U.S. Small Business Administration

SMALL BUSINESS INNOVATION RESEARCH PROGRAM (SBIR)

ANNUAL REPORT – FY 2000

Office of Technology
U.S. Small Business Administration

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OVERVIEW

The Small Business Innovation Development Act of 1982, Public Law 97-219, directs the U.S. Small Business Administration (SBA) to establish policy for monitoring, evaluating, and reporting on accomplishments of the Small Business Innovation Research (SBIR) program. This is the 18th annual report on the SBIR program, which summarizes program activities and results for FY 2000.

Public Law 97-219 was signed on July 22, 1982. Congress reauthorized the SBIR program in 1986, and again in 1993, extending it to October 1, 2000. This reauthorization also mandated an increase in the percentage of research and development (R&D) funds that participating Federal agencies must direct to small businesses under the program from 2 percent to 2.5 percent.

In contemplating the program's reauthorization of 1993, Congress concluded that technological innovation creates jobs, increases productivity and economic growth, and serves as a counter force to inflation and the Nation's balance-of-payments deficit. Congress also found that while the small business sector is the Nation's principal source of significant innovation, large businesses, universities and government laboratories historically have conducted the vast majority of federally funded R&D.

In FY 2000, the SBIR program continued to demonstrate that with focused program support from the Federal Government, small high-tech firms could convert basic ideas and research into commercial products. In doing so, these firms increase national productivity, and contribute to American leadership in the competitive international marketplace. This partnership between the Government and private sector has proved to be remarkably effective.

Over a 18-year period, Federal agencies participating in the SBIR program have awarded more than 59,000 awards worth over $10.6 billion to thousands of small high-tech companies. The innovative small businesses that have received awards have applied their ingenuity and inventiveness to fulfilling Federal R&D requirements and to creating profitable commercial products. These products encompass a wide range of industries and technologies, from the familiar to the exotic.

SBIR program highlights since FY 1983 include the following:

- Successful commercial sales arising from SBIR awards come from an ever-broadening range of technologies and industries such as laser manufacture, medical research, robotics and military decision-making.

- New products and techniques emerging from SBIR awards support America's competitiveness worldwide, and improve the lives of people here and abroad.

- Surveys by SBA and the General Accounting Office indicate that at least 25 percent of SBIR award recipients have reported commercial success of SBIR-supported product(s) within 4 years of receiving a Phase II award.

- Small disadvantaged and women-owned businesses have received a significant portion of SBIR awards.

Despite their talent, determination and entrepreneurial spirit, many small high-tech businesses could not have commercialized their innovation without the unique support

of this program. As the company profiles and statistics in this report suggest, an increasing number of firms are succeeding in commercializing new products, processes and services derived from SBIR awards.

In administering and managing the SBIR program, SBA's Office of Technology encourages small high-tech companies to respond to solicitations from Federal agencies participating in the program. A number of small businesses continue to win multiple awards reflecting their persistent spirit of innovation.

INTRODUCTION

The Rationale

The rationale for enactment of Public Law 97-219 was to give small, innovative enterprises a greater role in federally-funded R&D. The goal was to develop the Nation's industrial technology base for creative technical achievement, and to expand markets for ideas developed by America's small high-tech businesses.

Public Law 97-219 recognized that small businesses -- especially technically oriented firms -- were responsible for most new products, processes and technologies. It also recognized that these firms were particularly adept at turning R&D activities into viable commercial products. In many cases, the only thing such small firms needed to succeed was financial assistance.

The SBIR program has yielded many small business successes. These successful businesses have created many new jobs, expanded the Nation's tax base, and bolstered America's economic viability and productivity.

Legislative Background

Public Law 97-219 requires that, beginning in FY 1983, each Federal agency having an extramural research and research and development (R/R&D) budget in excess of $100 million in FY 1982, or any year thereafter, set aside a portion of such requirements for competitive award under the SBIR program. Through a 4-year phase-in period, civilian agencies were required to increase the percentage of their R/R&D set-asides from 0.2 percent in FY 1983 to 1.25 percent in FY 1986. The Department of Defense was allowed 5 years to phase in its increase from 0.01 percent in FY 1983, to 1.25 percent in FY 1987.

The Small Business Research and Development Enhancement Act of 1992 (Public Law 102-564) extended the SBIR program to October 1, 2000. It also incrementally increased the percentage of annual extramural R/R&D funds that participating Federal agencies must direct to small high-tech firms from 1.25 percent to 2.5 percent.

Public Law 102-564 also sought to:

- Expand and improve the SBIR program.
- Emphasize increased private-sector commercialization of technology developed under the program.
- Increase small business participation in Federal research and development.
- Improve dissemination of SBIR program information to encourage participation of women-owned and socially and economically disadvantaged small businesses.

Participating Federal Agencies

Pursuant to Public Law 97-219, the following Federal agencies are required to participate in the SBIR program:

- Department of Agriculture (DOA)
- Department of Commerce (DOC)
- Department of Defense (DOD)
- Department of Education (ED)
- Department of Health and Human Services (HHS)
- Department of Transportation (DOT)
- Environmental Protection Agency (EPA)
- National Aeronautics and Space Administration (NASA)
- Department of Energy (DOE)
- National Science Foundation (NSF)

SBIR Program Structure

The SBIR program is structured in three phases:

- Phase I: Awards up to $100,000 are for research projects designed to evaluate the feasibility, and the scientific and technical merit of an idea. Phase I awards are for a period of up to 6 months.

- Phase II: Phase I projects with the most potential are funded for further development of the proposed idea. Phase II funding of up to $750,000 may be awarded over a period of up to 2 years.

- Phase III: No SBIR funds may be used in this phase. Private-sector investment and support must be used to bring an innovation to market. However, as appropriate, Phase III funds may include follow-up contracts with Federal agencies for production of Phase II innovations.

SBA Authorities and Responsibilities

SBA has authority and responsibility to:

- Develop, coordinate, issue and update a policy directive for the Federal government-wide conduct of the SBIR and R/R&D Goaling Programs.

- Develop and administer an information and outreach program for the SBIR program.

- Develop and maintain a source and information file of interested small businesses.

- Develop, coordinate, publish and disseminate SBIR Pre-Solicitation Announcements.

- Survey, monitor and report on each agency's SBIR program.

- Report at least annually to Congress on each agency's SBIR program and on SBA's monitoring activities.

- Coordinate private-sector commercialization of SBIR innovations.

- Obtain information on the current National Critical Technologies.

Authorities and Responsibilities for Participating Agencies

Each participating agency has the authority and responsibility to:

- Determine the categories of projects to include in its SBIR program.

- Issue SBIR solicitations in accordance with a schedule determined cooperatively with the SBA.

- Unilaterally determine research topics within each SBIR solicitation, giving special consideration to broad research topics and to topics that further one or more National Critical Technologies.

- Receive and evaluate proposals resulting from SBIR solicitations.

- Select awardees for SBIR funding agreements.

- Ensure that funding agreements under the SBIR program include provisions setting forth the respective rights of the United States and small businesses with regard to intellectual property rights and follow-on research.

- Administer SBIR funding agreements (or delegate such administration to another agency).

- Make payments to SBIR award recipients based on progress toward or completion of the funding agreement requirements.

- Submit annual reports on the SBIR and R/R&D goaling programs to the SBA.

PROGRAM SERVICES

In setting SBIR program policy and in monitoring and evaluating the program, the SBA seeks to simplify and standardize grant and contract award procedures, minimize paperwork, and encourage small companies owned by women, minorities and disadvantaged individuals to participate in the program. The SBA also conducts an ongoing national information and outreach campaign, and ensures that participating agencies conform to SBIR policy directives.

The SBIR solicitation process minimizes administrative burden. It mandates timely receipt and review of proposals, peer review, and adherence to cost principles. Also, it establishes guidelines for proprietary-information, selection of awardees, data-rights retention, title to Government property, and cost sharing.

Pre-Solicitation Announcements

The SBA's SBIR Pre-Solicitation Announcement to small businesses presents basic program solicitation information in a succinct and understandable manner. Each quarterly announcement provides complete information on all SBIR activity for that quarter, eliminating the need for small businesses to track the activities of each participating agency individually. The announcements are available from the SBA's electronic bulletin board, SBA On-Line, and on the Internet. The announcements provide small businesses with--

- A brief statement of each research topic, listed by participating agency;
- The opening and closing dates of each solicitation;
- An estimate of the number of awards to be made under each solicitation;
- The party to contact for a copy of the agency's solicitation; and,
- A master schedule of solicitation opening and closing dates for all participating agencies.

Other SBIR information available from SBA includes award winners from the latest available fiscal year and the SBIR Proposal Preparation Handbook.

Outreach

SBA field representatives and public and private organizations play significant roles in dissemination of SBIR program information. During FY 2000, SBA worked with many organizations in conducting SBIR seminars and conferences, providing information, materials and speakers.

Another form of outreach involves briefing officials of foreign governments. During FY 2000, foreign interest in the SBIR program continued to grow. SBIR-type programs are in place in the United Kingdom and other European countries.

PROGRAM DATA

Reporting Requirements for SBIR

To monitor and report on the participating agencies' SBIR programs, SBA has established a reporting base to compare against each agency's budget data. To determine extramural obligations as a base for the size of each agency's SBIR program, Public Law 97-219 provides a definition of research and development.

It should be noted that a 3-year budget cycle is used for establishing extramural R/R&D obligations. Within any given year, a participating agency's initial estimate can change due to congressional action on that agency's R/R&D budget. To ensure proper implementation of the program, each agency establishes an estimated budget as a basis for operations during the year. The SBA uses a system of deficits and credits to make the necessary adjustments during the course of the budget cycle. In this way, SBA determines whether agencies comply with SBIR set-aside requirements.

FY 2000 Summary

There have been long-term upward trends in the number of Phase I, Phase II and total SBIR awards.

- In FY 2000, the 10 agencies participating in the SBIR program released a total of 13 Phase I solicitations. The Department of Health and Human Services, the Department of Defense and the Environmental Protection Agency each released two solicitations; the other seven agencies released one each.
- Participating agencies received 17,641 Phase I proposals from small high-tech enterprises. Agencies subsequently made 3,166 Phase I awards, representing 17.9 percent of proposals received.
- A total of 2,533 Phase II proposals were received by participating agencies, resulting in 1,330 awards. These awards represented 53 percent of Phase II proposals received.
- In total, 20,174 Phase I and Phase II proposals were received in FY 2000. Phase I and Phase II awards totaled 4,496, representing 22 percent of the total number of proposals received.

(See Program Data Chart)

SBIR Program Data

Fiscal Year 2000 SBIR Agency Obligations Summary (dollars in thousands)

	DOA	DOC	DOD	DOE	DOT	ED	EPA	HHS	NASA	NSF	TOTAL
Agency Extramural Budget	622,334	278,324	22,140,724	3,340,312	146,929	233,598	243,433	14,481,610	3,684,000	2,500,000	47,671,264
Agency SBIR Budget	15,558	6,958	554,721	83,508	3,673	5,935	6,085	362,040	92,100	64,800	1,195,378
Dollars Obligated	14,956	6,852	501,981	85,931	5,715	5,935	8,045	360,621	93,090	65,359	1,148,485
Percent of SBIR to Extramural Budget	2.20%	2.46%	2.27%	2.57%	3.89%	2.54%	3.30%	2.49%	2.53%	2.61%	2.41%
Deficit/Surplus	-602	-106	-52,740	2,423	2,042	0	1,960	-1,419	990	559	-46,893

Fiscal Year 2000 Award Profile (dollars in thousands)

	DOA	DOC	DOD	DOE	DOT	ED	EPA	HHS	NASA	NSF	TOTAL
Total Phase I Awards	89	42	1,217	203	9	50	41	1,013	290	212	3,166
Minority/Disadvantaged Phase I Awards	11	4	234	30	3	7	2	26	41	28	386
Total Phase II Awards	36	14	625	91	14	14	3	295	130	108	1,330
Minority/Disadvantaged Phase II Awards	2	4	117	17	1	2	1	7	16	19	186
Total Phase I Dollars Awarded ($)	5,961	3,020	103,108	20,070	888	2,485	2,887	122,406	20,160	21,049	302,034
Minority/Disadvantaged Phase I Dollars ($)	752	249	19,736	2,993	289	399	140	3,051	2,860	2,793	33,262
Total Phase II Dollars Awarded (Obligations)	8,995	3,833	446,007	65,861	4,827	3,450	4,948	233,016	72,930	44,310	888,177
Minority/Disadvantaged Phase II Dollars ($)	510	300	80,475	11,924	245	600	225	5,263	10,220	7,508	117,270
Average Amount for Phase I Awards ($)	67	72	85	99	99	50	70	121	70	99	95

Fiscal Year 2000 Agency Solicitation Profile

	DOA	DOC	DOD	DOE	DOT	ED	EPA	HHS	NASA	NSF	TOTAL
Number of Solicitations Released	1	1	2	1	1	1	2	2	1	1	13
Number of Research Topics in Solicitations	9	21	701	45	24	14	15	197	29	4	1,059
Number of Copies Distributed	6,000	3,000	36,000	3,500	250	1,600	10,000	5,482	25,000	20,000	110,832
Number of Phase I Proposals Received	480	338	7,201	1,086	134	160	532	4,039	2,271	1,400	17,641
Number of Phase II Proposals Received	59	35	928	184	17	33	30	718	318	211	2,533
Number of Phase I Awards	89	42	1,217	203	9	50	47	1,013	290	212	3,172
Number of Phase II Awards	36	14	625	91	14	14	8	295	130	108	1,335

Dollars obligated can include modifications to previous year's awards: DOD $73,063K HHS $5,199K in non-SBIR funds, and EPA 210K

Table 2: Number of SBIR Awards -- FY 1983 through FY 2000

Fiscal Year	Phase I	Phase II	Totals
83	686	-	686
84	999	338	1,337
85	1,397	407	1,804
86	1,945	564	2,509
87	2,189	768	2,957
88	2,013	711	2,724
89	2,137	749	2,886
90	2,346	837	3,183
91	2,553	788	3,341
92	2,559	916	3,475
93	2,898	1,141	4,039
94	3,102	928	4,030
95	3,085	1,263	4,348
96	2,841	1,191	4,032
97	3,371	1,404	4,775
98	3,022	1,320	4,342
99	3,334	1,256	4,590
00	3,166	1,330	4,496
Total	43,643	15,911	59,554

There have been parallel long-term upward trends in the dollar value of Phase I, Phase II and total SBIR awards.

- During FY 2000, participating agencies awarded $1.1 billion through the SBIR program.
- FY 2000 Phase I awards totaled $302 million.
- Phase II awards aggregating $888 million were made in FY 2000.
- In FY 2000, minority/disadvantaged-owned firms received 572 awards totaling $151 million.

Please see Table 3. (Note: The overall total includes $283 million in modifications to non-FY 2000 awards and $5.2 million in non-SBIR funds. In awarding funding agreements under Phase II, agencies utilize various acquisition methods of obligation and funding. (For purposes of consistency, the acquisition data in this report reflect only actual obligations during FY 2000.)

Table 3: Value of SBIR Awards-- FY 1983 through FY 2000 (in millions of dollars)

Fiscal Year	Phase I	Phase II	Totals
83	$ 44.5	$	$ 44.5
84	48.0	60.4	108.4
85	69.1	130.0	199.1
86	98.5	199.4	297.9
87	109.6	240.9	350.5
88	101.9	248.9	389.1
89	107.7	321.7	431.9
90	118.1	341.8	460.7
91	127.9	335.9	483.1
92	127.9	371.2	508.4
93	154.0	490.7	698.0
94	220.4	473.6	717.6
95	232.2	601.9	834.5
96	228.9	645.8	916.3
97	277.6	789.1	1,106.9
98	262.3	804.4	1,066.7
99	299.5	797.0	1,096.5
00	302.0	888.2	1,190.2
Total	2,925.1	7,740.9	10,666.0

FY 2001 EST: - $1.5 billion
Total includes award modifications

As in prior years, in FY 2000 SBA continued to use a system of deficits and credits to evaluate agency SBIR budgets against actual amounts obligated.

Through its SBIR Policy Directive, SBA requires each participating agency to list the number of Phase I awards made both within 6 months and after 6 months of the closing date of its solicitation announcement. Table 4 (immediately following) provides this information for FY 2000.

Table 4: FY 2000-- Phase I Time Frame

Agency	Total FY 00 Phase I Awards	No. within 6 Months of Solicitation Close	No. More Than 6 Months After Solicitation Close
DOA	89	0	89
DOC	42	42	0
DOD	1,217	1,181	36
DOE	203	203	0
DOT	9	9	0
ED	50	50	0
EPA	41	41	0
HHS	1,013	917	96
NASA	290	290	0
NSF	212	212	0
TOTAL	3,166	2,945	221

Highlights of Cumulative Data

The SBIR program continues to receive recognition for quality performance. The following highlights accomplishments of the SBIR program since it began in FY 1983:

- More than $9.5 billion has been awarded.
- Participating agencies received a total of 346,347 Phase I and Phase II proposals in response to 239 SBIR solicitations. A total of 59,554 Phase I (43,643) and Phase II (15,911) awards have been made.
- Minority/ disadvantaged firms have received 7,400 awards, representing 12.4 percent of all SBIR awards. The value of these awards is $2.1 billion, representing 22 percent of all dollars awarded under the program.
- Awards have been made to firms in all 50 states, Puerto Rico and the District of Columbia.
- Several participating agencies have allocated more for this program than required by law. In accordance with the law, each participating agency will continue to award at least 2.5 percent of its R/R&D extramural budget each fiscal year.

SUCCESS STORIES

The following stories represent the most recent successes from FY 2000 SBIR awards issued by the participating Federal agencies.

DANCING DOTS
Upper Darby, PA

Dancing Dots Braille Music Technology, L.P., was founded in 1992 to develop and adapt music technology for the blind. In 1997 Dancing Dots released its first product, the GOODFEEL(r) Braille Music Translator software. Meanwhile, the company has expanded its focus to enabling blind musicians to independently record, edit and print out their musical ideas. Their CakeTalking product, released in summer 2000, customizes the JAWS for Windows screen reader to give the blind user the highest level of access ever to Cakewalk, a mainstream application which converts a personal computer into a digital recording studio.

Bill McCann, Dancing Dots' president and founder, sees GOODFEEL(r) and CakeTalking is the first in a long series of high-tech tools to harness the power of the personal computer for creative people with disabilities. The company looks forward to further groundbreaking work in the area of developing Braille music teaching systems and music composition software.

McCann himself is a blind musician and programmer who has successfully competed for Federal and state contracts to advance this work. The company's prime sponsors have been the Pennsylvania Ben Franklin Technology Center and the U.S. Department of Education.

McCann says: "Funding through the SBA's Small Business Innovation Research (SBIR) program has made it possible for me to build a competitive, global business that is making a genuine difference in the lives of blind musicians, their teachers, colleagues or students. Our technology would most likely not have been supported by traditional sources of capital. However, SBIR funding has sustained the R&D effort which has brought it to this small but significant market which, in turn, has provided the foundation for a growing company."

Since 1997, when it released its first product, the company's annual sales have more than doubled in each calendar year. DancingDots is on course to continue this growth in the year 2000, which may very well also be its break-even year. In addition to its income from sales of software it has developed, other growing revenue streams include resale of assistant technology and mainstream music software and supplies, consultation and training, and a Braille music transcription service.

Dancing Dots has appointed resellers for its products in the United States, the United Kingdom, and Sweden. Dancing Dots has established a growing customer base in 19 foreign countries via its website and participation international conferences on technology and disability.

Dancing Dots has employed its founder and a full-time software engineer since 1994. During that time, the company has hired a few other developers and administrative staff as full-time employees or on a part-time contract basis. Notwithstanding these undeniable economic benefits, the company's work has opened or improved employment possibilities for countless blind people. Dancing Dots has customers who make their living as record producers/recording engineers, college music instructors, musical performers and radio show hosts! The company has been a strong voice for Braille literacy, inclusion and independence for students who will be the professionals of tomorrow. The technology fashioned by Dancing Dots

empowers talented blind people to apply their skills to making a contribution to society, to participate as actors rather than spectators in the economic and professional life of our country.

Dancing Dots received the Small Business Administration's Tibbetts Award in 1998 for "Championing America's Entrepreneurs." In 1999, Dancing Dots demonstrated its Braille music translator to the President and Vice President at a press briefing on technology and disability at the White House. Most recently the company was the recipient of the Access Award of the American Foundation for the Blind along with IBM and Pitney-Bowes. Dancing Dot's founder has been interviewed for numerous music and business publications and programs including the BBC World Service, the Associated Press and the Philadelphia Inquirer Business Section.

ASPEN SYSTEMS, INC.
Marlboro, MA

Aspen Systems, Inc., develops advanced technologies and products for energy and environmental applications that have high commercialization potential and offer global environmental benefits. Aspen is a leading manufacturer of "aerogels" in the United States. Aerogels have very high thermal insulation values, shielding, and acoustic and shock absorption characteristics. Aspen has been developing various aerogel products and technologies starting from a 1994 NASA Kennedy Space Center contract to develop flexible aerogel insulation for cryogenic applications.

In March 1999, Aspen invented a high speed manufacturing process for aerogels for which Aspen received the prestigious SBIR Technology of the Year Award in Manufacturing/Materials. The new process provides dramatic cost reductions in the manufacture of aerogels. Aspen plans to mass produce aerogels using this new method and open world markets for building insulation, skylights/windows, clothing, home appliances, aerospace, automotive, cryogenics and other applications. The potential worldwide market for low cost aerogels is projected to be $10 billion a year by 2005. A 1,000-liter pilot plant based on the new fast process is being built to be finished by mid 2001. It is anticipated that aerogel based insulation will set a new standard for energy efficient building insulation materials available at affordable prices. Also, widespread commercialization of aerogel insulation products worldwide will result in significant reduction in energy use and greenhouse gas emissions on a global scale.

Aerogels, initially made in 1931, is an engineered material that holds six world records for a solid: the highest thermal insulation value, highest specific surface area, lowest density, lowest speed of sound, smallest pore size, lowest refractive index, and lowest dielectric constant. In addition to these properties, aerogels boast a very high light transmission. Each one or combinations of these properties can be exploited to develop highly desirable products. Widespread use of aerogel-based insulation would significantly reduce energy consumption and emissions of greenhouse gases without forcing changes in lifestyle or industry practices on a global scale. Despite their temendous commercial potential and long history, aerogels have not been commercially available in large quantities mainly due to the high processing and initial capitalization costs of the supercritical extraction methods conventionally used for making them.

The very features that make the aerogels excel as thermal insulation, i.e., small nanometer sized open pores, require a long processing time for the heat and fluids to slowly diffuse through the aerogel matrix during aerogel drying process. This becomes even more acute when large production size extractors were to be used. There have been numerous failed or aborted attempts in the past to prematurely commercialize aerogels starting with Monolithic Silica Aerogels for transparent window glazing.

Aspen, a relatively new entrant in the long seven decade long history of aerogel development, started working on aerogels

when it first received a NASA SBIR Phase I in January 1993 to develop flexible aerogel blankets for cryogenic applications at Kennedy Space Center that resulted in a patented flexible aerogel blanket. Over the ensuing 7 years, Aspen received approximately $4 million spread over seven SBIR Phase I's, five SBIR Phase II's and two major non-SBIR contracts specifically on aerogels for various applications responding to the United States Government's needs. During this period of intense technology and product development, Aspen methodically accumulated and developed key aerogel technologies to become a leader in aerogel technology in the world. The total sales of aerogel samples to date amount to approximately $280,000 despite the small 40-liter production facility and scarce run time for commercial production.

A seven-decade-old dream of a breakthrough in aerogel technology came true in March 1999 through the effort of Aspen's team led by Dr. Kang P. Lee. A new, fast and efficient solvent extraction process was invented that speeds up the production of high quality aerogels by at least 10 times compared to the state-of-the-art supercritical CO2 drying process according to initial tests. The process speed is expected to increase much further, by an additional factor of two, when the process is fully optimized. In addition to its high speed, another crucial characteristic of this new process is that its speed can be virtually independent of production equipment size. This is in stark contrast to the conventional supercritical aerogel drying method according to which a larger extractor will require much longer time than a smaller extractor in proportion to the square of the dimensional ratio. This new process can be used for producing large aerogel panels or blankets in a fast batch process. The same method will dry aerogel beads in such a short period that connecting multiple extractors to a single wet gel process stream will approach the functionality of a fast continuous process! A 1,000-liter pilot plant based on this new patent-applied-for process is under construction at Aspen. This is being built as part of an ongoing DOE sponsored SBIR Phase II to produce large transparent aerogel panels for the Cherenkov detector community and skylight manufacturers. To build the pilot plant, Aspen Systems is contributing more than $250,000 in addition to about an equal amount coming from the DOE SBIR Phase II.

In addition to the enabling technology of rapid aerogel drying process, Aspen has developed the following key aerogel technologies that will be essential to widespread aerogel use as thermal insulation: (a) Flexible Aerogel Blanket (developed under a NASA SBIR Phase II). For the first time, aerogels could be handled and installed like any other insulation. This is a significant departure from the previous available forms of aerogels: brittle monolith, dusty powder, and beads; (b) Monolithic non-flammable/hydrophobic aerogels with glass like transparency (developed under DOE SBIR Phase II) useful for window and skylight insulation; (c) Non-flammable/hydrophobic aerogels (developed under a NASA SBIR Phase I) useful for cryogenic to building insulation; and (d) inexpensive, resilient, low dusting, and extremely flexible blanket called Spaceloft TM* and thin aerogel imbedded fabric called Aerotex TM* funded by NASA's SBIR program.

Aspen not only has developed many leading-edge, eminently commercializable aerogel technologies and products, but will also mass-produce aerogel-based products to service customers such as NASA, the military and commercial clients.

ADVANCED CERAMICS RESEARCH
Tucson, AZ

Most of Advanced Ceramics Research (ACR) successes in the high-temperature materials area can be attributed to the infrastructure and capabilities developed in the Navy SBIR Phase II Program. This technology provided a foundation for a new class of low

cost ceramic composite materials called Fibrous Monoliths.

The composite materials developed by ACR are expected to be used by DOD and its suppliers as stationary engine parts for fighter jets and high temperature components for various missile systems. By using these composite materials, it is expected that the time between each engine-overhaul could be tripled, which will lower engine maintenance costs considerably.

ACR has accomplished the following:

- Received NASA SBIR funding ($548,000) to develop continuous fiber reinforced composites for heat shields and leading edges
- Received NASA SBIR funding ($670,000) to develop refractory composites for hot gas containment
- Achieved commercial sales of over $450,000 to various customers.

ACR's core business areas consist of, (a) advanced composite ceramic materials, (b) rapid prototyping technologies for ceramics and composites, and (c) production of high performance composite carrier products used for polishing computer hard drive disks. Cumulative revenues for ACR since its founding in 1989 are now more than $22 million. Approximately $17.5 million are from commercial and Government sales, while $4.5 million are from the SBIR and Small Business Technology programs. Over the last 10 years, ACR's commercial sales have provided a net income of over $2.5 million, which has been fully reinvested for future growth. In August 1998, ACR completed construction of a facility at a cost of $3 million and moved its operations into this state-of-the-art facility, thus increasing the capacity and quality of its production and research programs.

ACR was selected as a winner in the first annual "Tibbetts Awards" in June 1996, to recognize its unique contributions as an SBIR Model of Excellence. The Inc. Magazine recently listed ACR as number 483 in the Inc. 500 listing for the years from 1993 through 1997. ACR's sales grew at an annual rate of 642 percent between 1993 and 1997. The Tucson Business Journal ranked ACR as a top-ten defense contractor in the Tucson area for 5 of the last 6 years. ACR won a 1999 R&D 100 Award for developing a water soluble support material for Rapid Prototyping under a DOD sponsored research program. This system was recently licensed to Stratasys, Inc. for use on their Fused Deposition Modeling rapid prototyping systems.

GENERAL INFORMATION

Publications Update

All publicly distributed SBIR documents have been updated and are available on the SBA's electronic bulletin board, SBA On-Line. The bulletin board can be accessed 24 hours a day via modem or the Internet, eliminating the printing, mailing and storage costs previously incurred for SBIR publications. Information is published on the bulletin board at the same time it is available in hard copy.

National Conferences

The Department of Defense and the National Science Foundation sponsored SBIR conferences in FY 2000 in Washington, DC; Seattle, Washington; and Tulsa, Oklahoma.

General Information

The SBA has offices located throughout the United States. For the one nearest you, look under "U.S. Government" in your telephone directory, or call the SBA Answer Desk at (800) 8-ASK-SBA. To send a fax to the SBA, dial (202) 205-7064. For the hearing impaired, the TTD number is (704) 344-6640.

To access the Agency's electronic public information services, you may call the following:

- SBA On-Line: electronic bulletin board modem and computer required:

  (800) 697-4636 (limited access)
  (900) 463-4636 (full access)
  (202) 401-9600 (DC metro area)

- Internet: using uniform resource locators URLs
- SBA Home Page: http://www.sba.gov/sbir
- SBA gopher: gopher://gopher.sba.gov
- File transfer protocol: fftp://ftp.sba.gov
- Telnet: telnet://sbaonline.sba.gov
- U.S. Business Advisor: http://www.business.gov

You also may request a free copy of The Resource Directory for Small Business Management, a listing of for-sale publications and videotapes, from your local SBA office or the SBA Answer Desk.

U.S. Small Business Administration
Office of Technology
Total SBIR Awards for Fiscal Year 2000

State	Phase 1 Awards	Phase 1 Dollars	Phase 2 Awards	Phase 2 Dollars	Total Awards	Total Dollars
Alabama	51	4,485,763	31	20,485,704	82	24,971,467
Alaska	1	100,000	2	878,459	3	978,459
Arizona	68	5,751,527	28	15,032,857	96	20,784,384
Arkansas	3	233,990	3	1,893,994	6	2,127,984
California	622	61,401,182	261	153,766,314	883	215,167,496
Colorado	173	15,222,480	66	38,430,550	239	53,653,030
Connecticut	43	3,961,204	27	14,445,183	70	18,406,387
Delaware	21	2,011,930	7	3,509,476	28	5,521,406
Dist.of Columbia	10	1,132,530	6	2,892,521	16	4,025,051
Florida	79	6,976,130	35	19,987,392	114	26,963,522
Georgia	37	3,357,080	13	7,483,949	50	10,841,029
Hawaii	11	935,985	8	3,698,626	19	4,634,611
Idaho	7	570,782	2	415,000	9	985,782
Illinois	52	5,021,610	23	12,955,961	75	17,977,571
Indiana	14	1,379,529	5	2,948,051	19	4,327,580
Iowa	5	484,173	1	592,723	6	1,076,896
Kansas	8	667,778	7	2,085,145	15	2,752,923
Kentucky	12	1,310,251	4	1,427,909	16	2,738,160
Louisiana	7	676,055	4	1,500,846	11	2,176,901
Maine	10	869,335	4	2,099,454	14	2,968,789
Maryland	135	12,921,490	71	43,703,954	206	56,625,444
Massachusetts	452	44,722,006	200	119,125,306	652	163,847,312
Michigan	44	3,939,419	22	12,018,090	66	15,957,509
Minnesota	44	3,905,351	19	11,033,969	63	14,939,320
Mississippi	5	529,310	6	3,129,896	11	3,659,206
Missouri	16	1,517,578	6	3,454,100	22	4,971,678
Montana	18	1,476,802	6	4,141,589	24	5,618,391
Nebraska	5	409,264	4	2,171,420	9	2,580,684
Nevada	5	429,978	3	1,580,505	8	2,010,483
New Hampshire	34	2,922,021	18	10,631,030	52	13,553,051
New Jersey	90	8,300,759	42	24,480,000	132	32,780,759
New Mexico	52	4,533,173	23	13,881,716	75	18,414,889
New York	133	13,755,267	52	28,620,318	185	42,375,585

ordered by: State

***Based on awards issued and funding obligations for new awards only.**

U.S. Small Business Administration
Office of Technology
Total SBIR Awards for Fiscal Year 2000

State	Phase 1 Awards	Phase 1 Dollars	Phase 2 Awards	Phase 2 Dollars	Total Awards	Total Dollars
North Carolina	46	4,855,939	13	6,255,607	59	11,111,546
North Dakota	3	300,000	4	1,835,000	7	2,135,000
Ohio	119	11,353,638	52	31,107,271	171	42,460,909
Oklahoma	9	709,874	3	1,540,784	12	2,250,658
Oregon	41	4,236,373	18	8,287,293	59	12,523,666
Pennsylvania	116	10,691,904	35	21,461,191	151	32,153,095
Puerto Rico	0	0	1	558,868	1	558,868
Rhode Island	18	1,667,855	6	2,712,217	24	4,380,072
South Carolina	14	1,067,303	5	2,719,642	19	3,786,945
South Dakota	3	268,949	1	400,000	4	668,949
Tennessee	27	2,443,447	13	7,166,730	40	9,610,177
Texas	135	13,172,432	49	26,992,022	184	40,164,454
Utah	30	2,903,852	11	5,770,344	41	8,674,196
Vermont	8	778,489	8	3,708,639	16	4,487,128
Virginia	164	14,279,013	69	45,534,274	233	59,813,287
Washington	81	8,169,778	24	12,907,842	105	21,077,620
West Virginia	6	505,675	3	1,544,808	9	2,050,483
Wisconsin	27	2,470,546	17	7,979,521	44	10,450,067
Wyoming	6	484,678	3	1,183,371	9	1,668,049

ordered by: State

***Based on awards issued and funding obligations for new awards only.**