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UNCLE SAM WANTS YOU -- TO HANDLE SMALL TECH RESEARCH

By Rosemary Clandos

Small Times West Coast Correspondent

There's good news for businesses that have promising small tech applications but little funding: The U.S. government is following the trend of major corporations and farming out more research and development projects to small businesses, universities and research centers.

The Small Business Administration manages two programs to provide seed money for MEMS researchers and other high-tech companies to research and develop technologies for government agencies and for future commercialization.

The Small Business Innovation Research Program (SBIR) directs funds to private U.S. companies that qualify for contracts with any of 10 government agencies.

The Small Business Technology Transfer Program (STTR) administers funds for universities or research centers and private businesses to work with government agencies.



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"A lot of the best ideas still come from universities and the small business community, and (the programs) allow the government to draw upon good ideas and get the best technology they can get," says Carl Ray, executive director of the SBIR/STTR program at NASA headquarters in Washington, D.C.

Participating agencies also include the U.S. departments of Defense, Energy, Health and Human Services, Transportation, Education, Agriculture and Commerce in addition to the National Science Foundation and Environmental Protection Agency.

"All the government asks for is a nonexclusive right to use the technology for certain individual products," says Ray. "It's a mechanism for getting funding to do something that would be considered high risk and high value in the high-tech community. Basically, it's free money."

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Well, not exactly free.

The programs have three phases. Companies that receive awards, which can total \$100,000, must develop ideas and demonstrate technical and scientific merit during the first phase, lasting six months. During phase two, companies can receive up to \$750,000 for two years while they work on actual research and development.

Phase three is the commercialization stage; companies are on their own and do not receive government funding.

Kevin Champaigne program director at Invocon Inc. in Conroe, Texas, says that the program has been very profitable for the company.

"It provides a good opportunity for us to work with NASA," Champaigne says. "We're on the small end of the companies that do SBIR (contracts), so it has been an excellent opportunity for us."

The privately held company with fewer than 40 employees has developed wireless sensors that are currently being used by NASA. The product contains "off-the-shelf" MEMS pressure sensors that were integrated into NASA's wireless instrumentation systems and used for monitoring temperatures, strains and acceleration on space shuttle payloads.

In its commercialization efforts, Invocon is targeting the military and industry with the technology that can monitor the temperature and strain in aircraft, vehicles and manufacturing machines.

American-owned and for-profit businesses with fewer than 500 employees and a principal researcher on staff can apply for SBIR contracts.

The STTR program focuses on helping research institutions move their technology into the mainstream commercial marketplace. It allows a small business to partner with a nonprofit research institution and develop new technology for the government.

The 10 agencies use their Web sites and Commerce Business Daily to post solicitations for the specialized research and development projects. Ray says that companies looking for giveaway money to sell their own products are not chosen and unsolicited proposals are not accepted.

For every solicitation NASA makes, it receives between 1,800 and 2,000 proposals. Only about 300 are chosen for the first phase of the project; and up to half of those are selected for phase two projects, says Ray. In 2000, NASA spent \$94.6 million on SBIR contracts and \$5.5 million for STTR projects.

At SBA headquarters in Washington, D.C., policy analyst Ron Cooper says that a recent survey of the 10 agencies involved in the program showed that 39 percent of the projects in phase two had resulted in actual phase three sales that were attributable to SBIR grant work.

In phase three, some companies sell their products to federal agencies; and some generate income by acquiring follow-on research contracts with the government.

"It's high by private sector standards for early stage companies," Cooper explains. "This is a very competitive program and only high quality proposals are accepted and companies have gone through the weeding out phase."

However, "we do find that a number of firms still have trouble raising financing and that's their number one constraint for continuing the work."

The SBA is considering revising phase three to help companies by supporting state-level business assistance programs that would give money and technical business assistance to SBIR firms at the end of phase two, says Cooper.

For many startups, learning how to make money is a key point.

"While the success rate is increasing, part of the secret to success is giving the businesses opportunities to learn how to become successful," says Ray. "Engineers and technologists are not always good business people. We're trying to provide access to sources for them to gain better business acumen."

At the NASA Commercialization Center, which is affiliated with the Jet Propulsion Lab at California State Polytechnic University in Pomona, Calif., Ray is developing a pilot program that targets SBIR phase two companies.

Other government agencies also have business incubators to support SBIR award winners, but Julie Holland director of the NASA Commercialization Center says that their robust program is unique.

"The intent is to roll it out on a national level for NASA." Out of 17 candidates for the program, four were selected to be participants. One of those is a company working with MEMS.

During the last seven years, 40 percent of the companies working with NASA have been new businesses, says Ray.

"We certainly have some companies that fail in the program. Failure is a hard word to use in a very risky environment. We're looking at things that have never been tried before and are predominately based on findings that did not exist before."

While failure with product development is something some companies have to deal with, others must cope with the changing needs of the government, says Martin O'Brien, engineering and operations director at OPHIR Corp. in Littleton, Colo.

"After a lot of work, the program for which the technology was being developed was canceled. It was very frustrating."

The company, with 20 employees, made an infrared air temperature radiometer with MEMS components for NASA's high-speed civil transport program.

"Folks came back and said, 'Why haven't you commercialized the technology?' That's a mark against the company. I said, 'Why did you cancel the high speed transport?'"

"When the program was canceled, it ruined the chances for commercialization. Now we have to find a totally different market for the work we've been working on for several years," says O'Brien.

Nevertheless, OPHIR is proposing the adapted technology to companies in the stealth aircraft industry that have government contracts.

O'Brien says the technology would be important on stealth aircraft because it can measure atmospheric air temperature without a physical probe that protrudes beyond the outer lines of the aircraft and therefore would not increase the chance of radar visibility.

OPHIR also is checking the commercial market for new applications of their technology.

Combining the awards from the 10 government agencies, the SBIR divvied up \$1.1 billion in 1999 to small businesses; and about \$66 million went to STTR contracts. Figures for fiscal year 2000 were not available.

Ray says that he is not anticipating any decline in the budgets for this year. In order to encourage research and development between the government and private businesses, Congress legislated that the 10 government agencies spend 2.5 percent of their extramural research and development budgets on SBIR contracts, and .15 percent on STTR contracts. So if there are cutbacks, they won't be felt immediately, says Ray.

"We don't know about next year. We look at it as being flat for a period of time.

"I see the program as playing a larger role in the overall assets of the nation's economy," Ray says. "We're going to see a lot more interest from the investment community. Eventually VCs will see these small businesses as a reasonable avenue for their investments."

For more information about the programs, visit www.sba.gov/sbir, or call the SBA at (202) 205-6450.

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