

Blue Force Technologies, Murray and Van Timmeren

[00:00:00] **Eric Lofgren:** Welcome to acquisition. Talk a podcast on the management technology and the political economy of weapons systems acquisition. I'm your host, Eric Lofgren You can find this podcast and more information, including links, commentary, and articles on acquisition. talk.com. Thanks for listening. .

[00:00:36] I'm speaking with Joseph Murray and Andrew van, Timmerman of blue force technologies and aerospace company that does everything from design to rapid prototyping and production. They are also developing military UAV capabilities in partnership with the air force. And that's what we're here to talk about today, Joe Andrew, thanks for joining me on acquisition, Todd.

[00:00:55] **Joseph Murray:** Thanks for having us. Thanks, Eric. Appreciate your time.

[00:00:58] **Eric Lofgren:** . So what are the air forces need in this adversary air role and what are you working on for them?

[00:01:04] **Andrew Van Timmeren:** Eric appreciate you in your listeners for taking some time to talk to us in order to talk about where we are and where we're going. We ultimately have to go back.

[00:01:12] And when it came to Vietnam, until relatively recently, we've been able to have our adversaries, our sparring partners, when we go out and fly, be at the level or greater than the level of the adversary that we'd expect to see. So we could put F sixteens or F fifteens, or maybe even F fours on the adversary side, they could even dumb down their systems and they could be an appropriate threat replicator.

[00:01:43] It's also important to understand why we have to have adversaries in the first place. If you think about a football team, say my Detroit lions, who I am an a sorrowful fan of, they cannot have a high school team go up against them because then they don't have the source sharpened. They aren't prepared to go every Sunday against the adversary that they would be out in the field against.

[00:02:07] That is essentially what we are doing right now as an operational air force. So for my background, former F twenty-two guy I spent 10 years flying the jet and we would routinely as a varsity NFL team, be sparring against a high school team, call it with T 30 eights or at Tyndall and Haldeman.

[00:02:27] They had F-4s. And sometimes we'd have other adversaries that are not up to par. And especially as we think about sec AF saying China, we need to build and bring sparring partners for our training that are threat relevant and capable to punish mistakes in the same way our adversaries would.

[00:02:46] The air force has recognized this problem. And they've tried to stop gap, at least for now in this called the CAFCAS or combat air forces, contract air services, six letter acronym, and ultimately they've allotted is 6.4 billion with a B billion dollar IDIQ that they are, that they have a number of companies against in awarded in order to provide adversary air services, because we don't have enough iron on our ramp in order to fulfill that sparring partner role indigenously.

[00:03:17] Ultimately, and this is not a hit at all. And the people that fly are the people that run those businesses, but those aircraft that they are providing are still at the high school level when we really need an NFL level adversary, because the only place these adversary air services companies can go again, this is no hit on the people at all is to the boneyard or to the retired jets the other air force has also don't want.

[00:03:39] And so what we are looking to do with our aircraft, we were calm. Fury is a high-performance purpose-built aircraft in it's going to do two things is going to be a great mum t [manned-unmanned teaming] sandbox aircraft, because we, our thesis is that if you really truly want to practice manned unmanned teaming with fighters in their realm, you have to perform like a fighter and you'd have to be out in their airspace with them every day.

[00:04:08] So how can we learn about mum t is actually in the well-regulated safe instrumented, airspace of our MOAs, restricted to warning areas right now. And we can learn a lot about the man unmanned teaming aspect through adversary air. And then the other thing that we're looking to do , through the development of Monte is use this aircraft in an adversary air role, which is going to do a number of things.

[00:04:29] Number one, because purpose built is going to look/ smell like a like that fifth generation or fourth plus generation aircraft that the adversaries have. It is also going to be cheaper and it's not going to put, wear and tear on our

frontline fighters. We know that the F 35 and the Raptor are somewhere north of 30, 50, 80 K an hour.

[00:04:50] And they might, be having some engine wear and tear issues. And so we're spending a lot of money in putting a lot of wear and tear on our frontline fighters to then get no training for my bros who are in the cockpit for this sortie. And so we can leverage current, no kidding off the shelf technology and package it in a purpose-built platform.

[00:05:10] We're going to get after a strategic capability of manned-unmanned teaming. Oh, by the way, happy by-product of that is realistic relevant training for my friends.

[00:05:18] **Eric Lofgren:** You brought up a fury, right? Is that the new name for red medium or what you had been calling red meat?

[00:05:24] **Andrew Van Timmeren:** Yes, it is. So our aircraft, it was called red medium because there are some others on the veering scale of size and performance.

[00:05:31] This is in the knee and the curve red medium that had been on our drawing board we are happy to call the aircraft fury. It is a Greek goddess who can punish mistakes and cause you to do dumb things, which is exactly what as an adversary air platform we're looking to do.

[00:05:48] **Eric Lofgren:** Joe, maybe you can you come in and give us like what are some of the specs for a fury? What is this aircraft look like? What is it going to do?

[00:05:55] **Joseph Murray:** . It's a 5,000 pound takeoff weight aircraft. about 28 feet long, 17 foot wingspan. Very similar in size to a T 38.

[00:06:04] basically can operate, up to 50,000 feet Mach 0.95 minus three plus nine G aircraft. . It's actually really focused on designing it in a way that we can maximize utility but build it very inexpensively. So we often talk about this as being a a business jet without a cabin.

[00:06:26] Most of the expense of any jet is to protect the humans that are in it. And so building something without the cabin is actually it's much, much less expensive. One of the other, I would say major kind of features of it is. It's built with almost exclusively commercially available aerospace hardware.

[00:06:43] So we are taking a commercial engine, which has 17 million hours of service out there. We've got all the other components are off the shelf, all highly manufacturable now. The only thing we're doing is we're wrapping it in a custom piece of carbon fiber to give us the performance and characteristics that we require for this application.

[00:07:03] It's also important to say that-- one of the other unique things as scar mentioned, the the. The generation fighters that go out and they use them right now to do adversary air. Those aircraft they fly for I dunno, up to 80,000, \$90,000 flight hour, really astoundingly huge numbers. This aircraft will be under \$4,000 a flight hour as a full up round --paid for, everything.

[00:07:29] So it's a dramatic difference in price, but it provides the same characteristics as the adversaries that we're trying to emulate. And we won't go into the details of what those are, but nonetheless, we can say that it gives us all of the necessary characteristics to give the F 30 fives and the F 20 twos a is a good one.

[00:07:50] **Eric Lofgren:** scar, you brought up that like \$6.4 billion ID IQ, as you're talking about some of these cost per flying hour numbers and 80 to 90, I, that's pretty high up there. People have been saying that 35 is coming down to 33, but 33 K you know, but we've been hearing lots of different numbers about that but \$4K per flying hour seems like a bargain.

[00:08:10] I was wondering, like, how do you think about selling these things to the government? Because it almost feels like you want to do adversary air, like asset service, almost like pay by, the flight hour of combat time that you're giving the pilots and use like a consumption-based solutions type model.

[00:08:27] Maybe that's still in the future for the air force, but like, how do you think about that kind of business model?

[00:08:32] **Andrew Van Timmeren:** Yeah, that's a really good question, Eric. We cannot begin to presume where the government wants to go. As far as a Gogo, GOCO or Coco model with these aircraft, we're just happy to produce them.

[00:08:45] And then we'll figure that out later, I think certainly in order to fulfill a gap that has been readily articulated via rand studies, internal air force studies, I saw some of those while I was still in uniform. This is a well-known need in the easiest way to get about it for the duty at the time was to contract it out. And for adversarial air services to continue that may still be the way. I think.

[00:09:11] The air force may also leverage these vehicles in a government owned government operated way. I can think of a number of reasons why they would want to do that. We have not had those conversations, and again, we can't presume to believe or to know what they're going to say or decide on. But I think there is a full range from Gogo to Coco and everywhere in between with the utilization of these vehicles.

[00:09:33] Do you have any topics?

[00:09:34] **Joseph Murray:** I would just say that, for the last, I don't know, probably two and a half months, we've been working with some of the folks in the air force on the cost analysis side, and they're doing a very deep dive look at all of the different elements of costs from operations maintenance, to procurement, to R and D all of the different elements that need to be put into place.

[00:09:52] I think the general consensus is that something in the range of go co with some vehicles becoming go where maybe there are classification or specific needs that need to be met would be probably from our standpoint probably the most optimal. The we've also had a lot of discussions with cap casts, contract holders, and there's a lot of interest by those vendors in these vehicles as well.

[00:10:19] We would imagine at some point in the future, they may be interested in buying these to supplement some of the legacy aircraft that they're flying on that contract now. So to parrot what scar was saying that the broad spectrum is viable.

[00:10:32] **Andrew Van Timmeren:** I think what's interesting as a service though, Eric is.

[00:10:35] If we think about it, a unique mission set that's getting increased discussion from the senior leaders is cruise missile, defense of the Homeland. I can tell you as a Raptor guy, again, 10 years in, I flew approximately zero pure cruise missile, defense flights. And yet that is an increasingly important thing that our senior leaders are talking about.

[00:10:56] We've heard General van Herc talk about it. We've heard general brown talk about it. We've heard many combat commandertalk about integrated air missile defense right now, how we simulate cruise missiles in live flight training is with Learjets Lear jets. Don't look to act, smell or very well replicate.

[00:11:16] What a LO cruise missile flying low and fast looks like. And so in order for us to provide realistic training this vehicle is going to fulfill a niche. It's just simply an unmet right now, which is pretty exciting.

[00:11:27] **Eric Lofgren:** you know, One thing that we've been hearing about a lot recently are these kinds of like unmanned, UAVs and there's a number of companies that are entering this space.

[00:11:36] So can you talk a little bit about, the competition of a Tribbles that we're seeing in the military, but also like how do you differentiate yourself from those guys?

[00:11:44] **Joseph Murray:** Sure. So I'll start and then I'm sure scar will want to chime in. So we really came to this market because as Scott alluded to, because of the requirements that we saw in cap casts and th this void that existed there when we started to formulate and consider what we would build in this

[00:12:03] space. As you can see red, medium, you would imagine there's a red high and there may be a red low as well. That's in fact true. But we were really looking at it's very effective price point, but to address the mission for unmanned adversary air.

[00:12:17] And so that mission requires more cycles a reasonable aircraft lifetime. So our aircraft is designed for 6,000 flight hours. That's not attritable purely from the standpoint of use it two or three or five times and then dispose of it. But the price point because of our design approach actually is at the low end of the range that the government's talking about for attritables.

[00:12:41] So we're a very high performance. We have similar performance to an F 16 up at 30,000 feet, but we are still a very low cost point. So I would say that's unlike anything from the other publicly known unmanned jets. Obviously you've seen the Kratos products you've seen what the Boeing folks are doing.

[00:13:03] Ours is a very different kind of performance point and it has a longer life and obviously the landing gear make it very cost-effective to get up and down as opposed to radio launch or some of the other approaches.

[00:13:15] **Andrew Van Timmeren:** Yeah, I would say when it comes to design point is especially if we want to get after some major lessons learned for man on man teaming, your aircraft has to be able to keep up with in maneuver like a fighter.

[00:13:27] And so we don't want to get, I put myself back in the cockpit. I really do not want to spend additional brain bytes worrying about this unmanned thing that's next to me that's not keeping up that can't turn with me that can't land quick, get gas and take off with me because at an ACE airfield, during a dynamic force employment generation this aircraft is built to not be the limiting factor for blue fighter operations.

[00:13:54] And that's how we're going to be able to facilitate man on man teaming. And that's how we're going to be able to facilitate a realistic training as an adversary platform.

[00:14:02] **Joseph Murray:** One other thing that differentiates us , it's actually a major element of it is. We have designed the aircraft to be completely open systems compliant.

[00:14:11] So our aircraft is effectively a flight computer, which is actually built on open systems hardware with a very application specific flight computer, because it's the map between the digital world and the physical world. And then we have an open systems, architecture, mission computing platform, and then we have a completely open payload bay.

[00:14:33] And our standard for open is that we can give a technical data package to another vendor and give them the nose of the aircraft. And they can integrate a capability into the nose without ever having to come back to blue force. So we envision making one aircraft and maybe three or four noses. And those, the nose that aircraft may go out and be integrated with lots of different capable.

[00:14:58] That because of classification or because of proprietary nature, we may never have access to it, but that is our standard for open. So we described that as a software defined aircraft, and we think that's a, it's a very significant differentiator between what in a lot of other aircraft in this space.

[00:15:17] **Eric Lofgren:** Well,

[00:15:17] It sounds like you're talking to the government's language at least recently that those are the exact types of things that they want to see. When you talk about this open architecture that you'll have, , is it almost open sourced for anybody to come in?

[00:15:30] Or how do, how does another company get engaged or would that happen through the government? The government can take ownership and then just contract out to whoever to upgrade the thing or put a new payload on.

[00:15:40] **Joseph Murray:** So our initial plan is that as I said, the flight computer will be carefully managed because.

[00:15:45] How we're going to avoid putting the aircraft in the dirt. But the mission computing space will be an open architecture framework and we anticipate we will provide a basic capability for the first four aircraft as those proceed forward. But it's designed to host the capability that they're developing in sky board.

[00:16:04] And there are other autonomy programs that we are aware of that are developing quite sophisticated. What I would describe as true autonomy capabilities. And those systems will be, it will be capable of being integrated into our mission computer and that, and obviously that's got most of that stuff is government owned.

[00:16:23] Although many of the major primes are involved in the development. It's all government software systems. So we would anticipate the, that being brought and integrated into our system potentially by those primes or potentially in conjunction with with the government directly.

[00:16:37] **Andrew Van Timmeren:** I'd be curious to hear your take on this because what's interesting about the attritable space is you may actually have a reasonably inexpensive aircraft with an outrageously expensive sensor, which then could drive some of the attritable discussions in a different way. Based on your you've talked to a wide variance of people where do you see this going?

[00:16:59] **Eric Lofgren:** It seems right that a lot more of this will be software defined, right? And that a lot of the it, the sensors, the payloads, all that kind of stuff, the computing that's going to communications, that's going to be driving more and more of the costs. Actually, when I was looking. In terms of the cost analysis, looking from the F four through the F 35 and just like at the work breakdown structures, cause we had cost data reports all the way back to them.

[00:17:20] And you can see the growth in avionics. And that was one of the only kind of standard parts is like airframe and avionics. That's all I had back then. You can see the API kind of growing. So it does make sense, I wanted to bring it back to you guys because it was interesting what you're saying.

[00:17:34] You're not like going full stack. It seems like. It's almost okay, we're not going to build the best AI algorithm for flight, but we'll be able to accept any of those best AI algorithms. And it seems like that's what the air force is looking for. Especially with Skyborg, they have their autonomy core system.

[00:17:52] And you're also entering the mix. You've got a contract. I don't know where that's at, but can you also talk a little bit about. The adversary air kind of blend into this also idea of having a loyal wing man, man, unmanned teaming and sky board, where is that all going?

[00:18:08] **Joseph Murray:** So really that it comes originally from when we, as a company pivoted to adversary air.

[00:18:16] So we decided some years ago that we needed to instead of just being a tier one provider to the Boeings and to saffron and other companies in the aerospace industry, we decided that as our muscle and capability grew, we wanted to be able to transition to our own products. So from that standpoint, we really looked for opportunities and that's, what's the Genesis of the SBIR. So when sky board came up for bid we were very pleasantly surprised to see the things that we had done in our phase one and phase two SBR fell directly within the scope of that because it gives the government an opportunity to leverage the government's SVIR data rights and contracting rights to get to us, to accelerate these programs.

[00:19:02] So it was a very, it was a good alignment. And when you go back to the software side, because now there's such a focus in skyborg and other programs on the development of these advanced algorithms and software systems, it was natural that we would create an open environment in which we can host all of that capability.

[00:19:23] I think it exactly dovetails with the direction the government is going and they desire to go. And I think we will be the first kind of software defined aircraft out there. That's available.

[00:19:33] **Eric Lofgren:** One of these things that seems to happen with the kind of government reference architecture is the kind of distinction on the intellectual property. So I was wondering, we're talking about the modular open systems and then also, being able to integrate government kind of reference architectures, also being able to potentially do GOCO, right?

[00:19:53] The government owned government operated kind of maintenance and facilities. Can you just describe, like also, how are you thinking about your

business model and what are your needs for intellectual property with respect to what you guys are doing in house relative to what you think the air force might need?

[00:20:08] **Joseph Murray:** That's an interesting question. As I said earlier, I've been around the DOD for. More than 26 years now working primarily at small business I've had the privilege of growing some smaller businesses into bigger businesses and selling them to major primes. A couple of occasions, I've always found that my home is in small business building these businesses, but one of the things that we did really starting all the way back in the late nineties it's an interesting time late nineties, because it was the period when the submarine fleet had just completed all of the R and D associated with the Seawolf platform.

[00:20:42] The early, really the early nineties, there was a famous spy case. The Walker spy case where secrets were given to the Soviet union that really were a devastating blow to our submarine community. At the same time the finish and Toshiba and finish engineering companies sold five-axis machining technology to the Soviet union in violation of every international law.

[00:21:04] And so you had this kind of conclusions of a big decline in the R and D budget for submarine fleet , coupled with all of these other events. And so the submarine community quickly found that they didn't have any money and they had their biggest, challenge in really 30 or 40 years. At that time, there were a handful of leaders within the new.

[00:21:25] Acquisition SES and GS 15 kind of program leads and program managers and acquisition folks. And they pivoted to small business to fill that gap. And that was the beginning of programs, including ARCI and the APS and the tech insertions in submarine communities, which all became very successful ways of introducing advanced technologies very quickly.

[00:21:48] So that's where I grew up was in those communities, developing systems within that framework. And they leveraged small business innovation research SBIR and STTR programs. In fact the foundation of a lot of those companies were those data rights and intellectual property. So I would argue that.

[00:22:05] SBIR which we always referred to as the grand bargain. But as a small business, you get a pittance of money to turn over all of your best, most novel, most disruptive ideas to the government. But the real value is not the 50 K or 150 K that you get for phase one. And, back in the day it was 500,000 or maybe \$750,000 for phase two.

[00:22:29] The real value is that they give you preference in contracting, in perpetuity for anything that derives from this, the core technology that you developed. And they also give you they give you sole source rights and the Navy took full advantage of that back in the day. And we're starting to see that the air force is starting to leverage those tools.

[00:22:53] They're getting a lot of ideas and a lot of innovation through app works and some of these open topic calls and that's where we started with this program. And they're transitioning some of those technologies and they have programs like stratfi as well, but those are initiatives to bring in some of these small disruptive technologies.

[00:23:11] And it's really the best mechanism as a small business is to invoke your SBIR data rights and protect your SBIR data rights because those data rights can actually be sold with your company later in the future. As an assets. Large companies are not prohibited from participating in phase three.

[00:23:30] So it, that is a primary mechanism. The other thing that blue force does from a intellectual property perspective is we protect a lot of things through trade secrets. A lot of our intellectual property is in our design and engineering processes and in our manufacturing process, And we've invested a lot of our own money over the years into that domain which is a necessary thing in the commercial world for us to be able to even compete.

[00:23:57] We have to be faster. We have to be better. We have to be more cost-effective to compete in, in that domain in aerospace.

[00:24:04] **Eric Lofgren:** It's interesting that you say that cause that's one of the things that it seems like Elon Musk also says, right? It's I'll just out innovate you. I have the better process, the better culture, the better, software defined processes to help me through this and I'm willing to compete.

[00:24:17] It's not really necessarily in the technical data package itself. It's in all the organizational capital that you have. It's interesting what you were saying though, you brought up HRCI. And I was actually just reading an article about that today from Christine Fox. So it was .

[00:24:32] , luckily enough to learn about this a little bit. What was it interesting there was that the Navy took that and then they broke apart the lead systems integrator and they allocated that down. And it seems like, what you're saying is, for this vehicle, at least this is almost like a peer defense play.

[00:24:47] You almost play the kind of the system that they have, the SBIR rights. And then of course you'll potentially, be one element, like the airframe is potentially one of those subsystems and then they can have the mission system, they can have the autonomy system and integrate around that kind of stuff.

[00:25:04] But you will be able to leverage the sole source and just scale up and just have the best product. Is that you're thinking about how this might.

[00:25:11] **Joseph Murray:** Yeah. I was part of HRCI early on. . So I worked for a company called digital system resources that was ultimately sold to general dynamics and really the key there early, this was in the very early days of cots hardware, living in combat systems.

[00:25:26] But what we found very early on was that portable modular software systems. Now we call it open systems, but back then we called it portable modular software systems. Coupled with cots, hardware offered an alternative approach to the legacy models that the major primes were we're introducing. Over the years what happened in HRCI is it part of HRCI is the combat system and the tactical control and those different elements. They broke those apart because other businesses developed a sufficient level of capability. , in the industrial base to allow them to do those major functional elements, they couldn't have done an entire busy to combat system, but they could do the tactical control system, or they could do the sonar system where they might be able to do one of the other elements.

[00:26:12] And if you had this federated system that was loosely coupled with good interfaces, you could actually acquire them differently. And that was a major advantage. However, when you move forward to other organizations that I've been involved with we found over and over again that creating a product that had this this home for innovative software solutions, software and firmware, there's a mix there was really the most.

[00:26:40] Powerful capability. So we've at blue force. We've really adopted that model directly. We know there are many innovative, big companies and small companies were in discussions with some of the biggest primes that you could name. And they have some very innovative and clever and insightful products to host in our aircraft.

[00:27:03] And we think it would be hubris for us to imagine that only we could provide the novel solutions inside of our product. Our capability is to rapidly build very high quality aircraft, integrate them and have a home for these

advanced software and sensor systems. And so although many companies might not feel comfortable with that.

[00:27:25] We feel very comfortable with it because we believed that we can win with speed and actually developing the products themselves.

[00:27:30] **Eric Lofgren:** Very cool. I just want to ask one more question here about fury now the old red medium it was touted as being low observability and I'm sure you're going to have lots of trade secrets on exactly what that means for your aircraft, but is low observability becoming more of a commodity now?

[00:27:49] Like, Is that something more achievable by firms? Cause it seemed . Lockheed and Northrop pattern it, like the big guys were able to do it. Is it something that's more in grasp of commercial technology and from smaller.

[00:28:01] **Andrew Van Timmeren:** So I'll say from a low observable operator perspective, the way that you can achieve low observable characteristics from radar cross-section perspective would be through a shape and materials.

[00:28:14] And we'll just say, is that we're leveraging both of those in order to be the. In most accurate threat replicator we can against the pacing threat that everybody talks about in the air domain. And that's about all, I'm going to say about that, but what, when it comes to the materials and whatnot, in order to facilitate that in a joke and probably talk way more extensively, but what used to be maybe in the sixties, seventies and eighties, as far as the materials that you'd have to buy, as far as tangible things to put on your aircraft , to help with the low observable aspects of it, those have actually become more readily available.

[00:28:50] And the commoditization of those materials, a hundred percent Eric you're right. But then you still have to apply them in an inappropriate way to achieve your overall objective. And that's what we're looking to do with our, for your vehicle.

[00:29:02] **Joseph Murray:** And then there's no doubt that building Aircraft that have we'll say the stealth performance of an F 22 or an F 35.

[00:29:10] That is a different class of vehicle. And what we're doing in this is we're providing the right characteristics in the key domains, but using commodity materials and good engineering to achieve that. And I think that's probably about as far as we could go on that topic.

[00:29:28] **Eric Lofgren:** Cool. We talked a little bit about this, but I want to bring up a quote from one of your friends.

[00:29:33] And co-founder, if complexity is the disease, then high costs, low production rates, low readiness, and low adaptability are the symptoms. So how do you guys think about implementing that in your develop.

[00:29:46] **Joseph Murray:** Yeah, that's a, it's a, it's an interesting comment. It's actually interesting because looking back at it, I had forgotten all about that quote.

[00:29:55] So looking back and trying to figure out, oh, where'd that come from? It's really ingrained in our culture. Blue force started as a small business of two people and they got their AAS 9,100 certification, because the culture of the company was to be based on quality processes and quality systems.

[00:30:16] And within that culture, you build a kind of a mindset about how you design and how you attack the development of products. Now, oftentimes when we were a younger company were the first, the smallest Nadcap qualified company ever. We had achieved a lot of Boeing Certifications, but when you're young company, you're stuck in the realm of doing a kind of build to print or some rapid development.

[00:30:41] So what we did when we were pivoting to developing our own products, red, medium, being the first theory now, fury. We really focused on how do you do this to keep it as simple as possible and as manufacturable as possible, because those are the driving factors that get into the costs. So the air frame itself is a highly integrated airframe.

[00:31:06] We were actually speaking with some folks in the air force and they were saying that AFRL had done some research and found that with composite aircraft you can achieve about a 90% reduction in part count on an aircraft. And that's exactly the domain where we're going. So we really focused on.

[00:31:22] Keeping things simple, but driving to the objective performance for that system. So we're not going to build all things for all people, and we're not going to build the joint UAV. This is a purpose-built UAV that's intended to be build tens or hundreds of, but never anticipate kind of building thousands or tens of thousands of these.

[00:31:45] It's really you're towards keeping it simple. And with a narrow set of requirements to achieve that scar,

[00:31:52] **Andrew Van Timmeren:** I was the one top off I'll say is. Based off of the utilization of nearly everything on the aircraft is commercial off the shelf. The only thing that truly is custom on the aircraft is the outer mold line, which is built for this mission set again, which is we're just trying to get after the DoD desired focus area of man unmanned teaming.

[00:32:13] And you go where's the best place to do that. That's adversary air. , it,

[00:32:16] **Eric Lofgren:** you know,

[00:32:16] **Andrew Van Timmeren:** it's interesting too, to Joe's point about, we're not the intendance aircraft and this kind of brings Eric back to the attractable discussion as well. The intent of the thing is we don't want to service life, extend these things forever.

[00:32:29] Unlike the B-52, which will fly over its own linebacker to a hundred year anniversary, this aircraft is not going to do that. And that is okay. Because of inexpensive manufacturer, as well as just utilizing stuff that's already being built on the shelf. But then through the lessons learned of this aircraft, that doesn't mean blue force, as we've alluded to already have other plans on the drawing board for future spirals, because maybe the greatest thing you can do again from an operator perspective in manned-unmanned teaming is build that trust.

[00:33:05] And there's been a lot of literature out there about how you build trust with autonomous systems, a number of different ways. You can do that. The demonstration of capability, intent, detectability, et cetera. When we can build trust with our aircraft day in and day out flying with my bros. I think we will find that future use cases in spiral development, potentially using the exact same core chassis.

[00:33:30] So to say this airplane will just naturally come as we have those discussions.

[00:33:34] **Eric Lofgren:** . Are you guys finding that it will be easy to get some flying hours with the air force or, how does that actually work? It, could you get like a CRADA where you just do it for no cost or how do you transition to that?

[00:33:46] **Joseph Murray:** We're in discussions with the air force on that exact approach. We will operate under MFR, a military flight release, the initial aircraft will. And so we will be operating inside of a range and we will be

operating in conjunction with the air force. Our colleagues at AFRL, our queue to ensure that we're safe to operate, but that will all be part of the flight test program.

[00:34:09] We'll all be part of the effort to move this forward, the production effort and the flight test program.

[00:34:15] **Eric Lofgren:** You're expecting to have first flight in 23. Was that right?

[00:34:19] **Joseph Murray:** Yeah. Everything is budget constraints. If money was not an issue, if budget was not an issue, we would have already had the first airframe done.

[00:34:27] In our commercial business, it's not. Unreasonable for us to build an aircraft in 10 months or 13 months even a quite sophisticated aircraft. We just have to, because of the nature of the government budgets and the funding available and the FYDP and POM and all the other thousand things that, you know very well we have to just be a, we have to work within our swim lane and the budget allocation and the timeline.

[00:34:54] Our plan, if budget was not a constraint would have been, we would have flown the aircraft within 21 months of a contract award. , and 12 months of that 21 to one is actually long lead materials, procurement. A big chunk of it is just waiting for hardware to show up. But we'll see, we have to wait and see how funding aligned.

[00:35:15] We've had incredible support from air combat command. We've got incredible support from AFRL. Particularly we've had great support from AFRL RQ and Dr. Greg's organization. So we hope that things will accelerate along as we proceed in the contracting process.

[00:35:33] **Andrew Van Timmeren:** And the one thing I'll add to what Joe mentioned in this is maybe a different way to take on flying hours, Eric is that we actually have a fully flying digital model based on, as you alluded to the amazing partnership that blue force has had over the last year and some change with AFRL. We have utilized.

[00:35:52] Literally millions of hours of supercomputer time simultaneously to build out a fully fleshed out six degree freedom arrow model that is flying right now. And so when it comes to machine learning training, when it comes to development of use cases, when it comes to modeling and SIM with an analysis

with A, nine or other organizations that want to see our aircraft fly today and potentially layer sensors in the digital world, which will then feed back through the digital thread to our design, it is all integrated because as baked into the cake, it has been through the partnership.

[00:36:31] They have IRL. So if there are government organizations that want our model it's flying right now where we have hours being put on it as we speak. And that's maybe a different way to think about it, but it's pretty cool.

[00:36:41] **Joseph Murray:** , we're actually in discussions right now on an interface to integrate with some of the autonomy systems that the government is developing.

[00:36:48] And we will take our model, which actually is our flight computer. We will containerize it and they can run multiple instantiations and integrate directly with it and fly their LVC type of training environment using their autonomy with our aircraft. As scar said, the AFRL was able to get us over 3 million hours of super compute time.

[00:37:12] We ran 10,000 CFD cases that within our digital design flow, all of that data comes out and goes into our flight sciences group, which uses that to define the performance of the aircraft. So we can develop the six off model,

[00:37:26] **Andrew Van Timmeren:** actually the real end game here, Eric, is that. When we do our first flight test, the brain of the airplane will already have tens of thousands of hours on it.

[00:37:35] It really is the first time the physical aircraft will fly. It's not the first time that as much as we can make it, make the simulated environment as real as possible. It's not going to be the first time that the aircraft does a full takeoff to touchdown.

[00:37:47] **Eric Lofgren:** There's a lot of interesting things there especially on that digital workflow.

[00:37:50] And it seems like that really helped you collaborate with the government and move the process along. But it also seems as you were talking about you could almost have the, you could have had the thing flying by now if money wasn't an issue. I wonder if you could just comment real quick on what was the decision to go after non-dilutive funding?

[00:38:08] You were saying like we have great partners in the air force, but they're constrained in their timelines. What they can do. And in terms of the Palm and getting money, we lined up and all that. So what was that kind of trade off between okay, I'll take a little bit longer to get there, but we'll get non-dilutive kind of revenue as opposed to going out and, either getting a loan, getting venture capital, getting something else like that.

[00:38:28] **Joseph Murray:** We've explored every single option I can assure you. We've talked to venture capitalists, we've talked to private equity. We've talked to virtually everybody And it's sometimes as we were going through the process AF works, we were early, as Africa was really developing a lot of muscle.

[00:38:45] So we had to figure out what their expectations were. So we actually engaged with private equity groups about bringing funding in and it all depended on so many different factors. I will say that we've had the phase one and the phase two SVIR. Blue force the executive management team of blue force.

[00:39:03] We collectively have decided to invest profits of our business into the development of this. So we have I know we have about 15% more money invested in this than the government does at this point. So we've invested a lot of our resources, our profits into this. **It's difficult.**

[00:39:24] **To find external investors that want to invest in a product that will largely be used for a relatively modest market. There's the potential for red and medium fury to, to build, let's say a hundred to 500 of those aircraft and then go on to the next aircraft. Or maybe as those are in production, we would transition to the next aircraft and design for example, red high it's another design that we have on the table.**

[00:39:54] But it takes a lot of resources to do that. And so we, you need commitments on the part of the government to justify it and **you hate to go out and dilute yourself and give away your entire company and only find out that the government's not going to get behind** it. So there is a level of patience you have to wait until there is a suitable level of support within the DOD or within the, in this case, within the air force.

[00:40:19] And we were able to get that support along the way, I think excellent support along the way.

[00:40:25] **Eric Lofgren:** let's step back a little bit, actually from even that question and just talk about like the idea to enter the government market at all, because it seems like you guys started out in roughly 2011 and you were supplying a lot of aerospace companies, but not necessarily the government itself.

[00:40:42] Now you're starting to do business direct with the government. So can you talk a little bit about that choice to make the dive?

[00:40:48] **Joseph Murray:** Yeah so Scott is the founder. Scott Bledso is the founder of blue force. He founded the company in late 10, early 11. I was working at another company.

[00:40:56] I was one of the founders of another company at the time, and we got to know each other because he actually built a radar for us many years ago. Scott, as I said they built up and became a S 9,100 and Nadcap certified very early as a business. So they did that to establish their culture.

[00:41:11] They built a business that was ideally suited to take on relatively complex design build or build to print, product for a range of companies. For example the H 47 helicopter blue force did and still does build a couple of major composite structures , on those aircraft.

[00:41:33] And they've delivered a one part, I think a 350 ship sets. And another part is maybe up to 10 or 15. It's a newer part that just transitioned to composites. So as you're building up that business space you have very limited ability to control your own future as the tier one provider. About four and a half years ago, Scott and I decided that we really needed to look at, transitioning to our own products.

[00:41:59] Something that we could control ourselves and sell directly to our customers without being gated by the major primes. And so about that time, about four years ago was when the class of aircraft was really beginning to be talked about. There were some competitions we looked at a penetrating ISR vehicle, and then ultimately we decided to transition over to the unmanned adversary air because we felt it was an area that there nobody was considering it.

[00:42:28] Nobody was looking at it. In fact, the first time that we went to ACC to give a presentation there were fighter pilots sitting in the room, looking at us like, do you want to sell us unmanned jets to do our job? In fact, scar was one of those people sitting in the room. So you know, it was .

[00:42:44] An area that there was no competition. There was opportunity for a lot of innovation and novelty. And so we felt like we could invest our time in that. And that's why we spent our own money that early designing the vehicle and supplementing the funds that we received from the government was so we could accelerate and move ahead.

[00:43:02] But to transition out of that tier one domain and into a product provider, it was a deliberate decision that we made as a strategic objective of the company. And we, because of my experience in SBAR, we decided that a component of that we're going to be SBIR to use those strong SBIR data rights that are part of the regulation.

[00:43:28] **Eric Lofgren:** So you mentioned that you were actually working on the H 47 and you're doing stuff for, government like defense programs, but at a lower tier. what kinds of business systems did you have to do or what kind of regulations did you encounter at that level? First? What do you now having to invest in, in order to get to that prime level?

[00:43:47] **Joseph Murray:** It's interesting because as a supplier to many of the major primes in particular Boeing on the H- 47 we had to have the proper accounting systems, the proper inventory control, , all of the things that are required to operate as a DOD prime, all of those. Infrastructure things were built up in, in place.

[00:44:07] All of the financial management, I would say the only area that we had never really had our toes in the water was on the security front. So once we transitioned to that prime role and that just happens to be because of how we how we entered into the market. But once we entered into that prime role and , you get a DD 2 54, and now you do need to work with DCS to get facility clearances and to manage those aspects of the program.

[00:44:34] So that was the only what I would describe as a business system or capability that we were lacking to transition to a prime contractor. We had already had all of the DCAA DCMA systems qualified systems in place to be able to support the things that they require.

[00:44:50] **Eric Lofgren:** And was there any kind of like investment, like major investment from you guys on, on that front?

[00:44:56] Or did you actually find it like this is not a huge cost and it's something that we know that we're going to have to do anyway. So there it is. Yeah. Or was it actually it felt like a barrier?

[00:45:06] **Joseph Murray:** Security is a barrier. It's very, it takes a lot of time. It's not a barrier necessarily because of cost as much as it just takes a lot of time to get through the processes and to become qualified.

[00:45:18] So that's one aspect. The rest of the systems, as I said, were in place. I would say that blue force in general, we invest a lot of money in our business systems like our digital engineering workflow and our advanced rapid prototyping system, but we didn't do that. So we could be a prime. We did that.

[00:45:37] So we could be a very effective commercial player in that market space. We build a lot of one-off aircraft for a lot of different companies. So we had to be very cost-effective and produce a very high quality product. So those systems were put in place at a, at an exceptional. It required a lot of capital investment on the part of the company to build some of the some of the technologies that we have that are very unique.

[00:46:01] I would argue that there are no other companies in the world that can do some of the things that we do in our ARP system and our rapid prototyping system.

[00:46:08] **Eric Lofgren:** I mean, that seems pretty important, we often hear about the machines that make the machines, and that's almost the more important thing than the actual product that you're putting out. Can you talk a little bit about that digital workflow that you have from end to end? Can you bring that out? Make it real for me?

[00:46:23] **Joseph Murray:** From concept generation all the way through tooling and product is a completely digital process.

[00:46:32] So we have concept generation we do all of our digital OML and the development of the aircraft and the structure of the aircraft, all of the modeling and simulation associated with the aircraft, all of the finite element models for loads and flutter and all of those types of techniques. In addition to all of the computational fluid dynamics for internal and external flow we do that.

[00:46:56] I will say that it's very beneficial to have a relationship with the government from that standpoint. The CFD [computational fluid dynamics] as Scar alluded to, we used 3 million hours of supercomputer time last year at AFRL, which would be very prohibitive for a small business to go out and buy that number of hours.

[00:47:12] But we use there. And then all of those data products integrate back into our flight sciences group, where they take the data products that have all of those modeling and simulation systems. And they use that to characterize and validate the aircraft design and performance. And then all of that goes into ultimately a lot of development.

[00:47:32] But equally as important is that our digital workflow is directly coupled to our advanced rapid prototyping system. And what we do is we can build tools directly from our digital models. We cut soft tooling. We scan our soft tooling digitally with laser scanners. We feed that back into our digital workflow to validate all of the surfaces against the actual models.

[00:47:59] And then we build the parts on those soft tools. And on our soft tools, we can build between five and 10 parts depends on the sophistication, but generally five and 10 to 10 parts. And those parts are then validated again, they're scanned and validated into the digital workflow. All of our plied cutting is done directly from the CAD.

[00:48:20] We've laid flat out of our CAD and it goes into our apply cutter and it cuts all of that automatically. And all of our labor projections for preregs come out of the same CAD and it all goes back. So we have this entire design simulation analysis and manufacturing system that is very efficient and coupled.

[00:48:40] And it's different than what a lot of people are saying. The digital Trinity, for example, when they talk about a digital workflow in those, in that context, they're often talking about a system analysis systems, engineering, markup, languages that were controlled requirements. I think that's a different approach.

[00:48:58] We really focus on the development of aerospace products in transitioning very rapidly. And I should also say that once we build prototype aircraft on soft tooling all of our digital artifacts and all of the data products that we develop including all of our work instructions, which are digitally stored with all of our our data products, all of that can directly transition to a hard tooling system.

[00:49:23] So we can transition directly into a more rapid production of the vehicle.

[00:49:28] **Eric Lofgren:** And the digital Trinity, can you bring that out a little bit more? That was that the kind of Roper idea of the create plus two open systems plus.

[00:49:37] **Joseph Murray:** Yeah. Yeah. I think that, at a high level, like I concur with what they're saying, the open systems coupled with the digital world.

[00:49:46] I think that's perfectly correct. I think it's about how you implement and how you employ that in the development of the system. You can take it overboard and becomes stifled by the overuse and oversubscription to some parts of it. I think that they're incredible value and we align with that very well.

[00:50:08] But I would say that our system is based upon our need to survive in a very competitive environment. We didn't develop it because the DOD wants you to use open systems. So they want you to use a digital workflow where they want you to use, a different open hardware platforms. We did it because it was the most expeditious and cost effective thing to allow us to be competitive in a commercial marketplace.

[00:50:35] And it just happens that those sets of tools and capabilities we developed as a business have direct application. And our view is that the DOD is starting to look very carefully at that and recognizing the value and that smaller businesses can participate in that industrial.

[00:50:52] **Eric Lofgren:** , it seems like you were actually aligned a little bit with it because you said you did have the open systems architecture. So the government would be able to plug and play some things. You have an end-to-end workflow that's potentially a lot more advanced or gives you guys a competitive advantage.

[00:51:09] And then you also said that you're going to go containerize the flight system, is it, is that going to be in like, platform one in their iron bank and now you're actually potentially meshing with quote unquote, own the tech stack for the government.

[00:51:23] **Joseph Murray:** Yeah. We have not talked with with anybody outside of a smaller group. We're actually in discussions with folks at AFRL who are interested in using our six off model for some of their analysis and integrating with app SIM and other things, and some major primes who are interested in coupling their autonomous mission system software in with our six off model, because a scar alluded to earlier, our aircraft is a different performance point than a lot of these other aircraft.

[00:51:53] And a lot of these other unmanned aircraft that are out there are controlled by companies that don't have a lot of incentive to be open. So we

have a lot of incentives to be open because we desire collaboration and working with, and we're a smaller business. We don't have a completely vertically integrated organization.

[00:52:10] We don't have 150 software engineers on the bench waiting to jump on and integrate an aircraft for us. We don't have some of those things that a major prime would have. So we want to use open as a mechanism to counter the traditional kind of stove-piped and closed system development models.

[00:52:30] **Eric Lofgren:** . So I want to talk a little bit about how you guys are scaling up here. You mentioned that you did a silver phase one and a phase two, and I hear you're in the works for an AFWERX stratfi award potentially which is that bridging, and we've talked a little bit about that on the podcast, but can you just talk about , how was that process of entering with AFWERX and how are you trying to lay the foundations for a program of record or recurring revenue out of this?

[00:52:57] **Joseph Murray:** Yeah, so that's, it's an interesting topic. As I said, we've, we invested a lot of money, came up with the concept and we submitted a proposal to the open topic. . And we won, I think it was a \$50,000. It was the \$50,000 opportunity to spend \$250,000.

[00:53:14] And so we were fortunate, we were already advancing our aircraft design on our own nickel. And we went, we spent a lot of time at ACC talking with anybody who would take a meeting with us to talk to us about it. We went to 53rd and we went to Nellis. And we engage with people and really got their feedback to formulate the requirements and move us forward to the phase two.

[00:53:38] , we received endorsements from some senior folks at ACC in the end of our phase one to get to phase two, as well as from folks at AFRL. We received the phase two and the phase two it was a 1.7 5 million phase two contract. And it was AFRL RQ that really contributed to that effort as well as a really excellent endorsement from air combat command.

[00:54:04] And then we were able to very rapidly move through the phase two. We went from the conceptual design review to a to a PDR . And then we finished up the program with an iron bird demonstration that had the full six dogs running and actuators everything in the lab. So from us winning a phase one AFWERX open topic SBIR to us winning a skyborg IDIQ contract award, which is a phase three SBIR by definition.

[00:54:36] It was 14 months. And so I think that the air force should, stand up and high five because afterwards demonstrated that they could very quickly 14 months go from. A novel disruptive concept to having a contract award in 14 months, that's the, one of the quickest transitions. I think I've ever seen.

[00:54:56] It's a, it was actually quite remarkable in it. And for, there have been hiccups along the way with different elements of figuring out contracting and different things that happen in the government. But I think overall efforts did an outstanding job of presenting opportunities to small business.

[00:55:10] **Eric Lofgren:** And what advice would you give another firm trying to enter the process?

[00:55:14] **Joseph Murray:** I would say persistence. Lots of people have good ideas. If you're fortunate enough to win a phase one go to the customers, go to the end users and listen. They often are willing to tell you these are our pain points. These are issues that we're having. This is the trouble.

[00:55:30] That can help to shape your novelty and your innovation. So if you're disruptive enough, it's very difficult to say no. So you have to be persistent. I think that thus far we've been fortunate in that we have been a very disruptive offering. There was a huge problem. There's a \$6.4 billion contract.

[00:55:52] That's not really giving them the training they want. The other alternative is to fly our own F 20 twos and F 30 fives in that role. And that's extraordinarily expensive and it doesn't give our pilots the training that they need. It doesn't count as training. So there happened to be this gap and there happened to be leadership in both the end user and the customer side that were willing to engage and talk about it.

[00:56:15] And so the key, I would say for another small businesses listen carefully and be persistent

[00:56:21] **Eric Lofgren:** And how about that next transition? You said that, okay. You got the, it took 14 months to get that Skyborg ID IQ, but that's still a competitive process and to get the program of record or whatever it is, to get substantial orders out of that, what's your thought?

[00:56:37] Is it just we just have to execute on what we're doing now and the rest will fall into place. Have you laid the foundation you feel like, or what are those next steps to, bridging the quote unquote valley of death?

[00:56:48] **Joseph Murray:** Yeah. So the valley death it's hard, right? Yeah.

[00:56:51] I think any small business needs to be prepared for funding gaps when you're working with the government, it's just, it's a difficult contracting process. I think we've been very fortunate because of the people we're working with on the government side. We've had funding gaps. We had a, I think an eight or nine month funding gap between phase one and phase two.

[00:57:09] And we had we're in a funding gap right now. We're still proceeding with our development again on our own nickel, but we, we know that there's, we know that something's coming we're working on the process. And. Our focus is that on this next contract, we will build aircraft and we'll get them out there and we'll test we'll test them on the ranges and we'll demonstrate all of the key performance parameters and capabilities that we need to demonstrate.

[00:57:34] And we feel that will lead forward to a follow on opportunity as part of a budgeted program to provide this capability. If we're successful, if we fail, of course, that opportunity will slip away, but we feel that we're in a very strong position to, to execute that and move forward.

[00:57:52] **Eric Lofgren:** Let's bring it up to acquisition at a higher level. If you were czar for a day or control of all of acquisition and you could make any change to DOD acquisition, what would you,

[00:58:02] well,

[00:58:02] **Joseph Murray:** this is funny because I've literally been talking about this for years and years. I think that the biggest challenge for the DOD on the whole, is that it's very difficult to plan and to budget for innovation and disruption and novelty.

[00:58:23] It's novel and it's disruptive and it's innovative because it was not in the plan. Nobody anticipated it being there. And when you go to the POM issue papers, and then you get into the FYDP, and it really it's best case three or four years out before any significant resources can be had.

[00:58:43] And if you look at what Congress has done, they've done CTDs and eight oh fours and RIFs and follow on phase twos and sequential phase twos. And, the list goes on and on of different ways to mitigate this this kind of valley of death issue. So if I were czar for a day. I would actually take a direct look at the DOD instructions on independent research and development.

[00:59:06] And I would take a direct look at the SBAs regulation on SBIR and STTR technology. And the SBA regulation says that all FFRDCS, major prime contractors, GOGO, GOCO, and COCO's. And the government itself is required to show preference and to look at SBR technology and to transition that technology to the extent possible.

[00:59:31] That's what the SBI our regulation says. And when you look at DOD instruction, 3204. Signed by now secretary of the air force Kendall many years ago it gives you a prescribed recipe for what are the appropriate uses of independent research and development. So I R and D independent research and development is reimbursed in a company's GNA by the government.

[00:59:59] So for the last four years, by way of example Lockheed Martin has been reimbursed by the government over \$1.3 billion per year, every year in IRND D funding. And so that means that the government is paid Lockheed Martin, \$1.3 billion a year to independently use these funds to do research and development.

[01:00:25] That should benefit the government. So if I were czar for a day, what I would do is I would make a rule that is compatible with the SBAs regulation and it's compatible with the DOD instruction that says all companies that are reimbursed more than \$10 million a year in independent research and development.

[01:00:45] Which really means the major primes, smaller companies just simply can't afford to do that in the rates. So any company that's reimbursed by have at least \$10 million, I would require that 50% of all of their I R and B funding that is reimbursed by the government above \$10 million above a threshold would be used to fund S B I R phase three and S TTR phase three transitions from independent companies. So it would require the no affiliation between the prime contractor and the company, because that's exactly compatible with the SBAs rule for these prime contractors to use these companies.

[01:01:21] The valley of death is that there's no funding resource available. So a simple rule like this. Requires the prime contractors to engage with the businesses that are developing these technologies under SBIR and these institutions under SBIR and STTR, and it's completely compatible with the acquisition law as it is now.

[01:01:42] And it's also very easy for DCAA to actually audit and track because you could easily manage that because it would all be contracted work. You could easily account for it in any of their accounting systems by showing this

this, these contracted phase three transitions. And that would basically eliminate the value of death immediately. As I said, Lockheed Martin and their annual report, they show that they've got 1.3 billion a year of refunded, independent research and development under their GNA. I'm sure that Raytheon and I'm sure that Northrop, Grumman and BAE and all of the others have similar amounts, you would be talking about effectively a pool of IRN D funding reimbursed by the government already.

[01:02:27] Probably more than \$10 billion annually, that would be able to be used for transition technology. It would be a simple rule. **It would be greatly protested. I can assure you of that.** But it would be a way that technology could be pulled forward and leveraged and it could develop some, I think, exceptional collaborations between major primes and small.

[01:02:49] **Eric Lofgren:** That's an interesting one that I've actually never heard or thought about before, but you think that it would have actually helped you because you guys are almost looking to be like a prime status in a way. So I'm the airframe or would you transition the airframe and then they would integrate mission systems around it and repackage it for the government, right?

[01:03:06] **Joseph Murray:** Absolutely. I think that if there was such a requirement or a rule, I feel very confident that some of the other major primes that, that we have actually very good relationships with would have, would be very interested in using some of their I R and D budget.

[01:03:21] If it was required to take some of their sensor systems and mission systems and integrate them into our aircraft. And it would have been mutually beneficial. But when that money is contained within the company and there's no requirement, statutory or regulatory requirement to use it for the broader community, it's never going to leave the company.

[01:03:44] It's gonna be very difficult for, to leave a company. So it would be a requirement. It would have to come through a statutory or regulatory requirement.

[01:03:50] **Eric Lofgren:** Let's say it does happen again. Do you fear that like the companies that are companies doing business, would they be relegated to a lower level or, in some way.

[01:04:02] Could they be taken advantage of for one reason or another, do they lose that? For example I guess relationship with the customer that you've had to

build organically, but then had actually informed you guys to a great degree. So is having that man in the middle, potentially a downside for businesses.

[01:04:20] **Joseph Murray:** How do you think about that? It's already a requirement of the SBA regulation. So if you pull the SBA SBR STTR regulation, it's a tome, but it's very interesting that regulation requires the primes and FFR RDCs and the government, and Coco's all ready to buy their regulation to commercialize SBAR technology is just not acted upon.

[01:04:44] All we're really talking about here is taking two unique regulations one being SBAs one being a DOD instruction and marrying them together and saying to implement this, we're saying that the funding is this government funding that we're reimbursing you through something called independent research and development.

[01:05:03] Could it result in unintended consequences? I'm sure it could. I would be very careful in crafting the rule like that to make sure that there could be no affiliation because a lot of big businesses by smallest SBIR companies and, and grow them and do different things with them. And if they just funded their own internal phase three transitions, that would be of no benefit to the broader community.

[01:05:23] But the real innovations and novelty are happening at companies that are probably haven't made it through an acquisition quite yet. So I think it would be, it could create some very interesting business models. It could create. And an environment that might foster joint ventures, acquisition agreements, meaning product acquisition agreements.

[01:05:44] I think that the impediment here the valley of death, what we're trying to fix is this gap in funding. So when somebody shows up with something novel and disruptive, that's always the funding that is the impediment. So that's the gap, and this is just an idea for how to do it. So I w I would love to explore this concept further.

[01:06:06] **Eric Lofgren:** Yeah, definitely. I mean, I've always looked at IRAD as this weird kind of, barrier to entry as well, because you have these major companies and they're like I'm not going to invest that a profit for something that the government may might buy, but No, there's no commercial market for it.

[01:06:23] So I'm going to use my IRA and D account for any of those expenditures, but then they're going up and you know, Boeing, for example,

might be competing against you guys in sky borg. And it's you're a small business and you had to invest directly out of profit. And you don't get that reimbursed.

[01:06:38] And what you were saying, there was, if you took all of that money, as I R and D that would be a huge number on your overhead rate. Even if you couldn't get it reimbursed by the government, whereas for Lockheed Martin, 1.3 billion is what 2%? So their G&A rate goes up by 2% because that's the last thing to get applied on the rate structure.

[01:06:57] And that's not as big of a deal relative to you guys. Having that on there.

[01:07:01] **Joseph Murray:** Just as you pointed out all of the other vendors that are in these competitions and in these big that they have preferential treatment in a way, because they already have a platform. And why do they have that platform? Because they can fund major elements of the development through their own resources, in their independent research and development activity, because it will benefit the government.

[01:07:26] So there's this weird kind of circular argument that they get that money, but small business simply can't get that money. It is not feasible. It's not possible to burden up our rates that way. So from that standpoint, it is an equitable use of government money because it is in fact government money, , this reimbursed independent research and development account that it lives under G and a is paid for by the.

[01:07:52] And so by the regulation or by the DOD instruction it's to benefit the government. So it seems logical that this type of a coupling of I R and D to funding of a phase three transitions, unaffiliated phase three transitions, is actually a pretty logical approach.

[01:08:10] **Eric Lofgren:** agree. It seems a more equitable approach across

[01:08:14] The industry as a whole as well. Yeah, before we wrap up, I want to bring it back because the way you started your czar for a day speech was actually like the planning and programming is too long and you came up with a very targeted answer to that, right?

[01:08:28] It's we don't need to look at the larger structures of acquisition because if we're talking about the problem is the valley of death, then we can have a targeted solution to that potentially through I R and D reimbursements

that allow for that transition. So you don't need to actually program the money for whatever that, that new product is.

[01:08:49] It's actually just coming out of, it's going to be on the rates, being reimbursed by every program in the company's portfolios for a Lockheed Martin or Boeing. But, we've also have been talking a lot about on this program about planning, programming, budgeting, execution, And the idea that, there's larger matters.

[01:09:07] It's not just the valley of death issue, right. it's also, appropriations issues O and M versus RDT&E just the ability for even kind of major programs to just say, can we cut that large program and pursue this new opportunity or make trade-offs within the year of execution or delegate decisions down, which aren't, finally programmed in with the huge master schedule from years out to take advantage?

[01:09:31] Do you think that the overarching structure needs a little bit of change as well? Or do you think it's mostly in that valley of death issue?

[01:09:38] **Joseph Murray:** There are considerable issues in the overall 5,001 acquisition process. Even just the general hesitancy and reluctance, of people to look at, interesting novel ways , to use the system more efficiently.

[01:09:55] So yeah, there are major issues. I would say that the DOD budgeting and acquisition process is it's a a case study in plan continuation bias, right? When you look at a development activity in engineering development activity, things can look very promising early and you develop momentum and you start going down that path.

[01:10:16] And there is a point where sometimes things don't pan out, but because of the budgeting and acquisition process, There's just this inherent constituency that will, take that plan to the end, even if it's no value add. but it's difficult to think of how the different parts of that process that you could really modify to start to deal with some of these bigger problems.

[01:10:45] , my personal bias as a small business person is that, I've always been looking for what can we do to better enable the novelty? Because when you get to a point where in the, in these interesting novel new technologies or capabilities present themselves, Sometimes they can develop a lot of momentum as well.

[01:11:06] If they're good enough, if they're sufficient enough, other times, the big guys just steal them. So there's always that thread, but if we can find ways to get some of these ideas out there, without having to reinvent the 5,000 series instruction book.

[01:11:23] We used to look at the poster on the wall that had at least 250 interconnected blocks.

[01:11:29] I dunno, it's just a, to me, it's a pragmatic question. What are the practical things and pragmatic things we can do to address issues in the shorter term to get some of that acceleration that general brown is talking about, but maybe not without having to reinvent the whole system.

[01:11:46] **Eric Lofgren:** Yeah. I've always looked back to the pre McNamara years and then they basically had these bigger portfolios where they could reallocate funds.

[01:11:54] They didn't go to a stove pipe, weapon system. And that's always been my issue with the valley of death. It's we can think of what they're doing now is they're looking for another kind of bridge fund rapid innovation fund type of thing, or even let's just say with the iRead idea, let's just say Lockheed teams with a SBIR business, they come up with the product and it's like a new product.

[01:12:14] And then they go over the government and they say we have this and the government. Okay let me drop a requirement and then I'll program for that budget. And then three to five years, we'll have that competition and it will be done. And then you'll get in on it,

[01:12:28] **Joseph Murray:** so I would view a proposal like this as a stop gap measure. So the idea is you have a technology that's made it through these initial, very nominal funding phases of the government, but now it needs a bigger influx to really get to a viable demonstration.

[01:12:44] The I R and D program. That would be a way to do that. However, I also feel that there is a general reluctance by the acquisition community to fully embrace the sole source mechanisms and preference preferential contracting of SBIR and STTR we have routinely heard over and over that, , this is over my many years.

[01:13:06] Oh, now we have to go compete that. But that's absolutely not true when we develop and innovate in phase one, the competition is done. They

don't go. And recompetes F 35 every year because of something, because there's somebody who might have a better idea, they don't go. And recompetes the B 52, right?

[01:13:23] These products live a long life. So once it's competed, they need to take advantage and use the acquisition system as it's defined. And SBIR and STTR means that it's sole sourced and it can go to that company. So my view is that if it takes two or three or five years to get to the full program.

[01:13:42] And if it's funded via some form of a I R and D initiative like that in that stop gap period, then that's fine, but they don't have to go and compete it once it's there. What they need to do is they just need to transition it directly to production. All of the prototyping, all of the explorations and research and development should have been completed.

[01:14:03] And it would be on to a production program of record in the case of a production type product. That's my view, at least from in that kind of narrow area. And the reason I've been thinking about this for years is because this is always where the road ends. It's very difficult to transition to real funds that could carry a company and deliver product or service.

[01:14:30] **Eric Lofgren:** No, that makes a lot of sense. And to all the contracting officers out there listening to this there's the plea from the SBIR phase II-- just use this sole source. We've heard a lot of times that there's reluctance to use the phase three sole source and where's the vehicle coming from, but, use the authorities out there.

[01:14:47] When the capabilities are in front of you is there anything you'd like to end on?

[01:14:52] **Andrew Van Timmeren:** No, we're just, I appreciate the opportunity, Eric. We are really excited to bring a real opportunity to learn and practice man on man teaming. As we are looking to utilizing the digital workflow, small business regulations, pretty much everything that from SAP AQ on and Anna above have said, they've been asking for a blue force has got that baked into the culture and the cake from day one.

[01:15:18] And so being able to, say our app works success story in encourage others to, latch on for the ride as well. It's worth it. We just appreciate the opportunity and we'll look forward to seeing you out there in the airspace, Joe.

[01:15:34] **Joseph Murray:** That's it. Thanks very much. Appreciate to find that human being that joys acquisition as much as I do

[01:15:40] **Eric Lofgren:** Joseph Murray, Andrew van Timmeren thanks for joining me on acquisition talk.

[01:15:45] **Joseph Murray:** Thank you. Have a great day.

[01:15:46] This concludes another episode of acquisition. Talk, if you have comments, interview recommendations, or just want to chat, please contact us@acquisitiontalk.com. Thanks again. And until next time. .