Airborne Antenna Technology for Joint Tactical Radio System

This is a request for information (RFI) and not a solicitation.

INTRODUCTION:

The purpose of this RFI is to gather information to be used in determining the state of technology and development requirements of an airborne antenna solution that will be required for the future JTRS Cluster 4 radios. The Government is requesting information from companies working on low profile, low cost (including installation) airborne antenna systems that may be suitable for use with the future multiband, multichannel, multiwaveform JTRS Cluster 4 airborne communications terminals. The Government is interested in receiving information from antenna systems vendors as well as key Industry members that could provide insight and recommendations as to the optimum implementation of a JTRS airborne antenna system.

The optimum antenna system solution should minimize acquisition costs for the airborne platforms that will be installing the JTRS Cluster 4 radios. A low profile configuration should minimize the footprint of the antenna exterior to the aircraft and minimize fuel costs associated with aerodynamic drag presented by the antenna system. Also, the optimum antenna-system solution would reduce co-site interference, mutual coupling, and enable reconfiguration and adaptive interference cancellation mechanisms. This antenna system must enable connectivity for all three domains [Space, Airborne, and Ground] – A-S, A-A, A-G.

The AF JTRS Migration Plan (also available as a part of this RFI) provides the schedule information on a platform by platform basis. This includes the communications connectivity requirements for each of these platforms. Although not a current requirement, it is understood that evolving wideband waveforms will eventually be supported by JTRS Terminals. Such future waveforms include: the Wideband Networking Waveform (WNW). Therefore, the antenna system solution should additionally address the requirement for this eventual capability. Information regarding WNW and the frequency spectrum that it will occupy is included on this site as supplemental information in the form of a Powerpoint presentation.

SCOPE:

Companies should understand that firm requirements for an airborne antenna system that is compatible with the airborne JTRS requirement have not been defined. Requirements will evolve and will be influenced by the availability, maturity and cost of technology, and cost of installation. “Cost as an independent variable” [CAIV] and “total cost of ownership” [TCO] may be significant differentiators.

The Government will use the information gathered in response to this RFI to gain an understanding of potential approaches to the development of an airborne antenna system for the JTRS Cluster 4 requirement. This information will subsequently be used in potential antenna development activities and future airborne JTRS communications terminal procurements.

The Government seeks to solicit the interest of antenna vendors or those industry sources with JTRS and airborne antenna implementation knowledge.

Potential information being sought includes (but is not limited to) the following items below. Address all or individual components of the requested information below:

1. New antenna technology suitable for meeting a portion or all of the JTRS frequency band requirements. Emphasis is on improved performance over current capability, minimum height, and lower cost (ownership and installation). Details on the following topics are desired:

    - Passive or active design and any associated power and digital control interfaces required to control the antenna
    - Power handling limitations
    - Protrusion
    - Efficiency and proposed sizing
    - Design maturity and test data supporting assessment, including measurements on laboratory units at JTRS or scaled frequencies. Identify cost and schedule to complete the development of identified antenna technology, including EMD.

2. Modeling and simulation capabilities applicable to the installation of JTRS (antenna(s), amplifiers, cabling, radio) on platform. The government is interested in accurately assessing platform co-site interference and antenna pattern coverage prior to installation. The ability to easily modify the tool or methodology for different configurations and various platforms is of interest.

    - Status of analysis capability including product outputs and description of existing commercial and internal products
    - Background on current uses for the modeling and simulation capability
    - Schedule and cost associated with completing the proposed capability
    - Limitations on analysis accuracy including requirements on accuracy of input data as well as limiting assumptions within the code

3. Proposed solution(s) for antenna and amplifier implementations to meet system cost and performance objectives.

    - Adaptive cancellation or blanking techniques
    - Antenna solution(s) including recommendations on subbanding and/or arraying
    - Highlight equipment needed and proposed development

4. Relevant antenna performance test (anechoic chamber or range) and/or simulation data.

    - Gain
    - Pattern (azimuth & elevation)
    - Frequency response
    - Phase response
    - Pattern & gain control (if active)
    - Re-tuning time (if applicable)

DATA SUBMISSION REQUIREMENTS:

The Government requests that interested companies provide an information package to include the following items:

1. A short description of qualifications describing applicable experience, including: JTRS or SDR and development of airborne qualified antennas.
2. Definition of proposed antenna solution.
3. Description of other onboard airborne communications antenna requirements aside from the future JTRS Cluster 4 antenna that could be satisfied with the proposed antenna system.
4. Projected Performance, Risks, Constraints and vulnerabilities.

POINT OF CONTACT:

Responses to this RFI are due by 5:00 PM EST on June 11, 2004. Respondents should identify their company's name, address, telephone number, and point of contact. Proprietary information should be clearly marked. The response should be limited to a maximum of ten (10) single sided 8.5" by 11" pages including brochures. Responses should be in the form of an electronic file. The electronic file should be in Adobe Acrobat Portable Document Format (PDF) and mailed to steven.best@hanscom.af.mil

A subsequent response by the Government will likely take place via a telephone conference and potentially through a face to face meeting. It is currently expected that it will take the Government 3 weeks to read all information provided and to determine the specifics of further interaction with the respondents. Contact with the respondents will begin after this period.

Please refer any questions regarding this RFI to Dr. Steven Best; AFRL/SNHA; (781)-377-3780 or Mr. Bill Cook; AFRL/IFGC; (315)-330-7439.

NOTE: ***The information received will not obligate the Government in any manner nor will the Government reimburse contractors for any costs associated with submittal of the requested information. This request does not constitute an Invitation For Bid or a Request for Proposal, nor should it be considered as a commitment on the part of the Government.***