Elevated Sensors and Glide Phase Missile Defense

[Mr. Riki Ellison MDAA Founder and Chairman]
Good afternoon, ladies and gentlemen, from a beautiful day here, sunny day, a little brisk spring day here in Alexandria, Virginia. I'm Riki Ellison. I'm the founder and chairman of the Missile Defense Advocacy Alliance. We are a non-profit and our sole core mission is to make our nation and our world a safer place through the deployment, evolution, and development of missile defense. We've been involved with it for 40 years.

This is our 73rd Congressional Roundtable. It is on persistent sensors and glide missile defense. These two areas are significant gaps in our nation's missile defense systems, having overhead persistent sensors and not having the glide phase missile defense capabilities. It has been a requirement by our combatant commanders, probably for over a decade, they come up on posture hearings on the Hill, specifically our CENTCOM, specifically INCOPACOM, specifically NORTHCOM, and request these requirements for the best defense of our forces. It's been a windfall. Last week, the United States Army announced a $4 billion program going towards dirigibles, overhead persistent surveillance, a tremendous win for this. And last week in our previous virtual with MDA director, excuse me, MDA Tim McRae, we put forward that the capability of putting a glide phase missile defense system can be done by 2030 instead of what the time frame is right now at 2035.

We've had great momentum from great leadership. The turning point has been driven by the warfighter. I give a lot of credit to General Kurilla of CENTCOM to make that movement to get the U.S. Army to provide the capability. I also can go back to Charlie Flynn and INDOPACOM to also support that effort. We also recognize General Glen VanHerck, who was a former NORTHCOM commander and the current NORTHCOM commander, General Guillot, to be able to move forward with these requirements coming into reality.

We at MDAA have also played a big part in this. We have believed and advocated for these two mission sets. We built our USC SHIELD program four years ago, where we brought in, I think, 76 graduates, where we brought in our warfighters, our acquisition people, our civilians, and to study eight months a year on that. We've developed 23 capstones. Most of them have been courses of action, and most of them have had congressional law done. Two of them, specifically last year on dirigibles, and the other one the year before on glide-phase missile defense, have come to fruition. So, we recognize that, and we want to bring forward the challenges, basically, why has it taken this long to get something that is required by the warfighter? And what is exactly that, as much as we can explain it?

So, from my perspective, it certainly can be part of the golden dome architecture for our country and for the world. And we know that these overhead persistent dirigibles are working. They're working in Israel today. They're working in Poland today. And that's great to see. So, we're going to start off.

We have a couple of our board members here with us. That have expertise in each of these areas. So, I see Mark Montgomery, he's coming in from Israel. He's, I think, in Israel right

now. And I think he actually visited a couple of those dirigibles that are working in Israel. So, Mark, welcome to the discussion. You ready to roll?

[Rear Admiral (Ret.) Mark Montgomery Former Director of Operations, U.S. Pacific Command]
Sorry about that. Actually, I just came in off the red eye from Israel.

[Mr. Riki Ellison MDAA Founder and Chairman]
Okay. You're back. I'm sorry I thought you were in Israel, but you just got back.

[Rear Admiral (Ret.) Mark Montgomery Former Director of Operations, U.S. Pacific Command]
So, listen, I'm excited about where we're headed right now. I believe that the President's decision to prioritize missile defense in the homeland is important. You know, I think we have to remind ourselves, you kind of have to go back, you know, if John Rood were here, he'd take us back to the beginning, you know, the creation of the fire and the wheel. But I won't go that far. And I'll just say, go back and say that every president since 9/11 has said defense of the homeland is the most important thing in their national security policy. And that's because 9/11 reminded us of that.

Now look, when President Trump said it in 2017 in his national security statement, and President Biden in 2021, I think there's becoming to be more and more, particularly with President Trump, thinking about the border. But what I would tell President Trump is that this is more than the border now. We are at significant risk in cyberspace and in missile defense. And both of those issues are going to take investment. And one of those costs a bit of money, cyber defense, and one of those costs a lot of money, missile defense. So we now have a president who's prioritized this issue. And that's important. And we now need to make sure that we properly plan for it. So that's why I'm excited.

Why I'm concerned is that if we're not careful, Riki, we're going to be repeating the same mistakes we made in the defense of Guam, where after four and a half years, or four plus years of theoretical effort, we're pretty much back where we were four years ago, light a couple billion dollars. And we have a frustrated INDOPACOM commander who does not have a realistic plan for the defense. He does not have an actionable system for the defense of Guam. And there's nothing on the horizon. So how do we get to right? I think there's two big things I'd say.

You have to have the right vision for command and control of how this goes down. I don't just mean the situational awareness tools being used to transfer information. I mean, how do you organize yourself for success in executing the president's executive order? And then what's your vision for what it looks like? And I think you've done a great job over the last two virtual seminars talking about missile defense agency strengths and weaknesses. And I think Mike Griffin was pretty honest about the missile defense agency's limitations as a three-star command.

So I would take both of those together, the need for a four-star commander and the need for a brilliant set of architects, take that chocolate and peanut butter and make a Reese's cup. And it would look like this. Bring in a four-star commander, probably someone with experience in space, put them in charge, and make their deputy the dual headed missile

defense agency head as the lead architect. So, to me, that's the command and control you have to get. If you get to there, look, can you still screw it up? Yes, we're the government. We can still screw it up. Can we waste the money we're about to get? Yes, we can. But I think if you start with that philosophy, a warfighter who has experience in this domain, where we're headed with this domain, in charge, and you and I have our opinions on who that ought to be, but we ought to leave that. You can talk about that during yours. And then I'll be very specific here.

The head of the Missile Defense Agency, Lieutenant General Heath Collins, as his deputy, his or her deputy, and most importantly, his agency, the Missile Defense Agency, is the lead architect of this. I forget how many engineers. I think we never did.

[Mr. Riki Ellison MDAA Founder and Chairman]
I think it was 10,000, Mark. I think they mentioned 10,000 with civilians and that whole movement.

[Rear Admiral (Ret.) Mark Montgomery Former Director of Operations, U.S. Pacific Command]
So, he has a certain number of engineers, Mr. McRae, at MDA. But I don't know what that number is. But it's a healthy number who are experienced in this area. So that's issue number one. Get your organization right at the top. If they do those steps, Riki, we're already headed to the right spot.

[Mr. Riki Ellison MDAA Founder and Chairman]
Mark, I think we're heading in that direction. So, I'm pretty confident we're heading in that direction. It's exciting. It's not done yet, but we're heading in that direction.

[Rear Admiral (Ret.) Mark Montgomery Former Director of Operations, U.S. Pacific Command]
And then I would say that the next part, before I talk about what the vision should be, I should say there's going to be a limit on the resources. If I had to bet money, the infusion of money is going to be about one quarter of whatever the reconciliation is. And I'm going to guess that's $150 billion. So somewhere between $30 billion and $40 billion. And here's why. There's three competitors for money.
The revitalization of the nuclear enterprise, which could use a lot more than $30 billion to $40 billion, frankly, because I think we all know the Sentinel is gobbling up cash as fast as possible. They have to create a new level of Nunn-McCurdy for what that thing's headed for. The Ohio class, which has overruns. So they're going to need money, and they still need money for B-21 procurement, things like that, that are actually tracking very well. That's number one.

Number two is shipbuilding baskets are going to get some, and the senators involved in the reconciliation have kind of carved out their amount, but that's going to be another $30 billion to $40 billion of it.

And the third group is restoring the readiness deficit that's in the Air Force, Navy, and Army from our post-October 7th activities in the Middle East, which is large and getting larger as we now have two carrier strike groups, a whole lot of Army missile defense, and extra Air Force squadrons. So, all three services secretaries eating a pretty big hole without an OCO

fund to draw from. There's a little bit of supplemental money for this, but not near enough. So that's a big divot.

So, Riki, after those three are paid for, there's a missile defense money. Now, why is that important? That's the money that comes to what I'm going to say next, which is, what's your vision? And again, you and I have talked about this for nearly a year, predating the executive order from the President, but certainly post-dating it. And that's that if you really want to do this right, you have to think about how I want to fight. Not how I could fight or do fight, but how I want to fight. And how I want to fight is from space. And I don't want to get into a fight about what's boost and what's ascent and what's midcourse. Look, I'm for anything that works in that realm. But I think it's from space. And its ligature is the satellite networks that have sensing, tracking, communicating—I sometimes use the word transport for that—engaging satellites in it. And we're building all of those types of satellites right now. We haven't launched them all in space. We have some, a few small numbers of the sensing and transport layer in space. But we've got to get the ones that allow you to track effectively and engage with weapons on them.

And the Space Force has come out full tilt over the last 48 hours saying the United States needs to weaponize space. And I think every senior government official involved in this needs to say that out loud in a cathartic way so that we all understand that's how we're going to fight. And this lawyerly legalese, we can't do this, is not anchored in law. International law does not limit us from fighting from space with conventional weapons. And this is going to be the most effective way to get ballistic missiles, to get hypersonic maneuvering missiles, and potentially some of the longer-range cruise missiles. And certainly, it will really significantly assist ground-based terrestrial efforts to engage all three of those. But this will be cost-effective over time. And the reason it's cost-effective is because we've driven down the cost of launch. And I know you've heard the numbers before, but it's less than $0.10 on the dollar of what it used to be, and I think it's going lower.

So that's it. Think about where you've got to go fight from, and you better put enough money and enough effort against that. I know MDA and a Space Force; Space Command type leader could do that.

I do acknowledge there's terrestrial opportunities here. And some are legacy, and some are new. And you just mentioned, as I came on—I'm sorry, I was a tiny bit late—but you were mentioning one of the interesting ones, which is something you and I have been arguing for, I think, for two and a half years now, which is dirigibles.

[Mr. Riki Ellison MDAA Founder and Chairman]
And we put the USC Shield capstone on that, Mark. That's good. And the U.S. Army came back. The U.S. Army gave us $4 billion on that last week. They announced that. So that was the battle that we've been on probably for a decade. But can you just open that up a little bit on really what that is, and why has it taken this long to do this?

[Rear Admiral (Ret.) Mark Montgomery Former Director of Operations, U.S. Pacific Command]

It's because we got embarrassed. What's crazy about this is if the Air Force or Navy got embarrassed like the Army does, we wouldn't have any airframes, right? Because I would gently say I think every airframe we've ever developed, except possibly the B-2, has had a crash in development. And the B-2s had one or two unusual crashes that have put the planes out of commission. But the JLENS, which was an aerostat, I think, around 10,000 feet up, with a firing quality track radar in it, and that was part of our integrated defense of the National Capital Region, with NASAMS, another thing that the Army never really fully came to grips with, a cruise missile defense system, it got underway. And I get it. It dragged its butt. It's dragged its lines through like Uncle Fester's farm somewhere in Pennsylvania, and we had to have an F-16 run it down. I get that it's embarrassing. We had local cops shooting at it. Not our finest moment, but it's over. No one died.

And why we got out of that kind of elevated, persistent elevated network sensor like that is beyond me. And it's not like the Army hasn't embraced dirigibles when they need them. They used them logistically and for situational awareness in Afghanistan on a routine basis. But we're back into this world. And believe me, we've had some cool ideas. Back in the 2010 timeframe, we had seven active programs going, at least. That's unclassified. I mean, not black programs going, including one which had the unfortunate name of ISIS, that operated up at about 60,000 feet in near space, that had a wicked long look on its thing. And the higher up you get, the longer you look. There's issues, though, with the higher up you get, the less likely you're on the tether. I mean, you've got to balance all these things.
But Riki, we should be procuring dirigibles or aerostats, probably tethered originally, and then moving on as the technology is more comfortable with them to ones that can maneuver, that we can put in different places around the country based on the threat.

Use our Canadian partners in this. And they are a big partner in our missile defense. I know that's lost a little bit in the President's discussion of Canada these days, the degree to which we're actually fully integrated with Canada in the defense of the North American continent.

But, you know, so for aerostats, I want to make sure we're getting that effort out there, getting high quality, firing quality track radars up there. I went and looked at the ones in Israel. You're right. They've lost one of them in combat. They didn't defend it properly. And the good news is, I don't think anyone's rocket or mortaring like Montana or Alaska or like Saskatchewan, right? We're probably safe from what got this balloon. But, you know, they are vulnerable. So are Wedgetails. So are satellites. So everything was vulnerable. That can't be the showstopper. Aircraft carriers are vulnerable. Even F-35s are vulnerable.

But we take risk. You decide how vulnerable am I versus how much I get done with the mission. That's how every one of us operated. That's how Corky and I commanded things for, you know, a couple of decades each, right? You can do this. We're smart enough.

Okay, I say this, Riki, because the other side of the Israeli coin is it's been highly effective in seeing the Houthi stuff, seeing the Iranian stuff. These are cruise hypersonic and ballistic missiles coming at them. It's been highly effective seeing the drones swarm, twice in the drone swarm's game. These are critical. By the way, that was designed with Missile Defense Agency money. And it's an American company that does a lot of the integrating work on it. So it's in Israel, but it's got a lot of U.S. on it. And the Poles have also bought a system. So,

we're not going to have to be the test, you know, the canary in the coal mine here. We've got other people doing it.

So, I want to do that. And look, are there other things I would buy? President Trump is not going to sign off on a plan that doesn't increase the size of the DAL, the Defended Asset List, from his house to Speaker Johnson's workplace, right? I mean, it's got to be more than the Pentagon to Congress in the national capital region. We're going to need to defend other, he'll probably want to defend other large population centers. However, whatever, he's president, he gets to choose. I mean, he doesn't normally choose the DAL, but he might. You know, he gets to decide what's the DAL, and then you kind of cut the deck with how much of this can I afford? Because it's going to be money that I think you're spending on exquisitely expensive launchers, you know, traditional launchers, either Aegis or THAAD or Patriot and NASAMS, or if we ever see IFPIC (indirect fire protection capability), and incredibly expensive missile system, actual effectors. So I want to marginalize that, whatever it takes to get the President happy, and maximize the investment in space to make the President, you know, President's number 48, 49, 50, 51, 52 happy, right? And so in my mind, get the command and control right of how you do it, get the vision right of what you're headed for, and understand what's the minimum to keep the President right, you know, happy with the next four years.

[Mr. Riki Ellison MDAA Founder and Chairman]
Just, I'd like you to hit the glide phase defense. And we talked about in the beginning that there is reality that we should get capability by 2030 instead of waiting for what we're waiting right now for 2035. And that needs to be addressed. But just a little bit on that before I introduce Corky.

[Rear Admiral (Ret.) Mark Montgomery Former Director of Operations, U.S. Pacific Command]
I picked that, I mentioned it at the end of Tim's talk, but I'd say something here about two minutes. So I'll say it goes like this. We have an acknowledged limited terminal-based glide phase defense, excuse me, terminal-based hypersonic maneuvering cruise missile defense. But everyone knows, hey, they're not going to shoot one at you. And it's like Marquess of Queensberry, here comes one, all right, you got that one, here comes the next. They're going to come in a drove, and you're going to need to thin the herd, and you're going to need to thin the herd in the glide phase, you know, on the way there. And the way you do that is with longer range intercepts. These missiles are going to be expensive. And that's why I recognize you have to do this. I don't want to go crazy doing it.

But what was even more frustrating is that there's two systems available for this being worked as of six months ago. And the Congress said, get it done by 2029. They got so pissed. Every year Congress had to add in, had to double the hypersonic defense budget from 250 million, 200 million, to about 500 million. By the way, at the same time, we were spending between three and five billion a year on the offense. And you know, Riki, you should not spend 19 cents out of every 20 on the offense and one cent on the defense. But that's what we were doing for three or four years. And DOD willfully put that budget in across multiple parties, multiple administrations. Congress got tired of doubling it and said, damn it, just get us down to someone we can select to get one done soon.

So, there's two options. One of them takes a lot of existing technology and existing weapon system and gets it done by time 2028. And one of them—and you could go into production in 2028—one of them is a really cool-looking system with a missile that hasn't been on ships or anything before that is going to be in the 2030s, maybe mid-2030s. And by the way, historically, missile defense systems don't deliver early, ever.

All right. Because of a lack of funding, MDA was forced into a down-select, and they took probably the long-term, better missile system over the one that could deliver sooner. But we shouldn't have forced MDA into that position. MDA should be given the assets to do both, keep the longer-term, higher-quality one in R&D, get the other one into low-rate production. And you tell each group, hey, look, this is capitalism. You low-rate guys, you guys who can deliver now, the more you can deliver now, the more you're going to get us to buy. To the other guys, you say, the faster you get to low-rate production, the less of the other guy we buy.

The winner is the soldiers, sailors, and airmen that are protected by these systems. And by the way, no one thinks it's a great idea to, when the enemy is building three or four different types of hypersonics, scramjets, other maneuvering ideas, that we're going to build one system to counter it. That's like the definition of get your butt spoofed. And Tim kind of averred to the idea that they may redress that thing. But he also said the truth, which is when you delay a decision, when you cancel one for six months, then bring it back, or nine months, you're not nine months behind, you're 18 months behind, or you're 27 months behind. So, I think the delivery on that other one might be 2030 now. I still would like it out there because I think our destroyers and our aircraft carriers, and our air bases and our maneuvering forces need to be protected against hypersonic weapons from China and Russia.

[Mr. Riki Ellison MDAA Founder and Chairman]
Okay. Thanks, Mark. I appreciate it.

I'd like to bring in Corky Charles Corcoran, former retired Major General, Deputy Air Forces' Operations. And Cork, just to come in on this, Mark gave a big overview. But to speak to overhead persistent, which I know is very important for the Air Force, and for the Army. Can you go into what this brings to it as compared to what we already have in existence with some of the things that we use for overhead, having persistent balloon type aerostat? Go ahead.

[Maj Gen (Ret.) Charles Corcoran Former Assistant Deputy Chief of Staff, Operations U.S. Air Force]
Absolutely, Riki. First off, thanks for your continued leadership on this front. And thanks to Mark and JD for being here today and offering their wisdom and perspective.

I'm not going to go back to the discovery of fire and the invention of the wheel, but I do think we need to always start with first principles with the problem we're trying to solve. And obviously what we're trying to do here is defend the U.S. and allied sovereign territory from attack. And those first principal requirements are always there. You got to sense, make sense, and act. And that sensing is what we're talking about with the dirigibles, obviously, that there's indications of warnings, as well as the ability to track any incoming threats,

making sense as a C2 structure out there to try to preserve decision space for the COCOMs, for National Command authorities to have shared awareness. And then ultimately the ability to act, which Mark was hitting on there at the end, the effectors on hypersonics, but on any type of threat is what we're talking about. Also, we got to have the ability to act in an offensive capacity. I know we're talking missile defense, but I'll come back around to that in a second.

Anyway, we have got to be able to demonstrate that we know who is attacking, so identify them and then demonstrate our ability and our will to deter them from doing so. So, I think it's great that you got these two topics today together because they are linked. The dirigibles obviously help with that sense and make sense and C2 and decision space piece, while the hypersonic glide kill vehicle is a very, very important in-game effector that we got to get fielded. MDAA, as you have already mentioned, we've addressed both of these in our SHIELD program at USC, and I encourage everybody to get their hands on the work we did there and read that work.

But at the end of the day, we're advocating, but we shouldn't have to be pushing this rope the way we are. And it's very discouraging that we are having to do that, rather than leaders stepping up in the DOD and across the interagency and doing their job.

For dirigibles specifically, I know you wanted me to touch on those. They're just one more piece of a layered, affordable, persistent, resilient network of detection and tracking, as well as a communication infrastructure that we need to have in place. We've utilized something similar in every conflict going back to the Civil War when we were using balloons. And as Mark mentioned, and as you mentioned, Israel successfully deployed and operated dirigibles as part of their layered system to counter the rapidly evolving threat landscape they face in their neighborhood.

So, I mean, in my opinion, I'm going to use the word criminal. It's criminal that we don't have these in place now in the homeland, in all U.S. territories that are forward. You think about Guam and other territories.

So why aren't they part of our current force structure? And I think one of the challenges that we see is that every mission area we look at seems in isolation. Is it, oh, my gosh, we have small UASs flying over New Jersey or Langley Air Force Base. Let's look at the mission from soup to nuts, from sense to in-game effectors. Oh, my gosh, we've got hypersonics. How are we going to deal with this? Oh, my gosh, we've got a Chinese balloon. Whoa. And we're looking at each of these as, hey, which service owns this? Which COCOM owns this? And I think maybe we ought to step back and talk about the sensing and C2, or the sensing piece, anyway, separately from the C2 and the in-game effectors.

And so, what I'm getting at here is let's talk about air awareness and air domain awareness and where the dirigibles, the dirigible is an air vehicle, right? And you can talk about the tethered aerostats all the way up to stratospheric balloons, but those are air vehicles. And in my opinion, the United States Air Force should be doing their part as part of the joint force to provide combatant commanders with air space awareness. And we have the tools today, including dirigibles, but other air-based sensors, stratospheric balloons, layered in with the space-based systems provided by our Space Force, ground-based systems provided by the

Army, maritime-based systems by the Navy. These should all be tied together such that we can have ubiquitous sensing linked all together so we have all domain sensors that would then support each COCOM, depending on which COCOM is responsible for which part of the globe and which mission area.

And so we shouldn't need to go, I'm going to defend Guam. Where are we going to get the sensors? I'm going to build Golden Dome. Where are we going to get the sensors? The sensors, in my opinion, should be in place right now. And thinking otherwise, I think it's kind of amateur thinking. We shouldn't have to start from the ground up to build a new joint kill chain every time we start talking about a new threat, whether it's hypersonics or small UASs.

So, I also think, well, I mentioned the Air Force for dirigibles. I think the sensing and INW network I'm talking about is a joint problem. It's an interagency problem. I already mentioned the other services and what they should be providing and how they should all be linked together to provide this ubiquitous network. But it's also an interagency problem. And we're going to see this in space as we start working through Golden Dome. We already are. What's the role of the FAA and their sensors? What's the role of Customs and Border? All the sensors we have available should all be tied together to provide this picture to the COCOM responsible. In this case, it would be NORTHCOM, I believe, for the homeland. But is it EUCOM over in Europe? Is it CENTCOM, General Kurilla, like you mentioned earlier?

We should have the sensors in place so that he can put his C2 network overlaid on that and the effectors that he has and use them to solve the mission. I just mentioned General Kurilla and General Cavoli, for example, Admiral Paparo. They're forward. And so, we're talking about the homeland primarily, but in reality, you want forward sensors not just to support those COCOMs that are forward, but to give you the earliest possible warning and indications of an attack coming to the homeland. So, we can't just place the dirigibles or any other sensors, this layered network, in the homeland. We've got to be forward. That requires allies and partners, whether it's our sensors forward or linking into their sensors, to feed into that COCOM C2 network so that then they can appropriately employ the effectors.

On hypersonic defense, Mark already hit on it, the affordability aspect, what we have now, what we need to get in place in space. But I'll say again, while we need to be able to defeat an attack, the best example of how to do this right is what Israel did, is you absorb that initial blow from the enemy, and you do that, not only with the in-game effectors, but they had the C2 network in place, they had the sensors in place to know it was coming so they could array the forces appropriately. But then what they did immediately thereafter is punish the actor. So, to say, hey, you do it again, I'm going to come take you out. I'm going to take out your capability to attack me. Again, that requires the forward sensors networked so that you can not only detect the threats, but you know who is responsible and you can hold them accountable. I'll stop there, Riki. Hopefully that hit on the big points you wanted to cover.

[Mr. Riki Ellison MDAA Founder and Chairman]
Hey, Corky, it says a lot that the U.S. Army is putting $4 billion on air domain awareness, which also says a lot about the Air Force not doing it. So, obviously, it means a hell of a lot to the Army to operate with that and getting consistent capability down to that. So, I want you

to talk about, because like you said, you said this is the Air Force's domain, but yet the Army is the only one out here stepping up with that kind of money and that kind of urgency to do that.

Then the second thing everybody kind of wants to know, well, it's not just a stationary target. It can be shot down easily. So, I'd like you to address that or how do you protect these things because it looks pretty vulnerable from the outside, from a public perspective.

[Maj Gen (Ret.) Charles Corcoran Former Assistant Deputy Chief of Staff, Operations U.S. Air Force]
Yeah, we'll start with your first question there, your first point. The Army, yeah, the Army, good on them for stepping up and potentially spending $4 billion. I mean, that's what they did. They may spend up to that amount. But it's negligence on the part of my former service, the Air Force. The Air Force should be providing for the Joint Force, for the Agency, for our allies and partners, airborne assets as part of that networked all-domain sensor layer. If the Air Force doesn't do it, then the Army is going to have to step up and do it.

But you could also come in with the leadership and DOD and tell the Air Force and Congress to tell the Air Force to do their job. The Army shouldn't have to build airplanes, and the Army shouldn't have to build dirigibles. The Air Force should be providing the air vehicles that have the sensors that we need to detect and track all these various threats. But if they're not going to do it, then good on the Army for stepping up to the game.

As far as the survivability piece, Mark again hit on this. Nobody is attacking these things if they're along the southern border, if they're in Montana, if they're in Saskatchewan, to name a few that he mentioned. Look, yes, these systems can be vulnerable. But 99.9% of the time, we are in a competition phase. We aren't in conflict. And so, we should have these sensors throughout the world because they're affordable and persistent.

And even if a conflict does start, probably the ones closest to the threat's territory are going to be the ones that actually find themselves vulnerable. I don't think Russia or China are going to sacrifice long-range missiles to try to take out dirigibles over the continental United States. They might take out forward systems. China might take out forward systems that are over Taiwan and the Philippines. But again, that's kind of a canary in the coal mine effect because now we saw that they did it and we can hold them accountable for it. And we can start using our expeditionary assets that are somewhat more survivable as required to now go in and fill the void.

But day-to-day, I shouldn't have to have E-7s or E-3s airborne 24-7. I should use an affordable, persistent asset that can provide me that same or even better, in many cases, capability.

[Mr. Riki Ellison MDAA Founder and Chairman]
And I think, Corky, just going to that, the class one drones, how much of this is dirigible capable? I know we have the TARS on the borders right now. The border security is using some of those. We're talking about different levels of...

[Maj Gen (Ret.) Charles Corcoran Former Assistant Deputy Chief of Staff, Operations U.S. Air Force]

This becomes a software problem, not so much hardware. We got the elevated sensors. You put the right hardware on those elevated sensors. And then it's just a matter of how you tweak the software to find the smaller targets. We have plenty of sensors that are perfectly capable that are both active and passive, quite frankly. I mean, MDA has done a lot of work, for example, on the passive sensors.

And those don't have to be just on the ground. Those can be placed in the air as well. So, linking all these various sensors and having the software programmed correctly so that you're not filtering out the low, slow, small objects, but you're actually looking for them and tracking them so that you can apply effectors against them.

[Mr. Riki Ellison MDAA Founder and Chairman]
As an F-22 guy and F-35, which are sensor platforms, you can weaponize. Is there a remote possibility, or is that real, to weaponize dirigibles as well as sensors? Because I think we're going to do this in space.

Why wouldn't we do this and have an ability to have a dirigible, have a weapon platform that's connected to its sensors?

[Maj Gen (Ret.) Charles Corcoran Former Assistant Deputy Chief of Staff, Operations U.S. Air Force]
Absolutely. Absolutely. You want to layer your kill vehicle capability, both kinetic and non-kinetic as well.

And there'll be plenty of opportunities, depending on the power available on the system, the weight it can carry, et cetera. But there are a lot of options there, again, both kinetic and non-kinetic, to put kill vehicles on this network system of either aerostats or higher altitude stratospheric balloons. That's the kind of things we're looking into at the Near Space Institute with the University of Arizona.

[Mr. Riki Ellison MDAA Founder and Chairman]
And that's with directed energy possibility, but again, that's power controlled and tethered. You'd have to have that kind of power. It's just interesting just to put that platform in place, not just as a sensor, but as also an ability to link in with a shooter as an aerostat.

[Maj Gen (Ret.) Charles Corcoran Former Assistant Deputy Chief of Staff, Operations U.S. Air Force]
I agree. Okay. All right.

[Mr. Riki Ellison MDAA Founder and Chairman]
Thanks, Corky. All right. We're going to go over to the Pacific and where a lot of this began.

I believe the whole JLENS (Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System) program really began at trying to defend Guam years ago and how important that is. Certainly, the hypersonic glide defense is vitally important in the Pacific. So, JD, you're there.

You've been there. It's all yours. Look forward to your...

[Mr. JD Gainey Former Senior Analyst, USINDOPACOM and National Security Affairs and Advanced Technologies]
Yeah. Thanks, Riki. I appreciate the opportunity to contribute and participate today to my panel panelists, Admiral Montgomery and General Corcoran. It's always an honor. Yeah. My input is for this panel and this discussion is let's start looking at removing and reducing the say and the do gap. There's a lot of talk about going out pursuing high-altitude balloons and lighter-than-air sensors, communications relay, but there's really not a lot of doing. In 2020, INDOPACOM did introduce high-altitude balloons in their exercise program. So, about five years, INDOPACOM has been utilizing this.

So, it's not new. The knowing how to operate these things, how to deploy in the operational environment, this is not new for at least with INDOPACOM perspective. It may be new for some other services and other agencies because they really haven't had a chance to dive into it.

So, when we look at the lessons learned and what we can leverage from either bad mistakes or things that just didn't work very well, we're not starting from scratch from these high-altitude balloons. We need to leverage those lessons learned and those operating instructions right now. That comes down to leadership and creating those forcing functions for lessons learned that happened in INDOPACOM exercise to carry over into other acquisition programs.

That's something that's always been wanting and it really hasn't happened. When we created the initial defense design, I don't want to say architecture, the first defense design for Guam, we had two major regrets. One is we didn't specifically include an elevated sensor. And the reason why we didn't call out one or two elevated sensors is because there's so many of them. And at the time, the Air Force were pursuing so many different options from the J-Lens-like capability, how they started to work on air motion target indicator from space, and also like the DAVI with their APY-9 radar, the early warning radars. There's so many things that we chose from.

Because we didn't explicitly put in elevated sensor, unfortunately, how the requirements were interpreted was, oh, we need to go create and deliver some type of cruise missile a sensing device. And that's how I think we got to one of the places we are with the Guam defense design, not using elevated sensors, but relying on multiple terrain-based radars to mitigate the cruise missile piece, which is bad. The other part we regret not enforcing was the very first requirement for Guam defense were the words persistent and enduring.

When it went into the Pentagon, the very first thing that was cut from our requirements was persistent and enduring. So aircrafts, you mentioned the F-22s and the 35s, the early warning, fantastic capability. They're not persistent and enduring, right?

They're needed at a very specific time and place. And that's it. The operational availability needs to be persistent and enduring. And so, again, that's one of the reasons why we are with respect to the Guam architecture in place right now. Aside from the TIPI-6 radars, there's really nothing else that's persistent and enduring. It's about operational availability and the way that the Army will intend to posture themselves based on the threat package, which, yeah, that's different than persistent and enduring.

When we look at the hypersonic lessons learned for the hypersonic glide intercept portfolio, yeah, we should go back and relook on the progression of decisions or really distractions that led to where we are right now. When it first came out in 2021, I believe, it was, let's get to a solution first and start building additional or advanced capability after the fact. So let's get something out.

Let's get something moved out. And you had multiple vendors provide credible and logical solutions. It came down to a couple of them that ended up within the competition. One you kind of saw a few weeks ago with sea-based terminal increment three successful testing. The only thing you need to do now to complete that kill chain, actually light off a weapon, which as progression happens with this type of testing, we know the performance of that weapon. We know the performance of the architecture and the design already in place.

It's just a matter of formality at this point in time. And you can go out and you can light that off. And so, yeah, there is a near-term viable solution for hypersonic.

It is terminal in place, but terminal is only with respect to where you place that weapon. So the farther out you push that weapon through a remote launch capability, which is real, that system already has remote launch capability. You can put those launchers out further out to provide you some type of credible defensive depth.

But going back to the distractions with respect to how we got to glide phase intercept, let's get something out. Well, hold on a second. We need to study it.

And then they said, oh, wait, we have some international partners who want to participate. So let's reevaluate and restudy glide phase intercept with our international partners collaboration and contribution. Oh, we're actually kind of limited understanding what they can actually do, their international partners.

So we need to go back and study it again. One of the things that we have noticed over the past couple of years with these disrupting type capabilities, these unmanned systems are being mass produced that are just coming out. Those entities haven't done the research and development that your core primes have already done.

But the hypersonic intercept, that R&D is already on the shelf for a majority of our partners, not our partners, but the prime contractors. The lessons learned of employment and experimenting, the internal research and investment dollars have already been there. So a lot of this stuff is not new.

It's just somebody needs to take charge, provide some leadership and pull it forward and put something in place. So taking all these lessons learned on what not to do as we move forward. As we mentioned, elevated sensors are ready now.

Where have we gone with respect to software and using accelerated intelligence, I don't want to say AI, because I think that's an abused term, but be able to process a lot faster, filter out a lot of the chaff, get to discrimination piece. You're able to understand who's who out there with respect to threats and threats coming in a lot faster than you were able to do a couple of years ago. And that type of fidelity of track control and track management is only going to keep getting better as time moves on.

So create an entity that actually pulls that type of technology in and allows us to go through there. I'd offer right now that throughout the Department of Defense Missile Defense Enterprise, there is not really an entity that looks at advanced concepts and advanced technologies. There's a little bit of a budget at MDA that does it.

There's a little bit of a budget with GIANDO through their nimble fire series that does it. But because the DoD Missile Defense Enterprise hasn't invested 20 to 25 percent resourcing time money to go out to advanced concepts and technologies, they have orphaned most of that to the primes who use their research and development dollars that can hire scientists, can leverage technology that's coming out to do that type of advanced technology demonstration and pursuit. So now, unfortunately, because there's no governance at the enterprise level for advanced technology pursuits, there's a lot of reliance on industry.

And whatever you go with industry, there's some type of conformity with respect to their technical roadmaps. And it gets funky, right? To be able to hash that out, it takes leadership.

It takes leadership to go, yeah, there's some best of breeds out there across industry, across government. Let's go out and start picking these things out and put them in place. Unfortunately, we really haven't seen that happen.

With respect to hypersonic glide intercept, putting those lessons learned in place, we're ready now with respect to sea base increment three. That's a fantastic program, very well managed, very well resourced. I was reviewing their unclassified 2020 technical roadmap.

They're actually on track and where they are right now, even with all the chaos that distractions with COVID, et cetera, sea base terminal in three is on track. That's a testament to this program managers and Congress keeping the money focused in that domain. There are no other missile defense enterprises.

With respect to hypersonic defense or employment, it's maintained pace like that. So we need to leverage that, give them some more cowbell and use that to get things out, at least operationally and start working through that. General Corcoran mentioned it, understanding where these threats are coming from, the launch platforms, people refer to as left of launch or time-sensitive targeting.

What that really is, and this is a requirement of the current Joint Firearms Network, is called offensive defensive integration. You have multiple platforms that do multi-missions and instead of adjudicate through boards and bureaus and discussions and PowerPoints and global force management discussions, you have the ability to compute and bring it together under a common battle management system. Not only do you know where the threat was launched, but you also have the ability to create effect on it at that point in time and I have seen it in action.

It will be according to the JFN roadmap by the end of the year, but all that stuff is kind of coming together. Again, these are just testaments to evolving, using advanced technology into the decision-making process. And I would offer this offensive defense integration wasn't an NDA or DoD missile defense enterprise.

It was a combatant command saying, hey, I need to go figure this out. And then he worked that through R&D separately. So I'll pause right there for questions with you.

[Mr. Riki Ellison MDAA Founder and Chairman]
let's go back to the fundamental thing here because the policy restrictions, my understanding was INDOPACOM did not have the policy restriction as NORTHCOM did where INDOPACOM's combatant commander could advocate for hypersonic glide defense. NORTHCOM was not allowed to do that through OSD policy. Today, just help me if I'm wrong or right, the executive order by the president of the United States on January 17th says that we can defend ourselves and our combatant commanders can advocate for that system.

Is that correct?

[Mr. JD Gainey Former Senior Analyst, USINDOPACOM and National Security Affairs and Advanced Technologies]
That's right. So sitting in the front row on those discussions back in 2019 with the NORTHCOM commander, General Shaughnessy was talking about homeland defense with respect to cruise missiles. We really talked about hypersonics in 2019 because we didn't see or realize or even appreciate how fast the hypersonic threat would be upon us.

We knew it was there, but not to the extent we did. And from a policy perspective at the time, the response was any attack on the mainland, we'll just defer to our nuclear deterrence strategy. And we're like, from INDOPACOM, we're like, hold on a second.

That doesn't make sense because Guam's part of the protectorate. So you're saying one cruise missile into Guam to take out that entire THAAD battery is going to respond to nuclear deterrent with respect to our nuclear deterrence strategy? No, not at all.

So what we at NORTHCOM discuss is like, let's figure out ways to provide flexibility with respect to the way we respond and enforce our deterrent mechanism in place. It's not just nuclear deterrent strategy is anything greater than one.

[Mr. Riki Ellison MDAA Founder and Chairman]
Today, we're wide open, right? Today, we can do it. Both combatant commanders could do it, correct?

[Mr. JD Gainey Former Senior Analyst, USINDOPACOM and National Security Affairs and Advanced Technologies]
But then there are assigned forces.

[Mr. Riki Ellison MDAA Founder and Chairman]
Correct. So INDOPACOM wasn't restricted, but they didn't come up with anything between now and then. So everybody's back equal again, forcing this thing to happen.

And hopefully, we're going to get this thing right to do it now.

[Mr. JD Gainey Former Senior Analyst, USINDOPACOM and National Security Affairs and Advanced Technologies]

The second thing I want to correct. No, no, that's not correct. It had nothing to do with the policy as it was with respect to fulfillment of the requirement.

And there were some distractions in that time period through the joint requirements validation process where we said hypersonic was one of our priorities. But like the result was like, no, we're going to kind of table that and share that. And we're not going to keep that at the same elevation.

Well, people refer to this stuff as the Davidson window. And there's a lot of people at that time like, yeah, I hear you, combatant command, but really not going to throw the resources behind it the way that you're articulating. And we can trace that back to the course of Congress.

[Mr. Riki Ellison MDAA Founder and Chairman]
Now we are, now we are.

[Mr. JD Gainey Former Senior Analyst, USINDOPACOM and National Security Affairs and Advanced Technologies]
Yeah, now we are, but I mean, we've lost five years, right? And so you're not going to make up that time and you're not going to be able to buy back that time either. It's too expensive.

So, so we're all just in a forcing in a place where we have to force ourselves. Let's take the best that we have right now, provide some leadership, put it all together in a gumbo pot, and let's provide something credible instead of say or hope to do something in the future.

[Mr. Riki Ellison MDAA Founder and Chairman]
JD, the next question I have, because the Indo-Pacific, because of the weather conditions, tethered, tethered aerostats have been a problem. You got to bring them down during the weather, bring them up. And obviously if we lost one in the wind in Pennsylvania, we got to be better at doing it there.

But aren't we limited with power? Because the more power the radars are and sensors up in that, the more they require ground power coming up from a tether than on their own. So there's got to be some sort of give and take on that with doing independent non-tethered.

And tethered gives you a lot of challenges in the Indo-Pacific, as I understand. So can you talk to that a little bit?

[Mr. JD Gainey Former Senior Analyst, USINDOPACOM and National Security Affairs and Advanced Technologies]
Well, you need less power at altitude, right? Just from the atmospheric attenuation and the power generation piece, that's just basic physics, right? That's the radar range equation.

If you're looking down, if you're up looking down, you don't need as much power to be able to complete that equation. Getting power up to that tether piece, I mean, now you're just talking about distance and then the size of your search pattern. Transportable power, new techniques with respect to power delivery, that changes every 12 to 18 months, right?

So if we're super imposing restrictions based on how we're not available now, it's because we haven't done the research or even pursued advanced transportation power techniques

to be able to pull that in place. The other piece of it, I mean, if you're talking about weather, it's going to be really crappy weather and the inflatables at 10,000 feet are not going to be effective. Okay, when you bring them down and whenever the weather subsides, you put them back up.

You don't make that as the primary argument of not to pursue this, right? I mean, we're not going to have aircraft flying in that weather if that's what you're talking about. So we're still relying on space-based capability.

Okay, that's why you have, as Mr. Corcoran said, you have a layer approach of sensing capability and battle management capabilities. If you're just relying on one piece, one radar, then it's going to fail. It's going to be defeated pretty easily.

[Mr. Riki Ellison MDAA Founder and Chairman]
Okay, great. Thank you. I know we're running a little late, but can you open it up for the public?

I have a couple of questions first, and then we'll wrap up.

[Mr. JD Gainey Former Senior Analyst, USINDOPACOM and National Security Affairs and Advanced Technologies]
Yeah, there was just one question that came in for the public, and Admiral Montgomery, this is for you. I think, what's the cost-benefit between ground-based radars and these lighter-than-air dirigibles?

[Rear Admiral (Ret.) Mark Montgomery Former Director of Operations, U.S. Pacific Command]
Look, so this is a hard question because they're both costly, and I think you can get equal range for less modules in an air-based one, but the air-based one costs more to operate hour-to-hour. One thing I'll say about the land-based ones, they're kind of hard to move. I know every once in a while you'll hear someone say they're transportable or they're mobile. Transportable to me means I can break something down and rebuild it three months later, maybe six months later, maybe a year later. Mobile means I can move it over weeks or months, not hours or days. So they each have their own advantages.

I'm not opposed to the ground-based ones. I'm opposed to a network of ground-based ones that's the backbone of your defense. I think that's a mistake.

I think it's satellite, these aerostats, other persistent UAVs, different kinds of sensors that might be up there, and some ground-based that fill known persistent requirement, like this is a threat vector that should always be monitored, then a ground-based would be good in that spot. We have a couple in those spots. What I don't want to do is say it's time to build 12 more of what we have in Alaska.

They wouldn't say that, maybe five or six more of these around different spots. I think that that would get cost prohibitive on us, and you'll find a lot of NIMBY when you're not in Alaska. A lot are not in my backyard, we're not in Alaska. So the answer is, it's not purely a money issue. There's a balance in there of what operationally they provide.

They provide something slightly different. But I think they're all part of an integrated thing, and it starts in space. That said, the thing is, mentally, we have to start in space.

That's the shift that has to occur. And I think if we do that, we'll be in much better shape over time. And again, I recognize we have to do some terrestrial defense, and that's effectors and missiles and launchers.

I think it's a mistake to make that a preponderance of our effort, though, and I hope we can really limit the White House's appetite for expanding the DAL until we're capable in space.

[Maj Gen (Ret.) Charles Corcoran Former Assistant Deputy Chief of Staff, Operations U.S. Air Force]
So, gentlemen, it's criminal that we don't know what's flying in our airspace, right? If there's something flying over the continental United States and our territories, we should know what it is. And so we need a layered set of sensors that can do that.

Then you can apply that tracking capability, that sensing and tracking, to any mission set you got to do. But we shouldn't have to wait for a hypersonic threat to go after this or we should be able to detect, track, identify anything that's flying over our territory. And oh, by the way, our allies and partners.

[Mr. Riki Ellison MDAA Founder and Chairman]
In your trade space, in our trade space, how much percent of this pie should be going to these two elements of the entire missile defense system? The overhead persistent sensors and the hypersonic glide versus all the other threats, the ballistic. Can you each of you project what that percent is or how important that is of this big pie that we're doing for Golden Dome, which is going to be limited, say, $40 billion?

[Mr. JD Gainey Former Senior Analyst, USINDOPACOM and National Security Affairs and Advanced Technologies]
Thoughts? Yeah, I'll go first and I'll actually steal this from the Australians. The recent missile defense strategies, we're going to put our effort into sensing, track control, early warning, and data, essentially threat data dissemination.

So that's a preponderance of what we do has to be on the front part of that kill chain. Effectors are going to come. We've seen a couple of companies essentially disrupt the underwater weapons territory.

The consummation piece is going to happen. Let's get the sensing and the battle management and the data distribution piece right.

[Mr. Riki Ellison MDAA Founder and Chairman]
How much percent, J.D.? What percent of your budget are you going to do that on your missile defense budget? I'll do 70 percent.

[Maj Gen (Ret.) Charles Corcoran Former Assistant Deputy Chief of Staff, Operations U.S. Air Force]
I got to run to another call, Riki, but I just want to let you know, I can't put a percentage on it because I think the effectors are going to be very expensive. But the first thing you got to do is what J.D. said. You got to know what the hell's going on.

You got to be able to sense and make sense. So, it might end up costing less because these things are cheaper. But it's got to be your number one priority is to make sense of what the heck's going on.

Thanks, guys, for your time. I'm sorry, I got to run.

[Rear Admiral (Ret.) Mark Montgomery Former Director of Operations, U.S. Pacific Command]
So, Riki, my thought on that is that it's, again, space-based, so sensor-based is important. Look, I think in the end, weapons from space are going to be cheaper. You don't have to strap a first, second, and third stage rocket motors onto them.

There's a lot of other things. You don't have to fight through Mother Nature, through gravity. There's a lot of benefits from space.

But currently, that doesn't exist. I mean, there's companies starting to develop them. They don't exist.

Again, this is a political battle. This is not a technical issue. It's not a strategery issue.

It is a political issue. Can we convince the White House to take the minimum for the next four years when our risk is, in theory, lowest against these kind of unusual attacks from China and Russia, and not just run to the current existing effectors that are priced in the $10 million to $20 million a shot, and not waste the money on that? And by the way, if I say GBIs, I almost get up to closer to $100 million.

Don't run to those. Do as little as you can extra in that to satiate the political need for progress while you work your way to space. Otherwise, if you try to fund both of these fully, space in the long term and terrestrial in the near term, you're going to get neither well.

And so I would put my preponderance against space, and again, I would 70-30, maybe 80-20.

[Mr. Riki Ellison MDAA Founder and Chairman]
And that would be up to the lead guy to make that decision, or is that going to be forced by politics to make that decision?

[Rear Admiral (Ret.) Mark Montgomery Former Director of Operations, U.S. Pacific Command]
No, it's up to the lead guy to make a coherent argument. I still believe a high-quality four-star can go in and convince leadership to do the right thing. I still believe that.

And so if that can happen, I think it would, and it would be like an 80-20, 70-30 split. And that doesn't mean you're not buying those things. Remember, there's still an MDA budget to think about in this too that gets placed against this.

But again, I would not buy a lot of legacy. You can't afford both. You can't do both well.

And so figure out which one you got to get done. I think that's the forward-thinking space-based one.

[Mr. Riki Ellison MDAA Founder and Chairman]
And that's when you're talking about a four-star taking this thing over, an Oppenheimer, a Schriever making that kind of decision, because they're going to want to go forward, they want to go big, and they want to go ahead of it instead of behind it.

[Rear Admiral (Ret.) Mark Montgomery Former Director of Operations, U.S. Pacific Command]
Let me say one last thing, because you're saying General Schriever all the time, and I just have to reckon he would have never survived in the age of social media. Like 19 straight misses would have been—he'd have been fired way before 19. So I get it.

He was a deliberate leader. Rickover would have never survived in today's social media environment. These kind of guys that we—

[Mr. Riki Ellison MDAA Founder and Chairman]
So, you're saying we can't fail? We can't fail.

[Rear Admiral (Ret.) Mark Montgomery Former Director of Operations, U.S. Pacific Command]
We have to succeed. I'm saying that it's hard to succeed, but I do think that if we have the right leader, the right resources, the right vision, we're going to be in a much better position. Thank you.

[Mr. JD Gainey Former Senior Analyst, USINDOPACOM and National Security Affairs and Advanced Technologies]
J.D.? Yeah, just to echo that, it's all about leadership. I mean, we got the money, we got the resources. It's about the right leadership.

And if I was space, I wouldn't want to talk about weapons either because that is expensive. But they can do the other part of the kill chain and get that in a place that can be transferred over. All right.

That's it.

[Mr. Riki Ellison MDAA Founder and Chairman]
Okay. All right. Well, thank you. I appreciate you guys coming in. Thank you for a great discussion today and a way forward as we leap into the Golden Dome in the future. So thank you for the participation. Thank you.