DEPARTMENT OF THE ARMY

DoD 22.4 Small Business Innovation Research (SBIR) Annual BAA
Release 2, Proposal Submission Instructions

March 10, 2022: Topics issued for pre-release
March 24, 2022: Army begins accepting proposals via DSIP
April 12, 2022: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET
April 26, 2022: Deadline for receipt of proposals no later than 12:00 p.m. ET

INTRODUCTION

The future Army must be capable of conducting Multi-Domain Operations (MDO) as part of an integrated Joint Force across an array of situations in multiple theaters by 2035. The MDO concept describes how the Army will support the Joint Force in the rapid and continuous integration of all domains of warfare – land, sea, air, and cyberspace – to deter and prevail as we compete short of conflict, and fight and win if deterrence fail. The Army must provide game-changing capabilities to our Soldiers. To capitalize on small business innovation, the Army has implemented an approach to advertise SBIR funding opportunities through the Department of Defense (DoD) Annual BAA process, outside of the three pre-determined BAA cycles. This approach also strives to create a more rapid award time from solicitation to closing.

Topics released under this BAA deviate from the traditional Army SBIR period of performance, contract award guidelines, and other proposal instructions. Please take note of the contents of the DoD Program BAA instructions, supplemented herein, when preparing proposals. Proposals will only be evaluated in response to an active corresponding Army topic.

Proposers responding to a topic in this BAA must follow all general instructions provided in the DoD SBIR Program BAA. Department of the Army requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Specific questions pertaining to the administration of the Department of the Army SBIR Program and the proposal preparation instructions for this topic should be directed to the Point of Contact identified in the Topic announcement; general questions can be directed below:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@mail.mil
Mailing Address:
Army Applied SBIR Office
2800 Crystal Dr; Ste 11252
Arlington, VA 22201

PHASE I PROPOSAL GUIDELINES

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Technical Volume (Volume 2)

Unless otherwise noted in the topic, the technical volume is not to exceed 5 pages and must follow the formatting requirements provided in the DoD SBIR Program BAA. The Army will not consider pages in excess of this limit.

Content of the Technical Volume
The Technical Volume will contain three key sections – technical approach, team qualifications and commercialization section. The technical approach section contains details on how the proposer is going to solve the problem. It should detail key elements of your approach, any risks, relevant past work and how you measure success. The team qualifications section should highlight the key personnel working on the project, and the resources that will be brought to bear on solving the problem. The commercialization section includes information on the commercialization strategy within the military, private sector or both. These instructions supersede those stated in section 5.3.c of the DoD Program BAA.

Cost Volume (Volume 3)
Unless otherwise noted in the topic, the Phase I Base amount must not exceed $250,000 for a 6-month period of performance. Phase I Options are not anticipated at this time. If an option is identified in the topic posting, costs for the Base and Option must be separated and clearly identified on the Proposal Cover Sheet (Volume 1) and in Volume 3.

Content of the Cost Volume (Volume 3)
ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel costs to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screenshot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds.

If a DCAA Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected for award, failure to include the documentation with your proposal will delay contract negotiation, and the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs (e.g., cost estimates for equipment, materials, and consultants or subcontractors). It is important to respond as quickly as possible to the Contracting Officer's request for documentation.

Company Commercialization Report (CCR) (Volume 4)
Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5)
Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3). In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army may accept the following documents in Volume 5:

- Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights

- Other (only as specified in the topic)

Please only submit documents that are identified in the topic instructions. All other submissions will be disregarded.

DIRECT TO PHASE II PROPOSAL GUIDELINES

Proposers interested in submitting a DP2 proposal in response to an eligible topic must provide documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

The Army will not evaluate the proposer's related Phase II proposal if it determines that the proposer has failed to demonstrate that technical merit and feasibility has been established or the proposer has failed to demonstrate that work submitted in the feasibility documentation was substantially performed by the proposer and/or the PI.

Feasibility documentation cannot be based upon any prior or ongoing federally funded SBIR or STTR work and DP2 proposals MUST NOT logically extend from any prior or ongoing federally funded SBIR or STTR work.

Format of Technical Volume (Volume 2)

The Technical Volume must include two parts, the Feasibility Documentation and the Technical Proposal.

The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus is detected, it may cause rejection of the proposal. Do not lock or encrypt the uploaded file. Do not include or embed active graphics such as videos, moving pictures, or other similar media in the document.

Unless otherwise noted in the topic, the length of the Feasibility Documentation is not to exceed 5 pages and the length of the Technical Proposal is not to exceed 10 pages. The Government will not consider pages in excess of the page count limitations.

Number all pages of your proposal consecutively. Font size should not be smaller than 10- point on standard 8-1/2" x 11" paper with one-inch margins. The header on each page of the Technical Volume should contain your company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created. The header may be included in the one-inch margin.

Content of the Feasibility Documentation (Volume 2a)

The content of the Feasibility Documentation Proposers should substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

Content of the Technical Proposal (Volume 2b)
The content of the Technical Volume should address three key areas: the technical approach, the team carrying out the work (and the accompanied resources), and the commercialization strategy. The commercialization strategy should include:

- Company information: Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.
- Customer and Competition: Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.
- Market: Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.
- Intellectual Property: Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
- Financing: Plans for securing necessary non-SBIR funding.
- Assistance and mentoring: Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., SBDC), commercial accelerators, DOD Prime Contractors, or other assistance provider.

Proposers are free to structure each section as they like, so long as it provides sufficient detail for evaluators to understand the proposed work, who will carry it out, and how the business plans to commercialize results.

Cost Volume (Volume 3)
Unless otherwise noted in the topic, the Army will accept Direct to Phase II proposals for a cost up to $1,700,000 for an 18-month period of performance. Proposers are required to use the Cost Proposal method as provided on the DSIP submission site. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

Content of the Cost Volume (Volume 3)
ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel costs to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screenshot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds.

Some items in the cost breakdown may not apply to the proposed project. If that is the case, there is no need to provide information on each and every item.

Cost Breakdown Guidance:

- List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
- Special tooling and test equipment and material cost may be included. The inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of

the Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the Army; unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the Army.

- Cost for travel funds must be justified and related to the needs of the project.
- Cost sharing is permitted for proposals under this announcement; however, cost sharing is not required, nor will it be an evaluation factor in the consideration of a proposal.
- All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc. Provide detailed substantiation of subcontractor costs in your cost proposal. Enter this information in the Explanatory Material section of the on-line cost proposal form. The Supporting Documents Volume (Volume 5) may be used if additional space is needed.

If a DCAA Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected for award, failure to include the documentation with your proposal will delay contract negotiation, and the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs (e.g., cost estimates for equipment, materials, and consultants or subcontractors). It is important to respond as quickly as possible to the Contracting Officer's request for documentation.

For more information about cost proposals and accounting standards, see the DCAA publication titled "Audit Process Overview – Information for Contractors" available at: http://www.dcaa.mil.

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- Allocation of Rights
- Other (only as specified in the topic)

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PHASE II PROPOSAL GUIDELINES
Phase II proposals may only be submitted by Phase I awardees. Phase II proposal submission window, notification process, expected budget/duration structure and additional instructions will be provided in the Phase I contract or by subsequent notification.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)
The Army, at its discretion, may provide Technical and Business Assistance (TABA). The Army will select a preferred vendor(s) for the Army SBIR TABA program through a competitive process. Alternately, a small business concern may, by contract or otherwise, select one or more vendors to assist the firm in meeting the TABA goals. The Applicant must request the authority to select its own TABA provider in the Army SBIR proposal, demonstrating that the vendor is uniquely postured to provide the specific technical and business services required.

Participation in the Army SBIR TABA program is voluntary for each Army SBIR awardee. Services provided to Army SBIR firms under the auspices of the TABA program may include, but are not limited to:

1. Access to a network of scientists, engineers, and technologists focused on commercialization and transition considerations such as protected supply chain management, advanced manufacturing, process/product/production scaling, etc;
2. Assistance with intellectual property protections, such as legal considerations, intellectual property rights, patent filing, patent fees, licensing considerations, etc;
3. Commercialization and technology transition support such as market research, market validation, development of regulatory or manufacturing plans, brand development;
4. Regulatory support such as product domain regulatory considerations, regulatory planning, and regulatory strategy development.

The Army SBIR program sponsors participation in the TABA program. The resource limitation for each firm is:

- Phase I Firms: Up to $6,500 per project per year (in addition to the base SBIR award amount);
- Phase II Firms: Up to $50,000 per project;
    - Army-Preferred Vendor: In addition to the base SBIR award amount;
    - Firm-Selected Vendor: Included in the base SBIR award amount and must be included in Phase II proposal.

EVALUATION AND SELECTION

All proposals will be evaluated in accordance with the evaluation criteria listed in the DoD Program BAA. It is the policy of the Army to ensure equitable and 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.

All proposal evaluations will be based solely on the above evaluation criteria. The Army will conduct an evaluation of each conforming proposal. Proposals that do not comply with the requirements detailed in this BAA and the research objective(s) of the corresponding opportunity are considered non-conforming and therefore will not evaluated nor considered for award.

Using the evaluation criteria, the Government will evaluate each proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion, and, based on these identified strengths and weaknesses, make a determination of the proposal's overall selectability. Proposals will not be evaluated

against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding opportunity.

Awards will be made to proposers whose proposals are determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the BAA herein, subsequent opportunities issued, and availability of funding. Given the limited funding available for each opportunity, not all proposals considered selectable will be necessarily selected for funding.

For the purposes of this proposal evaluation process, a selectable proposal is defined as follows:
Selectable: A selectable proposal is a proposal that has been evaluated by the Government against the evaluation criteria listed in the DoD Program BAA, and the strengths of the overall proposal outweighs its weaknesses. Additionally, there are no accumulated weaknesses that would require extensive negotiations and/or a revised proposal.

For the purposes of this proposal evaluation process, a non-selectable proposal is defined as follows:
Non-Selectable: A proposal is considered non-selectable when the proposal has been evaluated by the Government against the evaluation criteria listed in the DoD Program BAA and the strengths of the overall proposal do not outweigh its weaknesses.

Proposing firms will be notified via email of selection or non-selection status for a Phase I or direct to Phase II award within 90 days of the closing date of the BAA. The notification will come from the Army SBIR Program Office PoC mailbox sent to the Corporate Official listed on the proposal cover sheet. The Army promotes transparency regarding the technical evaluation for all Army SBIR proposals. The Army will provide a technical evaluation narrative to the proposer in accordance with the SBA Policy Directive, Appendix I, paragraph 4. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

A Contracting Officer (KO) may contact applicants, when the Army SBIR Office has recommended a proposal for award, in order to discuss additional information required for award. This may include representations and certifications, revised budgets or budget explanations, certificate of current cost or pricing data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. The anticipated start date will be determined at that time.

Proposers must not regard the notification email as an authorization to commit or expend funds. Until a Government KO signs the award document (i.e. contract), no obligations to provide funding are made. The award document signed by the Government KO is the official and authorizing award instrument (i.e. contract). The KO will email the signed, authorizing award instrument to the principal investigator (PI) and/or an authorized organization representative.

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.

As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award should be submitted to the Point of Contract identified in the topic solicitation:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@mail.mil
Mailing Address:
Army Applied SBIR Office
2800 Crystal Dr; Ste 11252
Arlington, VA 22201

Army SBIR 224 Topic Index
Release 2

A224-004 TITLE: Advanced Tire Technology for Manned and Unmanned Systems

OUSD (R&E) MODERNIZATION PRIORITY: General Warfighting Requirements (GWR)

TECHNOLOGY AREA(S): Materials

OBJECTIVE: Carbon Fiber Hoops will be embedded in the tire under the tread to tension the tire cords to reduce the air pressure required for full load capability and to better control the load distribution at low or zero air pressure. This reduces the load on the run-flat by about 50% and results in increased run-flat range and potentially speed with greater tire stability. With alternative light weight run-flats previously tested with reduced load capability, the expectation is that the overall weight will also be reduced by 20%.

DESCRIPTION: The current state of the art tire/run-flat for military ground vehicles is a Michelin or Goodyear tire with a Hutchinson solid rubber inner wheel for run-flat capability with a top speed of 30 mph and a range of 30 miles. The purpose of this topic is to increase run-flat range from 30 miles to 350 miles to support autonomous operations. The overall goals are to increase top run-flat speed from 30 mph to 45 mph, provide the same ride quality and terrain capability as existing pneumatic tires used for the military, esnure tire/runflat cost approximately 10% less than current tire/run-flat, and reduce weight of new HMMWV tire/run-flat by 20% minimum. Previous efforts with industry, academia, and USG entities have focused on trying to solve the problem with either the tire itself (low sidewall tires or other technology that makes the tire stiffer) or a lighter run-flat that typically was also stiffer or overheated with the load capacity required for an up-armored HMMWV. It becomes too much for one technology to do alone. Combining technologies will enable the tire to carry and absorb RFI and mobility loads during X-country operations so a lighter RFI can operate at zero PSI. Proposer should show the development of a tire using carbon fiber hoop technology to reduce the loading on the run-flat by approximately 50%. Pneumatic tires also experience cupping at low tire pressures and this technology can be used to better control the footprint at lower air pressure to reduce ground pressure and improve stability. Additionally, other technology used for extended range runflat capability at lower loadings will be combined with the tire technology to increase range, speed and lower weight & cost.

PHASE I: Successfully pass analytical and component testing for load carrying capability and durability. Simulate tire/runflat capability through DADS modeling.

PHASE II: Successfully demonstrate ride quality on a HMMWV in GVSC physical simulation lab. Successfully demonstrate operational requirements by qualification testing.

PHASE III DUAL USE APPLICATIONS: Complete testing, document ad release for production. Potential Military Application: HMMWV/AMBULANCE and directly to another vehicle using same or similar size tire. Example: SOCOM GMV 1.1 or army variants; other military vehicles, depending on success and scalability. Potential Commercial Application: Logging trucks, construction trucks, mining trucks, power company trucks, oil exploration vehicles, recreational and off-road vehicles, maritime landing vehicles, Security/VIP vehicles, and special cargo vehicles (nuke haulers, etc). Again, especially for differently sized vehicles, depends on success and scalability. Passenger cars and light trucks are examples for regular over the road use.

REFERENCES:

1. https://www.homelandsecurity-technology.com/projects/m997a3-tactical-humvee-ambulance/

KEYWORDS: Ground vehicles; tire/run-flat; tire; mobility

A224-005 TITLE: M997A3 Chassis Suspension Improvements

OUSD (R&E) MODERNIZATION PRIORITY: General Warfighting Requirements (GWR)

TECHNOLOGY AREA(S): Materials

OBJECTIVE: The purpose of this topic is to develop and implement chassis suspension improvement, especially in the front, to soften and smooth out the ride for patients, as well as attendant, driver, commander. It is equally important to improve initial response to shock loads and set stage for further improvements

DESCRIPTION: The objective of this topic includes analyzing loads into ambulance and select/test suspension components, most notably shocks, to lessen loads and impacts of them upon the chassis as a whole. Another objective is to find or generate materials that can be used as padding in open areas to also reduce shock and vibe loads. Finally, proposer should obtain samples suitable for demo/testing in DT and OT settings as well as local command demos, assess any possible lessons from commercial/industrial ambulance experience and hardware setups and develop better understanding of any unique challenges along the way. Currently, the M997A3 uses the same suspension as the main system, but has a different mission actually requiring more sensitivity to terrain effects on “cargo”. The M997A3 currently rarely uses upper bunks and avoids certain required terrain. Other options are either more sensitive to terrain or are much more expensive systems. Intent of this topic is to look past regular HMMWV suspension approaches to see if different items totally, or simply augmented shocks/logic can be put to use, at least on rebound. It will become even more important with the advent of leader/follower for the ambulance or autonomous operation as the attendant will have no warning about obstacles and their shock effects on attendant and patients.

PHASE I: Perform modeling/analysis on proposal. Obtain hardware, integrate into project.

PHASE II: Improve design, batch with any other needed changes, test in lab, socialize to users, start vehicle testing

PHASE III DUAL USE APPLICATIONS: Complete vehicle testing, decision point, document, release for production/kits. Potential Military Application: HMMV AMBULANCE; other military wheeled vehicle ambulances, assuming success and scalability. Also, perhaps niche application to security/VIP and special cargo vehicles (nuke haulers, etc) with special suspension rebound needs or desired characteristics.

Potential Commercial Application: Other wheeled system ambulances, private and public, assuming success and scalability. Perhaps niche application to VIP and special cargo vehicles (nuke haulers, etc) with special suspension rebound needs or desired characteristics. Also, gurneys/people movers, and rail systems. Potentially passenger cars and light trucks for regular over the road use.

REFERENCES:

1. https://hmmwvinscale.com/documents/M997A3%20Technical%20Overview%20Packet.pdf

KEYWORDS: Suspension; ground vehicles; shock; chassis; autonomous; ambulance

A224-006 TITLE: Variable Speed Engine Cooling Fan for Acoustic Detection Management

OUSD (R&E) MODERNIZATION PRIORITY: General Warfighting Requirements (GWR)

TECHNOLOGY AREA(S): Materials

OBJECTIVE: The objectives of this topic include the following: develop software / controls / integration that will allow a Variable Speed Fan Drive (VSFD) to be managed to reduce noise from the largest cause of HMMWV noise – the engine cooling fan; manage the thermostat and fan clutch such that it lowers the fan average acoustic signature and lowers the average acoustic detection distance of the HMMWVs; provide for adaptation to other systems, especially those that have been shown to suffer from the same acoustic signature issue; and develop better understanding and remedy for any unique challenges revealed along the way

DESCRIPTION: Currently, HMMWV doesn't attempt to modulate its fan or vehicle noise in any way to prevent detection in any way. However, the new approach from this topic can mitigate the highest risk source of acoustic detection on Army ground combat vehicles. Engine cooling fan noise has been found to be the most significant acoustic detection event on multiple vehicles, like HMMWV. In addition, there is no way for the Warfighter to predict or control exactly when the HMMWV engine cooling fan will be activated and the current fleet controls for the engine cooling fan is either on or off. The HMMWV cooling fan is obviously designed for maximum cooling, so with this type of control logic the engine cooling fan may only be activated for a couple of seconds to reduce the engine coolant temperatures to an acceptable level. With the addition of a variable speed fan drive system the cooling fans in these situations could be activated at a reduced speed and a much lower acoustic detection risk allowing the Warfighter to remain unnoticed by the enemy in many scenarios.

PHASE I: Obtain hardware, develop software, integrate, test out and assess impact on reducing noise

PHASE II: Improve design, batch with any other needed changes (noise freed up by fixing fan noise), test on several different HMMWV models

PHASE III DUAL USE APPLICATIONS: Resolve any issues, document, release for production/kits, export to other systems. Potential Military Application: HMMWV/AMBULANCE. With integration work, this type of technology could be applied to any military vehicle, construction equipment, generator set, or engine/fan-equipped systems. Planes and ships could also utilize it.

Potential Commercial Application: With integration work, this type of technology could be applied to any commercial, private or public vehicle, construction equipment, generator set, or engine/fan-equipped systems, that needs to maintain a low noise signature for safety, legal or environmental reasons. Planes, ships, and rail systems could also utilize it.

REFERENCES:

1. https://hmmwvinscale.com/documents/M997A3%20Technical%20Overview%20Packet.pdf

KEYWORDS: Engine cooling; acoustic detection; Warfighter