

The DoD Space Test Program: Free Launches for Amateur Satellites

# 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, ...)



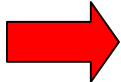
# Process

- 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*