

Lightweight Universal Codec (LUC) Questions and Answer (Q&As)

This document summarizes Q&As related to the DARPA LUC program, based on the HR001125S0014 solicitation posted to SAM.gov on July 6, 2026.

Version 3,

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Changes highlighted

July 10, 2026

1. Question: Are there standard simulation tools that you prefer we use for Phase 1?

Answer: There are no preferred simulation tools, but all simulation code must be shared with and implemented by the government T&E team.

2. Question: Can you clarify what will constitute the state of the art (SOTA) against which metrics will be evaluated? Is the SOTA defined as the reference being developed by TA2?

Answer: SOTA is defined as the prevailing commercial/industry performance for the technology being proposed for integration. At this time, GRAND is not implemented in any commercial/industry product.

3. Question: What is the expected TRL at program end?

Answer: Phase 2 will include field testing with the communications equipment, but no official TRL assessment will be held.

4. Question: Will performers need to negotiate licensing with MIT in order to implement GRAND and its variants on their own systems or will this be provided as GFI?

Answer: MIT and DARPA are in communication to determine the terms of licensing for use on the program. Performers leveraging GRAND will be required to obtain the licenses from MIT directly prior to doing so.

5. Question: How will power metric be measured in Phase 1 given it is simulation based?

Answer: Simulation tools can provide power measurement estimates.

6. Question: Are you more interested in seeing LUC developed using communication standards such as 5G, link 16, and other military waveforms or a demonstration with software defined radios with generic modulation and medium access that cover a breadth of approaches to show the gains available with LUC?

Answer: We are interested in both scenarios.

- 7. Question: Since Phase 1 is only one year, do you expect the codec to be implemented in software in Phase 1? Does the program expect FPGA designs or codec chip implementations to be developed in Phase 2?**

Answer: Please refer to the BAA.

- 8. Question: Do you encourage proposals that improve upon the current GRAND decoder or is using the reference GRAND decoder sufficient?**

Answer: Teams are encouraged but not constrained to leverage GRAND. Teams that believe they can improve upon the GRAND decoder (without infringing upon GRAND IP) are encouraged to do so as GRAND is not a complete solution with respect to the LUC metrics.

- 9. Question: For the BLER metric, do you assume a specific code or code rate?**

Answer: No.

- 10. Question: Is receiver feedback transit time included in the 100ms requirement?**

Answer: Yes.

- 11. Question: What aspect of universality is the program mostly focused on? Number of codes? Diversity of codes? Range of SNR regime we have to operate under? Block error rate is a good metric but are we constrained on Throughput?**

Answer: Please refer to the BAA (metric table) for program targets. There is no throughput constraint.

- 12. Question: A verbal statement appeared to imply that the GRAND decoder is unable to receive information about the code being used. Does this limitation originate from the planned demo scenario or a different source, and does it also apply to general communication between these hardware elements?**

Answer: GRAND operates irrespective of the code being used, not that it is unable to receive that information.

- 13. Question: The solicitation emphasizes adaptability to current noise conditions - does this imply that the encoder gets feedback info from the decoder? Or is info on noise assumed to be available to the encoder via some other mechanism? More generally, are the encoder/decoder allowed to communicate at the "control level", e.g., to indicate they are switching protocols?**

Answer: DARPA will not restrict design choices nominated by the performing teams.

14. Question: It looks like many of the GRAND works view noise as bit-flipping errors. Are there other forms of noise types being considered (e.g., insertions and deletions in digital channels)? What about noise that is dynamic (e.g., bursty) or adversarial?

Answer: All noise types are being considered for T&E.

15. Question: Is communication exclusively point-to-point or are other communication patterns (e.g., broadcast, distributed) in scope?

Answer: Broadcast and distributed are in scope but the majority of testing will be point-to-point.

16. Question: Where are the boundaries between TA1 and the TA2 performer for outlining collaboration when building a ROM?

Answer: There is no collaboration. TA2 is providing reference designs for GRAND for TA1 consumption.

17. Question: Is there any preference on a proposal bidding multiple technologies vs. a single technology?

Answer: There is no preference but please price each technology separately.

18. Question: Are there any preferences on the technology that the proposer bids?

Answer: No, please bid the technology you believe has the highest likelihood of success.

19. Question: Are there any specific use cases targeted by the LUC program?

Answer: No

20. Question: Are higher-layer technologies in scope for the LUC program?

Answer: Yes

21. Question: With respect to the communication technology and medium, are there limitations on testing?

Answer: At this time, there are no limitations on testing but be mindful of cost and the requirement to conduct A-B tests with an unmodified/non-LUC-enhanced technology.

22. Question: What is the format of the Phase 2 end evaluation?

Answer: The Phase 2 end evaluation is an additional live, field test.

23. Question: Is there a requirement to implement/integrate the hardware developed by the GRAND team?

Answer: No, GRAND hardware is not being provided to the performers. LUC performers are encouraged to implement GRAND or another universal decoder in whatever form

maximizes the benefit to the communication system.

24. Question: Is security of the LUC system being considered in evaluation of the abstracts or proposals?

Answer: While not part of the required metrics, we encourage proposers to consider evaluations of the security implications of LUC technology and the proposed integration and provide mitigation strategies to any identified vulnerabilities.

25. Question: Does the LUC program require solutions to be implemented in software, FPGAs, or ASICs?

Answer: LUC requirements do not specify the implementation.

26. Question: Does GRAND provide a complete decoding solution for the purposes of the LUC program?

Answer: At present, GRAND does not provide a complete decoding solution for the purposes of the LUC program.

27. Question: What is meant by "code convergence"?

Answer: Whereas code selection focuses on determining the most appropriate code for a single transmitter, code convergence can be defined as the strategy for selecting and utilizing an improved code within a larger population of transceivers.

28. Question: Will performers be able to explore applications of the technologies developed under LUC or is this out of scope and performers should only focus on the development of the universal codec? For example, a strong proposal/idea should include test scenarios for the universal codec, or will these be T&E responsibility?

Answer: Strong abstracts and proposals should describe the benefit/value of LUC integration into the proposed technology for both commercial and military applications. However, T&E scenarios will be designed and implemented by the government team.

29. Question: Is there interest in the applications of formal methods? Is there interest in the formal verification of the universal codec (or parts of it) and/or the formal verification of individual error correction codes?

Answer: Formal methods is not in scope for the LUC program.

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30. Question: Does the CMMC requirement still apply?

Answer: Yes. Please see the BAA Amendment and links to additional CMMC information provided therein.

31. Question: Any specific formatting or structural requirements for abstracts?

Answer: Please see the BAA and templates provided in the solicitation.

32. Question: Is there any incumbent/recompete or this is a brand-new project?

Answer: LUC is a new program; there is no incumbent for the TA being solicited.

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33. Question: If we modify the firmware of a device with our LUC implementation, does it still need retain all base functionality not related to communication? (e.g. Does a smart phone still need to act like a smart phone?)

Answer: LUC-enhanced devices will be tested against unmodified devices during program evaluations. LUC integration should not reduce the functionality/capability of the targeted communication device/platform.