs only if the pixel dimensions are the same as the full size FPA proposed design. Provide a final technical report of Phase II activities which will be evaluated to determine if a

Phase II company will be selected to continue development refinement in Phase II (Extended), or go into production in a Phase III contract.

**PHASE III: DUAL-USE APPLICATIONS:** This device could be used in various military and commercial applications similar to persistent surveillance including law enforcement, building, installation, airport and seaport security, building inspection, and nighttime emergency response situations.

**REFERENCES:** None.

**KEYWORDS:** SENSORS, INFRARED, IR, THERMAL, IMAGING, OPTICS, FOCAL PLANE ARRAY, DIGITAL CAMERA

SOCOM07-006 TITLE: Cultural Intelligence Wiki-berry

**TECHNOLOGY AREAS:** Information Systems

**ACQUISITION PROGRAM:** Psyop Global Reach ACTD

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), which controls the export and import of defense-related material and services. Offerors must disclose any proposed use of foreign nationals, their country of origin, and what tasks each would accomplish in the statement of work in accordance with section 3.5.b.(7) of the solicitation.

**OBJECTIVE:** Adapt a rugged, portable, internet capable personal digital assistant (PDA) with voice, image, document, and video collection, storage, and transmit capabilities that supports the field collection and transmission of multi-cultural data utilizing a wiki-based server to interface to existing databases. Field collection of the data should be possible by anyone with the PDA device. The data collection tool should be compact (PDA style) and semi-rugged enough to withstand harsh environments or have the capability to be packaged to withstand harsh environments. A communications capability that would allow the portable PDA unit to maintain communication with existing and future SOF communications devices to include tactical radios, wireless, and mesh environments in near-real-time is desirable. Local storage in the field will be able to be extended with the use of a flash memory stick compatible with Universal Serial Bus 2.0 or Institute of Electrical and Electronics Engineers (IEEE) 1394 standard and a port in the PDA. This device should provide a unique rechargeable power backup capability to allow the device to operate without degradation for at least 24 hours.

**DESCRIPTION:** A wiki (what I know, is) is a web application that allows users to add content, as on an internet forum, but also allows others to edit the content. The term wiki also refers to the collaborative software used to create such a website. The wiki allows the exchange of information through collaborative effort. For our purposes, a wiki needs to be developed and incorporated into small, portable and rugged PDA style devices. The devices will allow us to collect cultural intelligence on peoples of interest and combine the data to provide a wide range of knowledge to non-indigenous personnel. The data collected in the field will be transferred electronically to a large central wiki database for collaboration. The portable PDA style device should allow ease of use by anyone that has a need for data collection. The wiki server should have a password requirement to access/alter entered data. The PDA style device should also have its own power supply, preferably a rechargeable battery (similar to PDAs). The Wiki-berry should be able to operate in remote environments that do not have IEEE 802.11 or 802.16 cell or Wi-Fi 'Hotspot' coverage. The hardware/software must be able to interface with existing and future tactical radios such as the PRC-148G for wireless communications. Hardware design approaches may include internal and/or external video input capability.

Proposals should reflect the vendor's expertise, especially in small computer software design, small package mechanical design, and the advantages of their technical approach. Phase I companies will discuss their proposed research in detail and propose in general what they would continue in Phase II.

Successful proposals will use novel ideas to improve military utility, create future commercial markets, and increase functional capability. Pluses include:

- Giving detail on its proposed technologies to show expertise;
- Showing detailed expertise in technologies related to this Small Business Innovation Research (SBIR) topic;
- Fully demonstrating the company's past and present experience;
- Supplying references on proposing company's products/programs (particularly government program managers);
- Experience designing products for use by commercial or military customers.
- A small, lightweight system is required.

The proposing company should be prepared to deliver products in accordance with the general information outlined in each of the phases as listed below:

PHASE I: Develop a wiki-based information management system that is capable of using numerous collection sources (voice, image, document, and video collection, etc.) to operate on hand held PDA sized computer. Appropriate software and hardware documentation should include the theoretical performance projections, and an overall concept for tactical deployment of the Wiki-berry. Vendors shall submit a business plan for the commercialization of the technology developed on this topic. The Small Business Administration's web site [www.sba.gov](http://www.sba.gov) provides guidance, examples as well as contact information for assistance. Provide a final technical report for evaluation to determine if a Phase I company will be selected to continue development in Phase II.

All firms shall include as part of the Phase I proposal, transportation costs to travel to Tampa, Florida for two separate meetings. The first travel requirement shall be the Phase I kick-off meeting and the second travel requirement shall be for the Phase I out brief. The meetings shall take less than four hours and at least the Principal Investigator is required to attend both meetings. Notwithstanding the requirement for the Principal Investigator to attend both meetings, any other individual needed to discuss all aspects of the firm's approach to address the SBIR topic shall also attend the meetings.

PHASE II: Develop the appropriate software and hardware to demonstrate three (3) prototype systems in a realistic field environment. Conduct testing to prove reliability for collection and dissemination of multiple types of information over establish commercial communications capabilities. Conduct extensive testing to prove feasibility over varied extended operational conditions, to refine/validate MTBF data, validate Human Machine Interface and mechanical design, establish data transmission accuracy, and to validate the total system design. Make system design modifications, as necessary, within the proposed budget to ensure Government satisfaction with the prototype. Provide a final technical report of Phase II activities which will be evaluated to determine if a Phase II company will be selected to continue development refinement in Phase II (Extended), or go into production in a Phase III contract. Provide the three (3) prototypes and selected spare parts to the Government for Government testing and validation.

PHASE III: DUAL-USE APPLICATIONS: This system could be used in a broad range of military and civilian security operations where information collection and surveillance and tracking are necessary, for example, in overseas peacekeeping operations, international relief efforts, academic investigation, or in enhancing security in industrial facilities.

REFERENCES: None

KEYWORDS: Wiki, Wikipedia, PDA, Personal Computing Devices, 802.11, 802.16, WIFI

SOCOM07-007 TITLE: Abrasion protection, ballistic tolerance, and laser protection for windows/sensor on rotary wing aircraft.

TECHNOLOGY AREAS: Air Platform, Materials/Processes, Sensors, Human Systems

ACQUISITION PROGRAM: MH-47G, HH-60M, A/Mh-6, MH-53, & CV-22

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), which controls the export and import of defense-related material and services. Offerors must disclose any proposed use of

foreign nationals, their country of origin, and what tasks each would accomplish in the statement of work in accordance with section 3.5.b.(7) of the solicitation.

**OBJECTIVE:** Develop a multifunctional solution that will provide erosion, impact, ultra-violet rays, and ballistic protection for the windscreens/transparent surfaces on rotary wing aircraft (Threshold) and sensors (Objective). Additionally, the material solution should provide laser eye-protection for the aircraft transparent surfaces (Objective). Any solution must include consideration that aircraft occupant vision, vision systems, and sensor optic performance cannot be degraded to the point of causing impact to mission operations or modification to existing Tactics Techniques and Procedures.

**DESCRIPTION:** Environmental effects of blowing sand and dust particles erode vertical/short takeoff and landing (VTOL/STOL) aircraft windscreens, degrading the pilot's ability to see clearly. Also, the performance of mission aiding devices, such as Night Vision Goggles and various sensors, is degraded by erosion. In order to maintain operational capability, the damaged transparencies must be replaced frequently. The process of replacing windscreens/transparent surfaces or sensors grounds the aircraft, is expensive, and can be very time consuming. Polishing is effective for minor scratches, but creates a swirl effect, which makes sensor operation or flight with night vision equipment impossible. The transparent surfaces of rotary wing aircraft need to remain transparent, but also provide a greater degree of protection to the aircraft occupants than being currently afforded. The intent of this effort is to develop a multifunctional solution that will provide erosion, impact, ultra-violet rays, laser, and ballistic protection for the windscreens and transparent surfaces, without hindering current performance. Potential solutions are envisioned as, but not limited to films, coatings, or complete windscreen replacement.

Numerous laser eye protection systems have been developed and are integrated into different types of Air Soldier Systems. Such systems are helmet visors, spectacles, and filters for night vision systems. Eye protection for all aircraft occupants and the elimination of head borne protection devices is desired. The range of frequency spectrum coverage that can be provided for laser protection within a solution must be quantified during Phase I.

Proposed solutions need to demonstrate:

- Erosion protection, such as resistance to surface abrasion and cavitations caused by high-velocity impact of sand particles. At a minimum, the proposed solution should increase the useful life of aircraft windscreens/transparent surfaces by a factor of 2. Abrasion tolerance IAW ASTM 1044.
- Ballistic tolerance.
- Laser protection.
- Haze and Luminous Transmittance of Transparent Plastics IAW ASTM D1003
- Image quality and visual obscuration must not be degraded (light transmission must be greater than 70% and haze less than 2%) as well as must remain NVG compatible (spectral transmission over both photonic waveband (400 – 700nm) and effective ANVIS waveband (600 – 900nm)).
- Operability in environmental conditions, such temperature extremes Solar Radiation IAW MIL-STD-810F.
- Ability to conduct static charge.
- Chemical resistance to typical aircraft fuels and lubricants.
- Efficacy and field serviceability.

**PHASE I:** Design an all in one solution to satisfy the above criteria and provide quantifiable data to support the solution feasibility. Vendors shall submit a business plan for the commercialization of the technology developed under this topic. The Small Business Administration's web site [www.sba.gov](http://www.sba.gov) provides guidance, examples as well as contact information for assistance.

**PHASE II:** Optimize the Phase I design, fabricate, and conduct appropriate coupon and application level experiments that mimic operational environments. Demonstrate field serviceability and ease of maintenance support. Demonstrate manufacturability and cost effectiveness of the proposed concept.

**PHASE III:** Complete on aircraft testing and satisfy system performance and safety requirements to enable receipt of the appropriate Air Worthiness Release. Implement full-scale production of the proposed materiel solution for use on rotary wing aircraft (MH-60 - Threshold) and sensor windows (TBD – Objective).

PHASE III DUAL-USE APPLICATIONS: This technology is applicable for both commercial and DoD aircraft. This technology has application to Helicopters and other vertical/short takeoff and landing (VTOL/STOL) aircraft such as the V-22 Osprey and airplanes.

Note: The prospective contractor(s) must be U.S. Owned and Operated with no Foreign Influence as defined by DOD 5220.22-M, National Industrial Security Program Operating Manual, unless acceptable mitigating procedures can and have been implemented and approved by the Defense Security Service (DSS). The selected contractor and/or subcontractor must be able to acquire and maintain a secret level facility and Personnel Security Clearances, in order to perform on advanced phases of this contract as set forth by DSS and SOCOM in order to gain access to classified information pertaining to the national defense of the United States and its allies; this will be an inherent requirement. The selected company will be required to safeguard classified material IAW DoD 5220.22-M during the advance phases of this contract.

The prospective contractor must also adhere to the requirements set forth in the International Traffic in Arms Regulation (ITAR), 22CFR-120-130) in the use/placement on non-US citizens in the dissemination of ITAR controlled items and information.

KEYWORDS: Materials, Protective Coatings, Aeronautical Subsystems and Components, Laser Protection, Erosion, Windscreens, Transparencies.