The DoD Space Test Program
Free Launches for Amateur Satellites

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The Problem

Building and launching amateur satellites is a hobby we can't really afford

- Echo cost AMSAT approximately $500,000
- Future satellites will cost millions
- AMSAT has under 3,000 active members
  - You do the math...

My Solution

"Because that's where the money is"

– Willie Sutton, bank robber

"Let the government pay"

– me

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Introduction

- Primary audience is those seeking financial support for space-related projects
  - But, the whole AMSAT community must actively support efforts to acquire external funds
- Content is purely informational
- The AMSAT community *has* STP experience

Sources

- DoD Space Test Program
- Federal research funds

Sources – DoD Space Test Program

- The DoD Space Test Program (STP)
  - "provides spaceflight for qualified DOD sponsored experiments at no charge to the experimenter"
  - "DOD experiments normally originate in the Service (Army, Air Force, Navy, NASA) laboratories or research institutions (colleges, universities, think tanks, etc.) but are in on way limited to these institutions."

Sources – DoD Space Test Program

- Established in 1966 to provide centralized funding to launch DoD-relevant space experiments

- By early 2000, had launched 410 payloads on 150 missions
  - Free-flyers (via Space Shuttle or expendable launch vehicles)
  - Secondary (or piggyback) payloads
  - Shuttle experiments (Middeck or cargo bay)

Sources – DoD Space Test Program

- The STP has already launched amateur satellites:
  - PANSAT (PO-34)
  - ASUSat1 (AO-37)
  - OPAL (AO-38)
  - JAWSAT (WO-39)
  - Starshine 3 (SO-43)
  - PCSat (NO-44)
  - Sapphire (NO-45)

Sources – DoD Space Test Program

- The Satellite Experiment Review Board (SERB) maintains the DoD Experiment Priority List
  - Experiments must have a sponsor
    - DoD organization or other Federal agency
  - Experiments ranked based on:
    - DoD relevance
    - Technical merit
    - Agency ranking

Sources – DoD Space Test Program

- DoD relevance: examples (from 1998 budget):
  - Demonstrate feasibility of new space systems and technologies
  - Provide early operational capabilities to evaluate usefulness or quickly react to new developments
  - Perform operational risk reduction through direct space flight of prototype components
  - Improve operational design by characterizing the space environment, event or sensor physics proposed for an operational subsystem/system upgrade

Sources – DoD Space Test Program

- DoD relevance: more examples
  - Attracting, inspiring, and developing the next generation of space explorers, researchers, engineers
    - We do that...
  - Integrating satellites with terrestrial networks
    - We do that...
  - Explore applications of software-defined radios
    - We do that…
  - ...
- The *researcher* must demonstrate DoD relevance

Sources – DoD Space Test Program

- Technical merit
  - Successful proposals must demonstrate technical merit
    - Experiment must embody good science
      - What important question is being examined?
      - How will the experiment answer that question?
    - Experiment must require spaceflight
    - Experiment must have reasonable chance of success
    - Researcher must have command of current work in his or her field

Sources – DoD Space Test Program

- Clearly, competing for a “free” STP launch is a lot of work
- But, so is raising the cash to pay for a commercial launch

Sources – Federal Research Funds

- The Federal government has a strong interest in space
- The Federal government is funding lots of space-related projects similar to many AMSAT activities
- Federal research funds *may* be a potential source of funds for some AMSAT activities
- But, you have to ask for support
  - And, pursuing Federal research funds is a lot of work

Sources – Federal Research Funds

- Recent Federal research solicitations include:
  - "Inspiring the Next Generation of Earth Explorers; Integrated Solutions for K-16 and Informal Education" (NASA)
  - "University Nanosat Program" (Air Force Office of Scientific Research)
  - Small Business Innovative Research (SBIR) program (NASA, DoD, …)

Process

- Writing successful research proposals is a *lot* of work
- The competition is very intense
- But, it can be very rewarding
- And, you can't win, if you don't play the game

Process

- Identifying opportunities
  - Track research solicitations
    - The Internet makes this easy
  - Communicate with agency officials
  - Become part of the “in” crowd
  - Suggest content for future solicitations

Process

- Writing successful research proposals is something of an art
  - It is a lot of work
  - It requires a high level of technical expertise
  - You need to tell a good story
  - You need to tell it well and concisely
  - It demands a certain amount of creativity

Process

- In practice, contracts are generally awarded in individuals ("Principal Investigators"), rather than to institutions
- Program managers naturally tend to be risk adverse
  - A demonstrated track record is important
  - A track record with the agency is beneficial
  - Personal contact with the program manager is usually helpful

Process

- Pursuing Federal research dollars is probably a long-term process, rather than a short-term task
  - The first proposal probably won't win
  - Future proposals will probably be better
  - The chances of success will increase
  - It doesn't make sense to stop, once you develop the skills

What This Means for You

- If you are AMSAT or the Eagle Team
  - I recommend
    - Pursue an STP launch for Eagle
    - Consider hosting STP experiments
    - Pursue research contracts for Eagle experiments or subsystems
    - Position AMSAT to administer research contracts

What This Means for You

- If you are a member of the AMSAT community
  - Your help is critical in creating the AMSAT story
    - The AMSAT community is doing lots of important, relevant, meritorious things
    - "if it isn't written down, it didn't happen"
  - Your help is critical in telling the AMSAT story
    - The new Web site projects a far stronger image of AMSAT
    - But, we are doing lots of good (e.g., scientifically meritorious) things that aren't yet visible

Final Thoughts

- "I just make this stuff up"
  – me
- "Panic is good"
  – *ibid*
- "Just because I made it up, doesn't mean it isn't true"
  – *ibid*