Broad Agency Announcement
Waveform Agile RF Directed Energy (WARDEN)
Microsystems Technology Office
HR001121S0017
February 26, 2021

AMENDMENT 3
As amended April 1, 2021

The purpose of this amendment is to clarify proposal page limit guidance.

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ATTACHMENT 2: Proposal Summary Slide Template
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Additional Document Not Attached (See Attachment 3 for instructions):

- Collateral Secret Addendum

PART I: OVERVIEW INFORMATION

- **Federal Agency Name**: Defense Advanced Research Projects Agency (DARPA), Microsystems Technology Office (MTO)
- **Funding Opportunity Title:** Waveform Agile RF Directed Energy (WARDEN)
- **Announcement Type:** Initial Announcement
- **Funding Opportunity Number:** HR001121S0017
- **Catalog of Federal Domestic Assistance Numbers (CFDA):** 12.910 Research and Technology Development
- **Dates:** (All times listed herein are Eastern Time)
    - Posting Date: February 26, 2021
    - Proposers' Day: March 5, 2021
    - Requests for Security Classification Guide (SGC) and Classified WARDEN BAA Addendum: Must be made by March 25, 2021 at 5:00 PM (ET)
    - FAQ Submission Deadline: April 07, 2021
    - Deadline to Notify Security of Intent to Submit Classified Proposals: April 9, 2021 at 5:00 PM (ET)
    - Proposal Due Date: April 16, 2021 at 2:00 PM (ET)
    - Estimated period of performance start: October 2021
- **Concise description of the funding opportunity:** DARPA is soliciting innovative research and development on extreme power, broadband amplifiers and agile waveform techniques that combine frequency, amplitude, and pulse-width modulations to improve electromagnetic coupling and disruptive effects on targeted electronics. The goal of the Waveform Agile Radio-frequency Directed Energy (WARDEN) program is to extend the range of high power microwave (HPM) back-door attack by a factor of 10 beyond the current state of the art.
- **Anticipated Funding Available for Award:** Total awarded funding is expected to be $51M over four years.
- **Anticipated individual awards**: Multiple awards are anticipated for each Technical Area
- **Anticipated funding type:** 6.2
- **Types of instruments that may be awarded:** Procurement contract, grant, cooperative agreement, or other transaction.
- **Agency contact:**
    - Dr. David K. Abe, Program Manager
      BAA Coordinator: HR001121S0017@darpa.mil
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PART II: FULL TEXT OF ANNOUNCEMENT

I. Funding Opportunity Description

The Defense Advanced Research Projects Agency (DARPA) often selects its research efforts through the Broad Agency Announcement (BAA) process. This BAA is being issued, and any resultant selection will be made, using the procedures under Federal Acquisition Regulation (FAR) 6.102(d)(2) and 35.016 and 2 C.F.R. § 200.203. Any negotiations and/or awards will use procedures under FAR 15.4, Contract Pricing. Proposals received as a result of this BAA shall be evaluated in accordance with evaluation criteria specified herein through a scientific review process.

DARPA BAAs are posted on the beta SAM website, under the Contract Opportunities (FBO) link, at https://beta.sam.gov/, and, as applicable, the grants.gov website at http://www.grants.gov/. The following information is for those wishing to respond to the BAA.

The Microsystems Technology Office at DARPA seeks innovative proposals in the following areas of interest: High power microwave (HPM) amplifiers that use electromagnetic (EM) radiation to disrupt, disable, or damage targeted electronic components and circuits; theory and computational models to describe the coupling of electromagnetic radiation into complex enclosures via unintentional paths such as seams, apertures, and cable entry points (i.e., "back door coupling"); and agile waveform techniques capable of producing disruptive effects on electronic components, devices, and sub-systems. In the Waveform Agile RF Directed Energy (WARDEN) program context, "agile waveforms" are time-dependent signals that combine frequency, amplitude, and/or pulse-width modulations to maximize coupling into a complex enclosure and are optimized to produce disruptive effects on internal electronic components and sub-systems.

The WARDEN program is composed of three technical areas (TAs): TA1 HPM Traveling-wave Amplifier; TA2 Rapid Assessment & Numerical Generation of Electromagnetic Response (RANGER); and TA3 Agile Waveform Development. TA1 and TA3 are expected to address DoD application-specific information and will be classified at the collateral SECRET level. TA2 RANGER is expected to be fundamental research and will be UNCLASSIFIED. A single proposal to the BAA may respond to either TA1, TA2, or TA3 but not to multiple TAs within a single proposal. In other words, a proposer wishing to propose to multiple TAs must submit a separate proposal for each TA. This BAA will provide an overview of all three technical areas.

In order to propose to TA1 or TA3, proposers must follow the instructions detailed in BAA Attachment 3 "Security Classification Guide and Classified Addendum Request Form" and receive these additional documents. Note that only proposers who meet the personnel security requirements and the facility clearance status/level (DCSA Certified & Accredited Facility) along with possessing a background in high-power vacuum amplifiers (TA1) or electromagnetic effects on electronics and waveform techniques (TA3), may request the SCG and Classified BAA Addendum. If you do not meet the security requirements, it is suggested you look into teaming with other proposers who meet the requirements.

Proposed research should investigate innovative approaches that enable revolutionary advances in science, devices, or systems. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice.

A. Background

High power microwave (HPM) systems are a class of radio-frequency directed energy weapons (RF DEWs) that use electromagnetic (EM) radiation to disrupt, disable, or damage targeted electronic components and circuits. Electromagnetic radiation can couple into targets in-band via intentional ports such as antennas ("front door") or via unintentional coupling paths such as seams, apertures, and cable entry points ("back door"). The advantages of HPM systems include non-kinetic, wide area effects at large stand-off distances; deep magazines; operation in adverse environmental conditions; and speed-of-light engagement.

In general, current HPM systems use oscillators as their RF source. These systems operate at a fixed frequency, are not readily tunable, and lack the phase coherence necessary for power combining. Front-door systems have the longest range, but their effectiveness is limited to the specific classes of targets for which they were designed. Back-door systems are effective against a wider variety of targets, but their range is limited by EM coupling inefficiencies arising from their lack of frequency tunability. Agile waveforms, combined with broadband high-power amplifiers, can reduce the threshold of the susceptibility of targeted systems to back-door attacks and significantly extend the range and effectiveness of the HPM weapon system. The technology to create effects at tactically useful ranges faces three principal challenges which are outlined in the program description (Section B) below. Figure 1 provides a generalized illustration of the HPM concept and interactions. Note: the cruise missile depicted in the graphic is an example of just one class of target; WARDEN seeks to develop flexible technology that can be useful against a wide variety of target types.

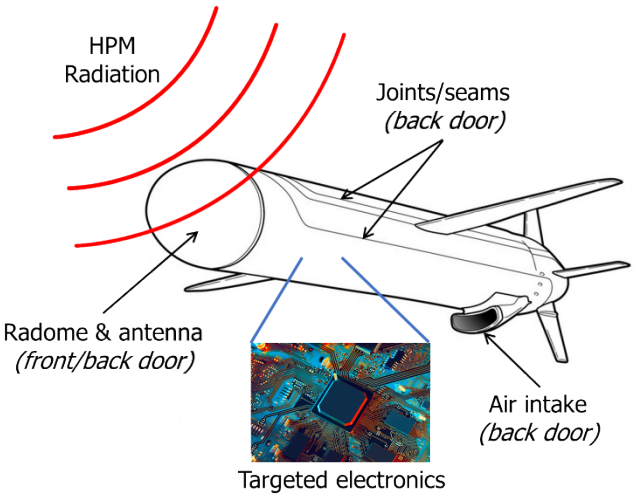

Figure 1: HPM radiation incident upon a target can couple into the target via front door and back door pathways and cause effects on internal electronics within the target structure.

WARDEN will address three key technical challenges.

Technical Challenge #1: Stable, High Power RF Amplification with Broad Bandwidth

To maximize coupling and effects, WARDEN seeks to develop high peak power amplifiers as the technology of choice for back-door HPM attack systems. In contrast to oscillators, a broadband amplifier has the frequency agility necessary to maximize EM coupling into targeted electronics. Laboratory measurements have shown that even with modest frequency tuning, coupling efficiencies can be significantly improved. In addition, amplifiers support waveform modulations which can reduce the susceptibility thresholds of internal electronics to disruption by EM radiation. Combined, these effects can increase the range of back-door HPM DEWs. A further advantage of amplifiers is that they possess the phase coherence necessary for power combining.

Despite their potential beneficial impact on HPM systems, high-power, broadband amplifiers have proven extremely difficult to realize. A central challenge for amplifiers is the suppression of instabilities, as their gain and frequency capabilities provide increased opportunities for perturbations and unwanted modes to produce growing waves that can lead to oscillation. In addition to beam-wave interaction circuit topologies optimized to avoid oscillation, electromagnetic reflections at interfaces such as input/output couplers and high-power vacuum windows are design concerns.

Technical Challenge #2: Fast, Predictive Capabilities for EM Coupling into Complex Enclosures

Given an instantaneously tunable transmitter technology, understanding the physics of EM wave coupling into a complex enclosure and the subsequent interaction with internal electronics is critical to improving the effectiveness of back-door HPM attacks. Computationally-efficient, time-domain models capable of simulating EM wave interaction with large structures containing features of widely-varying sizes and material properties present the principal technical challenges. At present, such models do not exist. Current deterministic methods based on finite-element and finite-difference discretization are accurate and capable of fine spatial resolution. However, dense meshing requirements make these methods computationally intensive, resulting in long runtimes for problems of even moderate complexity; the techniques are impractical for the multiple runs necessary for engagement analyses and waveform optimization. In addition, they require precise knowledge of the target geometry and EM illumination characteristics.

Technical Challenge #3: Agile Waveform Techniques for Operational HPM Use

The principal technical challenges are: (a) the development of physics-based computational tools to predict HPM effects on electronics; and (b) the creation of specific agile waveform techniques to produce maximally disruptive effects. Low-power laboratory experiments with frequency, amplitude, and pulse-width modulated waveforms have demonstrated reductions in the threshold of electronic components and system susceptibilities to EM disruption. However, because of the lack of the existence of amplifiers with sufficient power, bandwidth, and linearity to exploit these waveforms, there has been sparse R&D investment in agile waveforms for operational HPM use.

In the absence of a fast, accurate modeling capability, codes such as the Joint RF Effectiveness Model (JREM) – the principal DoD tool used to predict HPM effects on targets – are based on

empirical vulnerability data. The challenge is to develop physics-based models and to further improve the DoD's predictive capabilities.

B. Program Description

The objective of the WARDEN program is to develop hardware, theory, and computational models to extend the range and effectiveness of HPM systems for back-door attacks. WARDEN's three technical areas address the principal challenges to enhancing the range and effectiveness of HPM back-door attack: stable, high power, broadband amplification; theory and computational tools to predict EM coupling into complex enclosures; and predictive tools and agile waveform techniques enabling the identification and exploitation of electronic system vulnerabilities. The three technical areas will provide the enabling technologies for HPM back-door attack with agile waveforms that will extend the range by up to a factor of ten beyond the current state-of-the-art.

TA1 and TA3 will be classified collateral SECRET; TA2 will be UNCLASSIFIED. This BAA presents an overview of all technical areas to provide a clear understanding of the overall program scope and objectives. In order to propose to TA1 or TA3, proposers must follow the instructions detailed in BAA Attachment 3 "Security Classification Guide and Classified Addendum Request Form" and receive these additional documents. Note that only proposers who meet the personnel security requirements and the facility clearance status/level (DCSA Certified & Accredited Facility) along with possessing a background in high-power vacuum amplifiers (TA1) or electromagnetic effects on electronics and waveform techniques (TA3), may request the SCG and Classified BAA Addendum. If you do not meet the security requirements, it is suggested you look into teaming with other proposers who meet the requirements.

A single proposal to the BAA may respond to either TA1, TA2, or TA3 but not to multiple TAs within a single proposal. In other words, a proposer wishing to propose to multiple TAs must submit a separate proposal for each TA.

C. Program Structure

WARDEN will be a 48-month, three-phase program. Each Technical Area will consist of a 12-month Phase 1 (base), 24-month Phase 2 (option), and 12-month Phase 3 (option). In Phase 1, multiple awards in each Technical Area are anticipated. It is expected that fewer performers will be funded to participate in Phase 2 and Phase 3 of the program. Options may be exercised, at the Government's sole discretion, based on technical progress measured against the metrics and milestones defined in the BAA and funding availability.

Technical Area #1 (TA1): HPM Traveling-wave Amplifier

To address Technical Challenge #1, WARDEN TA1 will develop and demonstrate the first broadband HPM amplifier. The amplifier performance goals and metrics are specified in the classified addendum. In this BAA and its classified addendum, "bandwidth" refers to instantaneous bandwidth and "fractional bandwidth" refers to the ratio of the center frequency divided by the amplifier's half-power (3-dB) bandwidth, $f_c / \Delta f_{3dB}$, where $\Delta f_{3dB} = (f_{max,3dB} - f_{min,3dB})$ and $f_c = (f_{max,3dB} + f_{min,3dB})/2$. The bandwidth metric specified in the classified addendum is intended

to provide a broad, instantaneously scannable range of frequencies to maximize EM coupling and effects. While the frequency content of individual waveform techniques may not occupy the full bandwidth of the amplifier, the broad overall range enables the flexibility to select carrier frequencies for optimal coupling into complex volumes.

The development of an EM radiating aperture is beyond the scope of the WARDEN program. The RF output of the WARDEN amplifier will not be radiated into free space but rather dissipated in a dummy load.

In addition to a single high-power amplifier, WARDEN is open to design concepts that employ multiple amplifiers in a conventional phased array or a sparse, widely-separated array. Recent advances in multi-static radar illustrate the applicability of such solutions. If multiple amplifiers are proposed, the system, in aggregate, must be capable of producing the same minimum effective radiated power (ERP) as specified for single amplifiers in the classified addendum.

WARDEN TA1 performers should expect to interact with TA3 performers through Associate Contractor Agreements (ACAs) to receive waveforms developed within TA3 in a common non-proprietary format for use with the amplifiers developed in TA1.

Phase 1 of TA1 is the design phase and will last 12 months. In addition to the performance metrics specified in the classified addendum, successful Phase 1 designs must demonstrate – through simulation – absolute stability at maximum peak RF output power and pulse duration over the entire operating band. For vacuum electronic devices, stability analyses must include large-signal and 3D electromagnetic particle code simulations that include the impact of thermal electron beams and non-ideal matches at interfaces such as input/output couplers and vacuum windows. To aid in the analyses, codes such as the Naval Research Laboratory's large signal code TESLA[1,2] and 3D particle-in-cell code NEPTUNE[3,4] will be made available as government furnished property (GFP) along with training and technical support to aid in initial model setup. The use of these specific codes is not mandatory; other comparable, experimentally-validated particle and computational electromagnetics codes may be used for design and stability analyses.

While there is not a specific metric for amplifier linearity, the device must be capable of amplifying a complex waveform without introducing distortion products that could degrade the effectiveness of the waveform's disruptive effect on electronics. ACAs with TA3 performers can provide access to exemplar agile waveforms to serve as input for time-domain simulations to optimize amplifier design.

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[1] I.A. Chernyavskiy, et al., "Large-signal 2-D Modeling of Folded-waveguide Traveling Wave Tubes," IEEE Trans. on Electron Devices, 63(6), pp. 2531-2537, June 2016.
[2] I.A. Chernyavskiy, et al., "Modeling Vacuum Electronic Devices Using Generalized Impedance Matrices," IEEE Trans. on Electron Devices, 64(2), pp. 536-542, Feb. 2017.
[3] S.J. Cooke, et al., "GPU-Accelerated 3D Large-Signal Device Simulation Using the Particle-in-Cell Code 'Neptune," 13th IEEE Int. Vacuum Electronics Conf./ 9th IEEE Int. Vacuum Electron Sources Conf., Portola Hotel, Monterey, CA, April 24-26, 2012.
[4] S.J. Cooke, et al., "Vacuum Electronic Device Design Using 3D EM-PIC," 15th Int. Vacuum Electronics Conf., Monterey, CA, 22-24 April 2014.

In addition to the performance metrics and stability, key design and programmatic issues to be addressed in Phase 1 include:

- High peak and average power handling
- Broadband input and output coupler design
- Broadband vacuum window design
- Thermal management
- Overall experimental design including power supply/modulator, RF driver amplifier, and diagnostics
- Plan for Phase 2 fabrication and testing, including cost, schedule, risk assessments, and risk mitigation strategies

Proposals with multiple amplifier approaches must address additional issues that include:

- Phase stability and phase similarity objectives between individual amplifiers
- System synchronization
- System cost and fabrication challenges at the scale necessary to meet minimum ERP goals

Phase 1 will culminate in a Preliminary Design Review (PDR). The goals of the PDR are to:

- Assess the viability of candidate approaches as per the criteria described above
- Determine whether the amplifier design, fabrication, and testing approaches have a reasonable expectation of satisfying the performance metrics within the proposed budget and schedule

It is anticipated that the Phase 2 option will be exercised based on performance against program metrics and available funding.

Phase 2 of TA1 will last 24 months and will focus on fabrication, procurement, laboratory preparation, and initial amplifier testing. A Critical Design Review (CDR) will be held early in Phase 2 to verify that the final amplifier design is ready to proceed to fabrication. The goals of the CDR are to:

- Determine that the detailed design of the amplifier satisfies schedule and performance goals and metrics
- Assess the detail design compatibility with other equipment, facilities, and diagnostics
- Assess risk areas (on a technical, cost, and schedule basis)
- Determine the acceptability of the experimental characterization plan

Intermediate Phase 2 milestones include cold tests of amplifier components, followed by installation and demonstration of sub-systems (i.e., RF driver, high voltage power supply, etc.).

Phase 2 will culminate in the final assembly and integration of the amplifier, RF driver system, and diagnostics, followed by initial testing and demonstration of the amplifier system at low duty.

It is anticipated that the Phase 3 option will be exercised based on performance against program metrics and available funding.

Phase 3 of TA1 will last 12 months and demonstrate that the amplifier meets all of the performance metrics specified in the classified addendum. In addition, amplifier linearity will be evaluated using representative agile waveforms supplied either by the government team or TA3 performers. Waveform distortion due to amplifier nonlinearities will be analyzed and feedback provided to TA3 performers for further assessment.

Technical Area #2 (TA2): Rapid Assessment & Numerical Generation of EM Response (RANGER)

To address Technical Challenge #2, WARDEN TA2 will develop physics-based models to enable the rapid prediction of agile EM waveforms coupling into complex enclosures and the spatial distribution of the internal electric fields. To support the analyses of engagements using agile waveforms, key elements to be addressed include but are not limited to the ability to simulate waveforms in the time domain; the ability to simulate environments with multiple length scales and with multiple components; the ability to simulate engagements without requiring an exact knowledge of the internal composition and layout of the structure being engaged; and the ability to predict voltages and electric fields at locations inside and outside of the structure. Providing these capabilities may require a combination of modeling approaches that include first-principles, reduced, and statistical representations. For example, methods such as the Random Coupling Model[5] can provide a framework where statistical and deterministic descriptions of the critical elements of EM environments can be integrated into a hybrid approach to predict the statistical distribution of fields resulting from an EM engagement. To validate developmental models, the government team will define the parameters for a set of test enclosures of varying complexity. The parameters will be provided as Government Furnished Information (GFI) at program kick-off (see Section F "Government Furnished Equipment/Property/Information" for additional information). Model predictions of EM coupling efficiency and the spatial distribution of fields within the enclosures will be compared with performer-measured data and validated by the government team. The WARDEN program metrics for TA2 are shown in Table 1. For back-door coupling, interference effects have been found to be much more prominent at low frequencies (e.g. 1-4 GHz) compared with higher frequencies.[6] At these frequencies, typical enclosure sizes of interest run from on the order of a free-space wavelength to hundreds of wavelengths.

Table 1: WARDEN Technical Area 2 program metrics

	Metric	Phase 1 (12 months)	Phase 2 (24 months)	Phase 3 (12 months)
TA2	Model agreement [%] (with simulated or measured data)	>50	>80	>80
	Code runtime [minutes, non-HPC]	---	<60	<30

[5] G. Gradoni et al., "Predicting the statistics of wave transport through chaotic cavities by the random coupling model: A review and recent progress," Wave Motion 51, 2014.
[6] M.G. Backstrom et al., "Susceptibility of electronic systems to high-power microwaves: Summary of test experience," IEEE Trans. on Electromagnetic Compatibility 46(3), Aug. 2004.

Models developed in TA2 are encouraged to be shared with TA3 performers to inform and improve the waveform development task.

Phase 1 of TA2 will last 12 months and will focus on the initial development of time-domain theory and establish the framework for hybrid model development. Early models will be verified with existing codes and experimentally validated by comparison with measured data. Phase 1 will culminate in a review of the time-domain theory, initial model development, and hybrid model framework, along with a proposed Phase 2 development plan. It is anticipated that the Phase 2 option will be exercised based on performance against program metrics and available funding.

Phase 2 of TA2 will last 24 months and will continue the development of the various modeling approaches. Models will be validated by comparison with measured data from increasingly complex test enclosures as specified by GFI provided at program kick-off (see Section F "Government Furnished Equipment/Property/Information" for additional information). Phase 2 will culminate in the initial demonstration of the models integrated into a hybrid framework. It is anticipated that the Phase 3 option will be exercised based on performance against program metrics and available funding.

Phase 3 of TA2 will last 12 months and will complete the integration and validation of the hybrid simulation framework. Phase 3 will culminate in a demonstration of the predictive capabilities of the models and codes.

Technical Area #3 (TA3): Agile Waveform Development

While TA2 addresses the coupling of EM radiation from an external source into a complex volume, TA3 addresses EM interactions with electronics contained within the volume and the effects on system operation. Recent research on HPM effects on computers has provided an improved understanding of the physical processes of EM interaction with electronics and their relationship to the underlying engineering design rules for electronic systems. To address Technical Challenge #3, WARDEN TA3 will leverage recent test methodologies and modeling approaches and extend them to broader classes of target systems to create a physics-based computational framework for the prediction of HPM effects. The government team will specify representative classes of electronic sub-systems, printed circuit boards, and electronic components as key targets for model validation. The predictive capabilities of developmental models will be evaluated by comparison with performer-measured data and validated by the government team. In addition, TA3 will create and experimentally validate agile waveform techniques that combine multi-frequency content with amplitude and pulse-width modulations to produce maximally disruptive effects on electronics. The overall effectiveness of the waveform techniques will be experimentally validated with anechoic chamber measurements on specified electronic targets. Key metrics of effectiveness are provided in the classified addendum.

Proposals must address how they will execute technical exchange between relevant TAs while maintaining appropriate levels of security. WARDEN TA3 performers should expect to interact with TA1 performers through ACAs to provide waveforms developed within TA3 in a common non-proprietary format for use with the amplifiers developed in TA1.

Phase 1 of TA3 will last 12 months and focus on initial model development and the demonstration of agile waveforms optimized for effects on basic electronics. Initial model development with model verification and validation will occur in Phase 1. Phase 1 will culminate in an assessment of progress in relation to the metrics described in the classified addendum. It is anticipated that the Phase 2 option will be exercised based on performance against program metrics and available funding.

Phase 2 of TA3 will last 24 months and will continue the development of the predictive modeling approaches and waveform techniques for an expanded set of integrated electronics. Models and waveforms will be validated by comparison with measured data. Phase 2 will culminate in the demonstration of agile waveforms optimized to produce effects in integrated electronics with measures of success as defined in the classified addendum. It is anticipated that the Phase 3 option will be exercised based on performance against program metrics and available funding.

Phase 3 of TA3 will last 12 months and will use the results of the previous phases to demonstrate an integrated approach to waveform generation. Phase 3 will culminate in the demonstration of the predictive capabilities of the models and the experimental validation of the model-constructed agile waveforms against integrated electronics. Model verification and validation will be conducted with measures of success as defined in the classified addendum. Selected agile waveforms will be provided to TA1 performers for evaluation with HPM amplifiers. Amplified waveforms may contain distortion products and will be re-evaluated for effectiveness against electronics. A goal for TA3 is to compile waveform techniques and effects data into a searchable database for future use and development.

D. Schedule/Milestones

The total period of performance is 48 months. A high-level schedule is shown in Figure 2. Program kickoff and periodic review sessions are mandatory and represent an opportunity to interact with the Government on planned work, specifics of the technical approach, and any technical or programmatic items of concern. Regular technical and financial reporting is required by all performers.

General guidance for all proposals:

- All teams should plan for phase transition information to be required approximately 1.5 months prior to the end of a given phase (i.e., Phase 1 and Phase 2). Program reviews will be scheduled accordingly to facilitate the transfer of information to inform the transition decision process.
- A target start of October 2021 may be assumed for planning and budgeting purposes.

All proposals should include the following meetings and travel in the proposed schedule and costs:

- Proposals should budget for four two-day meetings over the course of the 48 month period of performance - one meeting in the Washington, D.C. area in Phase 1; one meeting in the San Francisco, CA area and one meeting in the Washington, D.C. area in Phase 2; and one

meeting in the San Francisco, CA area in Phase 3. Depending on the circumstances, virtual meetings may replace in-person gatherings.

- Regular monthly teleconferences will be scheduled with the Government team for progress reporting and the identification and mitigation of performance and schedule issues. Proposers should also anticipate at least one site visit per phase by the DARPA Program Manager, during which they will have the opportunity to demonstrate progress towards agreed-upon milestones.
- Budget for attending and presenting results at appropriate technical conferences is acceptable (one per 12-month period, at conferences consistent with the information being disseminated); beyond this level of conference, attendance will need substantial justification.

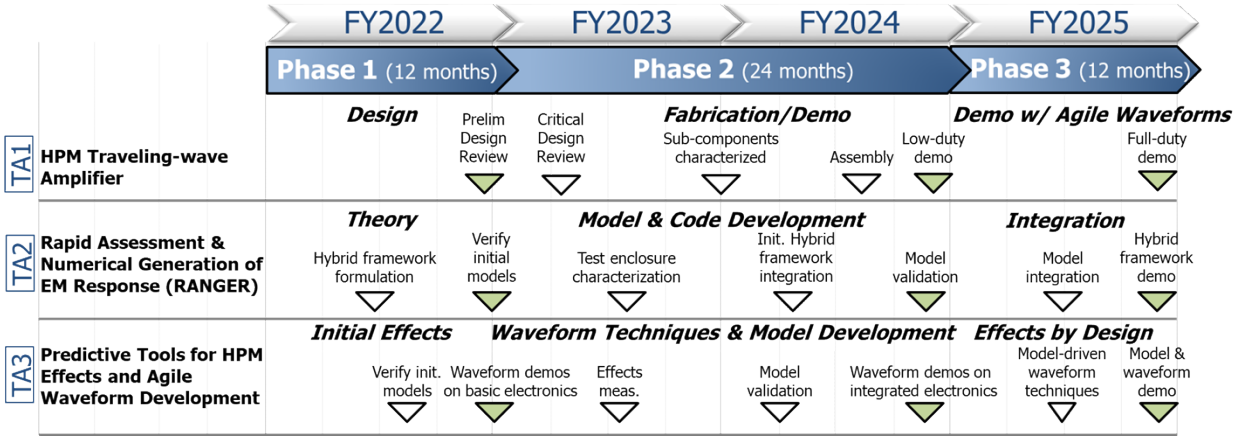

Figure 2: Overall program schedule and primary milestones

1. Technical Area 1: Schedule and Milestones

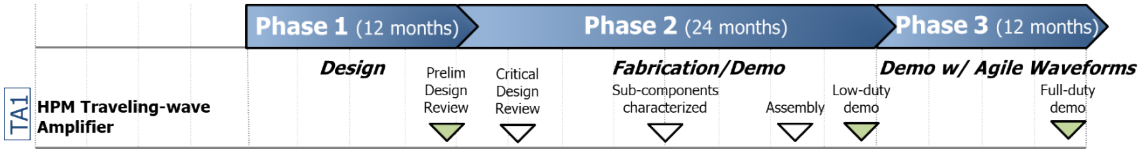

Table 2 summarizes the milestones for TA1.

Table 2: TA1 Milestone Schedule

TA	Phase 1 (12 months)	Phase 2 (24 months)	Phase 3 (12 months)
TA1	• HPM amplifier design meeting the specifications provided in the classified addendum • Stability analyses using state-of-the-art 3D particle-in-cell codes • Preliminary Design Review (PDR) to be held	• Critical Design Review (CDR) to be held in the first quarter of Phase 2 that addresses the key design and programmatic issues described in Section I.C • Cold tests of amplifier components	• HPM amplifier demonstration meeting all of the specifications provided in the classified addendum • Demonstration with TA3 agile waveforms and analysis of potential distortion products

	approximately 10.5 months after program kickoff that addresses the key design and programmatic issues described in Section I.C	• Installation and demonstration of sub-systems (i.e., RF driver, high voltage power supply) • Final integration of the amplifier, RF driver system, and diagnostics • Initial demonstration of the HPM amplifier at low duty	

Technical Area 2: Schedule and Milestones

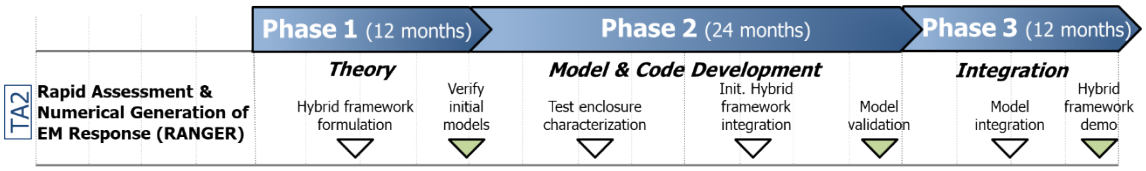

Table 3 summarizes the milestones for TA2.

Table 3: TA2 Milestone Schedule

TA	Phase 1 (12 months)	Phase 2 (24 months)	Phase 3 (12 months)
TA2	• Initial time-domain theory development • Hybrid model framework formulation • Model verification and validation • Model performance meeting the metrics of Table 1	• Experimental characterization of test enclosures • Model verification and validation • Initial model integration and demonstration in the hybrid framework • Model performance meeting the metrics of Table 1	• Model verification and validation • Model performance meeting the metrics of Table 1 • Finalize model integration into the hybrid framework • Demonstration of code/model predictive capabilities

2. Technical Area 3: Schedule and Milestones

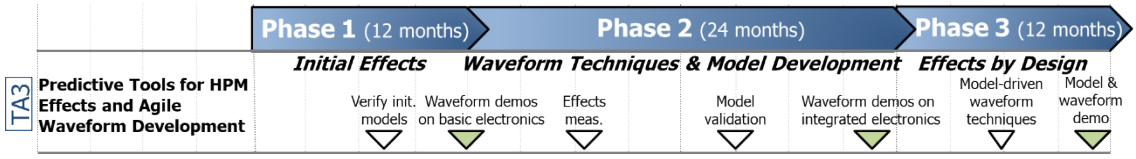

Table 4 summarizes the milestones for TA3.

Table 4: TA3 Milestone Schedule

TA	Phase 1 (12 months)	Phase 2 (24 months)	Phase 3 (12 months)
TA3	• Development and demonstration of waveform techniques on basic electronics • Initial model development • Model verification and validation • Model(s) meet the metrics specified in the classified addendum	• Development and demonstration of waveform techniques on integrated electronics • Model verification and validation • Model(s) meet the metrics specified in the classified addendum	• Model verification and validation • Model(s) meet the metrics specified in the classified addendum • Demonstration of model-driven waveform techniques • Demonstration of the predictive capabilities of the model(s) • Selected waveforms provided to TA1 performers and subsequent re-evaluation of the effectiveness of amplified waveforms containing distortion products

E. Deliverables

All performers shall deliver detailed spend plans at program kickoff and execution of subsequent option awards, quarterly technical reports, and monthly financial reports, including updated expenditures. Performers shall prepare and submit briefing materials and participate in quarterly progress reviews, either via telecon or at the performer's site at the discretion of DARPA. All performers shall travel to and support annual program-wide reviews scheduled at the Program Manager's discretion (reviews may alternatively be held virtually, depending on the circumstances).

- Quarterly technical reports are due within ten business days of the end of the given quarter, describing progress made on the specific milestones as laid out in the SOW (outlined in Section VI.C.)
- Monthly financial reports are due within ten business days of the end of each month (outlined in Section VI.C.)
- A Phase Completion report shall be submitted within 30 days after the end of each phase, summarizing the research done that includes:
    - A description of the technical development and achievements in each area
    - Component and system test results, if applicable
    - Charts and explanations of how well the system meets, exceeds, or falls short of specified program goals (as described in this BAA and its classified addendum)
    - Plans and projections for the following program phase with an updated risk assessment in each of the critical program areas

- Other negotiated deliverables specific to the objectives of the individual efforts. These may include registered reports, experimental protocols, publications, data management plan, intermediate and final versions of software libraries, code, and APIs, including documentation and user manuals, and/or a comprehensive assemblage of design documents, models, modeling data and results, and model validation data.

1. Technical Area 1: Deliverables

Table 5: TA1 Deliverables

TA	Phase 1 (12 months)	Phase 2 (24 months)	Phase 3 (12 months)
TA1	• Report documenting the HPM amplifier design and stability analyses that show the feasibility of meeting or exceeding the metrics specified in the classified addendum • Report documenting the overall experiment design concept, risks and risk mitigation strategies, and Phase 2 fabrication and testing schedules	• Report documenting the findings, resolution of issues, and schedules arising from the CDR • Laboratory test data from interim cold test measurements and sub-system characterizations • Laboratory test data validating the HPM amplifier's ability to meet or exceed the metrics specified in the classified addendum (at low duty)	• Laboratory test data validating the HPM amplifier's ability to meet or exceed all of the metrics specified in the classified addendum • Laboratory test data showing the amplification results using TA3-provided agile waveforms • Electronic copies of the amplified TA3 waveforms and a report documenting potential waveform distortion due to amplifier nonlinearities • Report detailing a plan for follow-on development

2. Technical Area 2: Deliverables

Table 6: TA2 Deliverables

TA	Phase 1 (12 months)	Phase 2 (24 months)	Phase 3 (12 months)
TA2	• Report documenting time-domain model development • Modeling data and results • Laboratory test data from enclosure characterization* • Report documenting overall theory and model development plans, code framework approaches, and Phase 2 strategies and schedules	• Modeling data and results • Laboratory test data from enclosure characterization* • Intermediate versions of software libraries, executables, source code, and APIs, including documentation and user manuals	• Modeling data and results • Laboratory test data from enclosure characterization* • Final versions of software libraries, executables, source code, and APIs, including documentation and user manuals • Report detailing a path for follow-on development

*Test data shall be provided with adequate documentation regarding test conditions, measurement techniques, etc. to enable government teams to independently verify and validate results.

3. Technical Area 3: Deliverables

Table 7: TA3 Deliverables

TA	Phase 1 (12 months)	Phase 2 (24 months)	Phase 3 (12 months)
TA3	• Waveforms and laboratory test data documenting effects on electronics* • Modeling data and results • Report documenting overall test strategy, model development and code framework approaches, and Phase 2 strategies and schedules	• Waveforms and laboratory test data documenting effects on electronics* • Intermediate versions of software libraries, executables, source code, and APIs, including documentation and user manuals	• Waveforms and laboratory test data documenting effects on electronics* • Selected agile waveforms provided to TA-1 performers for assessment with HPM amplifiers • Final versions of software libraries, executables, source code, and APIs, including documentation and user manuals • Waveform techniques and effects data compiled in searchable databases for future use and development • Report detailing a path for follow-on development

*Test data shall be provided with adequate documentation regarding test conditions, measurement techniques, etc. to enable government teams to independently verify and validate results.

F. Government Furnished Equipment/Property/Information

Technical Area 1: The government will provide access to and support for DoD-developed codes for TA1 performers to support the design and development of the WARDEN amplifier. These DoD-developed codes support the design of electron beam generation and transport systems, beam-wave interaction circuits, and electron collectors. In addition, they can provide insights into instabilities that can arise from the dispersive characteristics of the circuits and mismatches at interfaces. These codes can rapidly identify potential sources of instabilities and evaluate mitigation approaches, minimizing the need for time- and cost-intensive hardware prototyping. These codes will be provided at the program kick-off. Information about the codes can be found in [1,2,3,4] to support proposal responses. Use of these codes is not mandatory.

Technical Area 2: The government will provide specifications to TA2 performers for enclosures and configurations that will be used by the government as surrogates for verification and validation of theory and computational models developed in the WARDEN program. These specifications will be provided at the program kick-off. TA2 performers are encouraged to align their own internal test and evaluation conditions to those provided by the government.

Technical Area 3: The government will provide specifications to TA3 performers for electronic components, integrated electronics, and sub-system configurations that will be used by the

government as surrogates for verification and validation of waveforms and computational models developed in the WARDEN program. These specifications will be provided at the program kick-off. TA3 performers are encouraged to align their own internal test and evaluation conditions to those provided by the government.

G. Intellectual Property

The evaluation criteria will include the ability to transition developed technology to government applications. To assist with this assessment, proposers shall identify in their proposal any pre-existing technical data or commercial/non-commercial software that they will deliver to the Government with less than unlimited rights. See Section IV.B.10. for more information related to intellectual property.

It is desired that all non-commercial software (including source code), software documentation, hardware designs and documentation, waveform techniques, and technical data generated by the program be provided as deliverables to the Government, with a minimum of Government Purpose Rights (GPR), as lesser rights may adversely impact the lifecycle costs of affected items, components, or processes.

II. Award Information

A. General Award Information

Multiple awards are anticipated. The amount of resources made available under this BAA will depend on the quality of the proposals received and the availability of funds.

The Government reserves the right to select for negotiation all, some, one, or none of the proposals received in response to this solicitation, and to make awards without discussions with proposers. The Government also reserves the right to conduct discussions if it is later determined to be necessary. If warranted, portions of resulting awards may be segregated into pre-priced options. Additionally, DARPA reserves the right to accept proposals in their entirety or to select only portions of proposals for award. In the event that DARPA desires to award only portions of a proposal, negotiations may be opened with that proposer. The Government reserves the right to fund proposals in phases with options for continued work at the end of one or more of the phases, as applicable.

Awards under this BAA will be made to proposers on the basis of the evaluation criteria listed below (see section labeled “Application Review Information,” Sec. V.), and program balance to provide overall value to the Government. The Government reserves the right to request any additional, necessary documentation once it makes the award instrument determination. Such additional information may include but is not limited to Representations and Certifications (see Section VI.B.4., “Representations and Certifications”). The Government reserves the right to remove proposers from award consideration should the parties fail to reach agreement on award terms, conditions and cost/price within a reasonable time or the proposer fails to timely provide requested additional information. Proposals identified for negotiation may result in a procurement contract, grant, cooperative agreement, or other transaction, depending upon the nature of the work

proposed, the required degree of interaction between parties, whether or not the research is classified as Fundamental Research, and other factors.

Proposers looking for innovative, commercial-like contractual arrangements are encouraged to consider requesting Other Transactions. To understand the flexibility and options associated with Other Transactions, consult http://www.darpa.mil/work-with-us/contract-management#OtherTransactions.
In accordance with 10 U.S.C. § 2371b(f), the Government may award a follow-on production contract or Other Transaction (OT) for any OT awarded under this solicitation if: (1) that participant in the OT, or a recognized successor in interest to the OT, successfully completed the entire prototype project provided for in the OT, as modified; and (2) the OT provides for the award of a follow-on production contract or OT to the participant, or a recognized successor in interest to the OT.

In all cases, the Government contracting officer shall have sole discretion to select award instrument type, regardless of instrument type proposed, and to negotiate all instrument terms and conditions with selectees. DARPA will apply publication or other restrictions, as necessary, if it determines that the research resulting from the proposed effort will present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Any award resulting from such a determination will include a requirement for DARPA permission before publishing any information or results on the program. For more information on publication restrictions, see the section below on Fundamental Research.

B. Fundamental Research

It is DoD policy that the publication of products of fundamental research will remain unrestricted to the maximum extent possible. National Security Decision Directive (NSDD) 189 defines fundamental research as follows:

> 'Fundamental research' means basic and applied research in science and engineering, the results of which ordinarily are published and shared broadly within the scientific community, as distinguished from proprietary research and from industrial development, design, production, and product utilization, the results of which ordinarily are restricted for proprietary or national security reasons.

As of the date of publication of this solicitation, the Government expects that program goals as described herein may be met by proposed efforts for fundamental research and non-fundamental research. Some proposed research may present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Based on the anticipated type of proposer (e.g., university or industry) and the nature of the solicited work, the Government expects that some awards will include restrictions on the resultant research that will require the awardee to seek DARPA permission before publishing any information or results relative to the program.

Proposers should indicate in their proposal whether they believe the scope of the research included in their proposal is fundamental or not. While proposers should clearly explain the intended results

of their research, the Government shall have sole discretion to determine whether the proposed research shall be considered fundamental and to select the award instrument type. Appropriate language will be included in resultant awards for non-fundamental research to prescribe publication requirements and other restrictions, as appropriate. This language can be found at http://www.darpa.mil/work-with-us/additional-baa.
For certain research projects, it may be possible that although the research to be performed by a potential awardee is non-fundamental research, its proposed subawardee's effort may be fundamental research. It is also possible that the research performed by a potential awardee is fundamental research while its proposed subawardee's effort may be non-fundamental research. In all cases, it is the potential awardee's responsibility to explain in its proposal which proposed efforts are fundamental research and why the proposed efforts should be considered fundamental research.

III. Eligibility Information

A. Eligible Applicants

All responsible sources capable of satisfying the Government's needs may submit a proposal that shall be considered by DARPA.

1. Federally Funded Research and Development Centers (FFRDCs) and Government Entities

a) FFRDCs

FFRDCs are subject to applicable direct competition limitations and cannot propose to this solicitation in any capacity unless they meet the following conditions. (1) FFRDCs must clearly demonstrate that the proposed work is not otherwise available from the private sector. (2) FFRDCs must provide a letter, on official letterhead from their sponsoring organization, that (a) cites the specific authority establishing their eligibility to propose to Government solicitations and compete with industry, and (b) certifies the FFRDC's compliance with the associated FFRDC sponsor agreement's terms and conditions. These conditions are a requirement for FFRDCs proposing to be awardees or subawardees.

b) Government Entities

Government Entities (e.g., Government/National laboratories, military educational institutions, etc.) are subject to applicable direct competition limitations. Government Entities must clearly demonstrate that the work is not otherwise available from the private sector and provide written documentation citing the specific statutory authority and contractual authority, if relevant, establishing their ability to propose to Government solicitations and compete with industry. This information is required for Government Entities proposing to be awardees or subawardees.

c) Authority and Eligibility

At the present time, DARPA does not consider 15 U.S.C. § 3710a to be sufficient legal authority to show eligibility. While 10 U.S.C.§ 2539b may be the appropriate statutory starting point for some entities, specific supporting regulatory guidance, together with evidence of agency approval, will still be required to fully establish eligibility. DARPA will consider FFRDC and Government Entity eligibility submissions on a case-by-case basis; however, the burden to prove eligibility for all team members rests solely with the proposer.

2. Other Applicants

Non-U.S. organizations and/or individuals may participate to the extent that such participants comply with any necessary nondisclosure agreements, security regulations, export control laws, and other governing statutes applicable under the circumstances.

B. Organizational Conflicts of Interest

FAR 9.5 Requirements

In accordance with FAR 9.5, proposers are required to identify and disclose all facts relevant to potential OCIs involving the proposer's organization and *any* proposed team member (subawardee, consultant). Under this Section, the proposer is responsible for providing this disclosure with each proposal submitted to the solicitation. The disclosure must include the proposer's, and as applicable, proposed team member's OCI mitigation plan. The OCI mitigation plan must include a description of the actions the proposer has taken, or intends to take, to prevent the existence of conflicting roles that might bias the proposer's judgment and to prevent the proposer from having unfair competitive advantage. The OCI mitigation plan will specifically discuss the disclosed OCI in the context of each of the OCI limitations outlined in FAR 9.505-1 through FAR 9.505-4.

Agency Supplemental OCI Policy

In addition, DARPA has a supplemental OCI policy that prohibits contractors/performers from concurrently providing Scientific Engineering Technical Assistance (SETA), Advisory and Assistance Services (A&AS) or similar support services and being a technical performer. Therefore, as part of the FAR 9.5 disclosure requirement above, a proposer must affirm whether the proposer or *any* proposed team member (subawardee, consultant) is providing SETA, A&AS, or similar support to any DARPA office(s) under: (a) a current award or subaward; or (b) a past award or subaward that ended within one calendar year prior to the proposal's submission date. If SETA, A&AS, or similar support is being or was provided to any DARPA office(s), the proposal must include:

- The name of the DARPA office receiving the support;
- The prime contract number;
- Identification of proposed team member (subawardee, consultant) providing the support; and
- An OCI mitigation plan in accordance with FAR 9.5.

Government Procedures

In accordance with FAR 9.503, 9.504 and 9.506, the Government will evaluate OCI mitigation plans to avoid, neutralize or mitigate potential OCI issues before award and to determine whether it is in the Government's interest to grant a waiver. The Government will only evaluate OCI mitigation plans for proposals that are determined selectable under the solicitation evaluation criteria and funding availability.

The Government may require proposers to provide additional information to assist the Government in evaluating the proposer's OCI mitigation plan.
If the Government determines that a proposer failed to fully disclose an OCI; or failed to provide the affirmation of DARPA support as described above; or failed to reasonably provide additional information requested by the Government to assist in evaluating the proposer's OCI mitigation plan, the Government may reject the proposal and withdraw it from consideration for award.

C. Cost Sharing/Matching

Cost sharing is not required; however, it will be carefully considered where there is an applicable statutory condition relating to the selected funding instrument. Cost sharing is encouraged where there is a reasonable probability of a potential commercial application related to the proposed research and development effort.

For more information on potential cost sharing requirements for Other Transactions for Prototype, see http://www.darpa.mil/work-with-us/contract-management and https://acquisitioninnovation.darpa.mil.

D. Associate Contractor Agreement Clause

This same or similar clause will be included in all TA1 and TA3 awards against HR001121S0017:

a) It is recognized that success of the WARDEN research effort depends in part upon the open exchange of information between the various Associate Contractors involved in the effort. This clause is intended to ensure that there will be appropriate coordination and integration of work by the Associate Contractors to achieve complete compatibility. By executing this contract, the Contractor assumes the responsibilities of an Associate Contractor. For the purpose of this clause, the term Contractor includes subsidiaries, affiliates, and organizations under the control of the contractor (e.g., subcontractors).
b) Work under this contract may involve access to proprietary or confidential data from an Associate Contractor. To the extent that such data is received by the Contractor from any Associate Contractor for the performance of this contract, the Contractor hereby agrees that any proprietary information received shall remain the property of the Associate Contractor and shall be used solely for the purpose of the WARDEN research effort. Only that information which is received from another contractor in writing and which is clearly identified as proprietary or confidential shall be protected in accordance with this provision. The obligation to retain such information in confidence will be satisfied if the Contractor receiving such information utilizes the same controls as it employs to avoid disclosure, publication, or dissemination of its own proprietary information. The receiving Contractor agrees to hold such information in confidence as provided herein so long as such information is of a proprietary/confidential or limited rights nature.
c) The Contractor hereby agrees to closely cooperate as an Associate Contractor with the other Associate Contractors on this research effort. This involves as a minimum:
    a. Maintenance of a close liaison and working relationship;
    b. Maintenance of a free and open information network with all Government identified Associate Contractors;

c. Delineation of detailed interface responsibilities;
d. Entering into a written agreement with the other Associate Contractors setting forth the substance and procedures relating to the foregoing, and promptly providing the Agreements Officer/Procuring Contracting Officer with a copy of same; and,
e. Receipt of proprietary information from the Associate Contractor and transmittal of Contractor proprietary information to the Associate Contractors subject to any applicable proprietary information exchange agreements between associate contractors when, in either case, those actions are necessary for the performance of either.

d) In the event that the Contractor and the Associate Contractor are unable to agree upon any such interface matter of substance, the technical data identified is not provided as scheduled, the Contractor shall promptly notify the DARPA WARDEN Program Manager. The Government will determine the appropriate corrective action and will issue guidance to the affected Contractor.
e) The Contractor agrees to insert in all subcontracts hereunder which require access to proprietary information belonging to the Associate Contractor, a provision which shall conform substantially to the language of this clause, including this paragraph (e).
f) Associate Contractors for this WARDEN research effort include:

Performer	**ACA With**
Each TA1 performer	Each TA3 performer
Each TA3 performer	Each TA1 performer

Note: It is intended that ACAs be established between TA1 and TA3 performers prior to contract award.

E. Other Eligibility Criteria

1. Collaborative Efforts

Collaborative efforts/teaming are strongly encouraged. After proposal selections, the Government reserves the right to seek contractual arrangements, such as Associate Contractor Agreements (ACAs), between separate performers if doing so benefits the overall program/project goals and objectives and mutual interests of the parties.

2. Classified Efforts

Proposals to TA1 and TA3 of WARDEN are expected to be classified at a minimum of COLLATERAL SECRET. Therefore, performers will require collateral SECRET clearances and secure communications in order to support classified development. Please reference BAA Attachment 3 “Security Classification Guide and Classified Addendum Request Form” for additional information. Proposers that meet the personnel security requirements and the facility clearance status/level (DCSA Certified & Accredited Facility), along with possessing a background in high-power vacuum amplifiers (TA1) or electromagnetic effects on electronics and

waveform techniques (TA3), may request the SCG and Classified BAA Addendum. If you do not meet the security requirements, it is suggested you look into teaming with other proposers who meet the requirements.

Prior to submitting a classified proposal, proposers must notify security by April 9, 2021 at 5:00 PM (ET). An email to HR001121S0017@darpa.mil is sufficient. Please include details on the package enclosures and tracking number, as applicable. If a courier is planned, email coordination will be required due to COVID-19 procedures and restricted access to the building.

Proposers must also be able to handle Controlled Unclassified Information. All award instruments will include a CUI clause or article. See BAA Part II. Section IV.B.4. "Disclosure of Information and Compliance with Safeguarding Covered Defense Information Controls."

IV. Application and Submission Information

PROPOSERS ARE CAUTIONED THAT EVALUATION RATINGS MAY BE LOWERED AND/OR PROPOSALS REJECTED IF PROPOSAL PREPARATION (PROPOSAL FORMAT, CONTENT, ETC.) AND/OR SUBMITTAL INSTRUCTIONS ARE NOT FOLLOWED.

A. Address to Request Application Package

This announcement, any attachments, and any references to external websites herein constitute the total solicitation. If proposers cannot access the referenced material posted in the announcement found at www.darpa.mil, contact the administrative contact listed herein.

B. Content and Form of Application Submission

All submissions must be written in English with type not smaller than 12 point font. Smaller font may be used for figures, tables, and charts. Copies of all documents submitted must be clearly labeled with the DARPA BAA number, proposer organization, and proposal title/proposal short title.

1. Full Proposal Format

All full proposals must be in the format given below. Proposals shall consist of two volumes: Volume I – Technical and Management Proposal (3 sections), and Volume II – Cost Proposal (4 sections). The submission of other supporting materials along with the proposals is strongly discouraged and will not be considered for review. Section II of Volume I, Technical and Management Proposal, shall not exceed 20 pages. The page limitation for full proposals includes all figures, tables, and charts. Proposals with both classified and unclassified pages in their Technical and Management Proposal shall not exceed the page limitation, 20 pages, when combined. There is no page limit for Volume II, Cost Proposal.

Proposers should not propose to more than one Technical Area in a single proposal. Proposers who wish to submit to more than one TA must submit a separate full proposal for each. Tasks that would be duplicated in the effort if both TAs were awarded must be called out explicitly.

A summary slide of the proposed effort, in PowerPoint format, should be submitted with the proposal. A template slide is provided as Attachment 2 to the BAA. Submit this PowerPoint file in addition to Volumes I and II of your full proposal. This summary slide does not count towards the total page count.

a. Volume I, Technical and Management Proposal

Section I. Administrative

A. Cover sheet to include:

(1) BAA number (HR001121S0017);
(2) Technical area;
(3) Lead Organization submitting proposal;
(4) Type of organization, selected among the following categories:
Large Organization, Small Disadvantaged Organization, Other Small Organization, HBCU, MI, Other Educational, Other Nonprofit;
(5) Proposer's internal reference number (if any);
(6) Other team members (if applicable) and type of organization for each;
(7) Proposal title;
(8) Technical point of contact to include:
Salutation, last name, first name, street address, city, state, zip code (+4), telephone, fax (if available), electronic mail;
(9) Administrative point of contact to include:
Salutation, last name, first name, street address, city, state, zip code (+4), telephone, fax (if available), electronic mail;
(10) Total funds requested from DARPA, and the amount of cost share (if any); AND
(11) Date proposal was submitted.

B. Official transmittal letter.

The transmittal letter should identify the BAA number, the proposal by name, and the proposal reference number (if any), and should be signed by an individual who is authorized to submit proposals to the Government.

Section II. Detailed Proposal Information

A. Executive Summary

Summarize the technical approach, anticipated performance, and expected outcomes of the proposed effort. The executive summary should be concise and to the point. Tables, graphs, and diagrams can be used as supplemental material along with narrative to convey the information.

B. Technical Approach

This section is the centerpiece of the proposal and should succinctly summarize the innovative claims for the proposed research and clearly describe the proposed approach without using any jargon. All proposers should use the information contained within Section I., "Funding

Opportunity Description," as a reference for their proposal. This section should demonstrate that the proposer has a clear understanding of the state-of-the-art and should provide sufficient justification for the feasibility of the proposed approach(es). This section should include a detailed technical rationale, technical approach, and constructive plan for accomplishment of technical goals in support of innovative claims and deliverable creation. Proposers should provide a technical and programmatic strategy that conforms to the entire program schedule and presents an aggressive plan to fully address all program goals, metrics, milestones, and deliverables, including, as appropriate, specific TA1 or TA3 metrics as detailed in the classified addendum to this BAA and specific TA2 metrics at detailed in Table 1. The task structure must be consistent across the proposed schedule, Statement of Work, and Cost Volume.

TA1 proposers should provide substantive arguments, supported by simulations, experimental data, or referenced work, explaining why the proposed approach is expected to meet performance goals. Proposals must describe in detail the amplifier design approach to achieving the performance metrics specified in the classified addendum as well as the simulation tools, strategy, and analysis approach(es) that will be used to verify the design in Phase 1. Proposals must also address fabrication issues and the overall design of experiment and facilities required to demonstrate the amplifier performance in Phases 2 and 3, including, but not limited to, high voltage power supply/modulator(s), RF input drive sub-systems, and specialized diagnostics. The WARDEN program has no specification limiting the size, weight, and volume of the amplifier and its supporting systems, however the evaluation criteria will include the ability to transition developed technology to government applications.

TA2 proposers should provide arguments, preferably quantitative, explaining why the proposed approach is expected to meet performance goals. Proposals must describe in detail the theoretical and computational approach(es) to achieving the time-domain simulation capabilities described in Section I.C including, but not limited to, strategies to combine multiple modeling approaches, as appropriate. Proposals must also describe experimental capabilities, facilities, and diagnostic techniques that will be used to characterize EM interaction with complex volumes as well as verification and validation strategies required to demonstrate the metrics of Table 1.

TA3 proposers should provide arguments, preferably quantitative, explaining why the proposed approach is expected to meet performance goals. Proposals must describe in detail the theoretical and computational approach(es) to creating the predictive EM effects tools described in Section I.C, including, but not limited to, strategies to combine multiple modeling approaches, as appropriate. Proposals must also describe experimental capabilities, facilities, and diagnostic techniques that will be used to characterize EM interaction with electronic components and sub-systems as well as verification and validation strategies required to demonstrate the metrics specified in the classified addendum.

C. Statement of Work (SOW)

In plain English, clearly define the technical tasks/subtasks to be performed, their durations, and dependencies among them. The page length for the SOW will be dependent on the amount

of the effort. The SOW must not include proprietary information. For each task/subtask, provide:

1. A general description of the objective (for each defined task/activity);
2. A detailed description of the approach to be taken to accomplish each defined task/activity;
3. Identification of the primary organization responsible for task execution (prime, sub, team member, by name, etc.);
4. The completion criteria for each task/activity - a product, event or milestone that defines its completion.
5. Define all deliverables (reporting, data, reports, software, etc.) to be provided to the Government in support of the proposed research tasks/activities; AND
6. Clearly identify any tasks/subtasks (prime or subcontracted) that will be accomplished on-campus at a university, if applicable...

*Note: Each phase of the program must be separately defined in the SOW. Include a SOW for each subcontractor and/or consultant in the **Cost Proposal Volume**. Do not include any proprietary information in the SOW(s).*

D. Schedules and measurable milestones

Schedules and measurable milestones for the proposed research. (Note: Measurable milestones should capture key development points in tasks and should be clearly articulated and defined in time relative to start of effort.) Where the effort consists of multiple portions which could reasonably be partitioned for purposes of funding, these should be identified as options. Additionally, proposals should clearly explain the technical approach(es) that will be employed to meet or exceed each program metric and provide ample justification as to why the approach(es) is/are feasible. The milestones must not include proprietary information.

E. Results and Technology Transfer

Description of the results, products, transferable technology, and expected technology transfer. This should also address mitigation of life-cycle and sustainment risks associated with transitioning intellectual property for U.S. military applications, if applicable. See also Section IV.B.10., "Intellectual Property." If there are no proprietary claims, this should be stated.

F. Risk Analysis and Mitigation Plan

Identify the major technical and programmatic risks in the program. Include a risk matrix. For each risk, assign a probability of occurrence on a scale of 1-10, where 10 indicates a high likelihood that the risk will impact program success, as well as an assessment of impact, also on a scale of 1-10, where 10 indicates that this risk would maximally limit the program from delivering prototypes on schedule or meeting performance objectives. For each item with total risk (likelihood × impact) exceeding 40, include a plan for mitigating the risk and assessing risk reduction.

G. Ongoing Research

Comparison with other ongoing research indicating advantages and disadvantages of the proposed effort.

H. Proposer Accomplishments

Discussion of proposer's previous accomplishments and work in closely related research areas.

I. National Security Impact Statement

To reduce the potential for unintended foreign access to critical U.S. national security technologies developed under this effort, proposals shall describe:

- How the proposed work contributes to U.S. national security and U.S. technological capabilities. The proposer may also summarize previous work that contributed to U.S. national security and U.S. technological capabilities.
- Plans and capabilities to transition technologies developed under this effort to U.S. national security applications and/or to U.S. industry. The proposer may also discuss previous technology transitions to the benefit of U.S. interests.
- Any plans to transition technologies developed under this effort to foreign governments or to companies that are foreign owned, controlled or influenced. The proposer may also discuss previous technology transition to these groups.
- How the proposer will assist its employees and agents performing work under this effort to be eligible to participate in the U.S. national security environment.

J. Facilities and Equipment

Description of the facilities and equipment that would be used for the proposed effort and how they will support meeting program metrics.

K. Teaming

Describe the formal teaming arrangements which will be used to execute this effort. Describe the programmatic relationship between investigators and the rationale for choosing this teaming strategy. Present a coherent organization chart and integrated management strategy for the program team. For each person, indicate: (1) name, (2) affiliation, (3) abbreviated listing of all technical area tasks they will work on with roles, responsibilities, and percent time indicated, (4) discussion of the proposers' previous accomplishments, relevant expertise and/or unique capabilities.

L. Security Management

Describe security management architecture and/or approach for the proposed effort. Detail unique additional security requirements information system certification expertise for controlled unclassified information (CUI) or classified processing, OPSEC, program protection planning, test planning, transportation plans, work being performed at different classification levels, and/or utilizing test equipment not approved at appropriate classification level (may not be applicable for fundamental research).

Section III. Additional Information

Information in this section may include a brief bibliography of relevant technical papers and research notes (published and unpublished) which document the technical ideas upon which the

proposal is based. Copies of not more than three (3) relevant prior papers may be included in the submission.

b. Volume II, Cost Proposal – {No Page Limit}

All proposers, including FFRDCs, must submit the following:

Section I. Administrative

Cover sheet to include:

(1) BAA number (HR001121S0017);
(2) Technical area;
(3) Lead Organization submitting proposal;
(4) Type of organization, selected among the following categories:
Large Organization, Small Disadvantaged Organization, Other Small Organization, HBCU, MI, Other Educational, Other Nonprofit;
(5) Proposer's internal reference number (if any);
(6) Other team members (if applicable) and type of organization for each;
(7) Proposal title;
(8) Technical point of contact to include:
Salutation, last name, first name, street address, city, state, zip code (+4), telephone, fax (if available), electronic mail (if available);
(9) Administrative point of contact to include:
Salutation, last name, first name, street address, city, state, zip code (+4), telephone, fax (if available), and electronic mail (if available);
(10) Award instrument requested:
Cost-Plus-Fixed Fee (CPFF), Cost-contract—no fee, cost sharing contract—no fee, or other type of procurement contract (*specify*), Grant, Cooperative Agreement, or Other Transaction;
(11) Place(s) and period(s) of performance;
(12) Total proposed cost separated by basic award and option(s), if any, by calendar year and by government fiscal year;
(13) Name, address, and telephone number of the proposer's cognizant Defense Contract Management Agency (DCMA) administration office (*if known)*;
(14) Name, address, and telephone number of the proposer's cognizant Defense Contract Audit Agency (DCAA) audit office (*if known*);
(15) Date proposal was prepared;
(16) DUNS number;
(17) TIN number;
(18) CAGE Code;
(19) Subcontractor Information;
(20) Proposal validity period (120 days is recommended); AND
(21) Any Forward Pricing Rate Agreement, other such approved rate information, or such documentation that may assist in expediting negotiations (if available).

Attachment 1, the Cost Volume Proposer Checklist, must be included with the coversheet of the Cost Proposal.

Section II. Detailed Cost Information (Prime and Subcontractors)

The proposers, to include eligible FFRDCs, cost volume shall provide cost and pricing information (See Note 1), or other than cost or pricing information if the total price is under the referenced threshold, in sufficient detail to substantiate the program price proposed (e.g., realism and reasonableness). In doing so, the proposer shall provide, for **both the prime and each subcontractor**, a "Summary Cost Breakdown" by phase and performer fiscal year, and a "Detailed Cost Breakdown" by phase, technical task/sub-task, and month. The breakdown/s shall include, at a minimum, the following major cost items along with associated backup documentation:

Total program cost broken down by major cost items:

A. Direct Labor
A breakout clearly identifying the individual labor categories with associated labor hours and direct labor rates, as well as a detailed Basis-of-Estimate (BOE) narrative description of the methods used to estimate labor costs;

B. Indirect Costs
Including Fringe Benefits, Overhead, General and Administrative Expense, Cost of Money, Fee, etc. (must show base amount and rate);

C. Travel
Provide the purpose of the trip, number of trips, number of days per trip, departure and arrival destinations, number of people, etc.;

D. Other Direct Costs
Itemized with costs; back-up documentation is to be submitted to support proposed costs;

E. Material/Equipment
(i) An itemization of any information technology (IT) purchase, as defined by FAR 2.101 – Documentation supporting the reasonableness of the proposed equipment costs (vendor quotes, past purchase orders/purchase history, detailed engineering estimates, etc.) shall be provided, including a letter stating why the proposer cannot provide the requested resources from its own funding for prime and all sub-awardees.
(ii) A priced Bill-of-Material (BOM) clearly identifying, for each item proposed, the quantity, unit price, the source of the unit price (i.e., vendor quote, engineering estimate, etc.), the type of property (i.e., material, equipment, special test equipment, information technology, etc.), and a cross-reference to the Statement of Work (SOW) task/s that require the item/s. At time of proposal submission, any item that exceeds $2,000 must be supported with basis-of-estimate (BOE) documentation such as a copy of catalog price lists, vendor quotes or a written engineering estimate (additional documentation may be required during negotiations, if selected).

(iii) If seeking a procurement contract and items of Contractor Acquired Property are proposed, exclusive of material, the proposer shall clearly demonstrate that the inclusion of such items as Government Property is in keeping with the requirements of FAR Part 45.102. In accordance with FAR 35.014, "Government property and title," it is the Government's intent that title to all equipment purchased with funds available for research under any resulting contract will vest in the acquiring nonprofit institution (e.g., Nonprofit Institutions of Higher Education and Nonprofit Organizations whose primary purpose is the conduct of scientific research) upon acquisition without further obligation to the Government. Any such equipment shall be used for the conduct of basic and applied scientific research. The above transfer of title to all equipment purchased with funds available for research under any resulting contract is not allowable when the acquiring entity is a for-profit organization; however, such organizations can, in accordance with FAR 52.245-1(j), be given priority to acquire such property at its full acquisition cost.

F. Consultants

If consultants are to be used, proposer must provide a copy of the consultant's proposed SOW as well as a signed consultant agreement or other document which verifies the proposed loaded daily / hourly rate and any other proposed consultant costs (e.g. travel).

G. Subcontracts

Itemization of all subcontracts. Additionally, the prime contractor is responsible for compiling and providing, as part of its proposal submission to the Government, subcontractor proposals prepared at the same level of detail as that required by the prime. Subcontractor proposals include Interdivisional Work Transfer Agreements (ITWA) or similar arrangements. If seeking a procurement contract, the prime contractor shall provide a cost reasonableness analysis of all proposed subcontractor costs/prices. Such analysis shall indicate the extent to which the prime contractor has negotiated subcontract costs/prices and whether any such subcontracts are to be placed on a sole-source basis.

All proprietary subcontractor proposal documentation, prepared at the same level of detail as that required of the prime, which cannot be uploaded to the DARPA BAA website (https://baa.darpa.mil, BAAT) or Grants.gov as part of the proposer's submission, shall be made immediately available to the Government, upon request, under separate cover (i.e., mail, electronic/email, etc.), either by the proposer or by the subcontractor organization. This does not relieve the proposer from the requirement to include, as part of their submission (via BAAT or Grants.gov, as applicable), subcontract proposals that do not include proprietary pricing information (rates, factors, etc.).

A Rough Order of Magnitude (ROM), or similar budgetary estimate, is not considered a fully qualified subcontract cost proposal submission. Inclusion of a ROM, or similar budgetary estimate, may result in the full proposal being deemed non-conforming or evaluation ratings may be lowered.

H. Cost-Sharing

The amount of any industry cost-sharing (the source and nature of any proposed cost-sharing should be discussed in the narrative portion of the cost volume).

I. Fundamental Research

Written justification required per Section II.B., "Fundamental Research," pertaining to prime and/or subcontracted effort being considered Contracted Fundamental Research. Proposers should see also Attachment 4: "WARDEN Controlled Unclassified Information (CUI) Guide."

Note 1:

(a) "Cost or Pricing Data" as defined in FAR 15.403-4 shall be required if the proposer is seeking a procurement contract per the referenced threshold, unless the proposer requests and is granted an exception from the requirement to submit cost or pricing data. Per DoD Class Deviation 2018-O0012, dated 13 April 2018, the threshold for obtaining certified cost and pricing data is $2,000,000. Per DFARS 215.408(5), DFARS 252.215-7009, Proposal Adequacy Checklist, applies to all proposers/proposals seeking a FAR-based award (contract).

(b) In accordance with DFARS 215.403-1(4)(D), DoD has waived cost or pricing data requirements for nonprofit organizations (including educational institutions) on cost-reimbursement-no-fee contracts. In such instances where the waiver stipulated at DFARs 215.403-1(4)(D) applies, proposers shall submit information other than cost or pricing data to the extent necessary for the Government to determine price reasonableness and cost realism; and cost or pricing data from subcontractors that are not nonprofit organizations when the subcontractor's proposal exceeds the cost and pricing data threshold at FAR 15.403-4(a)(1).

(c) Per Section 873 of the FY2016 National Defense Authorization Act (Pub L. 114-92), "Pilot Program For Streamlining Awards For Innovative Technology Projects," small businesses and nontraditional defense contractors (as defined therein) are alleviated from submission of certified cost and pricing data for new contract awards valued at less than $7,500,000. In such instances where this "waiver" applies, proposers seeking a FAR-based contract shall submit information other than certified cost or pricing data to the extent necessary for the Government to determine price reasonableness and cost realism; and certified cost or pricing data from subcontractors that are not small businesses or nontraditional defense contractors when such subcontract proposals exceed the cost and pricing data threshold at FAR 15.403-4(a)(1).

Note 2:

Proposers requesting an Other Transaction who meet the definition of "nontraditional defense contractor," as defined at 10 U.S. Code § 2302(9), should submit information similar to "data other than certified cost or pricing data," as defined at FAR 2.101, to the maximum extent possible to allow for the Government to evaluate cost realism. Proposers (to include subcontractors) who do not meet the definition of a nontraditional defense contractor (who are, therefore, considered a traditional defense contractor) shall submit "data other than certified cost or pricing data." It is incumbent on a proposer requesting an Other Transaction to provide an adequate amount of cost information needed in order for the Government to be able to evaluate cost realism. Failure to provide an adequate amount of cost information will result in the proposal being deemed non-conforming.

Note 3:
Proposers are required to provide the aforementioned cost breakdown as an editable MS Excel spreadsheet, inclusive of calculations formulae, with tabs (material, travel, ODC's) provided as necessary. The Government also requests and recommends that the Cost Proposal include MS Excel file(s) that provide traceability between the Bases of Estimate (BOEs) and the proposed costs across all elements and phases. This includes the calculations and adjustments that are utilized to generate the Summary Costs from the source labor hours, labor costs, material costs, etc. input data. It is requested that the costs and Subcontractor proposals be readily traceable to the Prime Cost Proposal in the provided MS Excel file(s) – although this is not a requirement, providing information in this manner will assist the Government in understanding what is being proposed both technically and in terms of cost realism. NOTE: If the PDF submission differs from the Excel submission, the PDF will take precedence.

Note 4:
The Government strongly encourages that proposers use the provided MS Excel™ DARPA Standard Cost Proposal Spreadsheet in the development of their cost proposals. A customized cost proposal spreadsheet may be an attachment to this solicitation. If not, the spreadsheet can be found on the DARPA website at http://www.darpa.mil/work-with-us/contract-management (under "Resources" on the right-hand side of the webpage). All tabs and tables in the cost proposal spreadsheet should be developed in an editable format with calculation formulas intact to allow traceability of the cost proposal. This cost proposal spreadsheet should be used by the prime organization and all subcontractors. In addition to using the cost proposal spreadsheet, the cost proposal still must include all other items required in this announcement that are not covered by the editable spreadsheet. Subcontractor cost proposal spreadsheets may be submitted directly to the Government by the proposed subcontractor via e-mail to the address in Part I of this solicitation. **Using the provided cost proposal spreadsheet will assist the Government in a rapid analysis of your proposed costs and, if your proposal is selected for a potential award, speed up the negotiation and award execution process**.

Any questions pertaining to use of the DARPA Standard Cost Proposal Spreadsheet, to include permitted changes and prohibited changes thereto, should be directed to costproposal@darpa.mil. Please read the instructions provided within the DARPA Standard Cost Proposal Spreadsheet, "General" tab, to include the General Spreadsheet Instruction document embedded therein. It is very important that proposers not make changes to the format of the spreadsheet where specifically instructed not to do so.

Section III. Other Transaction Request, if applicable

All proposers requesting an Other Transaction (OT) must include a detailed list of payment milestones (Milestone Plan). Each milestone must include the following:

- Milestone description
- Completion/Exit criteria (to include identifying all associated data deliverables excluding those specifically providing project status)
- Due date
- Payment/funding schedule (to include, if cost share is proposed, awardee and Government share amounts)

- For each data deliverable, identify the proposed Government data rights (keeping in mind how each data deliverable will need to be used by the Government given the goals and objectives of the proposed project)

It is noted that, at a minimum, milestones should relate directly to accomplishment of program technical metrics as defined in the BAA and/or the proposer's proposal. Agreement type, expenditure or fixed-price based, will be subject to negotiation by the Agreements Officer. Do not include proprietary data.

Section IV. Other Cost Information

Where the effort consists of multiple portions which could reasonably be partitioned for purposes of funding, these should be identified as options with separate cost estimates.

The cost proposal should include identification of pricing assumptions of which may require incorporation into the resulting award instrument (i.e., use of Government Furnished Property/Facilities/Information, access to Government Subject Matter Experts, etc.).

The proposer should include supporting cost and pricing information in sufficient detail to substantiate the summary cost estimates and should include a description of the method used to estimate costs and supporting documentation.

Cost proposals submitted by FFRDC's (prime or subcontractor) will be forwarded, if selected for negotiation, to their sponsoring organization contracting officer for review to confirm that all required forward pricing rates and factors have been used.

2. Proprietary Information

Proposers are responsible for clearly identifying proprietary information. Submissions containing proprietary information must have the cover page and each page containing such information clearly marked with a label such as "Proprietary" or "Company Proprietary." Note, "Confidential" is a classification marking used to control the dissemination of U.S. Government National Security Information as dictated in Executive Order 13526 and should not be used to identify proprietary business information.

3. Security Information

a. Program Security Information

Proposers should include with their proposal any proposed solution(s) to program security requirements unique to this program. Common program security requirements include but are not limited to: operational security (OPSEC) contracting/sub-contracting plans; foreign participation or materials utilization plans; program protection plans (which may entail the following) manufacturing and integration plans; range utilization and support plans (air, sea, land, space, and cyber); data dissemination plans; asset transportation plans; classified test activity plans; disaster

recovery plans; classified material/asset disposition plans and public affairs/communications plans.

b. Controlled Unclassified Information (CUI)

For Unclassified proposals containing controlled unclassified information (CUI), applicants will ensure personnel and information systems processing CUI security requirements are in place.

i. CUI Proposal Markings

If an unclassified submission contains CUI or the suspicion of such, as defined by Executive Order 13556 and 32 CFR Part 2002, the information must be appropriately and conspicuously marked CUI in accordance with DoDI 5200.48. Identification of what is CUI about this DARPA program will be detailed in a DARPA CUI Guide and will be provided as an attachment to the BAA or may be provided at a later date.

ii. CUI Submission Requirements

Unclassified submissions containing CUI may be submitted via DARPA's BAA Website (https://baa.darpa.mil) in accordance with Section IV.C.2. of this BAA.

Proposers submitting proposals involving the pursuit and protection of DARPA information designated as CUI must have, or be able to acquire prior to contract award, an information system authorized to process CUI information IAW NIST SP 800-171 and DoDI 8582.01.

c. Unclassified Submissions

DARPA anticipates that submissions received under TA2 of this BAA will be unclassified. However, should a proposer wish to submit classified information, an *unclassified* email must be sent to the BAA mailbox notifying the Technical Office PSO of the submission and the below guidance must be followed.

Security classification guidance and direction via a Security Classification Guide (SCG) and/or DD Form 254, "DoD Contract Security Classification Specification," will not be provided at this time. If a determination is made that the award instrument may result in access to classified information, a SCG and/or DD Form 254 will be issued by DARPA and attached as part of the award.

d. Both Classified and Unclassified Submissions

For a proposal that includes both classified and unclassified information, the proposal may be separated into an unclassified portion and a classified portion. The proposal should include as much information as possible in the unclassified portion and use the classified portion ONLY for classified information. The unclassified portion can be submitted through the DARPA BAA Website, per the instructions in Section IV.C.2., below. The classified portion must be provided separately, according to the instructions outlined in the 'Classified Submissions' section below.

e. Classified Submissions

For classified proposals, applicants will ensure all industrial, personnel, and information systems processing security requirements are in place and at the appropriate level (e.g., Facility Clearance Level (FCL), Automated Information Security (AIS), Certification and Accreditation (C&A), and any Foreign Ownership Control and Influence (FOCI) issues are mitigated prior to submission. Additional information on these subjects can be found at http://www.dss.mil.

The efforts being solicited by this BAA in TA1 and TA3 are expected to be classified or otherwise involves access to, or generation of, classified information. Security classification guidance via a Security Classification Guide (SCG) and/or DD Form 254, "DoD Contract Security Classification Specification," is provided as an attachment to the BAA classified addendum.

Classified submissions shall be transmitted in accordance with the following guidance. Additional information on the subjects discussed in this section may be found at http://www.dss.mil/.

If a submission contains Classified National Security Information as defined by Executive Order 13526, the information must be appropriately and conspicuously marked with the proposed classification level and declassification date. Similarly, when the classification of a submission is in question, the submission must be appropriately and conspicuously marked with the proposed classification level and declassification date. Submissions requiring DARPA to make a final classification determination shall be marked as follows:

> "CLASSIFICATION DETERMINATION PENDING. Protect as though classified _____ *(insert the recommended classification level, e.g., Top Secret, Secret or Confidential).*"

NOTE: Classified submissions must indicate the classification level of not only the submitted materials, but also the classification level of the anticipated award.

Submissions containing both classified information and CUI must be appropriately and conspicuously marked with the proposed classification level as well as ensuring CUI is marked in accordance with DoDI 5200.48.

Proposers submitting classified information must have, or be able to obtain prior to contract award, cognizant security agency approved facilities, information systems, and appropriately cleared/eligible personnel to perform at the classification level proposed. All proposer personnel performing Information Assurance (IA)/Cybersecurity related duties on classified Information Systems shall meet the requirements set forth in DoD Manual 8570.01-M (Information Assurance Workforce Improvement Program).

Proposers choosing to submit classified information from other collateral classified sources (i.e., sources other than DARPA) must ensure (1) they have permission from an authorized individual at the cognizant Government agency (e.g., Contracting Officer, Program Manager); (2) the

proposal is marked in accordance with the source Security Classification Guide (SCG) from which the material is derived; and (3) the source SCG is submitted along with the proposal.

When a proposal includes a classified portion, and when able according to security guidelines, we ask that proposers send an e-mail to HR001121S0017@darpa.mil as notification that there is a classified portion to the proposal. When sending the classified portion via mail according to the instructions, proposers should submit six (6) hard copies of the classified portion of their proposal and two (2) CD-ROMs containing the classified portion of the proposal as a single searchable Adobe PDF file. Please ensure that all CDs are well-marked. Each copy of the classified portion must be clearly labeled with HR001121S0017, proposer organization, proposal title (short title recommended), and Copy _ of _.

Confidential and Secret Information
Use transmission, classification, handling, and marking guidance provided by previously issued SCGs, the DoD Information Security Manual (DoDM 5200.01, Volumes 1 - 4), and the National Industrial Security Program Operating Manual, including the Supplement Revision 1, (DoD 5220.22-M and DoD 5200.22-M Sup. 1) when submitting Confidential and/or Secret classified information.

Confidential and Secret classified information may be submitted via ONE of the two following methods:

- Hand-carried by an appropriately cleared and authorized courier to the DARPA CDR. Prior to traveling, the courier shall contact the DARPA Classified Document Registry (CDR) at 703-526-4052 to coordinate arrival and delivery.

  OR

- Mailed via U.S. Postal Service (USPS) Registered Mail or USPS Express Mail. All classified information will be enclosed in opaque inner and outer covers and double-wrapped. The inner envelope shall be sealed and plainly marked with the assigned classification and addresses of both sender and addressee.

  The inner envelope shall be addressed to:

  Defense Advanced Research Projects Agency
  ATTN: Program Security Officer, MTO
  Reference: HR001121S0017
  675 North Randolph Street
  Arlington, VA 22203-2114

  The outer envelope shall be sealed with no identification as to the classification of its contents and addressed to:

Defense Advanced Research Projects Agency
Security & Intelligence Directorate, Attn: CDR
675 North Randolph Street
Arlington, VA 22203-2114

Top Secret Information
Use classification, handling, and marking guidance provided by previously issued SCGs, the DoD Information Security Manual (DoDM 5200.01, Volumes 1 - 4), and the National Industrial Security Program Operating Manual, including the Supplement Revision 1, (DoD 5220.22-M and DoD 5200.22-M Sup. 1). Top Secret information must be hand-carried by an appropriately cleared and authorized courier to the DARPA CDR. Prior to traveling, the courier shall contact the DARPA CDR at 703-526-4052 to coordinate arrival and delivery.

Sensitive Compartmented Information (SCI)
SCI must be marked, managed and transmitted in accordance with DoDM 5105.21 Volumes 1 - 3. Questions regarding the transmission of SCI may be sent to the DARPA Technical Office PSO via the BAA mailbox or by contacting the DARPA Special Security Officer (SSO) at 703-812-1970.

Successful proposers may be sponsored by DARPA for access to SCI. Sponsorship must be aligned to an existing DD Form 254 where SCI has been authorized. Questions regarding SCI sponsorship should be directed to the DARPA Personnel Security Office at 703-526-4543.

Special Access Program (SAP) Information
SAP information must be marked in accordance with DoDM 5205.07 Volume 4 and transmitted by specifically approved methods which will be provided by the Technical Office PSO or their staff.

Proposers choosing to submit SAP information from an agency other than DARPA are required to provide the DARPA Technical Office Program Security Officer (PSO) written permission from the source material's cognizant Special Access Program Control Officer (SAPCO) or designated representative. For clarification regarding this process, contact the DARPA Technical Office PSO via the BAA mailbox or the DARPA SAPCO at 703-526-4102.

Additional SAP security requirements regarding facility accreditations, information security, personnel security, physical security, operations security, test security, classified transportation plans, and program protection planning may be specified in the DD Form 254.

NOTE: prior to drafting the submission, if use of SAP Information Systems is to be proposed, proposers must first obtain an Authorization-to-Operate from the DARPA Technical Office PSO (or other applicable DARPA Authorization Official) using the Risk Management Framework (RMF) process outlined in the Joint Special Access Program (SAP) Implementation Guide (JSIG), Revision 3, dated October 9, 2013 (or successor document).

SAP IT disposition procedures must be approved in accordance with the DoD CIO Memorandum of April 20, 2020[6].

4. Disclosure of Information and Compliance with Safeguarding Covered Defense Information Controls

The following provisions and clause apply to all solicitations and contracts; however, the definition of "controlled technical information" clearly exempts work considered fundamental research and therefore, even though included in the contract, will not apply if the work is fundamental research.
DFARS 252.204-7000, "Disclosure of Information"
DFARS 252.204-7008, "Compliance with Safeguarding Covered Defense Information Controls"
DFARS 252.204-7012, "Safeguarding Covered Defense Information and Cyber Incident Reporting"
The full text of the above solicitation provision and contract clauses can be found at http://www.darpa.mil/work-with-us/additional-baa#NPRPAC.
Compliance with the above requirements includes the mandate for proposers to implement the security requirements specified by National Institute of Standards and Technology (NIST) Special Publication (SP) 800-171, "Protecting Controlled Unclassified Information in Nonfederal Information Systems and Organizations" (see https://doi.org/10.6028/NIST.SP.800-171r1) and DoDI 8582.01 that are in effect at the time the solicitation is issued.
For awards where the work is considered fundamental research, the contractor will not have to implement the aforementioned requirements and safeguards. However, should the nature of the work change during performance of the award, work not considered fundamental research will be subject to these requirements.

5. Human Subjects Research (HSR)/Animal Use

Proposers that anticipate involving human subjects or animals in the proposed research must comply with the approval procedures detailed at http://www.darpa.mil/work-with-us/additional-baa, to include providing the information specified therein as required for proposal submission.

6. Approved Cost Accounting System Documentation

Proposers that do not have a Cost Accounting Standards (CAS) compliant accounting system considered adequate for determining accurate costs that are negotiating a cost- type procurement contract must complete an SF 1408. For more information on CAS compliance, see http://www.dcaa.mil/cas.html. To facilitate this process, proposers should complete the SF 1408 found at http://www.gsa.gov/portal/forms/download/115778 and submit the completed form with the proposal. To complete the form, check the boxes on the second page, then provide a narrative explanation of your accounting system to supplement the checklist on page one. For more information, see (http://www.dcaa.mil/preaward_accounting_system_adequacy_checklist.html).

7. Section 508 of the Rehabilitation Act (29 U.S.C. § 749d)/FAR 39.2

[6] The title of this memorandum is CUI and the memo is classified SECRET//HANDLE VIA SPECIAL ACCESS CHANNELS ONLY. This memorandum may be provided under separate cover.

All electronic and information technology acquired or created through this BAA must satisfy the accessibility requirements of Section 508 of the Rehabilitation Act (29 U.S.C § 794d)/FAR 39.2.

8. Grant Abstract

Per Section 8123 of the Department of Defense Appropriations Act, 2015 (Pub. L. 113-235), all grant awards must be posted on a public website in a searchable format. To comply with this requirement, proposers requesting grant awards must submit a maximum one (1) page abstract that may be publicly posted and explains the program or project to the public. The proposer should sign the bottom of the abstract confirming the information in the abstract is approved for public release. Proposers are advised to provide both a signed PDF copy, as well as an editable (e.g., Microsoft word) copy. Abstracts contained in grant proposals that are not selected for award will not be publicly posted.

9. Small Business Subcontracting Plan

Pursuant to Section 8(d) of the Small Business Act (15 U.S.C. § 637(d)) and FAR 19.702(a)(1), each proposer who is a large business concern and seeking a procurement contract that has subcontracting possibilities is required to submit a subcontracting plan with their proposal. The plan format is outlined in FAR 19.704. As of the date of publication of this BAA, per FAR 19.702, the threshold for submission of a small business subcontracting plan is $750,000 (total contract amount including options).

10. Intellectual Property

All proposers must provide a good faith representation that the proposer either owns or possesses the appropriate licensing rights to all intellectual property that will be utilized under the proposed effort.

a. For Procurement Contracts

Proposers responding to this BAA requesting procurement contracts will need to complete the certifications at DFARS 252.227-7017. See www.darpa.mil/work-with-us/additional-baa for further information. If no restrictions are intended, the proposer should state "none." The table below captures the requested information:

Technical Data Computer Software to be Furnished with Restrictions	Summary of Intended Use in the Conduct of the Research	Basis for Assertion	Asserted Rights Category	Name of Person Asserting Restrictions
(LIST)	(NARRATIVE)	(LIST)	(LIST)	(LIST)

b. For All Non-Procurement Contracts

Proposers responding to this BAA requesting a Grant, Cooperative Agreement, Technology Investment Agreement, or Other Transaction for Prototypes shall follow the applicable rules and regulations governing these various award instruments, but, in all cases, should appropriately identify any potential restrictions on the Government's use of any Intellectual Property contemplated under the award instrument in question. This includes both Noncommercial Items and Commercial Items. Proposers are encouraged use a format similar to that described in Paragraph a. above. If no restrictions are intended, then the proposer should state "NONE."

11. Patents

Include documentation proving your ownership of or possession of appropriate licensing rights to all patented inventions (or inventions for which a patent application has been filed) that will be utilized under your proposal for the DARPA program. If a patent application has been filed for an invention that your proposal utilizes, but the application has not yet been made publicly available and contains proprietary information, you may provide only the patent number, inventor name(s), assignee names (if any), filing date, filing date of any related provisional application, and a summary of the patent title, together with either: (1) a representation that you own the invention, or (2) proof of possession of appropriate licensing rights in the invention.

12. System for Award Management (SAM) and Universal Identifier Requirements

All proposers must be registered in SAM unless exempt per FAR 4.1102. FAR 52.204-7, "System for Award Management" and FAR 52.204-13, "System for Award Management Maintenance" are incorporated into this solicitation. See http://www.darpa.mil/work-with-us/additional-baa for further information.
International entities can register in SAM by following the instructions in this link: https://www.fsd.gov/fsd-gov/answer.do?sysparm_kbid=dbf8053adb119344d71272131f961946&sysparm_search=KB0013221.

13. Funding Restrictions

Not applicable.

C. Submission Information

DARPA will acknowledge receipt of all submissions and assign an identifying control number that should be used in all further correspondence regarding the submission. DARPA intends to use electronic mail correspondence regarding HR001121S0017. Submissions may not be submitted by fax or e-mail; any so sent will be disregarded.

Submissions will not be returned. An electronic copy of each submission received will be retained at DARPA and all other non-required copies destroyed. A certification of destruction may be requested, provided the formal request is received by DARPA within 5 days after notification that a proposal was not selected.

All administrative correspondence and questions on this solicitation, including requests for clarifying information on how to submit an abstract or full proposal to this BAA should be directed to HR001121S0017@darpa.mil. DARPA intends to use electronic mail for correspondence regarding HR001121S0017. Proposals and abstracts may not be submitted by fax or e-mail; any so sent will be disregarded. DARPA encourages use of the Internet for retrieving the BAA and any other related information that may subsequently be provided.

1. Submission Dates and Times

a. Full Proposal Date

Full proposals must be submitted to DARPA/MTO on or before 2:00 PM, Eastern Time, 16 April 2021, in order to be considered during the single round of selections. Proposals received after this deadline will not be reviewed.

Failure to comply with the submission procedures may result in the submission not being evaluated.

b. Frequently Asked Questions (FAQ)

DARPA will post a consolidated Question and Answer (FAQ) document on a regular basis. To access the posting go to: http://www.darpa.mil/work-with-us/opportunities. Under the HR001121S0017 summary will be a link to the FAQ. Submit your question/s by e-mail to HR001121S0017@darpa.mil. In order to receive a response sufficiently in advance of the proposal due date, send your question/s on or before 5:00 PM, Eastern Time, 07 April 2021.

2. Proposal Submission Information

The typical proposal should express a consolidated effort in support of one or more related technical concepts or ideas. Disjointed efforts should not be included into a single proposal. Proposals not meeting the format described in the BAA may not be reviewed.

a. For Proposers Requesting Grants or Cooperative Agreements:

Proposers requesting grants or cooperative agreements must submit proposals through one of the following methods: (1) electronic upload per the instructions at https://www.grants.gov/applicants/apply-for-grants.html (DARPA-preferred); or (2) hard-copy mailed directly to DARPA. If proposers intend to use Grants.gov as their means of submission, then they must submit their entire proposal through Grants.gov; applications cannot be submitted in part to Grants.gov and in part as a hard-copy. Proposers using Grants.gov do not submit hard-copy proposals in addition to the Grants.gov electronic submission.
Submissions: In addition to the volumes and corresponding attachments requested elsewhere in this solicitation, proposers must also submit the three forms listed below.
Form 1: SF 424 Research and Related (R&R) Application for Federal Assistance, available on the Grants.gov website at https://apply07.grants.gov/apply/forms/sample/RR_SF424_2_0-V2.0.pdf. *This form must be completed and submitted.*

To evaluate compliance with Title IX of the Education Amendments of 1972 (20 U.S.C. § 1681 et.seq.), the Department of Defense (DoD) is collecting certain demographic and career information to be able to assess the success rates of women who are proposed for key roles in applications in science, technology, engineering or mathematics disciplines. In addition, the National Defense Authorization Act (NDAA) for FY 2019, Section 1286, directs the Secretary of Defense to protect intellectual property, controlled information, key personnel, and information about critical technologies relevant to national security and limit undue influence, including foreign talent programs by countries that desire to exploit United States' technology within the DoD research, science and technology, and innovation enterprise. This requirement is necessary for all research and research-related educational activities. The DoD is using the two forms below to collect the necessary information to satisfy these requirements. Detailed instructions for each form are available on Grants.gov.

Form 2: Research and Related Senior/Key Person Profile (Expanded), available on the Grants.gov website at https://apply07.grants.gov/apply/forms/sample/RR_KeyPersonExpanded_2_0-V2.0.pdf. *This form must be completed and submitted.*

The Research and Related Senior/Key Person Profile (Expanded) form will be used to collect the following information for all senior/key personnel, including Project Director/Principal Investigator and Co-Project Director/Co-Principal Investigator, whether or not the individuals' efforts under the project are funded by the DoD:

- Degree Type and Degree Year.
- Current and Pending Support, including:
    - A list of all current projects the individual is working on, in addition to any future support the individual has applied to receive, regardless of the source.
    - Title and objectives of the other research projects.
    - The percentage per year to be devoted to the other projects.
    - The total amount of support the individual is receiving in connection to each of the other research projects or will receive if other proposals are awarded.
    - Name and address of the agencies and/or other parties supporting the other research projects
    - Period of performance for the other research projects.

Additional senior/key persons can be added by selecting the "Next Person" button at the bottom of the form. Note that, although applications without this information completed may pass Grants.gov edit checks, if DARPA receives an application without the required information, DARPA may determine that the application is incomplete and may cause your submission to be rejected and eliminated from further review and consideration under the solicitation. DARPA reserves the right to request further details from the applicant before making a final determination on funding the effort.

Form 3: Research and Related Personal Data, available on the Grants.gov website at https://apply07.grants.gov/apply/forms/sample/RR_PersonalData_1_2-V1.2.pdf. *Each applicant must complete the name field of this form, however, provision of the demographic information is voluntary. Regardless of whether the demographic fields are completed or not, this form must be submitted with at least the applicant's name completed.*

Grants.gov requires proposers to complete a one-time registration process before a proposal can be electronically submitted. If proposers have not previously registered, this process can take between three business days and four weeks. For more information about registering for

Grants.gov, see www.darpa.mil/work-with-us/additional-baa. See the Grants.gov registration checklist at http://www.grants.gov/web/grants/register.html for registration requirements and instructions.

Once Grants.gov has received a proposal submission, Grants.gov will send two email messages to advise proposers as to whether or not their proposals have been validated or rejected by the system; IT MAY TAKE UP TO TWO DAYS TO RECEIVE THESE EMAILS. The first email will confirm receipt of the proposal by the Grants.gov system; this email only confirms receipt, not acceptance, of the proposal. The second will indicate that the application has been successfully validated by the system prior to transmission to the grantor agency or has been rejected due to errors. If the proposal is validated, then the proposer has successfully submitted their proposal. If the proposal is rejected, the proposed must be corrected and resubmitted before DARPA can retrieve it. If the solicitation is no longer open, the rejected proposal cannot be resubmitted. Once the proposal is retrieved by DARPA, the proposer will receive a third email from Grants.gov. To avoid missing deadlines, proposers should submit their proposals in advance of the final proposal due date with sufficient time to receive confirmations and correct any errors in the submission process through Grants.gov. For more information on submitting proposals to Grants.gov, visit the Grants.gov submissions page at:
http://www.grants.gov/web/grants/applicants/apply-for-grants.html.

Proposers electing to submit grant or cooperative agreement proposals as hard copies must complete the same forms as indicated above.

b. For Proposers Requesting Technology Investment Agreements

Proposers requesting Technology Investment Agreements (TIA) awarded under 10 U.S.C. 2371 must include the completed form indicated below. This requirement only applies only to those who expect to receive a TIA as their ultimate award instrument.
The National Defense Authorization Act (NDAA) for FY 2019, Section 1286, directs the Secretary of Defense to protect intellectual property, controlled information, key personnel, and information about critical technologies relevant to national security and limit undue influence, including foreign talent programs by countries that desire to exploit United States' technology within the DoD research, science and technology, and innovation enterprise. This requirement is necessary for all research and research-related educational activities. The DoD is using the form below to collect the necessary information to satisfy these requirements.
The Research and Related Senior/Key Person Profile (Expanded) form, available on the Grants.gov website at https://apply07.grants.gov/apply/forms/sample/RR_KeyPersonExpanded_2_0-V2.0.pdf, will be used to collect the following information for all senior/key personnel, including Project Director/Principal Investigator and Co-Project Director/Co-Principal Investigator, whether or not the individuals' efforts under the project are funded by the DoD:

- Degree Type and Degree Year.
- Current and Pending Support, including:
    - A list of all current projects the individual is working on, in addition to any future support the individual has applied to receive, regardless of the source.
    - Title and objectives of the other research projects.

- The percentage per year to be devoted to the other projects.
- The total amount of support the individual is receiving in connection to each of the other research projects or will receive if other proposals are awarded.
- Name and address of the agencies and/or other parties supporting the other research projects
- Period of performance for the other research projects.

Additional senior/key persons can be added by selecting the "Next Person" button at the bottom of the form. Note that, although applications without this information completed may pass Grants.gov edit checks, if DARPA receives an application without the required information, DARPA may determine that the application is incomplete and may cause your submission to be rejected and eliminated from further review and consideration under the solicitation. DARPA reserves the right to request further details from the applicant before making a final determination on funding the effort.

c. For Proposers Requesting Contracts or Other Transaction Agreements

Proposers requesting contracts or other transaction agreements must submit proposals via DARPA's BAA Website (https://baa.darpa.mil). Note: If an account has already been created for the DARPA BAA Website, this account may be reused. If no account currently exists for the DARPA BAA Website, visit the website to complete the two-step registration process. Submitters will need to register for an Extranet account (via the form at the URL listed above) and wait for two separate e-mails containing a username and temporary password. After accessing the Extranet, submitters may then create an account for the DARPA BAA website (via the "Register your Organization" link along the left side of the homepage), view submission instructions, and upload/finalize the proposal. Proposers using the DARPA BAA Website may encounter heavy traffic on the submission deadline date; it is highly advised that submission process be started as early as possible.

All unclassified full proposals submitted electronically through the DARPA BAA website must be uploaded as zip files (.zip or .zipx extension). The final zip file should not exceed 50 MB in size. Only one zip file will be accepted per submission and submissions not uploaded as zip files will be rejected by DARPA.

NOTE: YOU MUST CLICK THE 'FINALIZE FULL PROPOSAL' BUTTON AT THE BOTTOM OF THE CREATE FULL PROPOSAL PAGE. FAILURE TO DO SO WILL RESULT IN YOUR PROPOSAL NOT BEING OFFICIALLY SUBMITTED TO THIS BAA AND THEREFORE NOT BEING REVIEWED.

Classified submissions and proposals requesting assistance instruments (grants or cooperative agreements) should NOT be submitted through DARPA's BAA Website (https://baa.darpa.mil), though proposers will likely still need to visit https://baa.darpa.mil to register their organization (or verify an existing registration) to ensure the BAA office can verify and finalize their submission.

Please note that the DoD-issued certificate associated with the BAA website is not recognized by all commercial certificate authorities, resulting in untrusted connection errors/messages. You can

either bypass the warning (possibly by adding https://baa.darpa.mil to your listed of trusted sites, or darpa.mil as a trusted domain), or visit DISA's site to download the Root Certificate Authority (CA): https://public.cyber.mil/from-iase/.

Technical support for DARPA's BAA Website may be reached at BAAT_Support@darpa.mil, and is typically available during regular business hours (9:00 AM - 5:00 PM EST, Monday - Friday).

d. Classified Submission Information

See Section IV.B.3., "Security Information," for guidance on submitting classified abstracts and proposals.

3. Other Submission Requirements

Not applicable.

V. Application Review Information

A. Evaluation Criteria

Proposals will be evaluated using the following criteria, listed in descending order of importance:

1. Overall Scientific and Technical Merit

The proposed technical approach is innovative, feasible, achievable, and complete.
The proposed technical team has the expertise and experience to accomplish the proposed tasks. Task descriptions and associated technical elements provided are complete and in a logical sequence with all proposed deliverables clearly defined such that a final outcome that achieves the goal can be expected as a result of award. The proposal identifies major technical risks and planned mitigation efforts are clearly defined and feasible.

2. Potential Contribution and Relevance to the DARPA Mission

The potential contributions of the proposed effort are relevant to the national technology base. Specifically, DARPA's mission is to make pivotal early technology investments that create or prevent strategic surprise for U.S. National Security.

The proposer clearly demonstrates its plans and capabilities to contribute to U.S. national security and U.S. technological capabilities. The evaluation will consider the proposer's plans and capabilities to transition proposed technologies to U.S. national security applications and to U.S. industry. The evaluation may consider the proposer's history of transitioning or plans to transition technologies to foreign governments or to companies that are foreign owned, controlled, or influenced. The evaluation will also consider the proposer's plans and capabilities to assist its employees and agents to be eligible to participate in the U.S. national security environment. In addition, the evaluation will take into consideration the extent to which the proposed intellectual property (IP) rights structure will potentially impact the Government's ability to transition the

technology. TA1 and TA3 performers must clearly demonstrate capabilities to support classified work by meeting both personnel security requirements and the facility clearance status/level (DCSA Certified & Accredited Facility) by program kick-off.

3. Cost and Schedule Realism

The proposed costs are realistic for the technical and management approach and accurately reflect the technical goals and objectives of the solicitation. The proposed costs are consistent with the proposer's Statement of Work and reflect a sufficient understanding of the costs and level of effort needed to successfully accomplish the proposed technical approach. The costs for the prime proposer and proposed subawardees are substantiated by the details provided in the proposal (e.g., the type and number of labor hours proposed per task, the types and quantities of materials, equipment and fabrication costs, travel and any other applicable costs and the basis for the estimates).

The proposed schedule aggressively pursues performance metrics in the shortest timeframe and accurately accounts for that timeframe. The proposed schedule identifies and mitigates any potential schedule risk.

It is expected that the effort will leverage all available relevant prior research in order to obtain the maximum benefit from the available funding. For efforts with a likelihood of commercial application, appropriate direct cost sharing may be a positive factor in the evaluation. DARPA recognizes that undue emphasis on cost may motivate proposers to offer low-risk ideas with minimum uncertainty and to staff the effort with junior personnel in order to be in a more competitive posture. DARPA discourages such cost strategies.

B. Review and Selection Process

1. Review Process

It is the policy of DARPA to ensure impartial, equitable, comprehensive proposal evaluations based on the evaluation criteria listed in Section V.A., and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals.

DARPA will conduct a scientific/technical review of each conforming proposal. Conforming proposals comply with all requirements detailed in this solicitation; proposals that fail to do so may be deemed non-conforming and may be removed from consideration. Proposals will not be evaluated against each other since they are not submitted in accordance with a common work statement. DARPA’s intent is to review proposals as soon as possible after they arrive; however, proposals may be reviewed periodically for administrative reasons.

Award(s) will be made to proposers whose proposals are determined to be the most advantageous to the Government, all factors considered, including the potential contributions of the proposed work to the overall research program and the availability of funding for the effort.

It is the policy of DARPA to ensure impartial, equitable, comprehensive proposal evaluations based on the evaluation criteria listed above and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals. Pursuant to FAR 35.016, the primary basis for selecting proposals for acceptance shall be technical, importance to agency programs, and fund availability. In order to provide the desired evaluation, qualified Government personnel will conduct reviews and (if necessary) convene panels of experts in the appropriate areas.

2. Handling of Source Selection Information

DARPA policy is to treat all submissions as source selection information (see FAR 2.101 and 3.104), and to disclose their contents only for the purpose of evaluation. Restrictive notices notwithstanding, during the evaluation process, submissions may be handled by support contractors for administrative purposes and/or to assist with technical evaluation. All DARPA support contractors performing this role are expressly prohibited from performing DARPA-sponsored technical research and are bound by appropriate nondisclosure agreements.

Subject to the restrictions set forth in FAR 37.203(d), input on technical aspects of the proposals may be solicited by DARPA from non-Government consultants/experts who are strictly bound by the appropriate non-disclosure requirements.

3. Federal Awardee Performance and Integrity Information (FAPIIS)

Per 41 U.S.C. 2313, as implemented by FAR 9.103 and 2 CFR § 200.205, prior to making an award above the simplified acquisition threshold, DARPA is required to review and consider any information available through the designated integrity and performance system (currently FAPIIS). Awardees have the opportunity to comment on any information about themselves entered in the database, and DARPA will consider any comments, along with other information in FAPIIS or other systems prior to making an award.

VI. Award Administration Information

A. Selection Notices

1. Proposals

As soon as the evaluation of a proposal is complete, the proposer will be notified that (1) the proposal has been selected for funding pending contract negotiations, in whole or in part, or (2) the proposal has not been selected. These official notifications will be sent via email to the Technical POC identified on the proposal coversheet.

B. Administrative and National Policy Requirements

1. Meeting and Travel Requirements

All key participants are required to attend the program kickoff meeting. Performers should also anticipate regular program-wide PI Meetings and periodic site visits at the Program Manager's discretion (reviews may alternatively be held virtually, depending on the circumstances)

2. Solicitation Provisions and Award Clauses, Terms and Conditions

Solicitation clauses in the FAR and DFARS relevant to procurement contracts and FAR and DFARS clauses that may be included in any resultant procurement contracts are incorporated herein and can be found at www.darpa.mil/work-with-us/additional-baa.

3. Controlled Unclassified Information (CUI) and Controlled Technical Information (CTI) on Non-DoD Information Systems

Further information on Controlled Unclassified Information identification, marking, protecting and control, to include processing on Non-DoD Information Systems, is incorporated herein and can be found at www.darpa.mil/work-with-us/additional-baa.

4. Representations and Certifications

In accordance with FAR 4.1102 and 4.1201, proposers requesting a procurement contract must complete electronic annual representations and certifications at https://www.sam.gov/.
In addition, all proposers are required to submit for all award instrument types (i.e., procurement contract, cooperative agreement, grant, and Other Transaction for Prototype) supplementary DARPA-specific representations and certifications at the time of proposal submission. See http://www.darpa.mil/work-with-us/reps-certs for further information on required representation and certification depending on your requested award instrument.

5. Terms and Conditions

For terms and conditions specific to grants and/or cooperative agreements, see the DoD General Research Terms and Conditions (latest version) at http://www.onr.navy.mil/Contracts-Grants/submit-proposal/grants-proposal/grants-terms-conditions and the supplemental DARPA-specific terms and conditions at http://www.darpa.mil/work-with-us/contract-management#GrantsCooperativeAgreements.

C. Reporting

The number and types of reports will be specified in the award document, but will include as a minimum quarterly technical and monthly financial status reports. The reports shall be prepared and submitted in accordance with the procedures contained in the award document and mutually agreed on before award. Reports and briefing material will also be required as appropriate to document progress in accomplishing program metrics. A Final Report that summarizes the project

and tasks will be required at the conclusion of the performance period for the award, notwithstanding the fact that the research may be continued under a follow-on vehicle.

D. Electronic Systems

1. Wide Area Work Flow (WAWF)

Unless using another means of invoicing, performers will be required to submit invoices for payment directly via to https://wawf.eb.mil. Registration in WAWF will be required prior to any award under this BAA.

2. i-Edison

The award document for each proposal selected for funding will contain a mandatory requirement for invention disclosures (and associated elections, confirmatory instruments, etc.) and patent reports to be submitted electronically through i-Edison (https://public.era.nih.gov/iedison).

3. TFIMS

The award document for each proposal selected for funding will contain a mandatory requirement for technical and status reports to be submitted electronically through DARPA's TFIMS (or similar) web-based tool.

4. DARPA Embedded Entrepreneur Initiative (EEI)

Awardees pursuant to this solicitation may be eligible to participate in the DARPA Embedded Entrepreneur Initiative (EEI) during the award's period of performance. EEI is a limited scope program offered by DARPA, at DARPA's discretion, to a small subset of awardees. The goal of DARPA's EEI is to increase the likelihood that DARPA-funded technologies take root in the U.S. and provide new capabilities for national defense. EEI supports DARPA's mission "to make pivotal investments in breakthrough technologies and capabilities for national security" by accelerating the transition of innovations out of the lab and into new capabilities for the Department of Defense (DoD). EEI investment supports development of a robust and deliberate Go-to-Market strategy for selling technology to government and commercial markets and positions DARPA awardees to attract U.S. investment. The following is for informational and planning purposes only and does not constitute solicitation of proposals to the EEI.

There are three elements to DARPA's EEI: (1) A Senior Commercialization Advisor (SCA) from DARPA who works with the Program Manager (PM) to examine the business case for the awardee's technology and uses commercial methodologies to identify steps toward achieving a successful transition of technology to the government and commercial markets; (2) Connections to potential industry and investor partners via EEI's Transition Working Groups; and (3) Additional funding for awardees to hire an embedded entrepreneur to achieve specific commercialization milestones and work towards the delivery of a robust transition plan for both defense and commercial markets. This embedded entrepreneur's qualifications should include business experience within the target industries of interest, experience in commercializing early

stage technology, and the ability to communicate and interact with technical and non-technical stakeholders. Funding for EEI is typically no more than $250,000 per awardee over the duration of the award. An awardee may apportion EEI funding to hire more than one embedded entrepreneur, if achieving the milestones requires different expertise that can be obtained without exceeding the awardee's total EEI funding. The EEI effort is intended to be conducted concurrent with the research program without extending the period of performance.

EEI Application Process:

After receiving an award under the solicitation, awardees interested in being considered for EEI should notify their DARPA Program Manager (PM) during the period of performance. Timing of such notification should ideally allow sufficient time for DARPA and the awardee to review the awardee's initial transition plan, identify commercial milestones to deliver under EEI, modify the award, and conduct the work required to achieve such milestones within the original award period of performance. These steps may take 18-24 months to complete, depending on the technology. If the DARPA PM determines that EEI could be of benefit to transition the technology to product(s) the Government needs, the PM will refer the performer to DARPA's Commercial Strategy team.

DARPA's Commercial Strategy team will then contact the performer, assess fitness for EEI, and in consultation with the DARPA technical office, determine whether to invite the performer to participate in the EEI. Factors that are considered in determining fitness for EEI include DoD/Government need for the technology; competitive approaches to enable a similar capability or product; risks and impact of the Government's being unable to access the technology from a sustainable source; Government and commercial markets for the technology; cost and affordability; manufacturability and scalability; supply chain requirements and barriers; regulatory requirements and timelines; Intellectual Property and Government Use Rights, and available funding.

Invitation to participate in EEI is at the sole discretion of DARPA and subject to program balance and the availability of funding. EEI participants' awards may be subsequently modified bilaterally to amend the Statement of Work to add negotiated EEI tasks, provide funding, and specify a milestone schedule which will include measurable steps necessary to build, refine, and execute a Go-to-Market strategy aimed at delivering new capabilities for national defense. Milestone examples are available at: https://www.darpa.mil/work-with-us/contract-management

Awardees under this solicitation are eligible to be considered for participation in EEI, but selection for award under this solicitation does not imply or guarantee participation in EEI.

VII. Agency Contacts

Administrative, technical or contractual questions should be sent via e-mail to HR001121S0017@darpa.mil. All requests must include the name, email address, and phone number of a point of contact.

The technical POC for this effort is:

Dr. David Abe
DARPA/MTO
ATTN: HR001121S0017
675 North Randolph Street
Arlington, VA 22203-2114
Email: HR001121S0017@darpa.mil

VIII. Other Information

A. Proposers' Day

The WARDEN Proposers' Day will be held on March 5, 2021 through a virtual platform. Advance registration is required for the webcast. See DARPA-SN-21-15 posted at https://beta.sam.gov for all details. Attendance at the WARDEN Proposers' Day is not required to propose to this solicitation.

B. Protesting

For information concerning agency level protests see http://www.darpa.mil/work-with-us/additional-baa#NPRPAC.