



## Remarks at the 32d Space Symposium

The Honorable Deborah Lee James

Secretary of the Air Force

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Thank you very much, Dave, for that very kind introduction and for those very kind words. I'm especially grateful that you pointed out to the assembled team here at Space Symposium that I have more than 30 years of experience in Defense. I started when I was nine, in case there are any math majors in the audience. Thank you really to the extended Raytheon team for your generosity and your sponsorship this evening. And thank you so much Ellis and to our fantastic CEO of the Space Foundation, Elliot Pulham. [inaudible]

I have to say, I always look forward to the event, not only for the Space Symposium itself but as well for the opportunity to return to Colorado Springs. You'd have to try look pretty long and hard to find a more inspirational location than this location right here. Because in addition to the majestic Rocky Mountain setting, and the fact that we are a mile closer to space, you don't have to go too far than right here in Colorado Springs to find our warfighters hard at work. Because you see, within 70 miles of this location, we have Active Duty, we have National Guard, we have Reserve Airman, we have beyond the Air Force, we have our other military partners as well, providing space capabilities that support our deployed warfighters all over the world. Our Total Force Airmen at Schriever, Peterson, and Buckley Air Force bases play a wide variety of critical roles in operationalizing our space capabilities.

And I am sure, and I hope, as you walked around the symposium today you saw some of our Air Force Academy Cadets. Who are working right now to hone their leadership skills—because these of course are skills they'll use as they lead America into the next chapter of air, cyber, and space preeminence.

Now the Space Symposium attracts the very best and brightest across the entirety of America's space enterprise and beyond. It's a great way to see so many of our international partners who are here I think at from 60 separate countries, if I'm not

mistaken. And it's events like these where our military space professionals, industry pioneers, members of academia, and innovators come together as we begin continue work to solve the most pressing space issues, and to ensure quite frankly that we retain our strategic edge. A strategic edge, I might add, that we have held continuously for over a half-century...an edge that I am certain we will continue to hold thanks to the visionary leaders, many of whom are sitting right here in this room.

Now come back with me if you will, 55 years ago to this very day in 1961. Because on that day, the Soviets shocked the entire world, as Soviet Cosmonaut Yuri Gagarin completed an orbit of the Earth. And wow, what an enormous achievement it was at the time. But then, about 5 years later, when Gemini IV lifted off from Kennedy Space Center – that was 50 years ago, and it was carrying American astronauts Lieutenant Colonel Ed White and Brigadier General James McDivitt—both US Air Force pilots—just saying not bragging, and that when we showed the world we would not be outdone. The US Government worked collaboratively with industry, and used the Mercury, Gemini, and Apollo programs to put the U.S. in the driver seat in space throughout the decades that followed.

Let us not forget—it was the United States who first put a man on the moon. Let us not forget—it was the United States who sent Voyager beyond our solar system. And let us not forget what government and industry has been able to achieve, time after time, when we work together. And there is so much more of this yet to come. Make no mistake about it, we will continue to advance our technology base and continue to lead the way through space.

For example, fairly recently we recently explored the surface of Mars and discovered water. We took the clearest pictures of Pluto ever seen by humankind, and that's thanks to our fantastic NASA team and Administrator Charlie Bolden you rock.  
[applause]

And then just last month we launched the twelfth, and final, GPS IIF satellite. By the way, many in this crowd, perhaps all in this crowd know, but I want to say anyway, that

the GPS constellation is operated of course by our Airmen. It's now 40 satellites strong and supports more than 3 billion users worldwide.

So how did we go from the Gemini program of 50 years ago to today's Space preeminence? Well it was through a combination of technological and scientific advancement second to none. Thanks to our military, our civilians, industry partners, scientists, engineers, and space enthusiasts, we have propelled ourselves from a 23-minute human spacewalk to a nearly 18-year human presence in space with the International Space Station.

So as you can probably tell, I'm pretty proud of our space heritage but I'm equally proud and very optimistic about what I consider to be a very, very bright future in space. We must continue to move forward, and I would argue, just as you heard Deputy Secretary of Defense Work argue, that we need to even kick it up a notch and show an increased sense of urgency to address the ever changing space environment.

Now speaking of changes, there have been quite a few changes since last year's Space Symposium, I was honored to be here last year as well, and so what I wanted to do for the remainder of my time this evening is to cover some of those changes with you this evening...as well as get to one key foundational item that has not changed.

First, I want to review with all of you some of the changes in DoD's governance, strategy, investment, and operations. Second, I'd like to touch upon some new developments and give some shout-outs to industry innovations as well as important allied partnerships. And third, under pinning all we do, I want to underscore the importance of the one element of our enterprise that must never change—and that is the high quality and dedication of our military personnel. And most especially, I am the Secretary of the Air Force; I want to brag just a little bit about our Airmen.

So let me just start with governance. Speaking for a moment both institutionally and personally, a pretty big change over the last year for me was when the Deputy Secretary of Defense, Bob Work, who many of you heard speak today, announced back in October of 2015, that we were going to evolve and give new powers and

empowerment to what we used to call the old DoD Executive Agent for Space. Specifically he named the DoD Principal Space Advisor.

Now as some of you know, in addition to being Secretary of the Air Force, well that position is held by me. And when I was [applause]... Now when I was first informed about all of this, of course keep in mind, we are in the Pentagon so we do like our acronyms, I was told, “Congratulations, you’re the new “Put-zah”. And I said the new whatsah? And the answer was the new “Put-zah” and I thought, I’m not overly picky, at least I don’t think I am, but “Put-zah” sounds like something you would call your grandmother, I mean it doesn’t sound like cool and hip. This is space for Pete’s sake- we need kind of an epic name for the 21<sup>st</sup> century, something cool, something that reflects the future and generations X and Y and millennials – something for the hip hop generation for heaven’s sake, something P-Diddy himself would find cool. This is this way I’m looking at. So I finally put my foot down and said forget this whole “Put-zah” thing and ladies and gentlemen you’re now looking at the P-Dizza, alright? And I’m going to be down with that, you know what I’m saying now?

Alright, so now that we got my acronyms squared away, now I can share with you that there’s at least two major differences between the old DoD EA for space and the PDSA. First, as the PDSA, I have the responsibility to provide independent advice on space directly to DoD senior leadership, like Bob Work...like Ash Carter. And I have a seat at all the major decision-making bodies on budget, on requirements, and on strategy.

I also have a seat, by the way, at the decision-making table for key interagency meetings to include the White House and the Intelligence Community. And to contrast that with the old EA for space, in that role I was a coordinator and I reported on the ideas of others, but had no role, real role I would say, in the interagency – no independent voice. All of that now has changed.

Second, the “P-Dizza” is tasked to oversee all Departmental space matters, including strategy, plans, programming, and architecture assessment across the entire

DoD Enterprise. This by the way is a substantial expansion over the portfolio of the old EA position.

Now one of the primary tools that I am using to accomplish these responsibilities is what we call the annual Space Posture Review, or “SPR”, which is designed to improve the alignment between our budget submissions and our strategy across the space enterprise.

Now in the past, the EA for space was a participant in this annual review. But no longer am I a participant in it, rather I’m chairing it and I’m driving it. And by the way, this year’s review is looking at three key questions. Bob Work touched upon these briefly in his remarks.

Number one is how can we measure resilience in system trades alongside the traditional dimensions of cost, schedule, and performance? So that’s question number one that we are going to try to advance the ball and answer. Question number two is once we have that resilience framework figured out, what should the next generation of missile warning and protected SATCOM systems look like – informed by those resilience metrics? And number three, very very important: How will we command and control these and all of our space assets in what could be a contested environment?

So these are the three questions of the space review and we’re hard at work and more to follow on that. And that’s just a little bit about some of the changes in governance over the past year.

So let me now turn to a little bit to strategy, investments, and operations. Unparalleled situational awareness, globally secure communications, and highly accurate positioning and timing enable our coalition to project force anywhere in the world, with a speed and precision which is unprecedented in the history of warfare. Now that statement, I know, is no secret to anyone in this room.

But guess what? That statement is also no secret to our potential adversaries, who are our competitors on the world stage. Those who might wish to move aggressively against us or their neighbors know that to operate with impunity, they have to find a

way to deny us or to interfere with us in some major way in space. See and from their perspective, space is both the secret weapon but it could as well be our Achilles heel.

Now these competitors have learned from our operations, over the last 25 years they have been watching us closely, and they have been investing in their own space capabilities, as well as in methods to take away our space capability. And believe me, they are not moving slowly.

For example the Chinese showed they had the ability to use rendezvous and proximity operations in Low Earth Orbit. They did it in 2010, 2013, and 2014. Russia by the way, followed suit in 2013 and 2014. China also showed they had the potential to test a Direct Ascent – Anti-Satellite System that could reach Geosynchronous Orbit. That happened in 2013. And most recently, a Russian satellite showed an unusual pattern of movements in Geosynchronous Orbit, including loitering near several U.S. commercial communications satellites. All of these, to me, are very worrisome developments.

There isn't a single aspect of our space architecture, to include the ground architecture, by the way, that isn't at somewhat risk. This threat represents an urgent imperative for the national security space enterprise, and sends a demand signal for both a very different space architecture in the future and for changes to the methods and pace by which we acquire it.

Now this is a pretty daunting challenge, the idea of trying to transform any major system of systems is daunting, let alone one as expensive and technically complex as our national security space enterprise. It can't be done all at once, so our space architecture needs to evolve in a way that is mindful of both of the threats that we face as well as our budgets.

That evolution is captured in a new plan, that you heard a bit about from General Hyten earlier today, it's known as the Space Enterprise Vision, and it's the first iteration that was produced jointly between AFSPACE and NRO, and was delivered to me back in December.

Now this vision starts with a set of architectural principles that are designed to guide the development of future programs, as well as the evolution to some of our existing programs. And it ends with a high-level roadmap of each major space mission area.

Now what we intend to do is we intend to use this vision to shape the decision space prior to acquisition, and hopefully, if we do it right, we will replace what today are lengthy, lengthy, lengthy Analyses of Alternatives and instead we will have faster, more focused studies. With commensurate changes to the requirements process, we hope to learn valuable lessons from agile demonstrators early in the life cycle, and avoid delays that all too often come into play in large development programs.

And with a common vision for a more resilient architecture, we intend to adjust our plan going forward and make trades as we gain operational experience without of course losing sight on the ultimate goal – which is mission assurance for the effects delivered from space to the warfighter and the public.

Now the first system decisions that will be considered through the lens of this new vision will be the BMC3, the Protected SATCOM, and the Missile Warning systems. And by the way, all three of these are being addressed through that SPR that I talked to you about earlier that I am chairing and driving forward. They're being analyzed as we speak. They are going to be briefed to our Defense Space Council during the month of May, and will be included programmatically in this year's Budget Cycle. And finally, because the Secretary of Defense views these areas as very important he's determined that he's going to bring them forward to the President for decisions later this calendar year.

Now to begin implementing our vision, we have budgeted more than \$5 billion in period of fiscal year 2016-2020, in light of what we see as this growing threat from our adversaries to U.S. space capabilities. And in FY17, we've bumped it up an additional 5 percent of an increase for space programs. So I'm talking here about key investments, like for example, Space Situational Awareness. The space fence is one such program and it will increase our ability to detect and track smaller objects, which

will improve the survivability of all of our space systems, and reduce the risks of our space operations.

And of course you've heard as well about the JICSpOC, which is our newest "space battle lab." JICSpOC is working to further reduce our space operational risk through very, very important experimentation. This effort now has completed three of the four experiments that we planned which determining the requirements and techniques, tactics, and procedures needed to detect, characterize, and attribute threatening space activities, and potential responses to keep our assets from harm.

So through these efforts, and variety of others in the works, we're looking for innovative solutions from industry and of course innovative partnerships with our Allies. Which brings me to point number two and that is, the importance of collaboration. We do nothing alone. Everything is through collaboration.

So let me begin this part with a few shout-outs about some innovations that are coming from the private sector.

First, the SATCOM industry is investigating beam shaping, wave forms, and encryption methods which both preserve their position in a very competitive global industry, and have the potential to benefit DoD's mission in a contested environment. And then, our academic and Earth imaging industry sectors are experimenting with constellations of small satellites numbering in the hundreds and thousands which could revolutionize the way the DoD thinks about preserving and reconstituting essential space capabilities.

And if that's not enough, let me add my congratulations to the congratulations that have been offered by others to both SpaceX and Blue Origin, who have been doing yeoman's work and making huge strides toward achieving full and rapid reusability of space launch assets, which everyone knows is so crucial for driving down the costs of launch.

Now when the commercial sector starts investing money and starts proving out important new capabilities like some of the ones I just cited, I can guarantee you that

DoD is going to figure out a way to take advantage of those capabilities and leverage it for our needs. And in every one of these examples, we are trying to link in with our partners to determine the right mix of academic, industry, and commercial contribution to innovation and investment to secure our national interests for the benefit of space capabilities. So fantastic domestic partnerships, and we're looking for to more in the future, but of course that's one element of the collaboration.

The other part of the collaboration has to do with the fact that we have benefited tremendously from cooperative efforts and the contributions from our Allies. And just to list off a few: the Fylingdales radar in the UK and the Globus II radar in Norway – we've had great partnerships with both countries working very closely together. In addition, we're making progress in information sharing agreements through regular engagements with broad range of countries, including Australia, the UK, France, Germany. And activities are now in progress to deploy a C-Band radar and a Space Surveillance Telescope to Australia which will help Australia develop an SSA capability and strengthen our collective ability to track space assets and debris.

Now we could look on the operational side, the U.S., Australia, Canada, the United Kingdom, and New Zealand signed, recently, a Combined Space Operations Memorandum of Understanding that was within the last year, to improve coordination and enhance our combined military effectiveness across all domains. And last but not least, not really last because I could go on all night, there's so many examples, but Canada operating and has been operating the space-based SAPPHIRE system in the surveillance network and of course we're grateful that information is shared with us.

So ladies and gentlemen there are many, many examples in all of these areas but I think you get the picture there have been so many important changes in governance, strategy, investment, operations, our collaborations across the board, all of which is for the good.

But that now brings me to the one thing that has not changed—and that leads me to my third and final point, and it's all about our people. Our military personnel and most

especially those I know best, our Airmen, are the finest space operators in the world. They work tirelessly to successfully implement National space policy and to provide America and our Allies with the strength and ability that are essential to maintain our strategic advantage.

They help to implement agreements, integrate capabilities, we share lessons learned, and all of this with the objective of being able to dominate and protect our assets in this important domain. Put simply, they're critical to every single space evolution milestone...and I just want to give you one quick story to illustrate my point about how effective they are.

A prime example was in 2015, not all that long ago, when one of the Navy's newest satellites called the MUOS-3 which stands for the Multiple User Objective System, experienced a problem on orbit. So the Navy contacted Air Force for help and our Airmen jumped into action and used one of our Geosynchronous Space Situational Awareness satellites, otherwise known as GSAT, our newest sensors in orbit ...to come to assist. And of course controlled by Airmen in the 1st Space Operations Squadron as well as a team of engineers and contractor personnel, they used the GSAT and its unique vantage point, capabilities, and maneuverability in a rendezvous and proximity operation and allowed GSAT to collect unique characterization data, ultimately allowing the Navy to fix the problem. So basically our Airmen saved the day on that one! And that is just one story, one story I can promise you of many stories that come from nearly 36,000-strong space enterprise across our Air Force. Most of them, by the way, are very, very young people.

Now, before I exit the stage this evening, I do want to just take a moment and offer my thanks to everyone here tonight, who has worked to cultivate and challenge our young people, our youth in the areas of math, science, and technology. I know many of you are working on this, have worked on this, and thank you to the Space Foundation, the Space Symposium there is a whole separate track that has been focusing on our young people.

Now last year I announced that the Air Force was partnering with the Air Force Association and industry to develop a STEM outreach competition called StellarXplorers. Now this similar in some ways to the successful CyberPatriot program, which is a competition in the cyber domain for StellarXplorers, is for all of us, but with the focus is on space.

Now five teams competed last year. This year, we saw StellarXplorers expand to 27 teams across the globe and there are plans to expand further in next year's competition. So needless to say I think this is fantastic growth, the program is really catching on. And it is my hope that the StellarXplorers program will generate excitement about the space-cyber business and inspire America's youth to follow that career path. And all of the programs that contribute to science, technology, engineering and math, and inspire our young people, there is goodness in all of them. So I want to thank all of you for your contributions to – that special thanks to StellarXplorer sponsors, AGI, Orbital, Kratos Technology, and the Space Foundation, and of course to AFA as well, to taking the program and running with it.

Now while I'm proud to say that the Air Force is unmatched in the sky... You know that is really not the end of the story. Because the truth is, the sky is not the limit for our Air Force. The sky is not the limit for you and it's not the limit for United States of America. So I challenge you... just like I challenge our Airmen every day... to think beyond the limits that we perhaps have put on ourselves and to know, to know way deep down, that innovation, hard work, and commitment – these are what will carry us way beyond the stars in the future. I thank you so very much. And thank you for your contributions to our very important space mission!

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