REQUEST FOR QUOTATION

THIS RFQ ☒ IS ☐ IS NOT A SMALL BUSINESS SET-ASIDE

1. REQUEST NO. BBG50-Q-15-0915MD
2. DATE ISSUED 09/16/2015
3. REQUISITION/PURCHASE REQUEST NO. T001-15-IQ-00082
4. CERT. FOR NAT. DEF. UNDER BDSA REG. 2 AND/OR DSM REG. 1
5a. ISSUED BY Broadcasting Board of Governors, 330 Independence Ave., S.W. Washington, DC
5b. FOR INFORMATION CALL (NO COLLECT CALLS)

6. DELIVER BY (Date) 02/15/2016

7. DELIVERY
   NAME Malita M. Dyson (e-mail: mdyson@bbg.gov)
   TELEPHONE NUMBER (202) 382-7204
   AREA CODE NUMBER
   a. NAME OF CONSIGNEE Daniel Maxwell
   b. COMPANY
   c. STREET ADDRESS All Prospective Offerors
   d. CITY Washington
   e. STATE DC
   f. ZIP CODE 20237

8. TO:

9. DESTINATION

10. PLEASE FURNISH QUOTATIONS TO THE ISSUING OFFICE IN BLOCK 5a ON OR BEFORE CLOSE OF BUSINESS (Date) 09/26/15 4:00P

11. SCHEDULE (Include applicable Federal, State and local taxes)

| ITEM NO. | SUPPLIES/ SERVICES | QUANTITY | UNIT | UNIT PRICE | AMOUNT |
| (a)      | (b)                 | (c)      | (d)  | (e)        | (f)    |
| 1        | The Broadcasting Board of Governors (BBG) Broadcast Technologies Division has a requirement for the development of software to allow reception of high frequency (HF) transmissions that are currently being broadcast by BBG. This will allow non-technical listeners to receive digital content of HF. See the attached Scope of Work. All responsible sources may submit a response which, if timely received, will be considered by the Agency. Submit responses to Contract Specialist Malita Dyson via email at mdyson@bbg.gov by the due date indicated in Block #10 of this Request for Quotation (RFQ). |

12. DISCOUNT FOR PROMPT PAYMENT

   a. 10 CALENDAR DAYS (%) ☐
   b. 20 CALENDAR DAYS (%) ☐
   c. 30 CALENDAR DAYS (%) ☐
   d. CALENDAR DAYS ☐

   NUMBER PERCENTAGE

NOTE: Additional provisions and representations ☐ are ☐ are not attached.

13. NAME AND ADDRESS OF QUOTER
   a. NAME OF QUOTER
   b. STREET ADDRESS
   c. COUNTY
   d. CITY
   e. STATE
   f. ZIP CODE

14. SIGNATURE OF PERSON AUTHORIZED TO SIGN QUOTATION

15. DATE OF QUOTATION

16. SIGNER
   a. NAME (Type or print)
   b. TELEPHONE
   c. TITLE (Type or print)

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STANDARD FORM 18 (REV. 6-95)
Prescribed by GSA-FAR (48 CFR) 53.215-1(e)
Statement of Work

Software Application for Decoding Digital Data in an Audio Signal

1. Purpose

BBG has a requirement for a software application for decoding digital data in an analog audio signal. This software will be paid for by the BBG and distributed free of charge around the world for its shortwave listening community. To prevent misinformation about what the software is actually doing, BBG intends to release the source code to the public, when requested. The BBG is presently airing test programs via shortwave from Greenville, North Carolina. Further information may be found at http://voaradiogram.net. This procurement is for the development and delivery of a user friendly software application that can be used by non-technical listeners to decode these transmissions.

2. Description of Work to be Performed

The contractor shall develop a software application to decode the specified digital transmissions. The software shall be capable of operating on multiple operating systems and shall be user friendly (for a non-technical person) to install and operate. The software will provide real time decoding on the screen and save the received data as digital files for later retrieval.

2.1 Operating System

The software shall be capable of running on Windows (XP and newer) and Android (4.1 and newer) operating systems.

2.2 Audio Coupling

The audio shall be ingested by connecting the earphone jack or other audio output of a shortwave receiver to the audio input of the computer. The ability to acoustically couple to the receiver by way of any built in microphone ("acoustic coupling") shall also be supported.

2.3 Installation

The software shall be easily installed by the end user. Ideally, the end user will not need administrator privileges in install the software.

2.4 Help Files

The software will include help files to assist the end user in operation.

2.5 Operation
The software will operate with a minimum of user required settings or intervention. It must be usable by a non-technical user.

3. Specifications

3.1 ANALOG SIGNAL CHARACTERISTICS:
   1. Baseband audio: 100Hz to 3KHz
      a. The analog signal is contained within the audio baseband up to around 5 kHz or the limit of the shortwave receiver’s demodulated audio output. The shortwave broadcast will be standard Amplitude Modulation (AM).
   2. Contains industry standard codecs: MFSK32, MFSK16, (reference 3.3.5.d below)...:
      a. The baseband audio stream or file contains digital information embedded within as data described by codecs such as MFSK32 or MFSK16.
   3. Contains markers or metadata to describe the codec being used such as the Reed Solomon Identifier (RSID).
   4. Information flows through a narrow bandwidth in the audio band and as a result the digital codecs are limited by audio bandwidth and quality.

3.2 TIME REQUIREMENTS:
   1. Real Time decoding:
      a. The digital data found in the demodulated audio should be displayed in real time through either on screen visualization or “busy indicators” in case the entire file needs to come across.
   2. On Demand decoding:
      a. The audio file may also be opened from the end user’s computer or other storage medium to decode and view the digital data at a future date in time with the option to run in the silent mode, storing all data to a directory on the host device.

3.3 SOFTWARE REQUIREMENTS:
   1. Minimal User Interface:
      a. The application should be simple to use with minimal user technical knowledge or setup. It should be intuitive and visually appealing.
      b. Touch friendly for use with a mobile platform such as a tablet, smartphone, or notebook.
   2. Ease of Use:
      a. The application should be easy to start, end, and save sessions.
   3. “Plug and Play”:
      a. The application should be ready to work upon initial start.
      b. The application should be set up to use default hardware settings of the host platform.
         i. Line In or microphone input.
         ii. User default document locations
         iii. User security conditions generally accepted by users worldwide (not security policies nor needing administrative privileges).
   4. Globalization:
a. The application should employ globalization in several global languages such as English, Mandarin, Korean, etc. The UTF-8 character set shall be used.

5. Functionality:
   a. Display:
      i. Display data as it is received with continuous vertical scrolling down the page until the end of transmission. MFSK images shall be supported as well.
      ii. For advanced users, or for debugging the app, the contractor may include a digital waterfall display showing the received spectrum that is viewable from a secondary screen. This provides visual feedback for the quality of the data received.
   b. Robust error correction:
      i. The software application should be robust enough to handle marginal signals containing noise and should utilize error correction such as Reed Solomon error correction and filtering as appropriate.
      ii. The application must be robust enough that it enables non-real time second or third pass analysis to improve on filtering and post-processing. If the signal is too noisy, a notification is posted to indicate status with options present to the user for retrying then or retrying after the transmission is complete.
   c. Data Cache and Storage:
      i. If possible, data should be cached locally in case of power failure.
      ii. User may save the session from beginning to end or current point in time.
   d. Codec switching automatic:
      i. The BBG has selected the MFSK16, MFSK32, MFSK64, MFSK128, Olivia 32-2000 and Olivia 64-2000 modes for use in this software. The codec used during the transmission may be displayed with visual indicators to the user if they prefer but must not require interaction. The application switches automatically to the transmitted codec and center frequency based on metadata, such as the Reed Solomon Identifier, RSID, received in advance of the block of audio.
   e. End result may be saved as a HTML page and links in the same folder or text file, depending on the material being transmitted.
   f. Codec upgradable:
      i. Codecs used in the application will need to be modularized and upgradable.
      ii. The application will contain notifications when new codecs are available and the user presented with a link to install the plugins using something like modern web browsers use for plugins.
   g. Application easily updateable:
      i. The application should be installed and upgraded either over the internet or through a file in local storage.
      ii. The application download and upgrade should not require administrative privileges.
4. Warranty and Support

4.1 The contractor shall provide to the Government for a period of one year after receipt of the final deliverables, at no additional cost, "bug fixes" and corrections for programming errors. During this one year period, the contractor shall also supply up to 40 hours of product technical support to the Government.

5. Deliverables

5.1 Initial concept and graphical user interface (GUI) design

The contractor shall provide to the Government a description of the initial concept design including a description of the concept of operation, flow charts, proposed supported platforms, development language, and at least a mockup of the GUI. The Government shall have at least ten business days to comment on the proposed designs.

5.2 Beta test version

When initial coding is complete and functional, the contractor shall supply the Government with a working version of the software for evaluation and comment. The Government shall have at least thirty business days to evaluate the operation of the software and to provide comments.

5.3 Final Deliverable

Upon completion, the contractor shall provide working software and distribution packages, including installation and help files, for all supported platforms, written documentation of the installation and operation of the software, and complete source code for all versions. ALL DELIVERABLES, INCLUDING SOURCE CODE, BECOME THE PROPERTY OF THE GOVERNMENT AND MAY BE PUBLICLY RELEASED, AT THE DISCRETION OF THE GOVERNMENT. THE CONTRACTOR RETAINS NO PROPRIETARY RIGHTS TO THE MATERIAL PRODUCED UNDER THIS CONTRACT.

5.4 Transmission of Deliverables

All deliverables shall be submitted to:

Daniel Maxwell
Broadcasting Board of Governors
330 Independence Ave. SW, Room #4077C
Washington, DC 20237

5.5 Period of Performance

To begin no later than September 30, 2015 to February 15, 2016.