

NASA Glenn Research Center (GRC)
Justification for Other than Full and Open Competition
EVA Radio Miniaturization Studies Task
PR# 4200332888

I. Description of Procurement

I recommend that NASA Glenn Research Center negotiate with Harris Corporation, Government Communications Systems Division, P.O. Box 37, Melbourne, FL 32902-0037 for the purchase of studies to determine the Crew (Constellation) Space Suit System (CSSS) radio upgrade path. The effort will require the contractor to conduct preliminary studies and analyses to define a CSSS Software-Defined Radio (SDR) miniaturization path (radio architecture) that incorporates existing, Harris Corporation proprietary technology, into miniaturized radios to provide digital module functions (baseband digital and complex electronics; modem and processing functions). These functions must address CSSS EVA requirements that can be accomplished by a radio under more constrained size, weight, and power (SWaP) budget profiles than currently exists.

The technology path needs to be understood and defined in order to allow for the significant lead time needed in order to develop the complex electronics components. Some anticipated mission profiles expected to use the upgraded radio architectures include integration into EVA full-up suit demonstrators, International Space Station (ISS) Extravehicular Mobility Unit (EMU) replacement, and deep space, and destination surface exploration campaigns.

Radio technologies already developed do not meet the functional requirements for EVA. Radios such as Space-to-Space EMU (Extravehicular Mobility Unit) Radio (SSER) do not provide sufficient flexibility to accommodate for changing mission profiles; yet, the SWaP envelope of current software radios exceeds those of EVA. CSSS EVA needs to operate in a lower SWaP envelope. Radio architectures must be capable of being evolved to support changing mission profiles and different waveforms for a variety of future space communication networks and changing mission profiles where umbilical communications cannot be relied upon. These changing profiles include space missions where most efforts are tied to a SWaP such as sortie missions to planetary bodies, surface destination exploration, and EMU replacement on ISS. The current EMU certification will end not later than 2020.

This procurement supports the ESMD EVA Technology Development Program (ETDP). The activities for this research will take place over a 9-month period of performance. The total estimated cost for this procurement is \$480,000.

II. Statutory Basis for Other than Full and Open Competition.

The statutory authority permitting other than full and open competition is 10 U.S.C. 2304(c)(1) "only one responsible source and no other supplies or services will satisfy agency requirements."

III. Rationale for Selection of Statutory Basis.

The intent of this research is to conduct preliminary studies and analyses to define a CSSS Software-Defined Radio (SDR) miniaturization path that incorporates existing, Harris Corporation proprietary technology, into their radios. Harris is the sole radio provider of the CSSS EVA program. Their radios are designed and manufactured under a Harris Corp. proprietary process. Harris is not willing to share its proprietary radio concepts, processes, drawings, and information with the Government for use in a competitive solicitation.

Harris is the sole radio provider of the CSSS EVA program and as such knows the EVA's current requirements and system architecture. Currently Harris is providing the CoNNeCT radio for that program, and EVA is requiring a miniaturized version of this existing CoNNeCT Harris radio, as the CoNNeCT radio will still exceed the anticipated EVA's SWaP profiles for the future. The CSSS EVA will require Harris's knowledge of their current CoNNeCT Ka-band radio in order to develop possible paths to further reduce its size, weight and power architecture.

Therefore, CSSS EVA and its radio provider (Harris) needs to determine, via these miniaturization studies, how to implement a software-defined (or reconfigurable) radio, and how that radio can be optimized for EVA's SwAP allocations and changing mission profiles,

The scope of this study will be to examine only Harris's product lines and concepts and how they can be applied to EVA's Communication / Navigation Assembly. The effort of this procurement involves only a predevelopment study. There will not be any prototype development or fabrication of a miniaturized radio under this effort. This proof-of-concept research effort will significantly affect the outcome concerning the types of development that can be conducted on future generations of EVA radios.

The non-recurring engineers' (NRE) time for another vendor to develop a radio at the current level of the existing Harris radio would be cost-prohibitive for the Government. In order to enter into a competitive procurement for these studies, another vendor would have to develop and fabricate a radio meeting the EVA's requirements and system architectures. This would constitute a substantial capital investment that would be borne by both NASA and that vendor. It is estimated that to develop a radio meeting the current type would cost approximately \$20 Million and take over five years. As the current EMU certification will expire not later than 2020, it is critical that research into defining the path to miniaturizing radios capable of supporting CSSS EVA's requirements take place immediately so that the results of this research can be implemented for the future use of the CSSS EVA radio development. This radio development necessitates significant lead times for complex electronics components to be developed timely and integrated into EVA prior to the expiration of the EMU certification.

IV. Description and Results of Market Survey

Based on surveys of technical interchange meetings with potential identified sources, no other source capable of satisfying the government requirements has been found. Harris is the only source capable of performing all of the miniaturization studies of the CoNNeCT radio required for this program. Harris was contacted and they confirmed that they are not willing to share their proprietary radio concepts, processes, drawings, and information with the Government for use in a competitive solicitation.

In accordance with FAR 5.2, a description of this requirement has been posted to the NASA Acquisition Internet Service/FedBizOpps on March 9, 2010, and all responses received will be considered.

V. Determination of Fair and Reasonable Cost

A cost and price analysis of the proposal will be made to determine a fair and reasonable price. The contractor will be required to provide adequate pricing data with their proposal in order to make this determination.

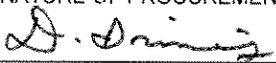
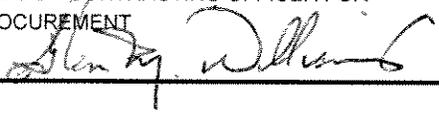
VI. Actions to Remove and Overcome Barriers to Competition

This effort is a study of improvements to Harris Company proprietary concepts. No actions to remove the barriers to competition are being contemplated, as this is a one-time study and additional studies are not anticipated to be procured.

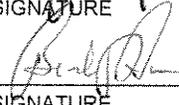
NASA Glenn Research Center
JUSTIFICATION FOR OTHER THAN FULL AND OPEN COMPETITION
 (Certifications, Reviews, Concurrences, and Approval)

<u>TITLE OF PROCUREMENT</u> EVA Radio Miniaturization Studies	<u>PURCHASE REQUEST NO.</u> 4200332888
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CERTIFICATIONS

1. I hereby certify that the attached Justification and its supporting data are accurate and complete.		
SIGNATURE OF PROCUREMENT INITIATOR 	NAME (Type or Print) David Irimies	DATE 3/8/10
2. I hereby certify that the attached Justification is accurate and complete to the best of my knowledge and belief, and I have determined that the anticipated cost to the Government for this procurement will be fair and reasonable.		
SIGNATURE OF CONTRACTING OFFICER FOR THE PROCUREMENT 	NAME (Type or Print) Glen M. Williams	DATE 3/12/10

REVIEWS/CONCURRENCES

TITLE AND NAME (Type or Print) TIMOTHY C. PIERCE CHIEF, EXPLORATION SYSTEMS BRANCH	SIGNATURE 	DATE 3/15/10
TITLE AND NAME (Type or Print) BRADLEY J. BAKER CHIEF, PROCUREMENT DIVISION	SIGNATURE 	DATE 3/16/10
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**REVIEW FOR pic 05-08 REPORTING POTENTIAL
 (ACTIONS OVER \$500,000.00 ONLY)**

TITLE AND NAME	SIGNATURE	DATE
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APPROVAL

TITLE AND NAME (Type or Print)	SIGNATURE	DATE
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REMARKS