



**SBIR 23.4 R4 Q&A Telecon Transcript  
07 September 2023**

- SOCOM234-004: Out-of-Band GNSS Tracker
- SOCOM234-005: Slim Form Cargo Loader/Unloader

**SBIR Process Timeline**

22 Aug 2023: Topics issued for pre-release

06 Sep 2023: USSOCOM begins accepting proposals via DSIP

21 Sep 2023: DSIP Topics Q&A closes to new questions at 12:00 PM ET

05 Oct 2023: Deadline for receipt of proposals no later than 12:00 PM ET

SOCOM234-005: Slim Form Cargo Loader/Unloader

**1. How high off the ground does the system need to lift a fully loaded 463L pallet?**

If it's a standard 463L pallet capable of holding up to 10,000lbs, it doesn't need to lift it too high off the ground, just high enough for a ground clearance and ramp clearance of the C-130, or whatever a plane it may be going on to. C-130 is the most restrictive in terms of ramp clearance. The other answer to this is, there is a system out there that allows stacking of 463L pallets. Now that top palette has a maximum weight of 3000lbs. So, that would not ever be fully loaded, and that would be as high as 72in terms of Max Lift. If it can do that, that would be amazing. If that's not feasible then that completely makes sense. At a minimum it should be able to lift 463L and cleared for ground clearance and ramp clearance. If it can also lift a smaller palette from that 72in height down, that would be great to have as well. But again, that's not as important as being able to lift the fully loaded palette.

**2. Is there any stacking of pallets or equipment required or does the system only need to be able to move fully loaded 463L pallets from point to point?**

There is no stacking of equipment required from it. It would only need to be able to move the palettes from point to point.

**3. Can the system attach to the sides of the 463L pallet or does the system need to lift the pallet from below?**

There's no specification either way we're looking for solutions that fit within the confines that we're required to operate within. If you're looking at the most restrictive airframe the Air Force has, which could be the C-130, you're talking a matter of inches on either side of the palette when it's in the plane. If there is a system that works with that capability and that restriction in mind, we're open to it. If it must lift it from below, totally understandable. Either way works, depends on which one you think would work best in that regard.

**4. What is the maximum incline or gradient (uphill or downhill) the system needs to be able to ascend or descend?**

The maximum would be the ramp of the C-130J Hercules, approximately thirteen degrees is the maximum incline of the C-130. It is not foreseeable that there'd be any incline greater than that.

**5. Is there a minimum speed requirement for transporting a fully loaded 463L pallet?**

Ideally, 3 to 5 miles an hour would be great. Obviously, the faster you go, the more risk you have to the load in terms of shifting of weight and losing the load. If you can do 3 to 5 miles, that would be





great. If you can only do 2 miles, being able to move 10,000lbs at 2 miles an hour on a lifter is much better than having a bunch of personnel having to push, pull that lift that load as well.

**6. What power sources can be used by the system and what fuels are allowable?**

We're open to fuel-based systems as well as electrical based systems. If it's electrical, realize that weight would play into a factor of it because it means you must have batteries. That might be an issue there, as far as fuels or fuel-based systems, there's no real restrictions. The Air Force can utilize a wide variety of fuels, JP-8 low gas is widely accessible. Whichever one fits better for the system that you are proposing will probably be best. There's not going to be external power available from the plane very easily, so I would not count on that as a possible power source.

**7. What is the C-130 model this is going to be specified for? A, B, D, E, H, J, G, L, J-30, etc. model?**

Predominantly, this is going to be focusing on the C-130J. That's the one that is in use by the majority of the people we've been approached for this. So, we're looking to spec it for the C-130J model.

**8. What is the ramp distance? What are the minimum and maximum distances between the end of the ramp and the ground?**

The ramp length is approximately 119 inches minimum or maximum between the end of the ramp and the ground. This is hard to give an exact answer to because there are different ways that the ramp can be arrayed for loading and unloading. They can get a fully extended ramp all the way to the ground, so it's going to be straight to the ground, the ramp can be lowered onto some crates, logs, or 55-gallon barrels depending on the requirements of the load. If we're talking cargo loader like this, you're probably talking all the way straight to the ground, so it's going to be that straight 13-degree incline of 119 inches from top to bottom. It's a matter of 2 ½ inches and 3 inches at most, depending on the terrain, how much the ramp sinks into the ground because the C-130 can be unloaded on the tarmac as well as softer terrain, so the ramp has the potential to sink into the ground.

**9. What personnel will be available to operate the system?**

The personnel that will be able to operate the system are those that would be working with the Loadmasters. There are basic Air Force personnel of a variety of different job classifications that might be around, so it's no one specialized in terms of loading. There might be a loadmaster available at the point of origin, but at the point of destination, it might be limited to essentially whatever personnel are available to conduct the unloading procedures which might end up being a communication specialist, for instance. If the intent of this question was to see how detailed or how specific the system could be, ideally, we want it to be operated with minimal experience and training. Obviously, you'd have some level of training, but we don't want to have a person who is required to go to a long course to utilize this system.

**10. What would be considered the most extreme load centers (side to side, front to back, and height) for a fully loaded 463L pallet?**

We do not have an answer to this question at this time. We will work with potential vendors to address this in future from an engineering perspective.

**11. Is the primary issue the lack of a loader to meet the listed requirements, or is the issue that current loaders are not autonomous?**

The primary issue is a lack of a loader that meets the requirements. The autonomous nature of it is





ancillary to the actual requirements that need to be met.

**12. How does the request for a "Semi-autonomous interface and interaction" factor into the overall project? What level of importance is placed on that capability?**

The semiautonomous interface interaction is ancillary to the overall goal of the project. If the product can only be operated by a person and the autonomous interface nature cannot be conducted within the confines of the project limitations based on the funding factors or time restraints, then the semiautonomous features would be the first ones we would prefer to see go as opposed to other features. If we can get the semiautonomous features in there, they are nice to have, but not necessarily a requirement.

**13. What TRL is expected at the beginning and end of the initial effort?**

The beginning TRL would depend upon the different technologies being proposed. The maximum TRL for a Phase II SBIR contract is TRL 7. But understand there would be potentially more development needed in a follow-on Phase III acquisition contract to fully developed and fully fieldable system.

**14. What is the funding amount and timeline for Phase II of this program?**

The length of the Phase II Period of Performance and the Phase II not to exceed amount will be provided by the Contracting Officer during Phase II.

**15. What is the current pallet-jack used for this specific aircraft loading tasks?**

This question has a variety of answers depending on the load and the unit as well as the environment being operating in. Within airport operations, your local bases, especially CONUS, or fully established bases, they have the full array of loaders available up to including 10K, 30K forklifts that can put the load in it. At the destination, they can be limited to hand jacks in some instances, and in some instances, they will have the plane dump the load; where they drop the ramp a little bit, and they'll push the load out onto whatever receiving area it might be. It might be an improved receiving area made up of wood, or some kind of metal they may have found or brought with them, and the plane might then move forward to make more space. Possibly going to be on the terrain, but typically they're operating with a pallet jack or less at the destination. That is driven a lot based on space and the capability of the current existing equipment. A lot of the pallet jacks can't operate on the rougher terrain such as sand or gravel. Pallet jacks tend to really struggle on that.

**16. What is a feasible price range for a single unit? Is the loader supposed to travel with the payload in the airplane?**

That depends on what TRL it is being proposed and follow-on negotiations. The maximum TRL is 7. Concerning the loader: Yes, it is, the idea is that this loader will go with the load in the airplane depending on the weight of it. The pallet position is limited to 10,000lbs, so that is the absolute maximum it could be. There is also the ramp pallet position which is about half of that; 5,300lbs that they often will put some ancillary equipment and stuff on. But, yes, the loader will go with the payload. Please keep in mind for your power sources, if it is going to be moving with the airplane, it probably would have to be lithium-ion phosphate batteries if you're going to use electrical.

**17. Could we get TPOC's contact info?**

USSOCOM does not give out the TPOCs contact information. The only ways to answer technical questions are through the DSIP portal if it's not during this Q&A itself.





**18. What is the intention of the semi-autonomous capability? Is it to automatically follow an operator, or some other type of semi-autonomous operation?**

We have heard from end user's different things. They would like to see a final loading capability. So, maybe it can take the load from a 90% step to 100% step, or maybe it's the ability to drive from the ramp to its unload destination, drop the load and come back. We're open to different aspects. There's more interest in the ability for the loader to do the work, and autonomy is a benefit that they would like to see if it makes sense within the confines of the system.

**19. Do you have any price targets you are able to share?**

Not to exceed the amount of 175,000. The Phase II not to exceed amount will be provided by the Contracting Officer during Phase II.

**20. The description of the topic starts by stating it is a feasibility study. What is the desired result of the end of Phase I?**

We are asking for a feasibility study as to what is in the art of the possible. Moving forward to Phase II depends on whether feasible solutions are proposed. In Phase II, what was determined to be feasible in Phase I will be demonstrated to validate that it can be brought into reality.

**21. Can drawings or models of the 463L pallet be provided?**

Drawings cannot be provided. We can tell you that the 463L is a standard system. Every single pallet is built exactly to those specifications. To that point, the 463L is a system commonly referred to as the pallet but everything that goes in that system conforms to the 463L system. The shipping containers that can be utilized, the 20ft, 40ft, and the EAC 90 or the IC 90 goes the same thing. Those are all conformed to that 463L system. That information that's out there as it concerns in terms of the dimensions, the requirements for hooking on it, and all that, USTRANSCOM has published a lot of requirements for that as well in terms of the DoD's operations of that system, that is at least something you can use.

**22. Do you intend to make multiple Phase I awards and down-select going into Phase II?**

There is potential for multiple Phase I awards with a down select to Phase II.

**23. I previously asked the funding amount in Phase II and the duration of Phase II execution. I did not hear that answer but the question skipped. Please provide.**

This is a Phase I effort that is not to exceed \$175,000 and 7 months in duration. Phase II specifics will be provided during the Phase II proposal invites.

**24. Will Phase I include a requirements development effort or does the USG have a proposed requirements list that can be provided?**

There are some requirements listed in the Phase I topic write-up to include lifting a fully loaded 463L pallet from the ground, moving distance of approximately 500 meters, loading on the back of a C-130, unloading the pallet, moving it approximately 500 meters and then setting it back down. Specifications for the platform you're proposing would need to be part of what you are proposing.

**25. Are there any weight or power requirements other than what would be required for air transport?**

No, we are limited only by the air transportability of it, so, no more than 10,000 lbs. If it's a fuel-based





system, it can have no more than half a tank of fuel in it. If it's electrical and it's using batteries, it must be those lithium-ion phosphate batteries and air transportable certified. That is the major restraining factor for weight and power is the ability to put it on a plane and move it.

**26. Are there any noise requirements?**

No, there's no noise requirements but the quieter the better. It's working around a plane which obviously generates noise so there's no noise requirements in terms of that.

**27. Is the system required to be transported on a 463L pallet or is the requirement for it to fit within the same footprint available as a 463L during transport?**

Either way, if it can fit on a 463L pallet, that's fine. If it can be loaded within those confines of a 463L system, that's also fine. Either way is fully acceptable, and probably easier in terms of loading. If it can load itself, so it can drive itself on, and then get chained down as opposed to how to put a pallet there and getting secured to that pallet, either way would be acceptable.

**28. Would the 463L pallet be able to be altered in any way?**

No, it would not be able to be altered. Alterations to the system require a lot of communication and discussions with a lot of agencies, and that would probably preclude the platform from being fielded at any time in the foreseeable future. So that's not going to be possible.

**29. Will a list of attendees be provided, allowing a software company to partner with a manufacturer building the slim loader?**

We are unable to distro the list of attendees.

**30. Do we have to submit a proposal for the software need written out in AF's SBIR topic?**

We're a little confused by that question, because it's a USSOCOM SBIR topic, not an Air Force SBIR topic.

**31. Do you have any drawings of C-130 load floor configurations it will operate on?**

We will not be able to provide drawings to this system. There is within USTRANSCOM documents for the transport certification of planes, and one of those has the C-130 load plan and indicates where the pallets are in terms of the C-130 and the exact weights of them. There are six positions from front to rear of the plane. The first two are in line. The first two do not have a 10,000lb weight limit. They're about 6-8,000lbs and the final four, which are the big four are 10,000lbs and they're again straight in line from the front of the plane to the ramp, and the last pallet ends at the ramp. If you were to Google C-130J load configuration the first result for us was a fact sheet that the Air Force, because they're the ones that own the C-130, produce. It dictates all the loading configurations for it as well. That would probably be a good reference for it.

**32. Is the platform capable of storing on the C-130?**

Ideally, we would want the platform, whatever is being proposed, be able to be loaded and stored on the C-130.

**33. Is there a general description on the roughest terrain that the system is expected to operate in?**

Loose sand, rough sand, the C-130 can pretty much land anywhere and with that in mind, that's kind of the operation terrain we're looking for, for the system. So, not necessarily beach sand, but a sandpit, maybe kind of that kind of sand. If that gives you a visual for it. Anything up to that





roughness, jungle, or coastal environment, is what we're getting at.

**34. Would it be a perceived benefit if the system weight allowed stowage in the ramp position with reduced weight capacity as to not be blocked by other pallets?**

It would depend upon how much weight capacity we're talking about losing. The ability to lift up to 10,000lbs is desired, so if we're losing a lot of weight, it is going to depend upon how much weight we've lost. It would not be as big a benefit as being able to lift 10,000lbs, that's more important than the ability to store on the ramp. If you can figure out a way to lift 10,000lbs and put it on the ramp, that'd be amazing. The ability to lift up to 10,000lbs is far more important, though.

**35. Could you repeat the Phase I funding amount one more time please?**

Not to exceed the amount of 175,000.

**36. Is the C-130 capable of storing anything on the ramp, not platform?**

Yes, the C-130 can store stuff on the ramp. It is not a 463L system compatible. It is just capable of holding cargo, it's typically loose cargo. It is limited in weight to about 5,300lbs though.

**37. Air Force topic titled Austere Cargo and Onload System. The objective of that topic asks for a system capable of loading 463L pallets. How does this relate?**

We believe that is speaking towards the Air Force Research Labs system. It is not a parallel effort; it is a different effort with different restrictions. That one as far as we are aware more open in terms of the weight and size of the system. Ours is far more restrictive.

**38. Is there a TRL requirement for Phase II?**

We would think that the Phase II would be a TRL level seven, but we won't know for that for sure until we get to it. For the Phase II, it'd be six, seven, preferably seven at the end of it. Maximum TRL is 7.

**39. 463L Pallets have different weights based on location within the aircraft, otherwise limited to 10,000 lbs. lower/preferred weight limit for this SFCLU**

We are guessing SFCLU is slim form cargo load or unloader, if you're talking about the C-130, weight limits, 4-6 are limited to 10,000lbs. This goes back to the other question, if you can somehow get a platform that can lift 10,000lbs that doesn't weigh 10,000lbs, that would be awesome and be amazing, but we are limited, no matter what, to the 10,000lbs for the heaviest pallet position.

**40. Is there any history or are there prior contracts associated with this effort that the offeror should consider?**

No.

**41. Can you speak about logistics for the device? Would it be preferable for it to unload the C-130 quickly to allow the C-130 to get back in the air, for example?**

If you unload the plane quickly, and then can move the cargo afterward that'd be great. The less time on the ground the C-130 or the plane in general spends, the better. Yes, that would be preferable if it could unload quickly, but it is not going to be a severely limiting factor for this discussion or for this project.





**42. How many units are expected to be made/purchased total?**

That's open to negotiation, there is a lot of interest in this across a variety of end-users. We can't really give a specific answer beyond that.

**43. Are there any videos highlighting the use case of the loader to be developed? Opportunities for industry to visit airfield to witness loading/unloading procedure**

This goes back to the ability to attach stuff to this platform right here. However, there are a lot of videos out there, especially if you go on YouTube, if you search up airmen unloading C-130 on YouTube, you're going to find a lot of videos that show different ways they unload or load the planes. You'll see how the ranking position in multiple different ways, how what systems they utilize to load or unload. Open for discussion to allow industry to get out there, to witness procedures of that nature that must be discussed at a future date.

**44. What is the maximum height for the loaded pallet? Is there a maximum height for the stowed loader to fit on C130?**

There actually is, and this goes into the idea of the 463L system. You're limited to about 108 inches from floor to ceiling on a C-130. However, that is not the actual height you've got. There is approximately 6 inches you take off for the rail system and then you have less height on these sides, it ends up being closer to about 96 inches is about as high as you can be from the ground to top. That would probably be the answer to the maximum height for the stowed loader; no more than 96 inches.

**45. So is this system more targeted for usage at destination, since fully established bases normally have other options to perform this task?**

Yes and no, it'll predominantly be used at destination, however, a lot of the units do not have ready access to the equipment that they would utilize for these operations. Some operations will come up quickly and they must load the planes quickly, for whatever the case may be, and it might take them too long to source the more established means of loading be it personnel or not working, and having these loaders readily available to them would make that more feasible.

**46. Worst case, would it be feasible to dictate to the C-130 crew "ramp angle not to exceed 10 degrees" and they shim the ramp accordingly as part of SOP?**

Yes, that is definitely feasible. Nothing says we can't do that so that's definitely feasible. I'd caution you not to limit the ramp, not to limit the ramp angle too much. Try to limit how much you restrict the ramp angling away from the maximum ramp deployment angle because that could lead to other issues. But yes, restricting it slightly is completely okay.

**47. Is there a defined maximum height for the loaded pallet? You mentioned potentially lifting a second pallet to a height of 72"?**

Correct, there is a pallet stacker system out there that is beginning to be experimented on and seeing some fielding in certain environments and uses. It has a secondary pallet position on top that cannot be higher than 72 inches in height off the lower position. If you could lift that 463L pallet to that height to 72 inches, and load it into that position, that would be great, however, if it cannot do that completely acceptable, completely understandable. That's more of a nice to have, not a requirement.

**48. Would this unit ever be required to withstand airdrop? If it is one of the rear pallet positions it would be "in the way" of forward pallet egress.**

No, not at this time. Whatever goes on to the plane gets downloaded at its destination and gets left







there. A lot of the end users of that we're working with for this system are looking for total deployment packages, and this fits in that package. So, it would go with them to destination, Get downloaded and then left at site.

**49. Is there a maximum height for unstacked pallets or is that only limited by C130 ceiling clearance?**

The maximum height allowance on a C130 is 100 inches but crews prefer to keep the height under 96 inches.

