The Department of Defense

DoD DEPARTMENTS/AGENCIES:

Department of the Navy

Department of the Air Force

Advanced Research Projects Agency

Special Operations Command

Defense Nuclear Agency

BMDO
Ballistic Missile Defense Organization

PROGRAM SOLICITATION 94.1
CLOSING DATE: 14 JANUARY 1994

FY 1994 SMALL BUSINESS INNOVATION RESEARCH (SBIR) PROGRAM

REFERENCES:
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Calvert, S. "Evaluation of Systems for Control of Emissions From Rocket Motors, Phase I." A.P.T. Inc., PB-245590/5, Aug 75. (available from NTIS as N76-32337).

Becker, D.L. "HCL Vapor Characterization and Detection." Johns Hopkins Univ, CPIA-PUBL-513, Jan 89. (available from NTIS as N90-22596).

Dreschel, T.W., et al. "Qualification of Hydrochloric Acid and Particulate Deposition Resulting From Space Shuttle Launches at KSC." Environmental Management, V.14 #4, 1990, p.501-507.

AF94-092 TITLE: Advanced Rocket Propulsion Technology

DOD TECHNOLOGIES: Propulsion and Energy Conversion

MAJOR S&T THRUST: Assured Access to Space

OBJECTIVE: The objective of this effort is to develop innovative rocket component technologies, component manufacturing techniques and component integration technologies which will contribute to the doubling of existing rocket propulsion capabilities by the year 2010.

DESCRIPTION: The Phillips Laboratory (PL) is in need of new, innovative approaches in the development of technologies which can double the existing rocket propulsion capability by the year 2010. Specifically, technologies that can increase the reusability of cryogenic liquid rocket engines from 3 to 100 flights prior to overhaul, decrease the cost and time of manufacturing solid rocket motors by 50%, increase the payload capability of existing launch and upper stage propulsion systems by 7%, reduce the number of parts for a cryogenic turbopump by 80%, integrate high energy density material into future rocket propulsion systems and reduce the environmental hazards of the rocket motors by 80%. Latitude is provided to the innovative scientist and engineer to address propulsion related technologies not specifically addressed by other rocket propulsion topics. For instance, electric propulsion concepts and solar thermal rockets show great promise for space applications. Solar rocket powered orbit transfer vehicles development might include research on solar rocket large space structures, Gossamer structures, payload integration, means for otbital Sun-tracking, optical quality mirrors and measurement devices, energy storage/conversion, solar boiloff propellant tankage, micro-thrust stands, thin film concentrator systems. Other advanced rocket concepts previously mentioned would have an equally lenghty shredout of potential research subjects but are not stated in the detail of the solar example. Research in these advanced rocket propulsion topics are included and structured to provide a maximum of innovative flexibility to prospective investigators.

Phase I: The initial research in this effort will assess existing capabilities and demonstrate through bench scale evaluation of the proposed new approach, the payoff to be derived by implementing the concept.

Phase II: Phase II will demonstrate selected advanced rocket technology concepts beyond bench scale and conduct verification testing of the concept.

Dual Use Commercialization Potential: Advanced rocket propulsion technology will transition to the US commercial space launch industry, thus enabling the US industry to better compete with foreign sources for space launch opportunities by reducing the cost of inserting payloads to space orbit. Advanced rocket propulsion technology also serves the commercial sector by enhancing our ability in remanufacture and maintenance of the US ballistic missile fleet.