

Request for Information N00014-16-R-RFI 4  
"Electromagnetic Maneuver Warfare Command & Control (EMC2) Low-band RF Intelligent  
Distribution Resource (LowRIDR)"  
Amendment 01

The purpose of this amendment is to answer questions received in response to Request for Information N00014-16-R-RFI 4.

Q#1: What User Systems does band 3 support? Are all 8 user systems, as depicted by Figure 1 of the RFI, supported?

A#1: Information on what User Systems are part of each band is found in slide 5 of the LowRIDR User System Description document. Band 3 will consist of Narrowband Comms, IO, EW, and Spectrum View. For Narrowband Comms the document list Digital Modular Radio (DMR), BFTN, and a new all digital system. The System Specification Document is also broken up by band 3 and band 4.

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Q#2: For all User Systems that are supported by Band 3 (question 1) can you please provide reference to waveform characteristics such as:

- bandwidth
- PAPR
- modulation scheme
- number of carriers

A#2: The system specification document references the various MIL-STDs on narrow band comms where additional information can be found. Details on some of the waveforms and modulation schemes can also be found online, for example the DMR data sheet list AM/FM/FSK/BPSK/QPSK/CPM

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Q#3: Are there any frequency bands in Band 3 that would have a higher priority? In the briefing in Nov some bands between 100MHz and 200 MHz were mentioned. If so, can you please list the bands?

A#3: For band 3, the requirements were written to provide the same priority throughout the band. However, legacy UHF LOS frequency range is 225-400MHz and VHF High LOS is 115-155 MHz for communication systems.

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Q#4: How many simultaneous user systems would Band 3 support? Can multiple single User systems be used (as an example can multiple link 16 be used)?

A#4: The number of simultaneous user is based on operation requirements and varies per ship. Ships are currently only configured to transmit one link 16 net (Link 16 is part of band 4). The number of simultaneous transmissions for band 3 are specified in Table 5 for receive and Table 21 for transmit in the System Specification Document.

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Q#5: Is there flexibility on frequency planning in each band?

A#5: The Navy currently uses AESOP as its frequency planning software. The frequencies are selected based on mission requirements and battle group configuration.

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Q#6: How many antennas are used for the band III now? How many antennas are expected in the future?

A#6: The number of antennas greatly varies by ship class. However, we expect to see a significant reduction of antennas.

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Q#7: What is the output power for band 3 (per carrier or waveform and total)? Please indicate if this is average or max power?

A#7: Total output power is not specified. Each function has an EIRP specified and the simultaneity tables specify how many of the functions must transmit at the same time.

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Q#8: What is the target linearity of the transmitter/PA (ACPR, EVM, etc.)?

A#8: This will be up to the developer to determine based on their design and how many signals they can support while meeting all the specifications provided.

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Q#9: What is the input interface? (digital / analog and NOB / Vpp)

A#9: The input from the User Systems to the LowRIDR subsystem is digital baseband except for IFF-T

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Q#10: What is the analog user system?

A#10: IFF-T

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Q#11: What are the control network, config network and discrete signal?

A#11: The User Systems need to send configuration and control messages to the multiband control subsystem to configure LowRIDR for TX/RX configurations required by the User System at a given time. Information is found in the architecture design document and interface section of the system specification document.

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Q#12: What is the envisioned form factor for the system? Are there any specific size limits for the Analog Conditioning Units/Power Amplifier (Band 3)?

A#12: There are no size limits specified for the Analog Conditioning Units (ACUs) as the requirements are for the entire system. However, the size the ACUs will depend on the ACUs used on the antenna arrays versus those used in the omni-antennas as the developer may decide to have the ACU be part of the below deck equipment for the omni configuration. The size of the ACUs in the array will vary by the overall size of the arrays, implementation, and be mast-mountable.

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Q#13: What is the system input power? Or gain of the PA?

A#13: The system is receiving digital baseband data from the User System. The input power into the PA is up to the developer and their implementation.

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Q#14: What is the target efficiency of the PA? Are there any constraints on system power consumption or maximum dissipated power per unit?

A#14: There is no target efficiency of the PAs. However, there are system power consumption requirements and a desire for the mast-mounted hardware to be air cooled

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