A Fireside Chat with Brig. Gen. Luke C. G. Cropsey

July 10, 2023

Lt. Gen. Bruce "Orville" Wright, USAF (Ret.):

From AFA headquarters, the Doolittle Building in Rosslyn, Virginia. I'm Orville Wright, President and CEO of your Air & Space Forces Association, and thank you to everyone for joining us in person and to the hundreds more today who are online and tuning in. We've got a packed house today, which tells you just how important Advanced Battle Management Systems, or ABMS, is to our Air and Space Forces and to the entire joint force, and to the opportunity for industry support. Operationally Focused ABMS is one of Secretary Kendall's seven operational imperatives. It is the department's components of Joint All-Domain Command and Control. The goal is to improve how we collect, analyze, and share information so we can make operational decisions better and faster than our adversaries, and I would offer be increasingly, lethal, and decisive at the merge.

Our guest today is the leader in charge of the daunting task that I just described. Brigadier General Luke Cropsey is the Department of the Air Force's first integrating program executive officer for command control and communications and battle management. He is tasked with modernizing the department C3BM systems to ensure we stay ahead of our pacing threat challenges. So General Cropsey, thanks so much for joining us today and with that, let's show our industry slide.

And I also want to give special thanks to our sponsors who are listed on the screens planking our stage today. It is your support, their support that makes Warfighters in Action possible. Well, with that, I think we can go ahead and get into the questions. Luke, if you're ready?

Brig. Gen. Luke C. G. Cropsey:

Absolutely, sir.

Lt. Gen. Bruce "Orville" Wright, USAF (Ret.):

And again, welcome.

Brig. Gen. Luke C. G. Cropsey:

Thank you.

Lt. Gen. Bruce "Orville" Wright, USAF (Ret.):

Well, to start, as I mentioned in the introduction, operationally focused ABMS is one of Secretary Kendall's seven operational imperatives. What does the ABMS structure look like today and how are you getting after the significant challenges involved, please?

Brig. Gen. Luke C. G. Cropsey:

Yeah, thanks. So first, thanks for everybody showing up and I'm looking forward to the Q&A and the interaction coming up here. To kind of replay history a little bit. You'll remember the on-ramps back in the 2018 timeframe and I mean the significant effort between Dr. Roper and Preston Dunlap in regards to trying to find new and innovative ways to get commercial technology into the department. And that had a significant impact on the way that we looked at and the way that we understand where and how the integration of these kinds of technologies come into play, both scale and speed that are needed for those things. And then you'll remember that we tasked the RCO to put some acquisition rigor around

some of the programmatic aspects of what needed to happen coming out of those on-ramps. And the RCOs just did a phenomenal job over the last couple years building that program and defining where and how we needed to move forward on a couple of key items, predominantly oriented around digital infrastructure.

In fact, they did so well in coming out of the operational imperatives work that was just mentioned that the secretarial was like, all right, we got to get after this thing at more scale and with more rigor. And so nine months ago, that conversation went to the next level at AFA back in September of last year. And so we've had about nine months now working through the combined ABMS, RCO ABMS team and the old chief architect office team under one roof getting after a very singular focus as it relates to our ability to do C3 across the air in the Space Force. And in the process of doing that, we've learned quite a few things. One of the things that we've learned is that you've got to be absolutely intensely focused around the operational problem that you're trying to solve. If you're not focused around that operational problem, you end up in a boil the ocean scenario where you're trying to do everything all at once.

And I think as history is replete with the examples of the programmatic carcasses that have littered the side of the road on those attempts, we're very diligent about staying focused around the operational problem. And we have actually the ABMS cross-functional team to thank as the best operational partners and acquisition program could hope to have. Special shout out to now retired Brigadier General Spaniard Valenzia for the three years of phenomenal work and support that he did with that team. And a huge welcome now to Brigadier General Select Clayton as he takes on that huge role. But they are quite frankly a key component to all of us working because they are the operational team that gives our acquisition folks the ability to focus on what those key problems look like. And it's really the ability to focus on those key operational problems that gives us really the ability to say no to a lot of things that otherwise would all end up on our plate and that ultimately diffuse your effort and your focus.

So right up front I would tell you that one of our major keys to success is we've been working through things over the last nine months, has been that ongoing partnership with that ABMS CFT team. The fact that we're literally welded at the hip together when it comes to what we're thinking about and how we're getting after it. So as a general structure for how we're set up to move forward, that partnership is going to continue and it extends beyond the CFT down in into the other match comms as well. Lots of dialogue going on with Air Combat Command, Global Strike Command, USAFE, PACAF, you name it.

That conversation is robust and as you might imagine, everybody has some pretty strong opinions about what the need and the requirement looks like. And we're all ears on how to meet those needs and facilitate our ability to do exactly what you articulated upfront or with regards to putting Airmen in and Guardians at the merge when and where we need 'em so that we can dominate in that decision space.

Lt. Gen. Bruce “Orville” Wright, USAF (Ret.):

Well, thanks. To further pursue your focus on solving operational hard problems, doctrine has shifted and for many of us have been around too long. It was always centralized command and decentralized execution. Now it's centralized command, distributed control and decentralized execution as the doctrine. It sounds like you're right within that framework. And could you expand a bit on then what is the DAF, Department of the Air Force Battle Network really all about? Why is it important? Where does it stand today including the 24 MDA support as you see it unfolding?

Brig. Gen. Luke C. G. Cropsey:

Yeah, sure. So one of the things that we talked through when we were standing up nine months ago was the scope and scale, the system of systems problem that we were trying to get after, and the realization that we kind of needed a way, a label that was distinct from ABMS, historically. If you looked at where

we've gone with ABMS as a label, I mean depending on the timeframe and who you're talking to, it can mean one of five different things. And making a sixth thing also labeled ABMS was going to be a challenge. So we put the label DAF Battle Network on what we're talking about today as a way of trying to better articulate the scope of the system of systems that are going to be required in order for us to actually win that decision advantage fight.

And to do that, there's a couple of key tenants that are involved in how we pull that together. The first is this idea that we've already hit on, that you have to be operationally focused around the problem that you've got to solve. That's the first thing. And I'll say this as a guy with three engineering degrees, so this isn't pejorative any sense because I've been there. If you turn engineers loose without supervision, they will absolutely guarantee find a solution for which you have no problem. Okay? So our first order of business was to make sure that we were solving a real problem that mattered fundamentally. But the second piece to this that I think comes out in spades is that you need to do it in a way that the architecture itself actually predominates in the dialogue and the discussion, not the individual product specs.

And what do I mean by that? What I mean is that the battle network, as we're defining it, is composed of everything from right sensors out there that build situational awareness about what's going on in the battle space, right? Brings your data in, gives you that situational awareness and allows you to start making operational decisions about where you need to go, where and when. And then it gives you the ability to direct the force with regards to what needs to be in those particular places and locations with what capability. If you look at it from that perspective, there are lots of individual parts and pieces that make up that end-to-end chain, right. From the sensors to the platforms to the weapons, and then the communication capability that connects them all together. If you don't have a perspective where the architecture requirements allow you to rapidly integrate new capability quickly and at low switching costs, where you end up in this space is an inability to pivot with regards to where the technology is moving.

And so ultimately what you have to do is you have to create a system and an architecture level that emphasizes the abilities of the architecture for solving that operational problem over the individual performance specs of the things that are in that architecture. Because the underlying assumption is that whatever or however good you think you are today, somebody else is going to be better in another 12, 18, 24, 36, pick your timeframe, number of months. And if you can't rapidly pull that in and integrate it, you're going to lose.

So our premise right now going forward is that as we're building that architecture out, the ability to extend that architecture to the next new problem, which we can't see coming, but it's going to hit us, is really the difference between winning and losing.

Lt. Gen. Bruce “Orville” Wright, USAF (Ret.):

That's great. I think you fire us all up. We're ready to go to war again with the information capability we've always wished we had. So when you talk about next generation air dominance and a system of systems approach, and then you bring in not just the next gen air dominance programs, but programs that are more mature, the B21, the F35 for example. It seems to me that you were talking about the foundation for finding targets, killing targets, getting immediate battle damage assessment, backing up to the integration of collaborative combat aircraft. You're build a command control system, ABMS that marshals those forces and that brings collaborative combat aircraft into the fight again to turn every threat into a target, find targets, and then obviously bring in the overhead capability of GMTI and AMTI into that. So it sounds to me like you all are going exactly the right directions.

Could you expand however you want to in sort of a broad question on how you're turning good ideas into killing capability every threat at target?

Brig. Gen. Luke C. G. Cropsey:

So maybe I'll just walk through at least the thought process that we're walking down. So starting with that operational problem that we're there to solve, right? We've stood up what's called the architecture and system engineering team underneath of Dr. Bryan Tipton. And Dr. Tipton really owns what I'll call the engineering and technical space of the program executive office. So his teams are broken basically up by domain with regards to, you can think of it where your target lives, airspace, maritime, land, what have you. And we're taking a very deliberate architecting approach where that operational problem defines the end state that we're trying to achieve. And then we're going through a rigorous mission analysis phase that allows us to take those operational problems, decompose them again, hand in hand with our ABMS cross-functional team and other subject matter experts in the operational domain to make sure that we're getting that mission analysis done correctly.

And then that decomposes inside of that analytical work through what the ACE is doing to a series of enterprise system and product architectures that ultimately have to be available and perform at a specified level in order for that operational outcome to be achieved. Once that analysis happens, you're able to actually now at the product level understand where you have holes, gaps or fragilities in your architecture and you can start filling those in with very specific concrete programmatic type activities to get after those holes. And as that conversation moves forward, you start to build out an understanding of what you have to do for an individual set of targets, and then as you layer it together, what you have to do holistically across the architecture in order to make the problem as a whole solvable. But there's a basic systems theory piece to this that says that if right John Gall back in the mid '70s basically postulated that every complex system that works started out as a simple system that works first.

And if you can't get the simple system to work first, you don't have a prayer of making a complex one work. So the idea is that your architecture gives you the ability to make the first problem work, but then extend it as you start layering in more and more complexity into that space so that you maintain your ability to expand the scope and the scale of that architecture. So that's kind of the overarching approach that we're taking with regards to how that part of the architecture works. Underneath of that, there's a whole nother set of activities that are already going on with regards to the ABMS program itself that the RCO started two plus years back and that gets after a lot of the communication networking and connectivity pieces. So if you don't have the digital infrastructure that allows you to connect the things across that architecture, you're at dead stop, okay.

And so the idea is that with digital infrastructure, regardless of what you're pushing through that pipe in terms of the particular mission sets that you have to enable, there's this overarching requirement that the things in it have to be connected. And so a lot of our initial efforts that you'll see and hear about over the coming months are really oriented around that digital infrastructure capability. And as that gets deployed and put into place, it now gives us the ability to very rapidly push the content that we're talking about in that architectural analysis piece into the system.

Lt. Gen. Bruce “Orville” Wright, USAF (Ret.):

Yes, sir. You know, brought up the RCOs leading role here. For many, I think of your industry partners, the challenges with security and insight into really meeting needs and bringing in opportunities for more advanced technology across the broadly defined ABMS program certainly is part of what you work every day. And so I noticed that one of your classmates, it's [inaudible 00:18:06], who works as our [inaudible 00:18:08], and I know you all are working, any one of a number of efforts to broaden the opportunities

for industry to support you, support the RCO and to make ABMS real. So could you talk about that a bit from your support or your invitation to industry to be participant even in be a partner?

Brig. Gen. Luke C. G. Cropsey:

Yeah, absolutely. So for those of you that I had a chance to interact with back in Denver this past winter, right? I kind of gave you the Heisman, I said, "Hey, come back and talk to me this next summer when I've actually got something concrete to tell you". I've got something concrete to tell you now. Okay. We've gone through that first analysis. Bryan Tipton's team spearheaded by Mark Daniel has done a phenomenal job on doing an initial crank through some of those priority mission sets. And we've identified some very clear needs around what that looks like. I also told you back last winter that I felt like a big part of our challenge was the fact that we had enough kill chains out there to choke a chicken. Everybody had their own and none of them really necessarily lined up. And that I was convinced that part of our ability to move forward collectively and at scale was going to be our ability to actually coalesce around a prioritized set of those kill chains that we could all hold in common.

Now to the point on security, that's still there and it's still real. To have a fully informed dialogue and discussion about that requires significant number of tickets. I haven't cracked the nut on that one yet, but we haven't quit beating on the nut yet either. Okay. So we're going to keep that conversation moving forward. We're going to have a broader conversation and General Abba and I have been engaged on some of this with regards to what they're doing on the SAP reform end of this.

But until that's in place, there are things that we're doing in the interim to try to make that conversation one that we can have and one that would actually allow you to align your own efforts around what we're trying to get after and how we're trying to do that. So I think as we're moving forward into that conversation, we're going to need to explore how we do that and the details of it, because the abstract doesn't help anybody when it comes to things that you need to go build in order to fill in those holes. Unfortunately the details are at those higher classification levels. So we're just going to have to keep working it. And collectively, I'm convinced we're find a way to lick it, but it's going to take the whole village here to work through what we have to do to make that happen.

Lt. Gen. Bruce “Orville” Wright, USAF (Ret.):

Thanks, you know, you got a great team out there and not just Air Combat Command, but it turns out Air Mobility Command very engaged. I was on a KC-46 not too long ago, and they're very proud of their ABMS role and in fact see that as important or more important than their air refueling and cargo role. It's a BA node, if you will, a airborne communications capability in the ABMS sphere, if you will, is really important to them. You also have the 505th wing, and obviously you have the Air Warfare Center as part of your team, so could you talk and certainly connected to Wright-Patt and to Hanscomb. So there's an incredible team out there that then I think will be really the go-to force for the joint community. If you want to make JADC2 work, talk to Luke Cropsey.

Brig. Gen. Luke C. G. Cropsey:

I think we're engaged at a lot of different levels across a lot of different mission sets. Obviously AMC is a huge partner with us on capability release one. And what we're trying to do with regards to what we're putting into the KC-46, I'm heavily engaged with General Cunningham and the team out at Nellis, and also with the 505th and the conversation that we're having with the shotgun out there. There is a very real need for us to have a operational capability to go out there and my term muck around with stuff and figure out what works and when it comes to how the battle manager brain interacts with the technology piece to this, and to be able to do it at a clock speed and a tech refresh rate that stays

relevant, which is a challenge. It's a challenge on the acquisition side of it, and it's also a challenge with regards to keeping the rest of the DOTMLPF pipeline aligned as you're going through that. And the last thing we want to do is drop capability on somebody's head and they'd be like, "What is this? How do I use this?"

So the 505th has a key role in regards to what that looks like and how we get after it from a experimentation standpoint as we're going through this so that as we're starting to tease out maybe new technology things to drop in, software applications, you name it, they're in that mix and they're in that fight with us trying to help us on the operational side understand what the impacts are, with regards to the technology that we're trying to introduce and vice versa. And I think a lot of times historically we've tried to bifurcate the operational requirements piece from the acquisition, go out and buy piece, and that doesn't work. We know that doesn't work. It's got to stay tight and it's got to stay connected. And the 505th is going to play a key role in what that looks like and how we do it.

Lt. Gen. Bruce “Orville” Wright, USAF (Ret.):

Well, thanks. You've got a good deal of space background, Luke, as you look at the evolution of GMTI and AMTI and bring space capabilities into ABMS and certainly into JADC2, could you talk a bit about how at the same time you're making ABMS real, you're bringing in untapped, unbelievable, awesome potential of GMTI and AMTI space capabilities. And then there's a PT piece to that too that, so AFRL just launched an experimental satellite at LEO, right, just focused on Link 16. So please.

Brig. Gen. Luke C. G. Cropsey:

Yeah, I mean it's probably impossible overstate how central role space plays in this whole conversation. Whether you're talking about the sensors, whether you're talking about comms, I mean the centrality that space is going to play in an extended fight is huge. I am absolutely blessed to have a deputy who has decades of space experience and understands that business inside and out. Gordon Kordyak is an amazing guy and we are tied directly into a couple of different key aspects of what's going on the Space Force side of it. Predominantly out at Space System Center out in LA, through both what General Sejba has been doing inside of the BMC3 portfolio, not to be confused with the C3BM portfolio. But then also within the SSC SIO group that's headed up by Dr. Leon out there. And Dr. Acosta, who is working as kind of dual hat, so she's both in SSC, but she also works as my space mission integration team lead underneath of Dr. Bryan Tipton on the architecture and system engineering side of this.

So that we're right, we're integrating and we're converging the space and the Air Force architectures together as part of the day job that the ACE team has as they're going through these different iterations. And it isn't right that you have a separate, "Hey, here's the space thing that I need you to go do". There is that component of it, but space is baked into everything that we've got going on. I can't do an air mission without space. I can't do a maritime mission without space. I can't do a land mission without space. So I have space embedded and integrated into everything that we're doing, and we have had absolutely phenomenal support from Lieutenant General Guetlein and the team out there, as well as Honorable Calvelli and the SQ team here in the building.

So can't say enough good things about that. There's also space operational capability that's embedded with the ABMS CFT. So the CFT isn't just air, it's air and space and we're getting the operator flavor coming in through that avenue as well as the obvious things that you would think about out in Colorado and the engagements that we have there.

Lt. Gen. Bruce “Orville” Wright, USAF (Ret.):

Outstanding. We're going to go to the audience here after one more question. So be ready, and if you're here in the room, please stand by, we'll use a microphone and then Amy will help facilitate questions from those folks who are online. But let me give you a chance just to wrap up in the context of where you could see an improved level of partnership with industry and take advantage of their own analysis that's constantly ongoing. And within your work and terrific level of acquisition experience, truly an acquisition journeyman if you will. How do you see a different set of opportunities going forward with industry, the department of the Air Force to partner with industry than maybe in the past? So let's look forward not backwards.

Brig. Gen. Luke C. G. Cropsey:

Yeah, well, so I think there's huge potential here. I think a lot of the technologies that we're talking about integrating are things that are being generated out of the commercial tech base, not inside of internal department R&D, although there's certainly plenty of that going on as well. And I think what we're trying to do is find ways of actually promoting more competition, not less competition as we're moving forward.

And so we're thinking very deliberately around how we create the conditions for deploying capability continuously. What does that look like? How do you do it? How do we get out of big bang acquisition, right? Where I spend a decade or better trying to get it all just right before I push it out the door. We've got to move to a different model where I am rapidly, iteratively, constantly moving capability incrementally forward at a rate that keeps up with where the technology is moving as a whole and how that looks. And the way that we do that I think starts to look more like thin slicing the problem as opposed to shoving it all over into a winter takes all kind of an environment.

That model is something that we got to go out and prove, frankly. That isn't something that I'd say we've got a ton of experience historically making work and make happen, but I think there's a lot of extent evidence out there in the system, both commercially and in bright spots around the department where they've taken that kind of mentality, that agile product manager focused kind of a perspective around what needs to get delivered. And they've made that work. And in fact, I would point to our own cloud-based C2 effort that we've been working with NORAD North Com for the last year as an example of this in this space. We just went through and delivered our first MVCR on that program this past month, just barely a year after standing that up. And we're going to be IOC by the end of this year.

So we're stripping the gears out of stuff when we can get after it, and we have very clear and concise set of problems that we need to go get after and solve. But I think that's an example where we brought in actually a very wide range of different players, both historical DoD OEMs as well as right smaller companies coming out of the commercial tech industry. And we brought them together in new interesting ways to include, quite frankly, the swags, the software wings out at the depots as part of those teams.

So we're serious about extreme teaming when it comes to how we bring people in and the way that we integrate capabilities, but we're interested in doing it in ways that allow us to leverage unique things that companies bring in without necessarily doing the whole enchilada at a level that we've maybe done it in the past. So I think there's going to be different sets of opportunities as we're moving forward. And I think certainly as we start building the backlog around the specific programmatic elements that we need for filling in holes or building out the scale and the capabilities and the future, as the architecture and system engineering team gets more legs underneath of them, there will be more and more opportunity for, I'll call it maybe platform specific or subsystem unique kinds of things that might go on particular platforms or otherwise that are already out there in existence.

Lt. Gen. Bruce “Orville” Wright, USAF (Ret.):

Before we go to Chris Gordon, first, I almost forgotten, I can't forget. And in the audience, our allied partners and Secretary Kendall to paraphrase talks about our national advantage is our international friendship. So some thoughts on ABMS and ally partnering.

Brig. Gen. Luke C. G. Cropsey:

So certainly, I couldn't agree more with the secretary on that front. My last job was working foreign military sales. So I am a huge believer in all of us going together and that takes a composite collection of nationalities, capabilities, technologies, you name it, right? We're stronger in part because of our heterogeneity, but that also complicates our ability to actually get everybody moving in the same direction at the same time.

So I'll offer a couple of thoughts. One, our current network centric view of security is killing us. Our ability to push data and the places into the people that need to get it right now is confined by whether or not you're on a network that allows me to talk to you. Okay? My ability to scale from an ABMS perspective is significantly constrained by that fact. What are the implications? The implications are that until I get to a good identity management system that's coupled in with a good zero trust capability that allows me to start to get to network agnostic data flows, our ability to integrate both across services and with partners is going to continue to be challenged.

So that's one piece of it. The other piece of it I'll tell you is that we're not waiting for the system to go figure that part of it out. We're also kicking tires and lighting fires around getting the existing structure that we're already operating inside of to accommodate those things when and where we need to in order to get the mission done. So our experience to date is that if you bring that very focused operational problem into the bureaucracy side of this and you tie what you're asking the bureaucracy to do back to the operational outcome, you can actually generate some pretty significant speed out of the bureaucracy.

Especially if you can articulate in a way that says, no, you don't understand. If we don't get to this, then the following operational outcomes aren't going to happen. And then now all of a sudden it's not an esoteric conversation about a widget, it's "Hey, if this doesn't happen, these are the operational impacts that either are or aren't going to be achieved". And so that's actually had a significant amount of positive energy in the system up to this point. So no, I don't have a silver bullet for how we're going to make all that work, but I'm not waiting around for the silver bullet. We're strong advocates of the George Patton, good plan today, violently executed is it better than a perfect one next week. So we have violent execution conversations on a regular basis.

Lt. Gen. Bruce “Orville” Wright, USAF (Ret.):

Terrific. Well thanks Luke. We got about 30 or so more minutes and we'll start with Chris Gordon and then we'll pass the microphone around here as well as take questions from online. So please start with Chris.

Chris Gordon:

Thanks, sir. We're already seeing legacy platforms such as JSTARS be retired. So what are we looking at in terms of near term operational capabilities to fill those gaps? Or is your project more of a long-term, 5 year, 10 year, type of thing?

Brig. Gen. Luke C. G. Cropsey:

So the secretary hasn't given me the benefit of picking one or the other, right? He said we got to do both and we need to get after both of them in a way that makes sense. For those of you that heard him talk about this, you probably heard him give the example of the JADC2 palace example. So here's kind of how it goes. There was a vision around how joint all domain command and control would ultimately be able to provide a joint coalition capability from a C2 perspective. His challenge that he talks about is the fact that we didn't actually have a blueprint for what that JADC2 palace would look like. And so everybody got busy out there making bricks with regards to the programs that we were all trying to implement and make happen. But because we didn't have that overarching blueprint, whether the brick actually fit into the building or not was an open question.

So what we're actively pursuing right now is what he would call, just get me to the modest house. I don't need a palace, but I need a house with a roof on it that will actually get the job done. And so the first job that he gave me was building the blueprint for what that DAF house would look like when it comes to our C2 modernization.

That's what Dr. Bryan Tipton's team is working on with regards to that architecture and system engineering analysis that they're doing. The second piece to that was, "Hey, I need you to go bake the bricks around what goes into that house". So if a brick doesn't fit the design, you need to come back and tell me, "Hey, we need to quit working on that one and ship the effort to something else that's actually going to get us where we need to go". There's a near term aspect to that. Are there obvious things that we're not doing or should be doing that we can just get after without a whole lot of additional thought? And those are the things that we're working on right now with regards to that digital infrastructure near term.

Chris Gordon:

So to follow up on that, how many bricks? How many near term problems have you been able to solve? What can we expect to see?

Brig. Gen. Luke C. G. Cropsey:

Yeah, so one of the daily challenges that we have is trying to figure out how we manage the complexity of answering that question. And so what I've done is I've kind of broken these down into a sequence of different battlefronts, right? So there's things that we're doing in digital infrastructure, there's things that we're doing in software, there's things that we're doing in aerial networks and space networks and data and software applications.

Those all tend to have things associated with them that tend to be clustered together with regards to who cares about them and the kind of impacts that they have. And so what we're trying to do is break that problem down in a way that allows us to get after each of those different classes of problems in a way that gets after some of those near term common sense kinds of things, but at the same time looks at that longer term blueprint that we're working on at an architecture standpoint and begins to drive convergence across them.

Lt. Gen. Bruce “Orville” Wright, USAF (Ret.):

Thanks, sir. Next question. Yes, sir.

Jack Catton:

Afternoon. Jack Catton, the Roosevelt Group. I think you rightly emphasized the focus of your team on getting the architecture right that's going to allow you to do all the different plugs and plays of new technology that you're talking about. How that gets communicated to industry matters, and I think

that's where OMS standards and compliance comes in, and I'd like to hear you am I right about that? Because if so, I think industry's grappling a little bit with what OMS really means and how they can be compliant to achieve your objectives of the right architecture. If you could talk about how OMS plays.

Brig. Gen. Luke C. G. Cropsey:

Yeah, so I mean, as a system engineer, I'm right. I'm a huge fan of modular. I'm a huge fan of open, neither of which actually guarantees that you'll have anything that looks like interoperable or integrable. I mean, history is replete with modular open systems that don't talk to each other. So part of the challenge that we have here is in the belief that there's going to be one ring to rule them all, "Hey, just mandate one standard, everybody complies with it, and we'll get in line and it'll work". History will demonstrate that the one ring to rule them all just ends up being the next standard in the list that everybody's using. So what we're trying to do is not solve this problem in the abstract. What we're trying to do is solve the problem in the particulars. So when it comes to that operational problem and the architecture that we're building in order to solve that operational problem, where do we need those standards?

What standards are already there that we don't have to go back and reinvent that we can just adopt out of commercial or otherwise? And then where we do have a legitimate shortfall and how does that get scoped in a way so that you get to the minimum specification required so that you don't over specify the problem. I mean, this is a huge challenge when it comes to our ability to actually execute the scale part of this because the more complex you make one solution, the harder it's going to be to scale it to other things. So we're actively thinking through your question right now as it relates to the analysis that we just completed, and that's work that we still have to do on our plate.

I'll tell you that as a general basis, having open standards that allow people to understand what that interface looks like, both from a physical logical data, whatever level of specification that's required for you to make that functional, I think is important to us. Because for us to do this at scale, I also have to be able to distribute out the doing of that to as many different parts and places as are functions or subsystems that are out there that need to be integrated. And you can't do that in the abstract. You actually have to have a level of design, engineering design detail in that so that the physics part of that problem works. We get that, we understand that, and we also recognize that without it, a lot of this just stays pie in the sky because at the end of the day, you got to get the physics right.

Lt. Gen. Bruce “Orville” Wright, USAF (Ret.):

Yes, ma'am. In the back, please.

Shelley Mesch:

Thank you, Shelley Mesch with Inside Defense. As role in integrating, could you talk at all about what sort of technology that already exists within the Air Force or Space Force in various different stove pipes that you've been able to pull together to help aid this architecture or any of the myriad of bricks or capabilities you've been looking at?

Brig. Gen. Luke C. G. Cropsey:

Yeah, sure. So kind of gets back to those battlefronts that I mentioned earlier. One of those is digital infrastructure. So when you look at what we're doing in digital infrastructure across the department, there's different digital infrastructure in different places, right? There's ABMS digital infrastructure that we're working on. There's ISR digital infrastructure that's associated with that side of the equation. There's space, digital infrastructure. How do you make sense out of those digital infrastructures? What's

unique to those particular areas on the sensor side versus on the operational end of it, the targeting piece from a space data transport layer, the things that are going on in that particular arena, and then how do you understand where there's overlap across those different things where you probably need to sort out, "Hey, do we have more than we need, not enough?" And then start converging those particular digital infrastructure efforts that are going on in each of those different areas so that you have a comprehensive plan around what that looks and how you actually affect that in terms of both the budget, who's buying what, ultimately how those things converge in the battlefield.

That's one example where we've had a very active dialogue and conversation over the last six months with what that looks like and how we get after it. Another one would be aerial networks. How are we going to solve the problem of being able to comm in and out with things that are flying through the air? And how do we solve the interoperability communications gaps that we have in our legacy platforms? Then how do we make sure they don't happen with the ones that we're building and pushing out in the future? Those conversations are all happening across multiple different program offices across multiple match comps, and we're kind of serving as the convening authority, as the guy that's got the rose pin on him for making sure that integration happens and that all by itself is generating all kinds of positive dynamics in the system.

Just having somebody that people can point to you and say, "Hey, Cropsey. You're the guy that's supposed to go figure that out. What are you doing?" "Good question. Maybe we should get together and talk about that". That conversation is now starting to happen in more than one way. And I'll tell you there's a huge, I think, positive amount of energy across the department right now from everywhere about how we converge and think through some of those system to system problems. So I'm hugely encouraged to date on how much active participation and proactive engagement that I've seen from really the enterprise as a whole.

Lt. Gen. Bruce “Orville” Wright, USAF (Ret.):

Great. Michael, please. Michael Gordon.

Michael Gordon:

Michael Gordon, Wall Street Journal. Sir, how does your initiatives that you articulated here fit with what the other services are doing in this sense? You've described your project of building the Air Department, of the Air Force House, and all the other services have their own piece of the problem. Somehow this has to be brought all together. How do you envision this being brought all together and what specifically is your office doing to facilitate it being brought all together at some point in the future if it is brought all together?

Brig. Gen. Luke C. G. Cropsey:

Yep. Great question. So we're heavily engaged on multiple fronts with both sister services and with OSD and the joint staff. So concrete example, we are engaged directly with the Navy and their project overmatch and what they're doing with comms as a service and their Arsenal app effort. In fact, we've demonstrated the ability, and for those that aren't familiar with the way the ATO process works, and the authorized and official process happens. We're to the point now with the Navy where we can seamlessly move apps that have been developed on the air and space side of this over to the Navy side of it and vice versa.

So just the say rather rudimentary idea that we could actually share applications across services is a nut that we hadn't cracked until relatively recently, and that happened this past spring. So that's one example. We're also heavily engaged with the Navy on that aerial networks discussion, and how do we

actually build the technical architectures that will allow Navy airplanes and Air Force airplanes and space satellites to actually do the communications problem in a way that makes sense moving forward.

And those are all happening, I would say, organically at the program office level, at the engineering level where the physics part of this problem has to get solved, where the rest is just kind of a wish and a hope. So that's an example on the service side.

On the OSD side, we are heavily engaged in conversations with the CDAO when it comes to the perspective around data, data fabric. What it looks like to understand what that picture looks like, if you're looking at it from a data centric view. And we're also very much engaged with the acquisition and sustainment side of it under Dr. LaPlante when it comes to the way that you actually think about programmatic integration at the department level between air, space, maritime and army related efforts, and how those programmatically get converged around the CJADC2 part of that problem that the joint staff is leading the charge on.

So multiple venues there, some of it's organic happening just because we're focused around the same operational problems and some of it's coming out of the alignment at the broader OSD and joint staff level.

Lt. Gen. Bruce “Orville” Wright, USAF (Ret.):

Great answer. Next question here. Back in the back, please. Thanks, Patrick.

Rajan Singh:

Hey, good afternoon. Rajan Singh from A.T. Kearney. Thanks for sharing a lot of the operation technology, unveiling a lot of the issues. Curious if you could share anything on affordability in some of the strategy around both in the near term, obviously, you're in very early development and requirements, and then maybe share a little bit about how you see that progressing through the acquisition life cycle.

Brig. Gen. Luke C. G. Cropsey:

Yeah, so affordability is going to be a huge deal. Maybe the best way to think about it is the difference between what I'll call first mover advantage architectures versus fast following architectures. First mover advantage architecture, you think Soviet style where, you know, had very large barriers to entry, it took a nation state worth of investment in order to move a technology forward. And that technology had a trajectory that you could predict pretty well and know where it was going to be in 10 years. And we built our entire system around being able to do that problem. And in a lot of ways, we're still doing that problem. The distinction with the fast following architecture is that you've given up on predicting where the technology's going. And you're building an architecture that allows you to very rapidly integrate that technology at low switching costs.

If you don't get the low switching cost piece right, you'll bankrupt yourself in the process of trying to integrate new technology. So when we talk about the architecture, the architecture actually has to be designed to do that problem. If it doesn't do that problem and it doesn't do it well, we either get behind the competition with regards to their ability to do it, or we bankrupt ourselves on the process of trying to get it integrated. So it's absolutely a key consideration at an architectural ility standpoint when it comes to, "Hey, how do I take whatever's going out there, wherever it happens to be, and whoever happens to invent it, and how do I get it in quickly and how do I do it in a way that I can afford?" The mechanics of that down and in get back to that modular open system dialogue that we're having before. And the specifics about how you define those interfaces.

If you don't do that well and you don't do it with an appreciation for the technical context that you're building, that interface inside of, all bets are off. So you got to have it end to end. You've got to have an architecture that recognizes that as a problem, but then you've got to do the engineering to follow that up so that people can plug into it in a way that allows you to very rapidly pull things in and out.

Lt. Gen. Bruce “Orville” Wright, USAF (Ret.):

Amy, I think you have a question from online.

Amy Hudson:

Yes, I have a question from the audience. Jason Davis asks, will airbase air defense be pulled into C3BM's portfolio? He says, it appears to be solving some of the same problems that you're tackling.

Brig. Gen. Luke C. G. Cropsey:

Short answer is yes. The more complicated answer is how, right? And part of this gets to, again, square peg, round hole. I am coming back to this analogy on a regular basis. I am a very big square peg in a round hole system, and one of those is the way that we have historically divvied out programs and executed them from a PEO perspective. So normally you would think, hey, as a PEO, you own cost schedule performance and where you report directly to the SCE and right, everybody else, interesting, but not relevant to me. But we're in a world now where for scalability purposes, I actually need to be able to provide technical direction and input into other PEOs as they're executing their programs. And in the process, I also have to get comfortable with the idea that another PEO could actually execute programmatics, cost, schedule, and performance on my behalf, which is like, I mean, that's anathema, right? That's crazy. You can't do that. That violates all the known laws about being a PEO.

Well, sorry, we're going to have to try something else because Cropsey's brain isn't big enough to do it. So we're going to need help from everybody. And on the ABAD thing in particular, Mr. Wert up at Hanscomb has got that portfolio already and has a team of folks up there that know that business.

So one option would be, "Yeah, hey, pull it into the C3BM portfolio and execute it yourself". Or "Hey, how about Mr. Werk takes it and operates what we need to do programmatically on the behalf of the enterprise with my team plugged into his team at the technical level to make sure that the architecture actually connects. That way I stay lightly and lethal with regards to the size of my program office, but I still provide the technical direction to ensure that integration and interoperability".

So right now, the way that we have it set up is ABAD as a program will go up to Hanscomb for Mr. Werk and the HB team to initiate and to run that with technical integration coming out of my team to make sure that it all plugs in together at the end.

Lt. Gen. Bruce “Orville” Wright, USAF (Ret.):

Please. Yes, ma'am. Get you a microphone real quick here.

Well, the online crowd needs it.

Kathleen Robertson:

Sorry. All right. Kathleen Robertson, I have a basic business question. So while you're consuming a lot of technology and reaching out there and so forth, when you go out to the operators, I recently spent a couple of weeks at a combatant commander, they A, don't have the training to use some of these tools, and there seemed to be an ongoing issue about licenses. And so there seems to be a bit of a conflict of what goes on in the business world versus what you're trying to do from a technical standpoint.

Brig. Gen. Luke C. G. Cropsey:

I agree. Well, I'll unpack that a little bit. The classic acquisition model typically involved nouns, right? Things, we went and bought products, we fielded products, we flew them as platforms or subsystems or we hung them off of airplanes and dropped bombs on things, or we built satellites and launched them. In this context, what I'm buying is literally decision advantage. And when you start talking about that, people's brains start turn into mush because it's not like a thing, I can't put a noun on it, I can't feel it, touch it, see it, right? And we're doubly challenged because you got a mechanical engineer sitting in front of you, not a double E guy. So I'm terrible in visualizing this stuff. So I actually almost brought it with me. I got this really big square, it's a square, almost like a four by four, looks like a post.

That's my square peg. And I use that as the, as the example with my team to say, "Hey, look guys, this is us in the system. We're not round, we don't fit in the round holes where there's the square post that's sitting out there waiting for somebody to swack". And part of the squareness of that peg is the acquisition philosophy that we're employing.

So if you think about what tech debt looks like and in regards to where the department is on its infrastructure, how do we not replicate that when it comes to what we're trying to do in this environment? Well, my premise is that, again, if I get into that deployed capability continuously, I'm deprecating that technology out as I'm pushing new stuff in. So I'm not hanging onto it. When it becomes obsolete, I'm pushing it out and I'm throwing it away. The other way to think about it is, and as a service model. So as a service model, I would be buying the license from you and you're doing all of that underlying infrastructure upkeep, not me, but we don't necessarily have a lot of acquisition savvy around how we do as a service when it comes to the procurement of those kinds of things.

And so we don't always think through all of the backend implications of buying something as a service, like the license piece, as a combat command. You're looking at the five meter target and saying, "Hey, what do I have available that could get after this right now?" You're getting after that right now as the combatant command, but the backend sustainment of whatever that is today isn't necessarily something that you've integrated into what you're doing right now. And that's when you get into some of those licensing related issues and somebody's like, "Wait a minute, what do you mean you're turning this thing off at the end of the year?" Well, it's not like you're buying historically something that you've been able to just hang onto. You're paying for a license now. That's a different concept. So we're working.

Lt. Gen. Bruce “Orville” Wright, USAF (Ret.):

And one more question from online, and then I think I have a wrap up question.

Brig. Gen. Luke C. G. Cropsey:

Okay.

Amy Hudson:

Thank you. This question is from Jim Keffer, Lockheed Martin. He says, to optimize the integration of JADC2 digital architectures across the services for joint operations execution at scale and speed. What are your thoughts on OSD standing up a JADC2 standards "light touch governance body with DOD, providing the operational requirements and heavy inputs by industry and providing the technology solutions?"

Brig. Gen. Luke C. G. Cropsey:

So that's not loaded. I think it goes a little bit back to the previous conversation on standards. Look, at the end of the day, there needs to be an overarching architecture that allows the services to plug into and ultimately interoperate across. Okay? It's possible that we might be able to figure out how to do that as a coalition of the willing. Historically, that hasn't proved out real well in terms of our ability to make that an actual reality. But here's the other thing I would tell you, if we were to do that, but we did that in the abstract, we would run into exactly the same problems that I'm talking about down here at the DAF level. It would just be at the next layer up. So the whole conversation that we had around how do you create standards that are the minimum specification required for that interoperability to happen. Light touch, I think was the way that they put it, I think is absolutely necessary with regards to our ability to make that happen at scale, across the joint space, and ultimately into the combined space.

I think it's really, and I don't think there's probably anybody that would argue the what part of it. I think it's a real question about the how and this is a path dependent problem. So if you don't do the how correctly you'll derail the system, you absolutely derail the system. And I think that's where the services get nervous when we start talking about a one ring to rule them all kind of mentality at the joint level. But I think just in the interactions that I've had at the joint level, I don't think anybody's talking about a one ring to rule them all kind of approach. I think they're trying to be very thoughtful and deliberate about how they would do that.

And so I'm cautiously optimistic that if we can continue to keep the dialogue going and the transparency, things are generally headed in the right direction when it comes to how we would solve that joint part of that problem. But it's the same dynamic at the next level. Everything that we've just talked about with solving the DAF problem is just another order of magnitude higher at the joint level, and you just compound the number of stakeholders. But I think it's still all the same dynamics.

Lt. Gen. Bruce “Orville” Wright, USAF (Ret.):

Well, to wrap up, I think today we've heard from today's ultimate joint Warfighter in many ways. You can tell from Luke's background and his passion, his sense of threat-informed requirements around the world that the best defense is a good offense. And that's how you're talking. Now, I wouldn't write the Wall Street Journal headline here, but here's an option. ABMS from A2AD to every threat, a target. So you've taken us well beyond the notion wringing our hands in sort of imaginable wine view of the world, to taking our capabilities.

A range of joint war fighting capabilities with a central pillar known as Airmen and Guardians to the fight. Again, every threat of target, whether it's surface to surface missile, launch origins or surface air launch origins, or any other air or ground or maritime capability, China or Russia would put into the fight, I think you got their number. And I think the ability, the credibility of our deterrence and your message today has reinforced that our department of the Air Force, our Department of Defense, are all about and ensuring the most lethal force in the world is empowered to enable, and we preserve the peace and stability around the world. So with that, however you want to wrap this up, Luke, we cannot thank you enough. You got a lot of friends here, online partners in the room, and we're proud of you. So please.

Brig. Gen. Luke C. G. Cropsey:

Thank you. So I think to just riff off of that, I get asked not all that in frequently, "Hey, why do you think this is going to be different this time?" Right? "We've been down this path before. We've seen how the story ends. Good luck". Right? So here's what I tell you. One, phenomenal senior leadership support, obviously, right? I get to go see the secretary in 90 days and give him an update on what's working and isn't.

It's surprising how many things start working. The second I would tell you, it gets back to the people. I have an absolutely amazing team of people working on this problem. I mean, the best I've seen, and I will tell you that from my perspective, I don't have a talent problem. I mean I need more of it, but the teams that I've got, a bunch of unicorns. I got a bunch of unicorns in this stable. No kidding. Do we need a few more? Yes. And can we use a few more folks to knuckle down on being able to scale out some of that workload? Absolutely. So if you know any, send them my way, I'm hiring. Like no joke, I'm hiring.

So between the senior leadership prioritization on this mission set and the brain trust that we have operating on this, I mean, we've got a lot of great Americans out there across this entire department that have fundamentally grasped the need and the requirement to figure this thing out. I think we're at a unique juncture in history right now when it comes to the pervasiveness with which the need to do something different exists across the entire department. It doesn't matter whether I'm talking air, it doesn't matter if I'm talking space, if I go over to the Navy, if I talk to the Army, everybody's on the same sheet of music when it comes to this topic. It's crazy. I've never seen this much alignment in the last 30 years that I've been doing this business. So that actually gives me huge hope that we're going to actually figure this thing out because we've got people that are dedicated to this thing.

We got people that have the talent to do it, and we've got leadership that are willing to break a few things in the process of getting it right and to give us enough headroom to kind of figure it out because we'll get it exactly wrong. I'm another first person to tell you I've got it exactly wrong, but we're generally headed in the right direction. And if we can operate in a system that will allow us to have it exactly wrong, but generally going in the right direction, and we do it in a learning environment, I mean we will strip the gears out of this place here in right 12, 18 months guaranteed, guaranteed. So I am like, I'm the luckiest guy on the planet when it comes to the eyes and the scope and the importance of the mission, the caliber of the people working for me. And quite frankly, all of you in this room and on the line who are right, everybody's rooting in a positive direction. And so if you're red, you should not sleep well.

Lt. Gen. Bruce “Orville” Wright, USAF (Ret.):

Thank you all again. What a great turnout for today and I know you all are busy. Thanks for your leadership and all of us together keeping the bad guys defensive. So thanks again, Luke.

Brig. Gen. Luke C. G. Cropsey:

Absolutely.