



Flight Opportunities

SpaceTech – REDDI – 2016

Q & A Sessions

v1

Jan 20 & 22, 2016

Facilitators:

Technology Manager – Steve Ord

Program Manager – Ron Young

Program Executive – LK Kubendran

Chat Monitor – Jennifer Thomson





Solicitation Overview

Goal of Solicitation

- Demonstrate crosscutting space technologies in relevant space-like environments using currently available U.S. commercial reduced gravity, high-altitude balloon, and suborbital reusable flight capabilities

Eligibility

- All U.S. private entities (for-profit & non-profit), Federally Funded Research & Development Centers, U.S. Universities, as well as foreign entities when in partnership with a U.S. entity (unless otherwise prohibited by the REDDI NRA or U.S. law)
- NASA Centers (except JPL) and other government agencies are not eligible (must use internal process)

Key Dates

- Submission Deadline: March 8, 2016 11:59 pm EST
- Selection Date: June 2016 (TARGET)
- Award Date: August 2016 (TARGET)
- Duration: 1 year

TRL Entry Level

- TRL 4 at time of submission
- Hardware should already have been bench tested

Payload Entry Points into FOP

Solicited
(Use Any Qualified Vehicle)

SpaceTech-REDDI NRA Appendix F1

Universities

Private Entities (for-profit)

Private Entities (non-profit)

FFRDCs (incl. NASA JPL)

Foreign Entities

w/ Lead U.S. Partner

Announcement of Flight Opportunities (AFO)
[Retired FY14]

Directed (Internal)
(Use IDIQ-2 Vehicle)

NASA FOP Internal Directed Process

NASA Centers
(ARC, JSC, GRC, LaRC, etc.)

STMD Programs
(e.g. GCD, CIF, SBIR, SST)

Other NASA Mission Directorates
(SMD, HEOMD, ARMD)

Other Government Agencies
(e.g. FAA, ORS, AFRL)

Solicitation Overview

Award Details

- Awards up to $300K
  - Max $250K for allowable flight costs (flight costs + indirect costs related to flight cost only here)
  - Max $50K for other costs (indirect costs, travel, labor, materials to build flight hardware)
  - Max amounts include any indirect costs if applicable 

Examples

✓ $200K Flight provider cost + $20K indirect university overhead = $220K

✘ $200K Flight provider cost + $60K indirect university overhead = $260K

✘ $20K labor + $15K indirect costs + $20K materials = $55K

✓ $20K labor + $15K indirect costs + $15K materials = $50K

- Two Funding Increments
  - Flight Reservation
  - Completion of testing and Reports

Solicitation Overview

Topics

- Topic 1: Demonstration of Space Technology Payloads
  - Technologies that address one or more needs described in Space Technology Roadmaps (STRs) , National Research Council (NRC) recommendations, Strategic Space Technology Investment Plan (SSTIP), and STMD focus areas

Examples

✓ Demonstrate new instrument technology to be eventually used for science missions

✘ Fly a mature instrument in order to gather science data on atmosphere

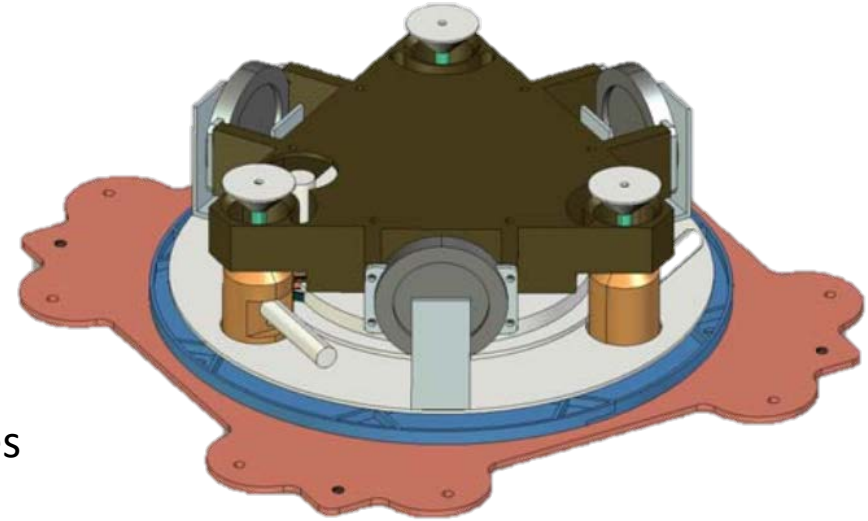
✓ Fly a knowledge payload to gather data for understanding a phenomenon on which a new technology will be based

Solicitation Overview

Topics Cont.

- Topic 2: Demonstration of Vehicle Capability Enhancements and Onboard Research Facilities for Payload Accommodation
  - Demonstration of new or enhanced onboard facilities for commercial suborbital reusable launch vehicles, reduced gravity aircraft, and high altitude balloons that will improve or enable use vehicles for science research and/or technology flight test applications

FOP Technology T0077-S
Vibration Isolation Platform (VIP)
on Masten Xaero Interface Plate
Controlled Dynamics Inc. (CDI)



Examples

- ✓ New or enhanced onboard facilities
- ✘ Actual facility development
- ✘ Enhance vehicle performance (e.g., to reach higher altitudes, to increase payload mass, etc.)
- ✓ Modifications to vehicles for purpose of payload accommodation

Solicitation Overview

Qualified Flight Vehicles

- Reusable suborbital launch vehicles, reduced gravity aircraft, and high altitude balloons
- Proposer's organization will directly purchase the proposed flight(s) on currently available U.S. commercial platforms
- Proposer is responsible for choosing which platform best meets their needs

- **Proposer is not restricted to flight providers historically used for the Flight Opportunities Program**

- Flight Providers must have conclusively demonstrated successful flight(s)
  - Test flights or flights for pay
  - Launched and recovered successfully with payload intact
  - Salient characteristics closely approach one or more of required characteristics, including payload mass and altitude achieved
- If you have a question on whether or not a flight provider is eligible, please submit your question to the Technical Question POC at HQ-STMD-FO@nasaprs.com

Solicitation Overview

Qualified Flight Vehicles Cont.

- Vehicle should also meet minimum requirements for reusability
  - With the exception of aircraft used for reduced gravity flight, all vehicles must be capable of achieving minimum altitude of 30 km above MSL OR use propulsion system of a class that can operate in vacuum
  - Rocket propelled vehicles shall be capable of reusing a minimum of 80% of vehicle's mass (excluding propellants and other expendables) within 60 days between flights
  - High-altitude balloons and other types of flight vehicles shall be fully recoverable and reusable, excepting items that are expended in normal flight operations of vehicle

Solicitation Overview

Reports

- Quarterly Progress Reports
  - Brief - 90-calendar-day basis
- Flight Reservation Report
  - Contract or agreement with flight service provider - flight schedule, payload integration and test requirements for flight
- Test Readiness Review (TRR) Report
  - Written evidence of payload acceptability for flight from the flight service provider
- Post-Flight Report
  - Within 48 hours of test
  - Flight activities and test results achieved against the stated test success criteria
  - Publically releasable short description detailing the flight activity and significant findings

Solicitation Overview

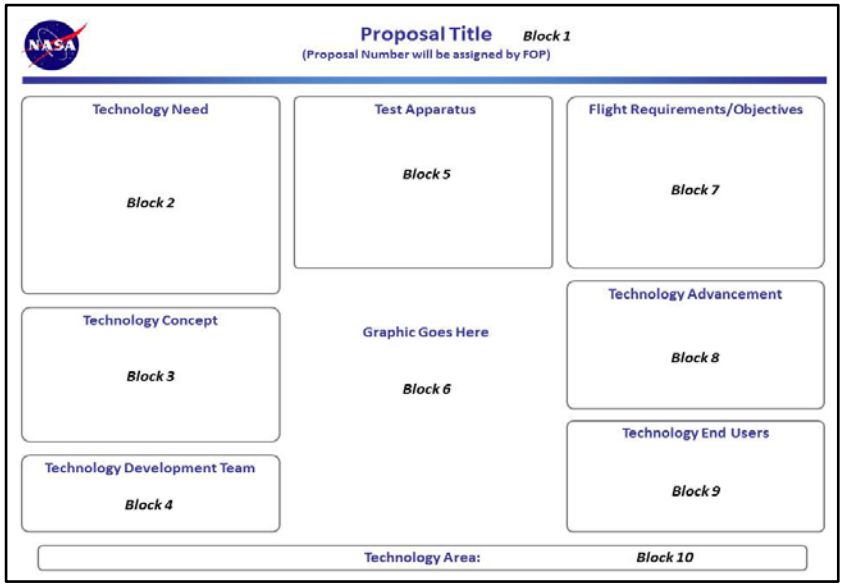
Reports Cont.

- Final Flight Report
  - Primary focus of awards made through this Appendix
  - Shall include:
    - Flight results
    - Photo documentation of technology being tested during flight
    - Technology's progress towards its intended space application and TRL
    - Publicly releasable short description of technology, future space application and what it offers to NASA

Summary Chart Overview

Summary Chart

- Top-level, critical information from proposal
- Used for NASA internal presentations
- May also be released publically if proposal is selected
- No Proprietary and/or ITAR information
- May be edited for formatting and uniformity by NASA



Technology Need Block

- Describe current state of the art
- Describe need for improvement
- Describe how your technology will advance the state of the art
- What will I now be able to do?

Summary Chart Overview

Summary Chart Cont.

Technology Concept Block

- Describe your technology – how does your technology work

Example

✓ By adding a sensor and actuator to a drinking cup, we measure the amount of coffee and control the lid so that coffee does not spill

✘ Coffee safety is critical to the U.S. automobile market where thousands of people are injured every year

✘ When we implement our technology, we will be able to drive safer and meet the needs of the U.S. Department of Transportation

Evaluation Criteria Overview

Evaluation Criteria

- **Criterion 1 - Relevance to U.S. Space Exploration and Utilization (40%)**
  - Alignment
  - Comparison to State of the Art
  - Infusion Potential

Important for STMD investment decision

- **Criterion 2 - Technical Approach (35%)**
  - TRL Assessment
  - Technology Development Plan
    - Includes degree of support/funding provided to date by other sponsors
    - Demonstrate flight test is required
  - Flight Test Plan
  - Qualifications and Capabilities
- **Criterion 3 - Cost, Value, and Schedule (25%)**
  - Cost – i.e. test plan makes optimal use of flight(s))
  - Value
    - Technology reduces mission and life-cycle costs, increases safety, or reduces risk, etc.
    - Potential to benefit more than one customer or mission type
    - Extent of cost-sharing provided by proposer
  - Schedule

Evaluation Criteria Overview

Review Process

- Compliance Review
- Technical Panel Peer Review
- Prioritized Recommendation
    - Consider programmatic aspects such as budget allocations, portfolio balancing, and past performance relative to FOP activities (including schedule performance, mission execution, timely delivery of required technical reports)
- Selection

Commercial Flight Opportunities for the **Rapid Development** of **Space Technology**

National Aeronautics and Space Administration

Armstrong Flight Research Center
Edwards, California 93523
www.nasa.gov/centers/armstrong

flightopportunities.nasa.gov