

# SBIR Basics

*An overview of the Small Business Innovative Research (SBIR) program, strategies for winning, and selected resources*

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## Introduction

For over a decade, I have been writing Small Business Innovative Research (SBIR) and Small Business Technology Transfer (STTR) grants, dealing with rejections and managing winning projects—all in the challenging context of U.S. governmental bureaucracies. This paper overviews the SBIR program and provides additional strategic information based on my own personal experiences and supplemented with information from seminars I have attended, web resources, and other readings.

This document is not meant as the final authority on the subject. In many places detail is sacrificed in favor of more concise synopses. Furthermore, the innovative spirit promoted by the SBIR program is reflected in its frequently-changing specifics. Official web sites, documents, experts, and help desks from the agencies involved provide the most current and reliable information. Get to know these resources and rely on them.

Additional ideas, questions, or suggestions are welcome via email ([info@garcoserv.com](mailto:info@garcoserv.com)) or my web site ([www.garcoserv.com](http://www.garcoserv.com)).

## Program Overview

The SBIR program is designed to stimulate technological innovation and provide opportunities for small business. Towards these ends, the SBIR program funds technology research and development (R&D) that serve two purposes:

- 1) to help build small businesses and the technology base in the United States, and
- 2) to meet identified goals of federal agencies.

***Dual-use technologies.*** The resulting technologies must therefore 1) be commercially viable, and 2) serve recognized federal needs. The catch-phrase for this is “dual-use technologies.”

***SBIR: small business set-aside.*** SBIR is a set-aside program; certain government agencies (with R&D budgets over \$100 million) reserve monies to fund SBIR development before allocating dollars to their operations. In 2002, \$1.3 billion was set aside for the SBIR/STTR program, resulting in over 4,500 awards in 50 states.

***STTR requires research partnership.*** The STTR program responds to the same solicitations as the SBIR program. However, the STTR program requires a partnership between a small business and a nonprofit research institution. Only five of the eleven SBIR government agencies make STTR awards. For simplicity, I use the term “SBIR” throughout this paper, even though in many cases “SBIR/STTR” would be more encompassing.

### SBIR/STTR Program Upsides

#### Small business

- receives funds for high-risk technology R&D that it could not otherwise justify
- retains rights to intellectual property
- does not repay award
- can leverage award to attract funds from other sources

#### Federal program offices

- meet requirements outside given budget

#### U.S. economy

- made stronger with marketable small business innovations

**Eligibility.** The proposing company must be:

- a small business (500 or fewer employees)
- for-profit
- independently owned
- a U.S. business

Also, the Principal Investigator must have primary employment with the small business.

**Once-a-year topics.** SBIR programs are usually announced annually (twice a year for the Department of Defense) in a *solicitation* that requests proposals and lists specific topics of interest. In order to meet dual-use requirements, proposals must address the needs described in one of the topics.

**Business owns IP.** This is one of the strongest incentives of the SBIR program. In order to further promote small business development, the government allows small businesses to retain rights to any intellectual property resulting from an SBIR award. However, the government reserves the right to use SBIR-developed technology on a royalty-free basis. Nevertheless, while IP ownership and government rights invariably consume substantial discussion time in SBIR seminars, the winds of practice often cause these issues to evaporate.

#### SBIR/STTR Program Downsides

##### Small business

- risks time spent in proposal preparation against (average) 25% award rate
- must wait 1-2 years for large-scale funding
- experiences uncertain, uneven funding profile
- may find it hard to contact program personnel

##### Federal program offices

- must deal with applicants in addition to existing work
- have less money to budget due to set-aside

**High-risk funding.** Typically, SBIR programs fund research and development to demonstrate feasibility, and then to develop fully functional technologies from the demonstrations that appear feasible. The SBIR program will fund higher-risk technology R&D than many small businesses can justify on their own or to financial backers. SBIR programs generally do not fund *basic research*, that is, experiments and explorations to discover new ideas and approaches. They also do not fund *productization*, which includes packaging and marketing technologies into salable products.

**Departments differ.** Eleven government agencies participate in the SBIR program, each with its own peculiar flair, making generalities difficult at times. When working with any given program, it is imperative to flesh out the broad statements of this paper with the particulars of that program.

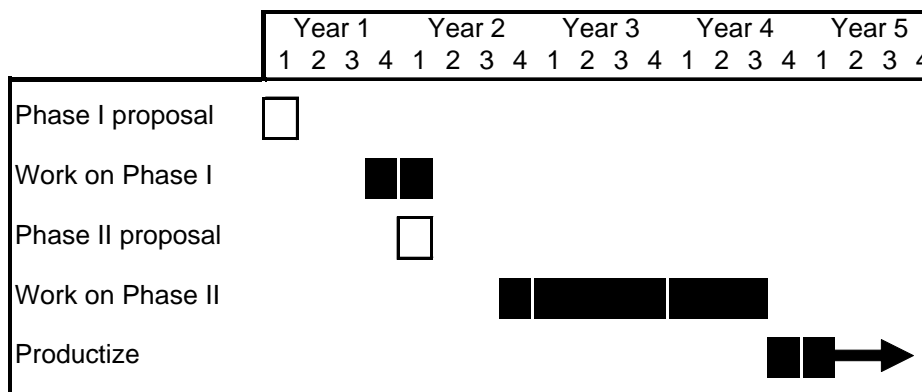
**Success rates.** Overall, one in five SBIR Phase I proposals results in an award. In 2001, for example, 3,156 awards were generated from a pool of 15,794 candidates across the ten agencies in the program at that time. The success rate for Phase II proposals, however, is higher—anywhere from 33% to 50% depending on the agency.

**Program Phases and Example Timeline**

All implementations of the SBIR program involve the same three phases, although timelines and amounts may differ among agencies.

<b>Phase I:</b>	<b>Demonstration of feasibility</b> 6 months, up to \$100,000
<b>Phase II:</b>	<b>Full research / technology development</b> 2 years, up to \$850,000 (must successfully complete Phase I first)
<b>Phase II:</b>	<b>Productization &amp; marketing</b> No SBIR support available; funded by small business & investors

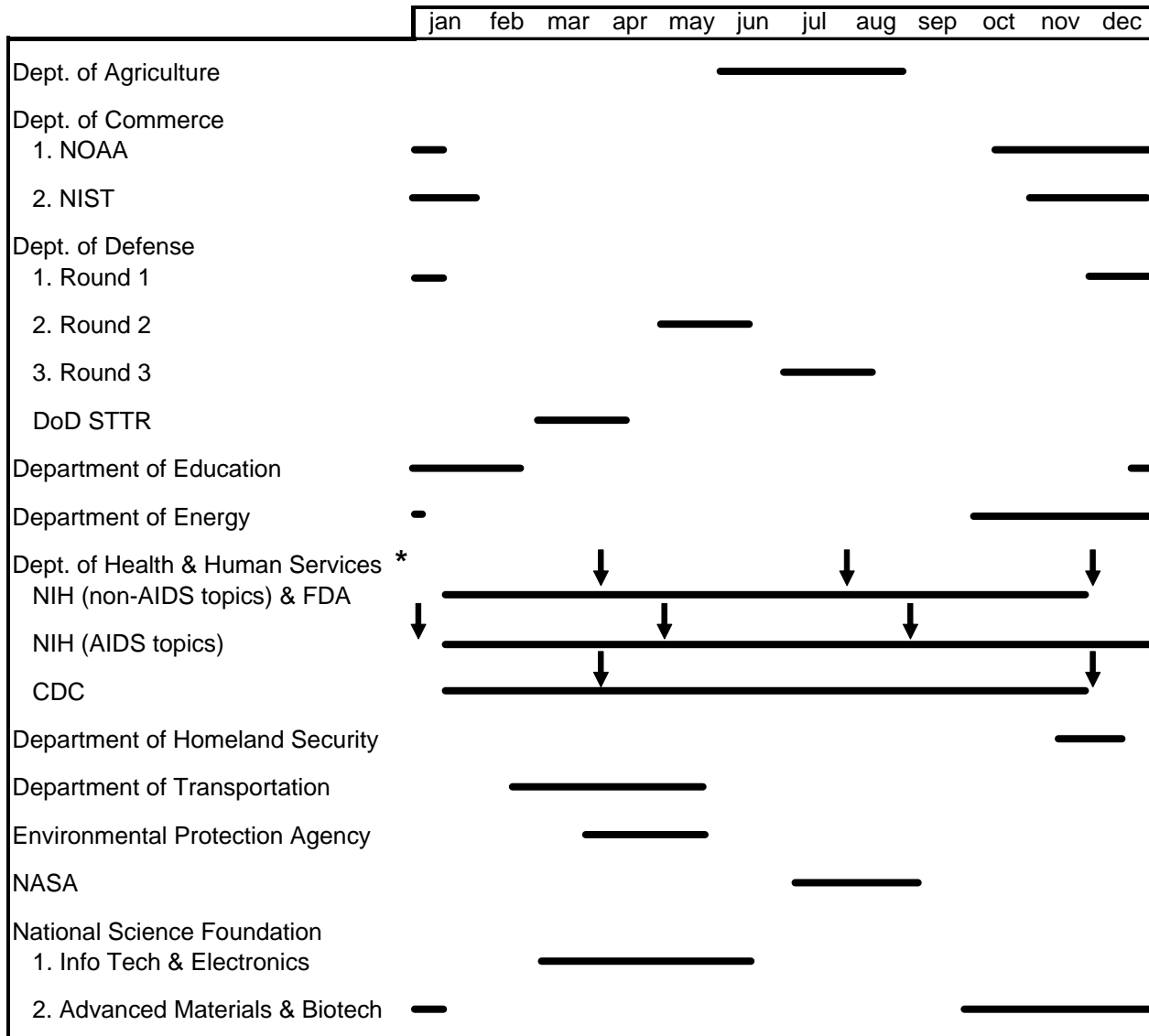
For the visually oriented, this Gantt Chart represents an example SBIR project timeline:



Note that after six months of work on Phase I, overlaid with a Phase II proposal effort, work stops for several months and may or may not continue. (The term “funding gap” recurs frequently). Several insightful analysts have observed that this discontinuous funding profile may be difficult for small business awardees to deal with. Agencies are responding with various methods to offset the problem, including longer phase I periods, bridge funding, and accelerated Phase II decisions.

## Solicitation Schedules

Agencies tend to follow the same SBIR/STTR schedule each year, but they are of course subject to change, like many aspects of the program. Nevertheless, below is a chart depicting a generalized schedule of SBIR proposal acceptance periods as of this writing.



\* HHS releases its solicitation in mid-January and has three acceptance dates for proposals addressing that solicitation: April 1, August 1, and December 1 for non-AIDS NIH topics, and May 1, September 1, and January 2 for AIDS-related NIH topics. CDC dates are April 1 and December 1.

The Department of Defense (DoD) disallows contact with program personnel during open solicitation periods. However, the DoD releases the solicitation to the public ahead of the official acceptance period, and contact with program personnel is recommended during that time. Each agency advertises when program offices are available for contact. Even during such “open” periods, however, obtaining a response from the individuals listed may require carefully

planned strategies such as appeals to successively higher authorities, the ultimate of which may require the medium of prayer.

## **Approaches to Winning SBIR Proposals**

The level of competition for SBIR awards is high: The heap of rejections is three times as large as the stack of awards. Proposals must respond to program goals and evaluation criteria, or they will quickly be absorbed into the large mass of rejections. Whatever the wording in individual solicitations, SBIR reviewers look for these main criteria:

- 1) how well it addresses the topic
- 2) degree of innovation and potential impact
- 3) the potential for sales in the marketplace—commercialization potential
- 4) feasibility of execution: qualified team and sound operational plan

Proposals must be certain to address these areas thoroughly if they are to compete successfully.

### ***Contact program personnel***

In addition to the stated goals, winning proposals also need to address program goals in general, which may or may not be evident in the topic itself. Hence the importance of contacting program personnel—during allowed periods. By discussing an idea with those who wrote the topic, a deeper understanding of the underlying intent is possible, and the idea can be molded to better meet that intent plus any larger goals surrounding it. For example, in one such pre-proposal discussion I learned that the office involved was focused on an annual review of its developing technologies. Knowing that, I included support of their review in the proposal timeline.

### ***Observe submission requirements***

As mentioned above, departments differ markedly in submission policies and practices. However, all programs are so stringent on submission requirements it merits special attention. Not meeting detailed submission requirements may immediately exclude a proposal from consideration. Choosing the wrong font, for example, could easily disqualify a proposal that took months to construct. Proposals must follow the stated formatting and page count rules scrupulously.

### ***Submit early...***

Savvy proposers leave time for double-checking and triple-checking adherence to submission requirements. This helps insure against a minor oversight or last-minute technical glitch wasting months of work in preparation. Allowing ample time is especially important with electronic submission. More often than not, overburdened governmental servers (the computers, not the local delis) slow and crash as last-minute supplicants across the country rush like lemmings to upload their proposals. Early submission is the ticket out of this higher-blood-pressure, lower-success-rate group.

**...And submit often**

There is no legal or ethical restriction against submitting a proposal to multiple agencies, as long as 1) that fact is made clear in each submission and 2) only one agency actually funds the work. (It is perfectly acceptable to decline an award in the event of duplicate funding.) However, some agencies such as NSF explicitly instruct the proposer to submit only one copy of each proposal to NSF; they will decide which department within NSF is the most appropriate. Submitting the same proposal to NSF and to NIH, however, is perfectly acceptable.

**Avoid wired topics**

Agencies gather and assemble topics for a solicitation 6 to 9 months prior to the solicitation release. If a program office knows of a technology called, say, “Bayonet” that would meet certain of their requirements, that office may submit a topic listing the requirements Bayonet can meet. The company developing Bayonet is then well positioned to respond to the topic. If a topic is worded so as to exclude competition, it is “wired.” Regardless of any attempts to wire topics, however, SBIR topics are structured as open competitions. In this example, another technology “A-bomb” could receive the award if it meets the stated requirements in a superlative manner.

Wired topics often expose their nature with a high degree of specificity or Byzantine terminology. Such topics offer poorer chances of success than more general topics—except, of course, for the company that is wired in. For the most part, it is wise to avoid topics that appear obviously wired.

**Question omnibus topics**

By contract, omnibus topics represent the most general of topics. They often list several high-level program goals that could be addressed, as well as several potential program offices. Omnibus topics are healthy in that they allow for innovative ideas unknown to the topic generators, but they also represent a lower hit rate than non-wired topics with clearly stated objectives. Proposals addressing omnibus topics benefit the most from interaction with the program offices involved.

**Other tactics**

Here are some of the many other approaches that have been successful in obtaining SBIR funding.

Scattershot – Submit an idea to several agencies without extensively tailoring for each. Expect no awards the first round, but use feedback on rejections to refine and submit again the following year.

Partnership – Including a high-profile expert or experienced large company as subcontractor can add to the heft of a proposal, as well as create collaborations for other-than-SBIR ventures.

Beyond SBIR – Contacts made during SBIR discussions can pave the way to other possible avenues of funding from a program office.

## Government Agencies Involved in SBIRs

The eleven agencies participating in the SBIR program and their web pages are listed below. One was added in late 2003: Homeland Security and Housing & Urban Development. Those participating in the STTR program are marked with a ✓.

STTR	Agency	URL
	Department of Agriculture	<a href="http://www.reeusda.gov/sbir">http://www.reeusda.gov/sbir</a>
	Department of Commerce:	
	National Oceanic and Atmospheric Administration	<a href="http://www.ofa.noaa.gov/~amd/sbirs/sbir.html">http://www.ofa.noaa.gov/~amd/sbirs/sbir.html</a>
	National Institute of Standards and Technology	<a href="http://patapsco.nist.gov/ts_sbir/">http://patapsco.nist.gov/ts_sbir/</a>
✓	Department of Defense:	<a href="http://www.acq.osd.mil/sadbu/sbir">http://www.acq.osd.mil/sadbu/sbir</a> or <a href="http://www.dodsbir.net">http://www.dodsbir.net</a>
✓	Air Force	<a href="http://www.afrl.af.mil/sbir/index.htm">http://www.afrl.af.mil/sbir/index.htm</a>
✓	Army	<a href="http://www.arl.army.mil/aro/arrowash/rt/sbir/sbir.htm">http://www.arl.army.mil/aro/arrowash/rt/sbir/sbir.htm</a>
✓	Navy	<a href="http://www.navysbir.brtrc.com">http://www.navysbir.brtrc.com</a>
✓	Defense Advanced Research Projects Agency	<a href="http://www.darpa.mil/sbir/">http://www.darpa.mil/sbir/</a>
✓	Defense Threat Reduction Agency	<a href="http://www.dtra.mil/acq/business/acq_smallbus.html">http://www.dtra.mil/acq/business/acq_smallbus.html</a>
✓	Missile Defense Agency (former Ballistic Missile Defense Organization)	<a href="http://www.winbmdo.com">http://www.winbmdo.com</a>
✓	National Imagery and Mapping Agency	<a href="http://www.nima.mil/cda/article/0,2311,3104_11957_1_16398,00.html">http://www.nima.mil/cda/article/0,2311,3104_11957_1_16398,00.html</a>
✓	Special Operations Acquisition and Logistics Center (SOCOM)	<a href="http://soal.socom.mil/index.cfm?page=sadbu">http://soal.socom.mil/index.cfm?page=sadbu</a>
	Department of Education	<a href="http://www.ed.gov/programs/sbir/faq.html?exp=0">http://www.ed.gov/programs/sbir/faq.html?exp=0</a>
✓	Department of Energy	<a href="http://www.science.doe.gov/sbir">http://www.science.doe.gov/sbir</a>
✓	Department of Health and Human Services	<a href="http://grants.nih.gov/grants/funding/sbir.htm">http://grants.nih.gov/grants/funding/sbir.htm</a>
	Department of Homeland Security	<a href="http://www.hsarpasbir.com/">http://www.hsarpasbir.com/</a>
	Department of Transportation	<a href="http://www.volpe.dot.gov/sbir">http://www.volpe.dot.gov/sbir</a>
	Environmental Protection Agency	<a href="http://es.epa.gov/ncerqa/sbir/">http://es.epa.gov/ncerqa/sbir/</a>
✓	National Aeronautics & Space Administration	<a href="http://sbir.nasa.gov/">http://sbir.nasa.gov/</a>
✓	National Science Foundation	<a href="http://www.eng.nsf.gov/sbir">http://www.eng.nsf.gov/sbir</a>



## Web Resources

The risk of printing links is that they go out of date quickly. Nevertheless, here are some major resources available as of this writing. My web site ([www.garcoserv.com](http://www.garcoserv.com)) lists these links and others, and is more current. Grant writing books and seminars abound. A standard web search engine or major bookstore site search will yield a profusion of helpful resources.

***Small Business Administration (SBA) SBIR site.*** The SBA Office of Technology has overall responsibility for the SBIR program, so this is the authoritative SBIR site.

<http://www.sba.gov/sbir/>

***SBIR Gateway.*** News items, conferences, search services, help & assistance services. Provided by Zyn Systems of Sequim Washington, provider of services to federal government technology sectors.

<http://www.zyn.com/sbir/>

***SBIR Resource Center.*** SBIR news, schedules, newsletter, contacts, and more links. Provided by JADE Research Corporation of Maryland, an association of corporate personnel who want to continue using their corporate skill sets.

<http://www.win-sbir.com/>

***SBIR World.*** Sponsored by National Science Foundation, this site provides excellent information about the SBIR/STTR program across all agencies, including submission schedules, program announcements, conferences and events, state resources, and links to all the federal agencies involved in the program.

<http://www.sbirworld.com/>

***SBIR Alerting Service.*** Pacific Northwest National Laboratory provides a useful bi-weekly email listing of SBIR announcements, conferences, and other resources—among many other technical forums it hosts.

<http://lyris.pnl.gov/cgi-bin/?enter=sbir-alert>

***Defense Technical Information Center (DTIC).*** DTIC provides documents, searchable database of research relating to specific SBIR topics, answers to questions about topics, and other DoD-related information.

<http://www.dtic.mil/dtic/sbir/>

## About the author



Roland Garton has over two decades of experience with program and project management, grant writing, and administration. He used his degrees in education (bachelors and masters from the University of Illinois) first to teach in public schools and then to develop educational materials for computers. His professional experience includes both university and small business employment, managing at companies with specialties in computer-based education and training as well as on computer security products at the operating system level.