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Maj. Gen. Larry Stutzriem (Ret.):

Well, good afternoon, ladies and gentlemen, and welcome to our panel. The Power of Unmanned Systems. As you've all heard, our next generation of fighters and bombers are envisioned as families of systems that incorporate autonomous collaborative aircraft or ACPs. ACPs will augment the capabilities of our most modern aircraft. While exactly how these aircraft might look is still not clear, these ACPs will need to have a high level of autonomy and a variety of capabilities to make them work in highly contested environments in that range. We also know that Secretary Kendall has placed a premium on buying large numbers of ACPs at lower costs. Today we have three perfect guests who are at the forefront of unmanned technology that will derive the developments of these systems moving into the future. Joining me today are Dr. Steven Burd, Mark Stiner, and Matthew George. Let me tell you a little bit about the gents here.

Dr. Burd is chief engineer for Pratt & Whitney Advanced Military Engine Programs, otherwise known as GatorWorks. Steve has a 24 year tenure at Pratt & Whitney with leadership roles and applied experience across numerous military engine platforms that extend across the product lifestyle from concepts to sustainment in the middle. Mark Stiner is a senior director of strategic business development at Elbit America. Elbit is a high technology company engaged in a wide range of programs, primarily in defense and homeland security areas. Stiner spent 22 years in the US Army as the retired colonel, and he also retired out of the job as military deputy for the Army's Communications Electronics Research Development and Engineering Center.

And finally, Mr. George is the CEO of Merlin Labs and a good friend. Merlin Labs is developing autonomous flight technology that works with existing aircraft. Prior to Merlin Labs, Mr. George founded and led Bridge. Now, Bridge is a platform that supports AI-enabled mass transportation. So thank you, all three of you, for joining us today. And I'd like to get started by allowing you to make some introductory remarks from each of you and how your companies fit in to the overall picture for UAS. So we'll start with Dr. Burd.

Steve Burd:

All right, well, thank you, sir. Yeah. Let me start by saying unmanned systems are playing an important role in terms of how we operate in the sky today. And as alluded to by the introduction, that role and the importance of unmanned systems is just going to continue to grow and carry more relevance. At Pratt & Whitney, we're proud to be the power and propulsion provider for unmanned systems today. And with that horizon in front of us, we are positioning ourselves to meet some of the challenges that we see facing as we start to deploy more of these systems out there.

At Pratt, there's a couple of things we're really focused on at the moment. The first is continuing to support those unmanned systems that are flying today. There's a sustainment element to them, and as they continue to operate, we are seeing the needs for additional capability and we're working hard to bring forward new technologies and capability to enhance those platforms. We have established a number of years back a group that we affectionately call the PIG, Platform Integration Group, whose sole purpose is to work with the weapons systems contractors, non-traditional and traditional, to find ways that we can leverage our commercial off the shelf products to best suit those applications. Beyond that, on the technology side, we are using agile development to find the capabilities that provide the most enabling aspects of these future designs and building the new solutions that could be leveraged in these air vehicles in the future.

This includes scalable architectures that will allow for the greatest leverage across platforms and economies of scale. And lastly, many of these systems to really achieve the mission objectives that are out there, they need disruptive capabilities, and that's a big focus in my area, specifically where we are trying to figure out what game changing capabilities in the integrated power propulsion and thermal side are needed and trying to ready those as quickly as we can going through technology maturation and demonstration. So it's a pleasure to be here today and certainly I think this is a very relevant topic and looking forward to the discussion.

Maj. Gen. Larry Stutzriem (Ret.):

Thanks, Dr. Burd. Mark Stiner.

Col. Mark Stiner (Ret.):

Thank you. As a former army aviator, I really appreciate the opportunity to be here at AFA and to be part of this panel. I thought I'd start by just taking a minute to talk about three trends that we see in the unmanned system space and then touch super briefly on where Elbit America is investing to meet those trends. The first is increased lethality. I think armed drones are not new. Drone strikes are not new, but I think what you're seeing now is a massive proliferation of weaponized unmanned systems. I think everything from first person viewer drones that you buy off the shelf to larger systems that are actually employing anti-tank weaponry. You're seeing a massive number of lethal unmanned systems. If you just look back at the evolution of unmanned systems, I think predominantly they were ISR systems, right? I mean, we've had drone strikes, but now I think there's a huge investment happening globally in weaponized UAVs.

The second trend is one to many. So I think if you look at what's happening today, what you primarily see are remotely piloted systems. We talk about unmanned systems, largely, they're remotely piloted. You tend to see one operator or pilot controlling one platform, maybe in some cases for the larger, more complex systems, you'll have two operators controlling a single platform. But with the proliferation of increasingly large numbers of lower cost systems, what you're going to have is one operator controlling multiple platforms. So that's going to drive the autonomy that we talk about. Everybody agrees that there's going to be increased autonomy. I think one of the things that's going to drive that trend is the fact that you have one operator controlling multiple systems. So they need to be able to react many more things without the operator intervention. And then the third trend is controlled from the cockpit or the fighting platform.

I think, again, when you look around today, predominantly the systems are controlled from often far away. But certainly by dedicated operators in a dedicated command shelter and that traces back to their lineages and ISR systems. So you have a dedicated operation cell that's operating these things and then communicating with the people who are directly engaged in the battle. And I think that paradigm will shift, I think in conflicts of the future, what you're going to see because of the immediacy, because the systems are lethal, weaponized, and integrated as part of the actual fighting that's happening, they're going to be controlled directly from the cockpit, from the land platform across the board. And so, Elbit is investing to meet these trends. We're making large investments into the sixth gen cockpit and how future pilots will be able to control the aircraft while operating and interacting with a large number of systems. We're building new platforms and we're building a number of electronic warfare and other payloads to support those platforms. Thank you.

Maj. Gen. Larry Stutzriem (Ret.):

Thanks, Mark. Matt George.

Matthew George:

Hey guys. Good afternoon. All right, there we go. We're still alive after lunch. My name is Matt. I lead up Merlin, unlike some of my colleagues. You guys may not have heard of Merlin. So a little bit about us. We're a growth-stage aerospace startup, primarily based out of Boston, but we've got a big group in Denver, Colorado, Los Angeles, and a flight test facility in Mojave, California. So if you're ever in the neighborhood, please look us up and we'll have you out and come see some autonomous aircraft.

And then, we have an incredible group in New Zealand where we've partnered with the New Zealand government to deploy the world's first nation-level autonomous air cargo network. I always joke to folks that I get to live every little kid's dream, which is being able to go build technology and systems to make giant flying robots. But one of the things I think we should really talk about today, and I think has been a conversation throughout at least sort of the past AFA and this AFA, is being able to take autonomous systems from the future tense and bring them into the present tense.

So instead of saying what we will be doing or what we want to be doing, being able to bring that back to the present tense and saying, what are we doing to make meaningful steps to be able to go get there? At Merlin, we're now leading the space deploying $150 million to be able to go develop autonomous systems in the future.

First, taking large airplanes and going from two pilots down to one. So we're developing a system that acts as a co-pilot on a very, very large aircraft. We announced a couple months ago that we were selected to be able to go bring crew reduction to the C130J in partnership with our friends at AFSOC and SOCOM, and then being able to go take that pilot and eventually then power a totally uncrewed flight. So we're really proud of the work that we're doing, especially on the civil side where we announce the world's first certification basis for takeoff to touchdown autonomy, including the only time ever that there's been a certification basis issued on truly non-deterministic autonomous system as opposed to a rule-based system. So really excited to be here, really excited to be able to go continue the conversation about how to take autonomy from the future tense and bring it back into the present tense.

Maj. Gen. Larry Stutzriem (Ret.):

Very good. Thanks, Matt. Well, let's dive a little bit further into this topic. And when we think about near peer competition, what comes to mind in today's world, a lot of problems, but mass is one of them, and we need capacity of all types of aircraft to be able to compete to fight and win against a peer. So I'd ask you all why is, first of all, why is mass important, and then how might ACPs help with the balance of mass in our favor? And I'll start with you, Matt.

Matthew George:

Yeah, great. As everybody here knows, we in a near peer competitive environment, we're not just talking about one aircraft type, we're talking about multiple aircraft types. So as folks like General Pringle and General White have talked about pretty extensively, being able to go say we only have one type aircraft that's able to fly autonomously, is not enough to be able to go support the war fighter. One of the things that we're most excited about is taking a pilot and making an autonomous pilot that can be applied wide variety of aircraft. So as some of you are pretty well aware, we are taking that concept and applying it to a wide variety of missions, starting first with cargo and refueling and then accelerating it from there.

So when we talk about mass, especially in the near peer competitive fight, we're not just talking about massive aircraft, but we're talking about massive mission types where we can be able to go deploy autonomy to refuel, to resupply, and free up our very precious human pilots to be able to go perform those high cognition missions that are best performed by a human and taking those missions that can be

performed best by autonomous systems, dull, dirty, and dangerous missions, and enabling those to be flown by an autonomous system.

And we're really excited to have an aircraft diagnostic autonomy platform where we can put it into everything from a very low cost King Air where we're working in partnership with companies like Dynamic Aviation out of Virginia on their king air platforms, all the way up to highly sort of exquisite new aircraft like the C130J, and then some future platforms as well. So when we think about mass, we're not just thinking about mass in terms of the number of aircraft. But we're thinking about mass in terms of the missions and the types of aircraft that can be powered by autonomy.

Maj. Gen. Larry Stutzriem (Ret.):

Hey, Matt, we'll circle back on autonomy in a second. It'd be pretty interesting, but Mark over to you for a discussion of mass and how ACPs might help that.

Col. Mark Stiner (Ret.):

I think one of the things about mass is it needs to be affordable. I think one of the things that we're seeing in Ukraine is the Russians, they had some good equipment, we think, but they didn't have enough of it, and it wasn't sustainable to deal with the conflict that they're in. So I think when you think about mass, it's got to be producible, it's got to be affordable, it's got to be trainable, and it's got to be sustainable, or it's not going to be relevant at the end of the day.

Maj. Gen. Larry Stutzriem (Ret.):

Not very good. Steven?

Steve Burd:

Yeah, I think there's good points made here. I meant, like you said, ACPs, it's plural. There will be different levels of autonomy. There will be different mission sets required of these vehicles. So we're talking large numbers. And I'll say as a nation, we have to find a way, whether through affordability or whatnot, to find a means to produce these in the quantities that we need within some of the financial constraints we have. Now, with that said, we know our peer adversaries are producing these in large quantities as well, and why do we need them? Well, in a couple respects, defensive. If our peer adversaries have quantities, well, we need to be able to interrupt any attacks that they have on their end. Having large quantities of various systems is a good enabler to help prevent the effectiveness of those attacks. Similarly, on the offensive, it's all probabilities and effectiveness.

If we have enough of these quantities to perform the right missions with the right capabilities, that will allow us to increase our probabilities and effectiveness on the offensive side. Thirdly, they're about protecting our pilots. We want our pilots to come home safely. And if you can couple the crewed aircraft with un-crewed aircraft, that's a big step in the right direction to allowing that capability to happen. In addition, these platforms offer up new opportunities to battle in the war space, including special operations. And just by the mass, just bringing the confusion and the uncertainty, we need to maintain an advantage in the battlefield. It's a complex situation. There's a lot of needs out there. We'll have to find that path. But at least from our perspective, the advantages in going this direction are very clear.

Maj. Gen. Larry Stutzriem (Ret.):

Very good, doctor. Hey, Matt, I'm going to come back to you here because there's been a lot of talk about research and just figuring out what ACPs might look like. It's not real clear. We had a workshop at

Mitchell Institute for the audience not too long ago where we talked about ACPs. We had a number of experts and very interesting workshop with some tremendous insights. Well, you, Matt, at Merlin, you were saying you're building autonomy software to allow larger aircraft to operate independently. What's the state of autonomy technology? How could it be used for war fighting? Is it close? Far? Where is it at?

Matthew George:

So I'll be controversial and say far. So I think if we had the ability to be able to go back and look at the last, I don't know, 15 years of AFA where we talk about what the future of truly autonomous collaborative aircraft could look like. We've sort of been putting up the same slides for a really, really long time. I think what I'm most proud of about the work that we're doing in Merlin, especially in collaboration with our partners at AFSOC and SOCOM, is being able to go take the first baby steps in order to be able to go get there. So for those of you who are pilots in the room, there's a pretty gradated process to be able to become a pilot. We don't first start you out and throw you in a dog fight with another fighter aircraft. We start with basic piloting skills.

So what we're doing at Merlin about building an autonomous co-pilot allows us to be able to go build a pilot and gain tens of thousands of hours of trust in that pilot as the second required crew member aboard in the aircraft with a human pilot sitting by its side, able to be able to go safely take control of the aircraft. If we make this binary step to full autonomy where we're taking a large amount of aircraft and putting it out into the world and saying it's got to be perfect, then we're going to be in a position where it's never going to be perfect and we're never going to fly anything, and we're never going to field anything.

And our near peer competitors are going to continue to accelerate their progress against us. So my opinion, and I know is an opinion that other people may not share, but being able to go bring autonomy into very real steps by putting it into the cockpit of an Air Force aircraft, getting it up in the air, and then starting to build that experience actually on the aircraft as opposed to sitting and showing PowerPoints and renders and videos of what it could look like and actually demonstrating what it can look like, trained and trusted by a human pilot in the left seat.

Maj. Gen. Larry Stutzriem (Ret.):

Giddy-up, Matt. Thank you. That's good. Let me segue a little bit here to talk about solving the range and payload issue. And Dr. Burd, you're familiar with this. Given the premium that's being placed on lower cost and mass, what's Pratt & Whitney doing to balance this capability with lower cost? What are the trade-offs?

Steve Burd:

Yeah, without question, affordability is going to be a big part of the equation. We're going to have to continue to strive to find ways that the air systems and the power and propulsion that are inherent to them find their way through business cases and manifest themselves in the way that we can procure these systems in large quantities. But there's a but, what I'll say is engine systems are not always a commodity. Some cases they're being treated that. But when you look at these systems, as we just mentioned here, these systems will have different capabilities needs. They will have different mission sets.

All these different aspects, these requirements, these ilities that we're going to be looking for from these systems do provide some differentiation that has to be recognized. Now, with that said, when you do look at these systems, and I'll just speak from the engine side, is the low cost model maybe does

work for some systems. If you're looking at a low cost decoy where the capabilities are very focused in terms of getting a missile system to a destination over a certain time and distance, there could be opportunity for a low cost paradigm for those types of systems. But as you look at more sophisticated systems, that's where the cost challenge becomes a little bit more difficult when you're looking for capability that actually costs some money to develop and to deliver. So we're very focused, I'll say, on both ends at this point in time. We look at some of our smaller and mid-size engine platforms that will be prime candidates in the near term for these ACPs.

And we're working very hard to find ways of continuing to reduce the cost of those systems through different approaches with manufacturing, supply chain, different design features, trying to add value to them to get more capability out of the same systems. And then on the far end, these systems, when you look at the fact that they're going to be going into contested airspace, require significant power levels to accomplish the missions that they need for the sensors and the other systems. That's where some large companies like ourselves, we do have some differentiating capabilities, and it's really the onus on us is to continue to mature those capabilities so that they're ready and they're ready in a way that doesn't break the bank. There's a value with that. And that's really our challenge, to make sure that we're bringing forward the value that the customers are willing to pay for at the end. So again, different systems, different cost models, we recognize that, but you got to play the spectrum here, and that's some of the challenges that I think we're facing as a whole.

Maj. Gen. Larry Stutzriem (Ret.):

Yeah, very good. Let me ask, Mark, you, a question, because you've got some experience in this. One way that is envisioned to use UAVs is in a swarming behavior or tactic as you want to call it. There are not too many options to defend against this, and you're working in that Mark at Elbit. You're a lead for, I guess, the swarming UAS and encounter UAS initiatives. Can you tell us about that current state of play and are swarms a reality? Can we defend against them?

Col. Mark Stiner (Ret.):

Thanks. Well, swarms are a reality. I mean, I think we're seeing one of the things people are doing to overwhelm defenses is simply to employ large numbers of systems to defeat countermeasures. Elbit America really got into the counter UAS business as part of our border security program. I know this is AFA, maybe people in this audience don't know the company that way. But Elbit America's been involved in security for a number of years as a prime contractor along our border with Mexico, and we're seeing a large number of commercial low-cost drones being employed by our adversaries in the border. And we've got a number of systems deployed down there to defend against those, and they're highly effective. When you look at low cost drones, or frankly, any remotely piloted drone, right? I said earlier today, today what you're primarily seeing are remotely piloted vehicles. So remotely piloted vehicles, the easiest way to attack them is to attack the data link.

If you're remote in control of that, those data links, they're making emissions. They can be detected, they can be targeted, they can be defeated. That's being done, that's an affordable thing to do, and it's a highly effective defense at the moment. I think what we'll see, if you look at the trend, I think you'll see sort of an investment, counter-investment, counter-counter measure. I think that the unmanned systems, this is where you get into the autonomy, right? Because the data links, the remotely pilot aspect is the easiest way to feed them. You're going to see platforms in the future that operate without that remote piloting, without a data link, and so now your primary method of defeating them is degraded. So now you have to be able to physically detect them.

Probably you're going to need active sensors to actually detect them, but yet you have to be able to physically detect them without their own emissions, and you have to be able, probably, to kinetically defeat them. So this is where Elbit's investing, right? We're looking at high energy lasers to attack the target. We're making major investments into new active sensors like radars, which can track thousands of targets simultaneously, and provide firing solutions so that they can be targeted and defeated. I think that's the swarm of the future is going to be large numbers of vehicles that have to be detected, tracked, and defeated all in a very short amount of time. Yeah.

Maj. Gen. Larry Stutzriem (Ret.):

Yeah, we need that for base defense, so hurry it up if you would. So we see a lot of countries now who want to have this capability. You see an explosion of UAVs. We've either talked about Nagorno-Karabakh, Syria, of course, Ukraine, and Russia. We see what's going on there. Even Taiwan is stepping big into this. So I'd like to ask all three of you your thoughts about if you are a new entrant as a country, as a nation into the world of UAVs, what do you need to be prepared to do? What do you have to have in order to use this technology effectively? I'll start with you, Matt.

Matthew George:

Yeah, I'll defer to my two colleagues who work a little bit more closely on that end of the spectrum. But one of the things we've talked about is, particularly with some of our partners at the Air Force, is being able to go use the Air Force is existing advantage. So the Air Force that we built to the best air force in the world. So how can we take those assets that we already have and enable those assets to fly with high degrees of autonomy, with structural barriers for a new entrant to be able to come and compete with us one to one for those autonomous capabilities. Whereas, on the smaller end of the spectrum, we have seen throughout the world the ability for state and non-state actors to be able to go match us or get pretty close to matching us one for one in smaller systems.

Maj. Gen. Larry Stutzriem (Ret.):

Mark, how about it?

Col. Mark Stiner (Ret.):

So a lot of our work is with the smaller systems, that's where a lot of my comments are. And I guess the alarming answer to your question of what does it take to get in the business of unmanned aircraft is not a lot, right? I think what we're seeing is that it's pretty easy to get off the shelf technology, which is very readily available at low cost and put weapons on them. I mean, one of the most effective things that I'm seeing happening is just taking first person viewer racing drones that a lot of people here may operate and putting explosives on them and flying them right into targets. It requires very little technology. It requires very little money, it requires no training. These things are just bought by people and used every day, and they could be done in high numbers. So this is what we're seeing is one of the reasons that I think we're going to see a lot of need, investment and counters to those types of low cost systems.

Maj. Gen. Larry Stutzriem (Ret.):

Yeah, very good. Dr. Burd?

Steve Burd:

Yeah, I think both of you spoke well about the small side. I'll just go a little bit to the larger side and I'll bring it a little bit to what I'm seeing here domestically. There's been a pretty large appetite for new

companies, new entrance to try to enter the market. That on one side, it's been very interesting seeing the innovation that's coming forward from some of those. But on the flip side, we're also seeing a lot of mixed results in that. We're seeing a lot of interesting concepts out there, interesting prototypes and the like.

And I'll say to your question, maybe the challenge here for us, for the United States and the like, is that when you look at these larger systems, getting that design, that concept design forward, that's the easy part. To actually get a system out there that can work, that can function, that's where there's a lot of important knowhow out there within our industry today to make sure that the subsystems work, that the integration works, that we can deliver a system that can achieve its mission, has the endurance, the durability that can actually be produced at a higher rate with the capability we need.

So I bring this forward that there is a differentiation between the small side and maybe the higher, larger side, higher value type ACPs where I think there's really a good opportunity to take advantage of what some of the new entrants are doing in getting them married with some of us and the OEMs to take some of those great vision concepts and make them a reality to help fill the void that we see as we look forward to bringing forward a whole family of ACPs.

Maj. Gen. Larry Stutzriem (Ret.):

Yeah, yeah. Very good. Thank you. Well, let's go back to ACP technology, and I want to ask all of you, and I'll start with Matt. Some of this technology is available today. Matt, you said a few minutes ago, some of it's way out there a bit. But what are some of the major milestones or obstacles we'll have to overcome to move forward with the technology we need for these notion of ACPs supporting other aircraft and maybe even operating independently? So, in other words, in five to 15 years down the road, where are we going to be with this technology, Matt?

Matthew George:

All of the technology problems for being able to go deploy a large aircraft autonomously, and when I say autonomously, I mean an aircraft, it's able to go think on its own, not operated by a remote operator in sort of a link list environment. There's some massive technology barriers that we still have to be able to go get there, but there's no break-a-glass of physics technology problems in there. The problem, at least in our opinion, and in my opinion that I've seen the most, is the willingness of both the defense sector as well as the commercial sector to make small incremental progress along that pathway to be able to go get there. I think we often hang our hats on these huge technology problems of what if, what if, what if. And by doing lots of studies and by doing a lot of talking, we're not actually out there going and flying, and we're not actually substantially de-risking the problem.

So if somebody had a magic wand, or if I had a magic wand or actually a dangerous thing, you don't want me with a magic wand, I promise. But if I had a magic wand, one of the things that I would do in order to be able to go meaningfully move this along is to create 24 month milestones of saying, how can we get autonomy onto an Air Force aircraft? And General Slife at AFSOC has been a really big proponent of this, where he has given us a 24 month time horizon to be able to go start to bring autonomy onto large Air Force aircraft and be able to go meaningfully demonstrate it. So by doing that, we can make so much more progress than if we do what we continue to do, which is really just think about it and delay instead of actually going flying, iterating, and flying again.

Maj. Gen. Larry Stutzriem (Ret.):

Yeah, Mark. Thanks, Matt.

Col. Mark Stiner (Ret.):

So I think when you talk about ACP, the C is for collaborative, and so collaboratives, it's two-way. So we've really, so far we've been talking a lot about the platforms, the unmanned platforms and what they're going to do and the autonomy that they're going to have and how they'll make decisions and what payloads they'll have. But there's also the collaboration, which is the actual pilots, right? Pilots aren't going away by any stretch. I think the future battle space is definitely going to need pilots. I think the airspace is going to be very crowded with large numbers of vehicles. You're going to have a huge number of friendly manned and unmanned vehicles and a lot of enemy manned and unmanned vehicles.

And so one of the areas that we're doing a lot of investing, thinking, talking to our partners in the Air Force about is what does the cockpit look like? What kind of sixth gen systems do you need as a pilot to be able to visualize that very crowded battle space, right? How can you understand what large numbers of things are doing at any point in time and then be able to provide direction often, to many of the friendly ones based on your understanding? How do you control those things, employ those things while still fighting the aircraft that you're in. And so that's really, I think, one of the challenges that we'll have to solve before we reach the desired end state.

Maj. Gen. Larry Stutzriem (Ret.):

Yeah, very good. And how about trust? Trust in these systems by those pilots.

Col. Mark Stiner (Ret.):

Yeah, trust is a big one. I think it's going to be incremental. I think you were talking about that. I think, in general, progress tends to be more incremental than revolution, revolutionary technology. I think we'll begin to see things that are autonomous, but maybe not machine learning vehicles that are adapting and making all their own decisions. I think as a pilot and talking to pilots, I think pilots really want systems they can team with that they understand and can predict, right? I think you want systems that have a high degree of capability. But are really operating on some autonomy algorithms that you can understand and predict until you get more comfortable with them as a teammate. This is the way I think it'll work, and of course it's going to require some robust cyber protection as well.

Maj. Gen. Larry Stutzriem (Ret.):

No, I appreciate that. Dr. Burd, back to that question about what obstacles are out there to get to the technology we need?

Steve Burd:

Yeah, I think to a good extent, we're still trying to figure out what ACPs are and what we can do with them and what we want to do with them. I think there's some really good dialog, some very good progress out there with a couple of platforms that there's been company investment in, there's been government investment in to really show what that capability might offer. But to a good extent, we're not moving at the speed of relevancy. I know that's a term that's been out there. But I think it really applies in this instance in that there are a lot of things we can do, and we're continuing to contemplate what those things are doing instead of starting to take some action. Right now, the possibilities are pretty large, and we need to get a little bit of focus out there so we can quickly mature platforms and get some of this capability fielded while we continue to figure out what the next generation of those capabilities could be.

So some of the challenges with that, I guess, lead to helping as a community figure out where our focus needs to be, aligning the budgets that are needed so that we can actually make that progress. And the fact that we have uncertainty, we don't have solidified budgets. You look at someone like myself that's representing a company, when we look at those two elements, that provides an awful lot of uncertainty in our business cases. So it really doesn't bode well for us to invest in something that carries a lot of uncertainty. So really looking for those three pieces or four pieces to come together. A little better clarity of where we need to go, roadmaps and plans that are aligned with that so that we as a company in partnership with the government, can align and rally behind those roadmaps to get some parts and vehicles flying.

Maj. Gen. Larry Stutzriem (Ret.):

Yeah. Very well said. We've only got a couple minutes left, but you bring up, all three of you bring up a pretty good insight that the government, Department of the Air Force in particular might be able to do better, telling industry or communicating with industry about clear choices and going in a direction and getting to procurement. Any last minute comments on that from industry?

Matthew George:

Yeah, I think we're living in a really exciting time. So from our perspective, for the first time, we have all the technology building blocks in order to make this happen. And we look out in the room, right? Selection bias of those of you who chose to spend some time in this room today during this panel, the folks here are going to be the folks that decide what the next 100 years of aviation look like. The previous 100 years are built around a human pilot. Unequivocally, the next 100 years are built around human pilots plus autonomy. We are at a pivotal moment where the technology's available, and it is our collective choice about what to be able to go do with it.

And if we make small incremental progress towards that incredibly important end goal, to be able to go make our skies safer and to make airplane safer for our pilots, the opportunities are absolutely endless. But if we delay making those hard choices to be able to get to that future, we see the definition of that future to somebody else. And we're working really, really hard at Merlin to be able to go define what that future is in collaboration with a lot of folks in this room. But that's the imperative that we all have.

Maj. Gen. Larry Stutzriem (Ret.):

Well said. I'll track it at that.

Col. Mark Stiner (Ret.):

Oh, I guess I would just conclude by saying I think the Air Force has done an amazing job of working with industry, our company included. I applaud you for being very open with industry and doing an excellent job of really describing how you see future conflicts playing out and what types of things you'll need to include the area of unmanned systems and autonomous systems, and how you envision using those. I think to really move forward, the next step is going to be to actually lay out acquisition strategies to acquire those things and timelines, and when will there be competitions and when will there be contract awards, because that's really what's going to allow industry to align their investments to have the products ready for the competitions.

Maj. Gen. Larry Stutzriem (Ret.):

Thanks, Mark. Take them, Steve.

Steve Burd:

Yeah, and I agree with both the other panel members here. I mean, the conversations, the dialog up to this point in time have been really productive in terms of describing what the art of the possible is. It is time at this point in time to translate that into acquisition strategies, roadmaps, and the like. We as a company are making small, medium-sized large bets on, I'd say, our read of the situation. Again, walking into a little cloud of uncertainty. The more we can clarify where we need to go, what those plans will be, what those programs and records will be, that'll help align where we go. It'll help pretty much light the fire behind our butts so that we can move more quickly. So those things are needed. Again, you look at the situation, we have to move faster and we have to move now.

Maj. Gen. Larry Stutzriem (Ret.):

Very good. Well, thanks to Merlin Labs, and Elbit, and Pratt & Whitney for your participation today. Gents, thank you for being on the panel. That concludes our panel. I do want to give... We're about 20 seconds over. There is another event today on manned teaming, myth and reality. It'll be here in Potomac C, at 15:45, hosted by Mitchell Zone, Heather Penney, and it extends this in great depth, this conversation into some other areas that I think you all will enjoy. So, thanks for all your service. This concludes the panel.