FY2010 Appropriations Request Form

Office of Congresswoman Jackie Speier
211 Cannon House Office Building
Washington, D.C. 20515
Phone: 202/225-3531
Fax: 202/226-4183
Website: www.speier.house.gov

Individuals/Organizations must respond to all questions on the form. Incomplete proposals will not be considered.

All requests will be evaluated before the 12th Congressional District's Citizens Oversight Panel. Appointments to appear before the panel must be made through Cookab Hashemi, chief of staff, at 202/225-3531 or Cookab.Hashemi@mail.house.gov. The panel will convene on the following days; Saturday, March 7, Friday, March 13 and Friday, March 20, 2009. All proposals must be submitted by March 2, 2009.

Date Submitted: February 26, 2009

Project Name: **High Resolution Wide Field of View Night Vision System (HW-NVS)**

Individual/Organization: *(Is the grantee located in the 12th Congressional District?)*

SA Photonics, Yes, 915-D Terminal Way, San Carlos, CA 94070 USA

Amount Requested (*if requesting report language, please attach.*): **$3.0 M**

Appropriations Bill/Account/Relevant Authorization law/bill/status (*e.g., "Public Law 107-111"; "FY2008 DOD Authorization", "Currently pursuing authorization through Agriculture Committee", "Safe Drinking Water Act" or "Hatch Act"*): **FY10 DoD Appropriations and Authorization**

Local Contact (*Please provide full contact information, including any relevant phone extensions, and indicate if there is a separate D.C. contact.*):

James Coward, President and Founder

Washington Representation: Tom Veltri, Federal Business Group

Organization's Main Activities. (*Please limit your response to 250 words and indicate whether it is a public, private, non-profit or private for-profit entity.*)

SA Photonics has assembled a world-class team of high-speed photonics, optical, electrical and mechanical engineers, who each have over 20 years experience in building complex, ruggedized systems for the military and for commercial industry. We have a long track record of developing commercial and military products for the aerospace, aeronautical, terrestrial telecom, and semiconductor industries. We have electro-optic systems flying on satellites, cockpit displays in every F/A-18 E/F aircraft and optical switches in commercial telecom networks around the globe.

SA Photonics personnel have designed some of the most advanced night vision and head mounted display systems in the world, including those for the Army's RAH-66 helicopter, the Air Force's NVS night vision system and the joint service JSF/F-35 fighter jet. Our expertise allows us to teach classes around the globe on the design of head-mounted display and night vision systems.

Please show main items in the project and total cost in a simplified chart form. (*Please include the amount of any Federal/State/Local/Private funds, including any in-kind resources.*)

FY10 funding would allow for the productionization ($1.5M) and safety of flight testing ($1M) of the HW-NVS system in support of USAF requirements via a Phase II SBIR contract. In addition, this funding will be used to support the inclusion of requirements from the Medivac, search and rescue and homeland security community ($0.5M). At the end of this effort we would deliver a flight-qualified prototype unit for evaluation to the Air Force Research Lab.

We have already received $100K of matching funds for our SBIR Phase I activity and $650K of matching funds from our SBIR Phase II activity from Vision Systems International (VSI, San Jose, CA). In addition, we have received commitment for $550K of matching funds from the Army.

Project Description, including a timeline, goals, expected outcomes and specific uses of Federal Funds. (*Your response must focus on the requested funds rather than the organization's mission and general activities. Please limit your response to 250 – 500 words.)*

SA Photonics is working with the Air Force Research Lab, Battlespace Visualization Branch, to develop a new class of high resolution, wide field of view digital night vision goggles. These goggles have an 80 degree field of view, higher resolution, and also provide for a much "clearer" image, especially in very low light conditions where accidents are most likely to happen. Digital image processing will enhance the imagery for better vision and allow it to be recorded for debriefing and feedback. An information overlay capability provides for the display of map overlays with escape routes and other critical aircraft information such as speed, altitude, heading and any warning conditions. This technology has application for military aviation as well as Medivac, civil search and rescue and homeland security applications.

Although there are other solutions to creating a wide field of view night vision goggle, they are all based on decades-old image intensifier tube technology and will not provide the resolution, low-light level performance or image enhancement possible with the HW-NVS. Once we reach production volumes, we believe that the digital night vision sensors (which can be made on a

semiconductor processing line) will be much less expensive than conventional image intensifier tubes which have to be assembled by hand.

How will this earmark serve to expand the capacity of your organization and how will your organization sustain this work beyond the federal funding? (*Your response must focus on the impact of the requested funds rather than the organization's long-term goals.*)

FY'10 funding will allow us to mature HW-NVS into a production-ready unit. This will allow us to grow SA Photonics, add an optical manufacturing and test facility and increase jobs for optical manufacturing in the 12th CD. We are already partnered with Vision Systems International, another Bay Area company, who has decades of experience selling and integrating these types of systems so that we will be able to sustain this work without the use of any additional federal funds.

What is the local significance of this project?

HW-NVS will provide economic opportunity, through the creation of additional jobs, as well as increase the economic diversity of the 12th CD job base by bringing more high-tech optomechanical assembly jobs to the district.

HW-NVS has applications not only for military aviation but also for Medivac, civil search and rescue and homeland security applications. This market will provide even more jobs and diversity and is a critical need, especially with the recent increase in Medivac helicopter crashes and the NTSB's recommendation that all helicopters be equipped with night vision goggles.

How many residents of the 12th CD will benefit from this project? *(i.e. jobs created, services rendered to, how many people, etc.)*

Additional 2010 funding will create **7** new jobs at SA Photonics that will be a mix of senior engineers and recent college graduates from the Bay Area universities. Successful transition into Air Force and other military night vision programs will bring an additional **30 jobs** to SA Photonics.

Successful development of the High Resolution Wide Field of View Night Vision System for the military will also lead to between 10-20 jobs in producing HW-NVS systems for Medivac, civil search and rescue crews and homeland security applications.

List any other organizations or state/local elected officials who have expressed support for the project in writing. (*Please submit copies of support letters along with the proposal.*)

We have received both written and monetary support from both Vision Systems International and the Army's Night Vision Labs. Both letters of support are included at the end of this

document. We feel that this industry and government support shows the need for a HW-NVS system and demonstrates that both industry and government views this as an important program.

Does the organization have any other funding requests for this project? (*Federal, State, Local or private pending*?) No

Has the organization previously received Federal funds for this project? (*Please list any funds received [by fiscal year] and briefly describe how those funds were spent.*) No

Please attach a list of your organization's staff and board members (*if any*).

Board of Directors
James Coward: Chairman of the Board, Founder
Dr. Steve Yee: Secretary, Founder

Key Management and Technical Area Leads
James Coward: President, Chief System Architect
Dr. Steve Yee: Chief Scientist
Dr. Michael Browne: Vice President of Product Development

Please attach any additional relevant materials.

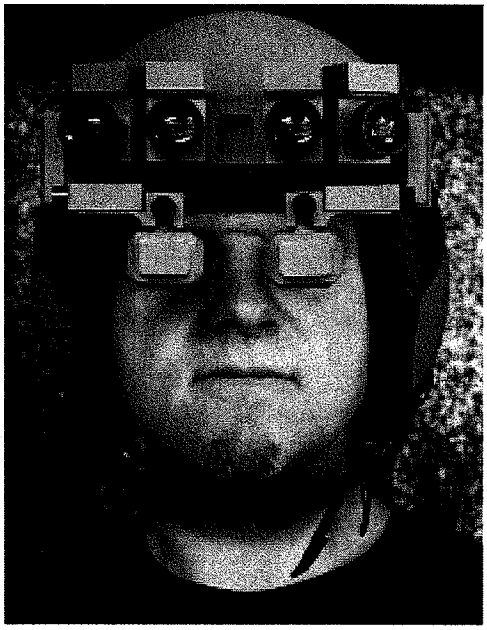

Figure 1: SA Photonics' HW-NVS System Provides for Safer Aircraft and Helicopter Flight in Low-light Level Conditions

High Resolution Wide Field of View Night Vision System (HW-NVS)

Appropriation: RDT&E, Air Force, PE 0603231F, Line 22 (09), Crew Systems and Personnel Protection Technology

Fiscal year 2010 ($ millions)

Funding Profile	FY09 Funding	FY10 Budget Request	**Our Request**	HASC	SASC	CONF	HAC	SAC	CONF
DNVS	$0.0	$0.0	**+$3.0**						

Issue: Most manned airborne missions are now flown at night employing night vision goggle technology developed in the 1970s. These systems are cumbersome to use and have a narrow field of view of only 40 degrees, which reduces pilot situational awareness and provides undue risks to pilots and their passengers. Studies have shown that the number one pilot request for night vision improvements is to increase the field of view of night vision goggles. In addition, Medivac helicopter pilots and search and rescue teams need a low-cost, wide field of view night vision system to improve their safety and that of their passengers. Existing wide field of view night vision goggles are too heavy, they block out much of the pilots vision within the cockpit and they are becoming obsolete.

Program Description: SA Photonics is working with the Air Force Research Lab, Battlespace Visualization Branch, to develop a new class of high resolution, wide field of view digital night vision goggles. These goggles have an 80 degree field of view, higher resolution, and also provide for a much "clearer" image, especially in very low light conditions where accidents are most likely to happen. Digital image processing will enhance the imagery for better vision and allow it to be recorded for debriefing and feedback. An information overlay capability provides for the display of map overlays with escape routes and other critical aircraft information such as speed, altitude, heading and any warning conditions. This technology has application for military aviation as well as Medivac, civil search and rescue and homeland security applications.

Discussion: Although there are other solutions to creating a wide field of view night vision goggle, they are all based on decades-old image intensifier tube technology and will not provide the resolution, low-light level performance or image enhancement possible with the HW-NVS. Once we reach production volumes, we believe that the digital night vision sensors (which can be made on a semiconductor processing line) will be much less expensive than conventional image intensifier tubes which have to be assembled by hand.

FY10 funding would allow for the productionization ($1.5M) and safety of flight testing ($1M) of the HW-NVS system in support of USAF requirements via a Phase II SBIR contract. In addition, this funding will be used to support the inclusion of requirements from the Medivac, search and rescue and homeland security community ($0.5M). At the end of this effort we would deliver a flight-qualified prototype unit for evaluation to the Air Force Research Lab.

Recommendation: Add $3.0 million to RDT&E, Air Force, PE 0603231F, Line 22 (09), Crew Systems and Personnel Protection Technology, only for the High Resolution Wide Field of View Night Vision System (HW-NVS).

Letter of Support from Russ Draper at the Army's Night Vision Labs

From: DRAPER, RUSSELL CIV USA AMC [russell.s.draper@us.army.mil]
Sent: Friday, October 17, 2008 8:28 AM
To: Mike Browne
Subject: RE: White Paper Proposal for Anamorphic Eye Piece Design

Dr. Brown,

I have reviewed the proposal and cost estimates for the research and development work in improving digital low light vision system resolution through the use of existing resolution spatial color displays in a monochrome mode and an anamorphic eye piece. The proposed approach to achieve pixel resolutions in excess of 2 mega-pixel effective resolution directly addresses the research areas we are currently pursuing as part of the Soldier Sensor Component and Image Processing Advanced Technology Objective (SSCIP ATO) in an innovative and cost effective manner.

As manager of the SSCIP ATO, I have proposed to NVESD management some funding within the SSCIP ATO budget for FY 09 and FY10 to apply to this investigation. The funding would be an amount not to exceed $300K during the FY09 period and not to exceed $550K for the period from FY09-FY10. The availability of any ATO funds during either the FY09 or FY10 periods for this purpose is subject to NVESD Director final approval of the SSCIP ATO budget.

I have also understood from our communications that the anamorphic eye piece and high resolution display development effort is part of the SA Photonics Air Force SBIR phase II project to develop a wide field of view all digital low light head mounted vision system.

Russell S. Draper
Branch Chief, Imaging Technology
Night Vision and Electronic Sensors Directorate AMSRD-CER-NV-ST-IT
10221 Burbeck Road
Fort Belvoir, VA 22060

Phone: 703-704-1982
DSN: 654-1982
Fax: 703-704-3134

Vision Systems International
641 River Oaks Parkway
San Jose, CA 95134-1907

September 17, 2008

SA Photonics, Inc. ("SA Photonics")
650 5th Street
San Francisco, CA 94107

To: Michael Browne – VP of Product Development

Subject: Commitment to Match Phase II SBIR

Dear Mr. Browne:

VSI is please to commit the full Phase II SBIR funding if SA Photonics is selected for Phase II. As you are aware, VSI has already provided a the Phase I SBIR funding of $100,000 and expects to provide an additional $650,000 at start of Phase II.

This investment from VSI continues to fund the development of the Wide Field of View (80 degrees) Digital Night Vision system that includes mechanical, electrical, and optical components. Unique elements of this joint development are anamorphic optics, micro-core electronics (new low power high speed video processing), high resolution night sensors for this application, and high resolution displays required for this application to be successful. In addition VSI and SA Photonics will move forward to solidify new markets that are emerging for digital night and as upgrades to existing systems. This effort will include the build of a prototype which demonstrates the capability of this advanced digital night vision.

VSI, a world leader in the development and production of HMD systems, has enjoyed a close working relationship with personnel at SA Photonics for over than 10 years. We are cognizant of your capabilities and have thoroughly reviewed the suggested design approach. We have aligned our internal developments to bring to market a complete solution. We believe that the demand for Digital Night and Digital Day/Night will grow as the benefits of weight, power, and most importantly capability go beyond legacy analog night vision products. We have existing products in both fixed wing and rotorcraft platforms and our analysis shows a significant market potential for this new Digital Night Vision capability

We look forward to continuing our mutually beneficial relationship

Sincerely,

Andres (Drew) Brugal
President
Vision System International