

3rd Annual Space Power Security Forum - Panel 1 transcript

Maj Gen Larry "Stutz" Stutzriem: [00:00:00] Well, I'm Larry Stutzriem. I go by Stutz, and I'm the Director of Research at the Mitchell Institute, and it's my pleasure to welcome you to our first panel, and it's that first tenet, denying first mover advantage. We've heard a lot about that already, but I will remind you that in 2017, it was John Hyten that said "we'd no longer be in the business of building fat, juicy targets on orbit."

And last year, General Saltzman, as we heard earlier, he went full throttle on this and when he made, denying first mover advantage, a key tenant or component of competitive endurance. So the Space Force, as we all know, is making remarkable progress, shifting toward a resilient proliferated space architecture that doesn't just involve more satellites and [00:01:00] LEO, but also explores new satellite concepts and ways of making tactically responsive space a reality. So today we're joined by representatives from the Space Force Acquisition Organizations, who are aggressively working these transformations, and also industry leaders delivering new capabilities to get them there.

So, again, this year, we are thrilled to have with us, Dr. Derek Tornier, Director of the Space Development Agency, and he's been with us for all three of our, our forums. But we've always had him as a launch speaker, so we moved him up early because he was losing some weight. So, if you see him heads down on a plate later, just leave him alone.

Welcome, Derek.

Dr. Derek Tournear: Thank you.

Maj Gen Larry "Stutz" Stutzriem: Next, we have Colonel Scott Klempner from Space Systems Command, and he's the Deputy Program [00:02:00] Executive Officer for Space Domain Awareness and Combat Power. And then from industry, we have to Derek's left, Joe Lorienti, CEO of Ursa Major. And then we have Jonathan Caldwell, Vice President and Deputy General Manager of National Security Space, Lockheed Martin.

So welcome to our panel. Really appreciate you taking the time. I know it's precious to be here. So let's start right away and get into some questions and we'll start with the news that splashed recently, related to space based weapons.

And the implication of what just happened recently for having a first mover advantage.

Various government officials revealed that Russia is planning a new anti-satellite weapon. Now we don't know the specifics about the threat, but the report certainly raises the heat on concerns about the extent to which adversaries might pursue ways that [00:03:00] could eliminate the U. S. space advantage. So for the panel, I want to start with this first question, what options does the Space Force have to mitigate the range of threats posed by folks like Russia and China? And how does this factor into your thinking about deterrence? And Dr. Tornier, let's start with you first.

Dr. Derek Tournear: Thank you. And see, Joe also got the note about the footwear today, so for those of you who didn't know, but no, that's good. So, thank you for that, and I won't go into any specific threats. I actually think that General Saltzman , gave some good remarks on that earlier today. He went into some specifics about how we deal with that.

But in general, right, in general I think it is exactly what General Hyten was talking about in 2017 and now we've shown is actually possible. That is you can defeat, or at least in General Saltzman's words, right, "make yourself more resilient" to [00:04:00] a large section of the threat base through proliferation.

And that's how you get a lot of resilience. So from that aspect, that gives you deterrence because now that they know you are resilient to a large class of attacks. And more importantly than that, you have deterrence because you can't, be taken out essentially on day zero with a single event.

So one of the, a single attack. So one of the, one of the beauties of proliferation is you can have some attrition and you can have a graceful degradation if you go into this kind of one on one, type of attack vectors. And so that's one of the things that proliferation gives you for resilience and for deterrence.

Now, as I've always mentioned, that only works when you don't have common mode failures. So the two biggest threats that I'm concerned with today and in the, you know, until I see something that leads me to believe that the threats there's more pressing threats. The two threats I'm most concerned [00:05:00] with are cyber vulnerabilities and supply chain.

Supply chain either interdiction or just the supply chain availability to be able to build and proliferate at the scale and the time frame we need. So, because of

that, we take extreme measures on all of our contracts and all of our ground systems to make sure that we have a lot of cyber protections in place.

In fact, we have one of the, our cyber protection strategy is now used as a model across most of the rest of the Space Force on how cyber security should be done in a proliferated architecture. So that's how I view it as playing out. You know, most of the threats we can make ourselves resilient against and we can deter the adversary from using just by proliferation.

For those that we can't, that are common mode, we, that's where we focus our energy to make sure we protect against those.

Maj Gen Larry "Stutz" Stutztriem: Thank you. We'll slide down the line, Joe.

Joe Laurienti: That's a fantastic answer from the perspective of our company building propulsion. We'd love to say this is a deterrence by production problem, but we know that, um, we know that [00:06:00] Replenishment is not the solution here.

So we think about avoidance. We think about detection and maneuvering on orbit as solutions here and General Saltzman touched on the tactically responsive launch demonstration of Victus NOX. It's a fantastic demonstration to show that there are avoidance and replenishment capabilities that aren't necessarily mass production efforts.

So this is more a technical problem than a strategic or a scale problem in our mind.

Col Scott Klempner: So proliferation I think is the best way to make your architectures and capabilities resilient. However, in the near term, through the end of the 2020s, we are going to have to fight with the architecture we have.

Space Systems Command operates a large number of legacy, high value assets. The large, juicy targets, we got them all. Uh, and we're actually, we're not done fielding them. So, no disrespect to General Hyten, but there are a couple, you know, the last of the HVAs are going to be launched through the end of this [00:07:00] decade and into the 2030s, and there are budget realities as to why that's the case.

I think the best way to think about deterrence, with respect to making it so that the, an attack on a spacecraft, uh, is not successful, is to rebalance attack and

defense, rebalance that towards a favoring defense. Because the strategy is if you attack, you win the name strategy. The winning strategy is to attack.

Obviously, if we are not able to instantly proliferate, and so we will get there. Even Space Systems Command is starting to proliferate its architectures, and following SDA's lead. The thing that we need, regardless of how it is you respond to an attack, you have to know that the first mover has actually moved.

That's something that we can't necessarily do today. We can't do it consistently. The thing that's "eating our lunch" is being able to have persistent space domain [00:08:00] awareness, being able to see that the attack with as little latency as possible, and to give ourselves as much decision space as possible to respond, whether that response is for high value asset to do escape maneuver or whatever else.

If you don't know you're under attack, it doesn't matter, you know, how I end that sentence, right? So, taking advantage of networks we don't yet have, persistent space domain awareness capabilities that we don't yet have, and the speed of decision making that we are working very actively to develop is what we're going to need to make sure that if an attack happens, uh, that we're going to be able to respond again, however that is.

All of our future HVAs are going to have some level of onboard resilience, whether it's maneuver capability or other, you know, layered measures. But whether we're getting attacked in our proliferated HVAC systems, configuration or not, knowing that we are getting attacked is going to remain a priority.

Making sure that [00:09:00] we have a rapid, agile, automated network for getting data from our sensors to our command centers into a rapid decentralized decision making space is going to always be a priority. And that's probably the best thing that we can do for protecting both HVAs and proliferated constellations going forward and that's where we're going to be spending our effort.

Jonathan Caldwell: So, what can we do to make any kind of attack on our space systems impractical? Proliferation, connectivity. As the Colonel noted, connectivity across all of the layers. This hybrid multi orbit architecture has to be able to talk amongst the layers. So we're strong advocates of going ahead and implementing that right now in the production lines, regardless of whether it's a paleo-asset.

A MEO or a new proliferative MEO asset or one of the GEO assets or even beyond GEO. An important point, attribution, right? I think we've seen in Ukraine that one of the [00:10:00] power, one of the powers of space was being able to unveil what's actually happening. And the idea that we're going to move into an era where all space platforms have some form of self awareness and neighborhood awareness. And then we have systems that are both classified and that are commercial that we can offer and show two speeds. What's going on and how can we expose that, bad actor to the rest of the world. So the rest of the world can take action.

Uh, and I think that's a practical reality. You know, it used to be a day when you, your car didn't come with a backup camera or a sensor. And then there was a time where you had to, the salesman would try to sell you whether that's a feature. And today I was going out shopping for the next car for the family.

And you can hardly find a car that doesn't have that kind of self awareness feature in it. And I think much like the auto industry, the space industry is going to come to see that as a natural part of any space system [00:11:00] that gets offered out. And finally, a reconstitution. If there's no point, there's no point in attacking if you can simply reconstitute the capability.

And I think industry owes it to our customers to demonstrate this, of our own volition without waiting to be asked. So following the footsteps of Victus NOX, Lockheed Martin launched our own satellite in December called Tantrum. Now what you didn't know is I actually used the SDA's production line.

I had a transport layer T zero contract. So I had a production line going, so I was able to pull a bus off, put a wide band, electronically steerable sensing array and launch a sensing satellite, get it operational in 72 hours. And collect the electromagnetic spectrum , and offer that data to customers.

I think that's a demonstration of commitment of industrial commitment to tactically responsive space that ought to give our adversaries [00:12:00] pause and say it's an inherent capability of industry. Not just something that happens when the government takes action.

Maj Gen Larry "Stutz" Stutzriem: Very good. Great discussion. I want to pivot a bit.

And, uh, you know, talk about one of the great hallmarks of U. S. strategy is always how we engage our, our partners across the planet. And so engaging them, uh, where does, where are we at with that in terms of denying a first

mover advantage? And I'd, I'd like to ask Joe to start this and then open it up to the panel.

Joe Laurienti: I'm probably not the right one to answer where we are at broadly, uh, as an industry, but kind of speaking for the non traditional contractor up here on the stage... It's become clear that there are extreme advantages that we can create with our foreign allies. [00:13:00] Especially in the space domain, where many of the problems are deeply technical.

These are, these are ways for us to diversify our capabilities on orbit. And, uh, it's extremely difficult for a company like Ursa Major to work overseas. We've worked on the policy side to try to improve that. We've worked directly via the commercial means which is the most accessible route to us partnering with, uh, an allied force.

But the, the headache that we face right now is that there is no, kind of, clear policy path to a partnership that is enduring and a partnership that is really meaningful. We, we may be able to, uh, after weeks, months of approval process, find the right commercial interaction. For more strategic capabilities, for more, more of the needs that we have on orbit today, there, there really is not a clear path to a non traditional, with our resources, with our limited time, with our limited headcount, to be able to partner overseas.

We see this as, as a huge need, especially when you think about, [00:14:00] talked about just about every day now, is this, uh, this kill web in the Western Pacific. This is an area for us to, really partner with our allied forces overseas. Build a strength for the coalition there in the Western Pacific that today is not being addressed.

So I think that certainly John can probably speak to it from the perspective of a larger industrial player, but I'd love to hear the government contributions on this panel there.

Maj Gen Larry "Stutz" Stutzriem: Jonathan, before we do that.

Jonathan Caldwell: Yeah, no. Trust me, I feel your pain as as one of the larger companies in the room. It's been a real challenge to expand and engage with our allies.

Now, one of the things that I'm heartened by as I look around the room is our allies are here. We're having a unified conversation around this important topic today. With the standup of space commands in Australia, in the UK, in Canada.

[00:15:00] Other allies now standing up their nascent versions of space commands.

You, you are individually acquiring your own sovereign space capability. No longer is it the realm of the U. S. to provide services to your nations. But now you're engaging in acquiring your own sovereign systems. I think there's an immense power in that for both resiliency and deterrence. Because it brings more people to the table.

What we need especially as international industry, because I do consider Lockheed Martin an international company, is the ability to more easily negotiate both the classification of the technologies that will empower our allies. And then the international trade and arms regulation. That technologies that were once in the seventies and eighties considered exquisite and the unique domain of the U. S. and potentially Russia are now much more commonplace.

So how can we more easily [00:16:00] facilitate the right transfers of technologies or the right awareness of capabilities to the folks in this room who are eagerly seeking to step up to the plate and be a part of the global deterrence posture in space. Um, and so we as industry are eagerly seeking ways to partner in country with you and do that. And for the folks on the U. S. side, empowering industry to be out there and build out this global security architecture. Your advocacy and your, uh, consistent push on the bureaucracy to make that happen is going to be tremendously important.

Col Scott Klempner: Sure. So the demand for allied collaboration and engagement and partnership for my organization is beyond what we can currently handle.

We don't have, we, we're trying to find the budget to kind of keep up with the pace and we're falling a little bit behind. [00:17:00] Uh, we have robust cooperation for sharing ballistic missile warning data. Capabilities that we are working to share with partners, that we're going to sell them copies of what we have, and then sharing space domain awareness data.

Uh, that sharing of the space domain awareness data is probably the best way that, relative to the topic, uh, that we can exploit what we have, but also exploit what they have. Meaning our partners, whether it's Australia, UK, Japan, are going to be generating their own data that we all want to share. So the Space Systems Command developed the Allied Exchange Environment.

It tacks on to our unified data library. And it becomes a way for us to create a synoptic view to where every space operations center has the same common operating picture for who's doing what in space. That is probably the most important way we can exploit, grow, and nurture allied cooperation.

I just want to say one more thing here. Foreign military sales, [00:18:00] it's a, it's run by the State Department because it's a instrument of national policy and politics. The DOD doesn't necessarily get to say, we don't have the final say on what systems or capabilities are shared with our partners. Uh, it is, you know, through, between Congress and State Department.

But when it comes to the war in space. I think the Space Force has an opportunity to go out, you know, yet again, uh, kind of define a new frontier here. Uh, usually for terrestrial domains, our partners are, are worried about their own security environments. It's regional in nature usually and they are solving their own problems that in some ways don't align with COCOM priorities.

Uh, aligning those COCOM priorities, there's a lot of effort being spent about how to steer allies towards ways to create a shared security environment. In space, when the war happens, there's only going to be one war, and we're all going to be fighting it. And so creating a shared force structure is something that I think [00:19:00] that we, with our space faring allies, can do in a way that, uh, is not necessarily the way we've done it in the other domains.

So what does that mean? If I want 30, you know, for example, hypothetically, if I want 30 of some system, but I can only afford 10, but I have partners who, they want to buy their own version of that system. Well great, we want them to have it. But, furthermore, we want to have coordinated, combined arms approach for combined operations when we, together, use those systems in a, extending the conflict, or sorry, extending the competition phase with our adversaries.

That is something that I think it's going a little bit further than we, we've done before with our allied cooperation and the other COCOMs. Not to say that it's not robust in those other COCOMs, but again, Space Force has an opportunity here that I think we should look to take allied cooperation a couple steps farther because we can and we must.[00:20:00]

Dr. Derek Tournear: Yeah, I find it a little discouraging that both you hear up here that, you know, the small companies and the large companies are both having problems in this area. That is something that we need to be able to figure

out how to work through cause it is going to be impactful. And I'm, I'm just going to dovetail on what the Colonel said.

That is, it is a unique position that the U. S. Space Force is in. If you think about it, right, the U. S. Space Force, uh, is, is in charge of presenting the force for the combatant commands, primarily, uh, for space command, which is a regional command. Globally, right? It's regional command, everything that is much different than any of the other services who will present forces to a combatant command that has their terrestrial region that then they deal with those allies in that terrestrial region and work that out.

So from the get go space command or US Space Force is set up completely differently, right? It has to be international from the beginning [00:21:00] because space doesn't, the terrestrial boundaries don't extend vertically. You're going to be over all nations. At a given point in your orbit and you have to, you have to work with that.

And from that, uh, what, what we've been doing to enable that piece of it within the Space Development Agency, is making sure that whatever we put out there, we work with our allies so that they understand what it would take for them to build a system to be able to plug directly into our architecture.

We publicize our optical comm standards. In fact, uh, a lot of our optical comm terminal vendors are from allied partners, right? So, they're working very closely. The allies know about that. If they put those standards on their satellites that they own and operate, and again, then follow the Nebula networking standard, which we publish, and we actually have a test bed at Naval Research Laboratory where all of this can be, the interoperability can be demonstrated and, and worked out.

Then we can work out the agreements on how to do the authority to connect, because then we've [00:22:00] solved the physical layer aspects of it and then it's just if you're allies, essentially, our networks are the SIPR net in space, we call the SOPR net, is our transport layer. We can figure out a way to do an authority to connect, to connect those.

Uh, to date, we've been working exceptionally well with our allies. NATO allies in particular that not only are putting ground entry points in some of their, uh, in some of their countries, but also working exceptionally closely with them to do LINK16 testing in the, in the future and plan for that.

All of our LINK16 testing to date has been done with a FiveEyes partner. Not in the, over CONUS. So it's already been done internationally, and we've got, uh, our international partners teamed with us to demonstrate that capability. So it's something that, you know, is inherently from the beginning.

This is how we have to team together to make sure that we can have a coherent, space network and a coherent space infrastructure. And if you want to talk to, you know, this is the way that you get rid of [00:23:00] that first mover advantage and you actually help with deterrence because if everything's interconnected and you have this kind of system, then our, through our allies we share assets.

So if an adversary wants to attack one, it's going to have to attack others. And that essentially puts a higher bar on that ability to attack before you, it takes away more of that first mover advantage. So those are all the aspects that make space unique in this area and hopefully we can push through it and make it easier for industry to, to engage as well.

Maj Gen Larry "Stutz" Stutztriem: Superb discussion. So beyond making systems more resilient, uh, and this is a question we'll start with Colonel Klempner to begin, but we want to talk about reconstitution and defensive operations that may be vital in what we're talking about. This topic today. What steps is Space Force taking to rapidly rebuild or replace damage capabilities?

Col Scott Klempner: [00:24:00] So reconstitution is interesting. Uh, in my portfolio we have the tactically responsive space effort that has come up a couple times today, and we get a lot of questions about, "is tactically responsive space, how we reconstitute?" And I think the predecessor to TAC-RS what is the, uh, tactically, tactically responsive, operationally responsive space, tactically our operational responsive space, right?

And that was geared at reconstitution. And that's not where we are. That's not what TAC-RS is. And so when it comes, so we... I'm telling you, when we've been asked the question, "well, wouldn't you want to reconstitute using tactically responsive launch to plug the hole that you didn't know existed until you got attacked?"

No, that's not where we are. Uh, if we have satellites on a production line, we are pushing those out as fast as we can. We're going to launch them and put them to service. We're not going to keep things on the ground because they are better served in orbit. One, providing service to the joint force or the strategic force.

Two, they add resiliency to the network because they add another targetable [00:25:00] node that further proliferates the capability. So the only way to reconstitute is to keep that production line going. What we've come up with instead is our, our CASR concept, commercial augmentation space reserve, as to where if we have a need either to surge or to plug a, an exploitable gap in capability.

We are looking at the contractual structures, the legal arrangements needed for us to call upon fielded commercial capability or about to be fielded commercial capability to provide those services to terrestrial forces. So that includes sensing, communications, uh, in some cases missile warning, uh, PNT.

Uh, so all the things that, that if there are, are gaps that we need to even augment large holes in our proliferated constellations, those exploitable gaps are things we're gonna want to plug as well. But Dr. Tournier is going to have his satellites on a production line being pushed into service as fast as possible.

And that is, that is how we get [00:26:00] ahead of, of drawdown, graceful degradation in space, is to keep our production lines going and to look for commercial augmentation where possible.

Maj Gen Larry "Stutz" Stutzriem: Dr. Tournier, any thoughts?

Dr. Derek Tournear: Just a, just a few. I completely agree. We're going to be building these satellites and launching them as quickly as possible, and, uh, and industry's going to, to keep that pace.

Right, Jonathan?

Jonathan Caldwell: Indeed.

Dr. Derek Tournear: Excellent, all right. Uh, and so that is exactly the model is that you know, you put these up. We, we don't really worry about, uh, about being able to fill certain portions. Have satellites in the barn at this time. Right? That's something that, that is for consideration.

If there was a way to get ahead of production. Then we would have to relook at that. Because there is, you know, a certain class of threats, that, uh, I'm not going to comment on here, I commented on it a couple weeks ago, and I was told that my proper response, what I was meant to say was "no comment." There's a certain class of threats, that [00:27:00] makes sense if you wanted to have capability in the barn. Ready to launch. By all accounts, the vast majority

of threats and the way that you, really get the resilience is just to get everything up as quickly as you can produce it and, and just keep that model have on orbit spares, if you will, with on orbit resiliency.

Maj Gen Larry "Stutz" Stutztriem: So, so let me ask the industry, uh, participants here on the panel. You know, what needs to happen to the industrial base to be able to reduce that time to get satellites on orbit?

Jonathan Caldwell: So I'm a big believer in diversity of supply chain. I think Derek and I've had a lot of conversations around this. One of the key elements to that production line is to have a robust industrial base.

You know, we at Lockheed Martin put together a 400 million venture fund because we don't think everything can be done inside of the large companies. The, there is a certain level of speed and innovation and risk that is well suited for the startup environment. [00:28:00] And so we've gone out and looked for the right kind of companies with the right blend of people and personality to get after some of that technology development and let us focus on our own technology development and amplify, uh, our effect on the industry. Uh, the reality is there's great capital money available on the street today. Uh, but you have to find a way to put together willing investors to go after it and demonstrate that there's a market.

Uh, and when you have a production line running, uh, then you're able to make those connections. I think, Derek said on cyber, I think the investments in cyber uh, securing and cyber hardening, uh, this network, because if you step back a little bit, what we're talking about is really a vast mesh network.

So how do you take the same concepts of a self healing self directed mesh network and put them into our existing orbit, on orbit systems? I think that connection is the first part, but then there's some underlying autonomy and [00:29:00] infrastructure that we're investing in. To offer, to say, how will data find its own way?

We're going to get to a scale where you have 10, 20, 30 thousand systems on orbit, where you can't have an individual operator decide how to route the network. I mean, can you imagine, that's like the old fashioned telephone operator from the 1920s, plugging faster and faster. At some point, you have to automate the system.

And I think we're on the verge of making that a reality, getting people comfortable that these systems will function autonomously in the time of need,

in the time of crisis, and at the speed we need. And so those investments and being able to demonstrate that, in fact our current Pony Express 2 on orbit testbed will be one of those commercial systems.

We'd love to see it come into the commercial realm. But it's demonstrating those kinds of autonomy, flying AI instances to automatically route the traffic and to understand what's the domain in which they exist. Um, [00:30:00] those are going to be a key things that we need to contribute as industry to the overall architecture.

Maj Gen Larry "Stutz" Stutztriem: Very good. Joe.

Joe Laurienti: I'll expand a bit on what the Colonel and John said. I think this is, uh, this is a challenge, but it's a really exciting one for industry to address within the supply chain. There's a supply chain scale question here, but a supply chain and a technical flexibility question as well. So, If we are looking to modularize some of our technologies and, uh, create the ability to assemble a one off sensor with a bus off of a production line with a propulsion system that might've been designed for a very different mission.

Uh, we have a lot of flexibility in our supply chain and our industrial base that really hadn't existed before, especially because we're reaching a scale now that, that enables it. Tying that to what, uh, John touched on the kind of innovation and investment side. Exactly that flexibility is what investors like ours are looking for.

If we have one mission we're trying to solve, it's [00:31:00] very difficult to fund it between, say, TRL three and TRL nine. But if we have flexibility, if we have one technology that can't address a field of missions, we can find private funding to advance that technology. And increasingly there are contracts available to see that through to TRL nine.

Whereas a few years ago that certainly was not the case. So we as a propulsion provider, but I think our peers as sensor providers and bus providers and prime integrators are increasingly excited about this notion that a production line can be flexible. We can provide a really capable, uh, node in the supply chain, uh, for more than one mission.

Maj Gen Larry "Stutz" Stutztriem: Very good. We've got a few minutes before we go to Q and A, but I, I want to, you know, we talked about proliferation. We talked about tactically responsive space. But now we need to talk about adding defensive measures and, uh, thoughts about some baseline

requirements with respect to that on [00:32:00] systems going forward? I'll start with, uh, the Colonel.

Col Scott Klempner: Okay. Where to start? Um, if we're gonna fight with a, with a network. We're gonna fight off the network. We're gonna have a network of data underlying everything we do. We spent 20 years of continuous war learning lessons about how do we think faster than our adversary and how do we react faster than our adversary.

So no matter what it is we're going to do, like I said, no matter how I finish that sentence, there are things we're going to need to make sure that we have that network and it's running as fast as we possibly can. Uh, when we were fighting in the Middle East, it took us years to, to learn those lessons.

We're not going to have years in a space conflict. Uh, we're currently, we, the Space Force currently operates with legacy systems, legacy processes and legacy mindset. There are people at across all three current field commands getting after legacy mindset. We're [00:33:00] trying to rehabilitate legacy systems, use them in new ways, build the future systems that, that work on top of those to get that network functioning.

Now, uh, in order to, to unlock the potential of those networks, we need to make sure that we have both ground and space based space domain awareness. Persistent SDA that can close our exploitable gaps with metric ranging, low latency, maneuver detection and reporting, which could mean always in COMM, uh, which is a link problem.

Uh, the ability to maneuver rapidly, the ability to understand your environment. So when I talk about the network fighting off of a network, the, the baseline of that is a sensor network, uh, for both indications and warnings, sensing. You know, visually what's in the local environment and what the RF environment's doing.

We need to essentially flood the domain with that sensor network. Back it up now with that second layer of having a resilient communications network, [00:34:00] whether it's through Dr. Tournier's backbone or through other means to make sure that we can ground that data into CONUS, into the network. Uh, and so there are, without making this take too long. Those are the basic technical requirements for what I think we're going to be looking for, for the future of how are we going to develop a resilient decision making sensor, mesh communications data network, that allows us to leverage defensive effects no matter what they might be.

Maj Gen Larry "Stutz" Stutztriem: Derek, anything on that?

Dr. Derek Tournear: I was really hoping he was going to say we were going to have a guardian with a ray gun protecting every satellite. So he didn't say that. So what...

Maj Gen Larry "Stutz" Stutztriem: Are you going to say that?

Dr. Derek Tournear: We're relying on SSE to prove it. No, so the, uh, um. Proliferation is our biggest defense. And then that that's how we that's how we plan on really getting the resilience and the defense of our entire architecture.

Right? [00:35:00] We, I like to, I'll, I'll steal it from, from SpaceX when they talk about Starlink, right? We, our satellites are cattle, not pets. And that's the way you have to look at it when you're talking about proliferated constellations. Each individual one, you can't really care about. You have to care about the health of the whole herd, the health of the whole architecture.

And so we have everything in place to make sure that we can maintain that resiliency and maintain that operations even if you start to lose individuals. So we don't, we don't go out, you know, we're not going to try to protect individual nodes. Now that said, obviously we have cyber protections in place to protect the entire architecture and the network.

And we have a lot of the environmental sensing pieces that are in place to give us an idea of what's going on. One of the key ones that, uh, for those of you that have been watching our solicitations, we put GPS, situational awareness sensors on our satellites for those kinds of things to, make sure that we can kind of sense the environment.

That's primarily looking at the terrestrial [00:36:00] environment, but it's very similar type of thing that we look just to, just to sense the threat environment of the domain. And then we would provide those as data to the, be proliferated through the rest of the Space Force and for Space Command in their unified data library. So that everyone has this common operating picture of what the LEO environment looks like.

That's really, uh, as far as we're taking any of the defensive measures.

Maj Gen Larry "Stutz" Stutztriem: We're going to move to some questions here, but I'll give you a, uh, a short period if you have anything to add from industry's perspective.

Jonathan Caldwell: I'll just say that one thing I really appreciate about General Saltzman was that, transparency and plain spokenness about what we're up against and our ability to keep having a conversation at a really at that really kind of, um, I'll call it almost a it's a really human level, right?

It's something we've gotten comfortable with in all the other domains. And we've just been really reluctant to acknowledge what we're up against in space, but when we [00:37:00] do acknowledge it and we talk about it in those kind of plain spoken terms, then we realize that we actually have the experience and the wherewithal to get after the problem. And so the more we continue the conversation that the chief has let off in the manner that he's let off, I think will empower us collectively to get after the problem.

Joe Laurienti: Agreed. And the transparency and the consistency with the messaging here today is fantastic for industry.

We, a term I've heard used a lot in the last, call it, two, three weeks is "the field of dreams model for technology. If you build it, the DOD will come." Obviously that's not a, uh, an applicable model, but in space even more so... where timelines are long, hardware is expensive, a production line is far more expensive than other domains.

So, the consistency in the signaling, the consistency in the messaging and the transparency at all levels is really helpful to industry.

Maj Gen Larry "Stutz" Stutzriem: Really well said. Well, let's open it up. If you have some questions, please raise your [00:38:00] hand, tell us who you are and direct your question if you will. Oh, I'm sorry.

We'll come here next.

Question 1: Hi. Good morning. Uh, Steve Jordan Tomaszewski with the Aerospace Industries Association. Uh, question about supply chain. Um, I think we touched on this a little bit, but, uh, I'm wondering, what is your biggest supply chain challenge for government? Uh, what's stopping you from executing your programs?

What, what's your biggest challenge? And then for industry, as you're scaling to, you know, meet demands, um, especially with a lot of new space architectures what is your top supply chain challenge right now?

Col Scott Klempner: Star Trekkers. No. Integrated, space specific components that have long lead times. So we want to get beyond the, the tyranny of long lead and some of our some of the new space companies, they have looked at how to integrate vertically, and so that they are not beholden to outside [00:39:00] suppliers. So star trackers, reaction wheels, control moment gyros, um, and there's something else, uh, that, that are just kind of eating our lunch with respect to timelines.

If we can find a company who's figured out how to, to get past that, uh, oh, sorry, uh, thrusters. In some cases thrusters.

Dr. Derek Tournear: Really hadn't noticed that.

Col Scott Klempner: So, those integrated specialized components where we have to plan years in advance and budget years in advance, that's where we want to get beyond.

Dr. Derek Tournear: Yeah, I'll add that. So, the other part I'll add to that is even on our short cycles where we have roughly 30 months order to orbit. What you think is going to be the long pole in the tent of your supply on day one, uh, tends to not be the long pole in the supply, uh, midway through the program, which is what we found.

And so, there's a lot of, there's a lot of components. And, uh, and, and the key thing is just [00:40:00] to make sure that the market stays healthy with a lot of tier two, tier three providers. Post COVID, you know, during COVID, it was difficult just to even get resistors and things like that. Some of those components are now coming online and making it easier.

But space based crypto, uh, space radios, those are big, even solar panels are, are a big deal. All of this, and like I said, I can't predict, because we knew space based crypto, uh, would be an issue from day one on, uh, on our tranche one. But now we're tracking some other ones that were not identified as the highest risk on the supply chain, such as propulsion.

And so this is one of the things that you just constantly watch.

Maj Gen Larry "Stutz" Stutzriem: Question right out here, and then we'll have to break.

Question 2: First of all, thank you, gentlemen for this very informative panel this morning. My name is Ruchika Tandon. I'm with the Air Forces and Space Association, the New Jersey Shooting Star Chapter.

We're here at this table. I'd like to ask a [00:41:00] question specifically for Lockheed Martin and for the United States Space Association. What is it that we're doing with regards to the space debris field that we have out there? With the amount of assets that you're putting out there, what percentage are we growing in terms of this debris field year, over year, or decade over decade?

And what kind of steps are you taking to have these new assets not eventually be a part of our space debris field? Thank you, gentlemen.

Dr. Derek Tournear: I think she said Lockheed Martin.

Maj Gen Larry "Stutz" Stutztriem: I'm pretty sure Jonathan... Jonathan, you'll close us up on this.

Jonathan Caldwell: No, look, I think all of the industry associations, uh, have to realize that we as, as large, uh, corporations take a leadership position in responsible use of space.

Uh, and the systems that we put up with are committed to the consistent de orbiting this, you know. One of the things that, uh, SDA and we have a lot of conversation about is we can take risks in mission, we can take risks in production. [00:42:00] But one of the things we're very careful about is making sure that we can in fact leave the space as good as when we found it.

And it's a challenge that we're going to have to continue to wrestle with. I think it provides great opportunities though. I mean, we have, if you can do in space production and in space refueling, you can get after, uh, a lot of these challenges. And so I think there's a tremendous opportunity. That's probably about to present itself for those of us in the industry if you're paying attention that there's going to be a market for, uh, for keeping the environment clean in addition to taking responsible steps about how we architect and design the vehicles that we're putting up.

Maj Gen Larry "Stutz" Stutztriem: Well, we've come to the end of this panel.

Dr. Derek Tournear: One quick, so we did, we did, uh, SDA just did release a special notice to our STEC BA, which is our open BA for ideas, to look for

people that, there are a lot of companies out there that are offering orbit maintenance services and we want to find out just how real that is and so we're looking to put some studies out there to find out the efficacy of that model because it would [00:43:00] allow us then to take larger risk on some of our satellites so we could drop the price of them in the future and so that's, that's one of the things we're looking at.

Maj Gen Larry "Stutz" Stutztriem: I think that's something Mitchell Institute could get into and raise a little cash I think. Maybe?

Dr. Derek Tournear: I'm all for it.

Maj Gen Larry "Stutz" Stutztriem: Thank you. Well, we come to the end of this panel and really appreciate the time you've given us a great discussion. We're gonna break in place for about 10 minutes and then we'll start our next panel.

Thank you.