SBIR 24.4 R1 Q&A Telecon Transcript
28 November 2023

- SOCOM244-001: Small Unmanned Ground Robotic Systems
- SOCOM244-002: Thermal Reflex Sight

SBIR Process Timeline
21 Nov 2023: Topics issued for pre-release
05 Dec 2023: USSOCOM begins accepting proposals via DSIP
03 January 2024: DSIP Topics Q&A closes to new questions at 12:00 PM ET
17 January 2024: Deadline for receipt of proposals no later than 12:00 PM ET

SOCOM244-001: Small Unmanned Ground Robotic Systems

1. **Would Phase I be suitable to perform a feasibility study on integration of the name-brand technologies listed in the solicitation with our UGV platform?**
   Yes, it would, the name brand technology listed, Tomahawk, Silvus, Persistent Systems Radios. So yes, it will be suitable to perform a study with those particular platforms listed in the solicitation.

2. **Does a successful phase 1 proposal need to incorporate a lot of technical information? The more technical equals more potential for an award?**
   The Government does not provide companies advice on how to write a proposal. We encourage you to put in any level of technical details you need, in order to convey your point and show the merits of your approach**.**

3. **Does the required runtime have to support the power draw from "various payloads via integrated picatinny rail"? If so, are there payload power requirements?**
   In this case, we do need the robot to be able to support power draw, but that's not how the endurance or runtime will be measured against, for exactly the reason that you're asking, what are the payload draw? There's a whole bunch of them. They're all different. So, we're just not able to put out that number. Let's just say the regular vanilla robot needs that run time, and it also needs to be able to put payloads, but if those payloads reduce the runtime, that's okay.

4. **Is there a spec sheet available for the proposed comms solutions? This would be helpful information for SWAP considerations on the UGV.**
   We believe, on the references there are some communication websites, and hopefully, you're able to work through those to find spec sheets available through those OEMs. If you scroll down to near the bottom of the SBIR call or the bottom of the SBIR topic and specifics, there's a references section, and if that doesn't give you what you need, maybe reaching out to those vendors, or someone in the industry can help you.

5. **Are there restrictions related to the use of active sensing such as LIDAR?**
   If you find that that gives you advantageous performance relative to what we're looking for, you're more than welcome to propose it. Your proposal will not be thrown out. You will evaluate

it in terms of how well it can provide us with the capability for what's listed in this announcement. There are certain safety burdens that come with the use of LIDAR if it's not an eye-safe LIDAR, so we certainly don't have the authorities to wave any of the FDA or other legal ramifications to the use of lasers in the battle space. Those restrictions are definitely present, because they don't extend to the SBIR; they come from other parts of the law, so those would still be in place for their use if you're using unsafe or class four lasers, or something like that. Those obviously have other restrictions, but they don't come from the SBIR. There are no restrictions against LIDAR in the SBIR, but there certainly are restrictions in the law and in the DoD, for how lasers must be used.

6. **For the identification of armed personnel at 50 meters (visual) or 40 m (infrared), what are the assumptions on lighting/weather/etc.?**
   That's a very fair question for us at SOCOM, that often comes up when we go to developmental or operational test, and how we construct a concept of operations, what sort of environment the SOF operator is going to be operating in. We felt it was probably a little early to get into that level of detail for the SBIR Phase I. We'd say you can sort of pick your environment, whatever assumptions you make for the capability that you're proposing, go ahead and make them. Do keep in mind that SOF operators are deployed around the world.

7. **Re "weight range of 2-10 pounds and 40-100 pounds" are these two different solutions/platforms? Should proposers target one weight range or both?**
   It is our intention that those are separate weight ranges, proposers should target whatever one they think is in their business's best interests, that could include both, that could include neither. We don't dictate which businesses have to write proposals, or we don't direct anyone to write a proposal. Those are two separate classes that we would field separately. They're not the same. And so, whatever one you think most supports you, there is a fair amount of commonality, and there obviously are some differences at those different weight classes, so you may propose to one or both, or neither. Whatever's in your company's best interest.

8. **Is cryptographic comms something the proposer will have to incorporate or is it assumed the referenced radio providers (Persistent, Silvus) will address?**
   The proposer should consider commercial standard certified cryptographic capababilities 128/256-bit encryption Federal Information Standards Publication (FIPS) 197 compliant for Advanced Encryption Standard (AES) standards per the National Institute Standards and Technology (NIST) document updated May 9,2023.

9. **Both the Silvus and Persistent Systems radios are large for a 2-10 lb robot. Can other radios be utilized? E.g. Doodle Helix or Microhard pico/femto series**
   SBIRs tend to be a nascent process. They're funded with research development tests and evaluation dollars, and it's understood that there's a lot of development that does go on, which is why it's a multi-faced approach. So, if you don't think you can hit the end state right out of the gate and you see value to proposing other options like a Helix or Microhard, whatever you think is the most appropriate, and shows your company in the best light to make you most competitive, propose that, make the argument, show why that's the most valuable thing

SOCOM can be spending its money and time developing.

10. **How many awards are planned for this topics?**
    This Q&A is for technical questions, programmatic questions cannot be answered.

11. **Can you describe the mission profile that the system will be used for?**
    The system must be able to operate in land or close spaces or subterranean environments. Those three types, keep those in mind when trying to come up with the feasibility study for this. I guess one other comment I would make on that is what we've seen in the drone space is that people come up with new uses, the warfighter is one of the most creative weapons, at least as creative as the acquisition enterprise, and so even when we give them a piece of equipment with a specific mission profile that it was tested to, they often come up with very creative and elegant ways to utilize that equipment that we never even thought of. So, especially something like a robot I would expect whatever mission profile I told you, the operator will probably use it in some other way. So just keep in mind that, think like a war fighter would. Think like a solider, sailor, marine, an Airforce, airmen. Just think about the things they want to do with their day and if you're dialing into this call its because you're an expert in robotics. So, think about what your users and your customers would be using for. SOF sometimes does a lot of things like that.

12. **Are the two weight classes the only weight classes that would be considered for this?**
    Those are the only weight classes that are listed in this SBIR.

13. **What about current robot systems fall short of these needs? Are you thinking this is a new robotic design or integration of current robotics with radios?**
    Our market research told us that we couldn't buy something that met all of our requirements today. If we could, we would just buy it. So, is it a new robotic design? You know, is a screw change a new design? I don't know. Is rewiring the circuit a new design? It's hard to say what constitutes your threshold for new. I could certainly see you repurposing a bunch of elements of existing robots, but we have not found anything that meets all our requirements today. Obviously the closer it is to a finished product, the less risky your proposal is, and that would make it stronger. So, if you're able to show that you're leveraging current robotics and minimizing risk in the proposal, we encourage you to play that up and show how that makes your company superior. But new design, we don't really draw a hard line on that. We just know that we don't have anything out there today which is why we're doing this SBIR topic. The more reuse you have, the less risk there is.

14. **Is this remote control or autonomous? How do you see controlling the robot?**
    Yes, definitely remote control, out of the gate. Autonomous means a lot of things to a lot of people. So, I'm assuming you're going to comply with the responsible use of artificial intelligence that's propagated by the Department of Defense. So will fall well into that for anything autonomy. Communications are highly contested on today's battle fields. Everybody's talking about that in the news, on the internet, the intel world. So certainly, there's a big push publicly to move the DOD into autonomy that also includes SOCOM, so an eye toward autonomy is not a bad idea, but it needs to be remote controlled.

15. **Do you want the image / sensor processing on board or off-board the robot?**
    I don't think we specified that specifically. Hopefully if you think there's a superior approach one way or the other, we encourage you to make that argument and substantiate as best you can. Also, wouldn't be the worst idea to cover that as part of the Phase 1 and set the course for the Phase II. So, really up to you, whatever you think offers the warfighter the best useful capability.

16. **Are there security restrictions or requirements for onboard comms and/or data storage?**
    Mission data shall be stored on the GCS. The only comms requirements are able to listen and communicate at distances that you state the system can do.

17. **Is there a cost target for the proposed solution?**
    Please refer to the USSOCOM specific instructions for the NTE amount assigned to this topic

18. **Can you talk more about terrain - does it need to climb stairs, step height, how fast does it need to go?**
    Yes, various environments and terrains. Sand, snow, dirt, marsh, rock, concrete, carpet, etc. SOF warfighters operate around the world, so if it could climb stairs that's really helpful for all kinds of reasons. If it could go up maybe one step and get over a sidewalk curb vs. can't, go up a flight of stairs, you know, make the argument for why your solution is the best. You do have some trade space to say well if I was to make it go up all the stairs maybe that would cause me to have an extra penalty somewhere else in the system and that would make it worse for whatever other capabilities we are asking for. So, encourage you to make the argument. SOF warfighters, it is known they do a lot of running as part of their training. Both in the selection, train up pipeline, as well as their day-to-day jobs. The more you can keep up with some of our war fighters the better it is. I don't think we have any specific speeds released in the SBIR. Maybe that's something if your successful you can uncover in the Phase I section and in Phase II you can build.

19. **Any form factor considerations beyond weight? Is this expected to be man packable?**
    I don't know that we released numbers specifically, but yes it definitely is expected to be man packable. Our SOF warfighters deploy all around the world. They often deploy with some but minimal support. Frequently do exercises with partners and allies and operations around the world so, portability is well known to be a SOF attribute. So yes, it is expected for it to be man packable.

20. **What are the expected production volumes?**
    We do not have anything to release at this time.

21. **Is there a desire for manipulation capability?**
    We really considered manipulation capability as a secondary optional pay load. It's not the minimum required that the robot can manipulate, we'll definitely will consider that. We can still field that. Whoever is asking this probably knows there's lots of benefits to manipulation. So, if

you're able to provide that and propose that, argue why that makes your solution superior and we'll grade all of them based on this list.

22. **How EW hardened is the robot expected to be?**
    I'm assuming EW means electronic warfare which would be resistance to jammers, and things that might interfere with the radio control link. I don't think we have any specific electromagnetic environmentals that we released, or threats sent put with this SBIR. We do have some cyber security attributes, we have some encryption stuff that's in here, but I don't think that we've listed specific electromagnetic environments that it must resist.

23. **Will the recording of this call be available after the call?**
    No, the team at SOFWERX will go through and provide a transcription and once everything's approved it will be posted on the website on the SOFWERX Site.

24. **Re storage and comms, is any red data expected to be collected and stored on platform and/or transmitted off platform?**
    Assuming red data is a euphemism for classified. At this time, we don't expect to be collecting or storing classified information on this platform.

25. **Any further thoughts on autonomy (obstacle recognition / avoidance, hazard ID, return home or known location lost link.**
    Robotics are a general enabler of autonomy, a precursor, you need hardware in order to do those things. That said, our SOF war fighters go into some of the most challenging and hostile environments in the world and there's plenty of contributions to the battlefield that these things can make without a lot of autonomy. I'll also say, pay close because even just in the last few weeks, there's been guidance released by the Department of Defense about how we use artificial intelligence responsibly, so some of these things are fairly benign, you know, lost link, but there is a point where Artificial Intelligence has to be used on the battlefield in a way that is consistent with the ethics and morals of this nation and the guidance of our higher headquarters. So just pay attention to those releases that are coming out from the pentagon. The things that you listed are features that intuitively make a lot of improvements for war fighters. So, if you are able to provide those or you think they discriminate your company's capability we encourage you to put that sort of thing in there. The minimums are listed in this SBIR. The more opportunity you offer the better, but I wouldn't say that any of that is a minimum at this point.

26. **Can multiple robots act as relays in order to achieve required communications distances?**
    We have been working this is a prerelease and so we're there is some possibility that some of the ranges may be adjusting in response to some elements. So, I will caveat that that specifically one of the range things we are looking at possibly needing an update or being adjusted before December 5th. That being said, the intention in the numbers that have been released here is that those are the non-relay distance, and the hope would be that we could then relay at those distances to get even further is how we've structured those numbers if that gives you any

clarity. So could it, Sure. If that's what you think makes your solution superior, go ahead and make the argument. But that wasn't how we constructed those numbers.

27. **What is the max required payload for the 40-100 lb system**
    Yeah, we were not able to release that information at this time.

28. **In terms of detecting threats, how precise in terms of geo-location is required? e.g. target grade coordinates or is less precise acceptable?**
    I don't think we'd put any specific categories of targeting precision. Obviously the more the better. There's no minimum that will get you disqualified from consideration. Make the argument for why your technology is the superior approach and we'll evaluate it against all the other proposals in the stack.

29. **What electrical/data interfaces are required for payloads?**
    We have not seen a standard interface adopted either by the community or the government or pushed out across the government just yet. So, we've tracked, we've been tracking a couple of these, but I don't think we've gotten anything to date that's firm. So, there's nothing required. For sure, the more you can adapt to, the better.

30. **Are we expected to provide a power solution for recharging?**
    We do expect these to be parts of some form and we expect that to provide, you know, if there's batteries required, batteries; if there's, you know, a special adapter or a certain charger required. We expect that to be part of this. If that's not to be provided as part of the ground robotics kit, we would expect that you would provide a, you know, suitable substitute or a commercially available specification for something because we will obviously need to recharge the robots during use.

31. **Do we assume MOSA, SOSA type of architecture is desired?**
    This is a tough question to answer. I'd say fundamentally we don't expect the government to buy the technical data rights packages to these robots. Obviously, the data rights for SBIR are well known and spelled out in the solicitation. We do not view this as if we were buying, you know, an aircraft carrier and that will be upgrading pieces and parts throughout the life cycle of the robot. That said, we do expect interchangeable payloads. We do expect software obsolescence. We do expect a number of those features. So, the more modular and open the system architecture is, the easier that process becomes and extends the lifespan of the robot or reduces the risk of technical, technical obsolescence during the life cycle of that robot. But we don't expect that this will be a, you know, an Arleigh Burke class destroyer where we're ripping things out and upgrading them. We don't have a specific threshold requirement because if I was to tell you that we have to have an open systems architecture, the next thing you would ask is, well, can you tell me about that architecture? So, we don't have anything like that to release. And so obviously the more modular the architecture is all those benefits for why people do this in the 1st place are realized. But I will say, we don't intend to procure the technical data package here and build these on our own, but you should be welcome to propose that if you think that's the best solution.

32. **Are there software requirements e.g. ROS 2, ROS M, etc.?**
    ROS being Robot Operating System, I don't think we have that specific requirement, although the more commonality we have with the services which do adopt those architectures, the better. I think in this case, we're trying to cast a wide net and we don't want to necessarily exclude people that might offer benefits in some other places if they don't offer those things. But the more commonality we have with the rest of the community, the better our systems are to be supported, sustained, interoperable. And so certainly encourage anyone to discuss the merits of their approach in relation to those.

33. **Are there any TAK integration plans?**
    Yes, we do have TAK plans.

34. **For cyber security capability, besides the general AES 256 encryption, does this topic require any advanced security techniques, like AI anomaly detection?**
    No, although do pay attention to, you know, we tried to list out in the description as well as in the references some Cybersecurity, Cyber Survivability, Endorsement Implementation Guide. We specifically tried to find resources that are accessible to anyone. So hopefully that gives you something if it's not written in here, you know the more advanced you can provide and if you think that gives your company's approach a discriminating capability, certainly encourage you to include that in the proposal. But I think we put what our minimums were in the in the topic itself.

35. **Any specific malicious scenarios (e.g., jamming, spoofing) are interest for the performance evaluation in Phase I or II period?**
    We don't. I mean the focus of this is not going to be electronic warfare or the radio. It's not a radio program, it's a robot program. So, I would expect there to be some of those, but I wouldn't expect it to be the focus. Our focus will be how the warfighter's going to use them, terrain capabilities, durability, handling, the environment, everything that we've got listed in this description, integration, you know, how do we transmit that data.

36. **Is there any requirement on how onboard power system is handled? Like swappable batteries?**
    Good question on swappable batteries, I don't think we've put that as a minimum in the SBIR announcement. Obviously presents some advantages for immediate recharge or very quick recharge I'd say you can propose. So, we do restrict ourselves to that we're not going to be combustion engine powered, so will be purely electrical and battery. If there's a specific advantage that you think can be offered by your approach, you know like including swappable batteries for fast turnaround time, certainly encourage you to talk that up and argue why that thinks you're make, why you think that makes your proposal the best one that we should pick.

37. **Do you foresee a requirement in the future to add weaponized payloads to this platform?**
    We just don't think we're able to answer that question at this time.

38. **In terms of NIIRS, what type of evidence is sufficient? I.e. experimental evidence required or are optics calculations acceptable?**
    In terms of NIIRS, which is National Image Interpretability Rating Scale, what type of evidence is sufficient? experimental evidence required or are optics calculations acceptable? In terms of the evidence you need to provide in the proposal, I think whatever data you think is necessary for you to make the argument is all that's required there. In terms of when we go to test to verify and validate before fielding a piece of equipment to the war fighter, we will be collecting experimental evidence. But that threshold need not apply to your proposal. So whatever evidence you find compelling that your company has or can collect is whatever you think you can make your argument, we encourage you to put that in the proposal. Show why it's the best approach, and we'll look at them all.

39. **Can an assumption be made regarding the availability of an Edge server to offload some computational requirements?**
    Well, while we're working on that mute issue, we'll keep covering this edge server. Can an assumption be made regarding the availability of an edge server to offload some computational requirements? Encourage you to list out your assumptions, arguing in the proposal, why those are reasonable and relevant to the war fighter. You know, we did list some things about TAC and other things in here, but I don't think we've offered too much else. Also keep in mind that SOF war fighters often operate at the edge. They do missions in lots of places with little to no support and so just keep in mind that sometimes can happen. So just be cautious with those assumptions.

40. **for comparison purposes, can you provide an example E/O sensor and infrared sensor that meet the objectives similar to the radios provided?**
    I don't think we're able to provide that right now. Too much trade space in optics land.

41. **BAA criteria includes "innovation of the proposed approach". One answer implied similarity to existing hw is favorable. Can you clarify weight of innovation?**
    Innovative solution can include repurposing existing hardware, that relates to risk. So, I wouldn't necessarily classify this as a binary either or, I think things can be innovative that also have similarities to existing hardware, you know where innovation can be on a software side, where innovation can be, you know, in lots of places. So, you know the weight of innovation, I don't know what's in the solicitation, but we don't believe that things are out there right now that meet our requirements. So, we do like to see that you're showing a break from the existing technology that's available. The I in SBIR is innovation. So that's why you see that as part of it. But again, managing that risk and you know, again, I would also say there's a system, you look at a system in its entirety, an approach in its entirety. And again, there's innovation all over the place within that. So maybe the hardware has less innovation, but something else in the approach has more innovation. So, we'd like to see good proposals. As far as like a percentage, I don't think we have any specific percentages. And the weighting is listed in the announcement.

42. **Durability (2-10 lb) as it relates to employment methods - throw thru window or on roof / drop in tunnel (height), survive water depth of 'X'? Min IP rating?**
    It would be nice in that particular category if they were able to be, you know, thrown, dropped, carried, you know, on a roof or in a tunnel or something. In those particular types of IP rating, we've seen 67's, we've seen lower than 67. So, water depth that's I mean think about the situations that these guys are going to be in. We don't have a particular requirement for water depth, but it's nice. Yeah, and if you, anonymous, if you can provide additional clarity in terms of if you're looking for specific situations, you know if there's something lacking in the SBIR and that changes things for you, we can clarify. The more the merrier for SOF, all those things are possibilities that's often used it for. The more you can argue the better.

43. **Is there an existing plan in place for Phase III transition or will that be decided only during Phase II?**
    We come from a program of record and so I don't think there needs to be a further engagement with the PEO. This is well informed by requirements for a program of record. And so, the phase three transition is directly to us. So, it's just continuous and when the equipment is ready for developmental tests, operational tests and fielding, then you know we'll be getting ready for procurement. And whether that's a Phase III or some other procurement mechanism is, is to be determined, but it'll be determined by the people who are running this SBIR topic.

44. **Can you give an idea as to the types of operations this is intended for?**
    You give a piece of equipment to a SOF war fighter and they're going to come up with new ways to figure out how to use it. We're never going to discount that the operator's going to come up with operations that we haven't thought of. We view it as primarily an ISR tool at least at this stage with multiple payloads that can go on. It goes in all sorts of operational environments for all sorts of ISR tasks. Maybe it's in urban operations, jungle, desert, mountains, hot, cold. So, I think the core activities of SOCOM are listed on the SOCOM website. So, if you look at those, you can get some idea of the type of thing, that type of thing that goes on.

45. **Is there a desired capability for robot teams? i.e. cooperation between robots to complete an operator request**
    Certainly, would consider that an objective, you know, same vein as autonomy. We don't have a minimum threshold, the one robot works today. I encourage you to propose whatever you think separates your company's, your approach.

46. **Can you share names of previous operations that used UGS, or share where we can find this information? So, we can us e as a reference.**
    I'd just direct you to the SOCOM public website and whatever you can find on the Internet, you're welcome to reference it and cite where you got it. We don't have anything like that to share.