

DoD Space Activities in Review of the Defense Authorization Request for FY24 and the Future Years Defense Program

May 2, 2023

U.S. Senate - Committee on Armed Services - Subcommittee on Strategic Forces

MEMBERS PRESENT:

Angus King (I-ME) [presiding]

Kirsten Gillibrand (D-NY)

Jacky Rosen (D-NV)

Mark Kelly (D-AZ)

Deb Fischer (R-NE)

Mike Rounds (R-SD)

Kevin Cramer (R-ND)

Tommy Tuberville (R-AL)

WITNESSES:

Honorable John F. Plumb - Assistant Secretary of Defense for Space Policy

Honorable Frank Calvelli - Assistant Secretary of the Air Force for Space Acquisition and Integration

General David D. Thompson, USSF - Vice Chief of Space Operations

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SENATOR KING: [Technical problems] – for the Strategic Forces subcommittee of the United States committee on Armed Services. The hearing today is on U.S.

Space Force and programs in review of the defense authorization request for fiscal year 2024 and future years. I want to thank our witnesses today for agreeing to appear before us, and I thank you for your service and your testimony.

The purpose of today's hearing is to examine the fiscal year 2024 budget of the Space Force, a separate Title 10 service, which was authorized in the fiscal year 2020 National Defense Authorization Act. Mr. Plumb, you all have finished up the Space Policy Review. In February, we had a classified full committee brief on it with Secretary Hicks.

And while the outcome satisfied many members' concerns, I still want to make sure our Space Force Guardians have ample opportunity to train and equip for conflict under this policy. Mr. Calvelli, you are responsible for the acquisition of space assets.

I would like to know how we can ensure our Guardians are equipped to have space assets to train with them for a conflict in space. For fiscal year 2024, the Space Force budget is \$30 billion, a \$3.7 billion increase over last year's enacted budget, or a 14.7 percent increase over fiscal year 2022.

General Thompson, it will be important to explain to the committee in open session, if possible, what this increase will be going for. Further, I want to know what is being transferred into the Space Force, especially with the transfer of uniformed Army and Navy personnel.

Last year, the administration has submitted a proposal for a new personnel system that would treat Space Force Guardians as either full or part time component based on reserve status. I want to know more about this, given this and given the competing proposals for Space National Guard.

Again, I want to thank our witnesses for joining us, and after the brief opening statements, we will have five- minute rounds of questions for the witnesses. Senator Fischer.

SENATOR FISCHER: Thank you, Mr. Chairman. Dr. Plum, Mr. Calvelli, and General Thompson, thank you all for being here today and for sharing your perspective with this subcommittee. And thank you each for your many years of service.

As members of the subcommittee know, space has and continues to play a critical role in upholding our nation's security and maintaining our prosperity. The United States leadership in space has been buoyed by a robust commercial space industry and cooperation with our allies and partners.

But our adversaries, like Russia and **China**, are also exploiting the benefits of space and are developing capabilities that put U.S. space assets, and benefits our armed forces receive from those assets, at risk.

I look forward to hearing how each of you intends to play a unique role in safeguarding U.S. space assets, countering the capabilities of our adversaries, and integrating the advanced capabilities of the U.S. commercial space industry.

I would also like to better understand how the Space Force is being incorporated into the combatant commands to ensure they have access to the full range of space expertise. Thank you, Mr. Chairman.

SENATOR KING: Secretary Plumb.

MR. PLUMB: Thank you, Senator King, thank you, Senator Fischer, members of the committee. I appreciate the chance to testify today on the department's national security space programs, and I am honored to appear alongside Secretary Calvelli and General Thompson. Space plays a critical role in our nation's security, in our prosperity, and in our way of life. For the DOD, space is essential to how we compete and fight in every domain.

We simply cannot fight without space. But our competitors understand this. They are fielding and developing increasingly complex systems to deny space missions to our U.S. Joint Force. And in just the last few years, the quantity and quality of those threats has significantly increased.

China has already fielded ground based counterspace weapons, including direct ascent, ASAT missiles, and it continues to seek new methods to hold our satellites at risk. **China** is also building a space architecture to enable long range precision strikes by its military.

China ultimately seeks to challenge our ability to conduct joint operations in the **Indo-Pacific**. Russia is developing, testing, and fielding its own counter space systems, including both ground and space based kinetic, anti-satellite weapons. Their goal is to degrade or deny U.S. space systems.

And as Senator King pointed out, President Biden's \$33.3 billion space budget for this fiscal year 24 invests in the capabilities necessary to meet these challenges and is roughly 15 percent over the fiscal year 2023 investments.

The president's budget request includes almost \$5 billion for missile warning and missile track, and this includes \$2.3 billion for new proliferated resilient architectures, \$2.6 billion for next generation overhead persistent infrared, OPIR, \$1.3 billion for position navigation and timing, including the development of the next generation operational control system for GPS, \$3 billion for 15 launch vehicles and first associated range upgrades, \$4.7 billion for protected and jam resistant SATCOM, and it includes additional investments in ground user equipment, science and technology research, and, of course, classified programs.

My office remains laser focused on the three priorities that I briefed to this committee before, which is space control, space cooperation, and space classification. On space control, the department will protect and defend our national security interests from the growing scope and scale of space and counterspace threats, and we will protect our – protect and defend our servicemen and women in harm's way from space enabled threats.

For space cooperation, we are investing in relationships with allies, partners, and commercial space.

These partnerships are an enduring strength and an asymmetric advantage that our competitors cannot hope to match.

And for space classification, the department is working at the highest levels to remove barriers to sharing information with our allies and to strengthen our ability to communicate really with ourselves across the U.S.

government. Our competitors have watched us.

They have learned from us. They have stolen from us.

And they have developed capabilities to hold us at risk.

But they are not ready for us. They aren't ready for us today, and with Congressional support for the national security space investments in the president's budget, they will not be ready for us tomorrow.

So, thank you to the committee for this hearing, for your dedication to the department and U.S. National Security, and I look forward to answering your questions.

MR. CALVELLI: Chairman King, Ranking Member Fischer, and distinguished members of the committee, thank you for inviting me to testify before you today. We continue to face an unprecedented strategic competitor in **China** and our space environment continues to become more congested and contested.

To address these challenges, we are transforming our space architecture from the large, highly capable but vulnerable satellites today, to smaller, proliferated, resilient systems across multiple mission areas.

For example, we are pivoting from the legacy missile warning architecture to a proliferated, resilient architecture that adds a new capability to actually track missile threats. We are adding new critical space domain awareness capabilities.

We are fundamentally transforming our military satellite communications and data transport architecture through disaggregation of missions, proliferation, and partnerships with allies and commercial. We are even collaborating with the intelligence community to develop a proliferated, space based, round moving target indication system.

As we transition to the to this architecture, we continue to deliver new, credible capabilities to our warfighters. Over the last year and a half, the Space Systems Command delivered to new geosynchronous space situational awareness satellites, a new space based infrared missile warning satellite, and a new GPS 3 satellite.

The Space Rapid Capabilities Office delivered their first set of missions to orbit this past January. And in March, the Space Development Agency delivered their first ten satellites to orbit in less than three years from contract award to launch.

As the Assistant Secretary of the Air Force for Space Acquisition Integration, I

am focused on adding speed to our acquisitions and delivering programs on schedule and on cost. I also recognize I inherited several troubled programs that are behind schedule and overrun on costs, and I am paying close attention to these programs.

Overall, I am proactively managing the space acquisition enterprise through weekly status reports, biweekly tag ops with my portfolio leads, and detailed quarterly program reviews. These reviews enable me to ensure all our programs remain focused on delivering capabilities to our warfighters on costs and on schedule.

In October 2022, I issued strategic acquisition guidance to the workforce outlining nine space acquisition tenants. These tenants form the basis of a new direction for space acquisition, and emphasize speed and program management discipline, while addressing the fundamental issues that slow up space acquisition.

I am committed to using all the tools and authorities Congress has provided to help speed space acquisition.

That includes the use of Section 804 middle tier of acquisition pathway, use of other transactional authorities, and use of the Space Acquisition Council to ensure collaboration and integration while avoiding duplication of effort across the entire national security space enterprise.

Thank you to the committee, and I look forward to your questions.

SENATOR KING: General Thompson.

GENERAL THOMPSON: Chairman King, Ranking Member Fischer, and distinguished members of the subcommittee, it is an honor to appear before you today on behalf of the Secretary of the Air Force, Chief of Space Operations, and 14,000 Guardians around the world executing our missions.

The capabilities and benefits provided from space are essential to our way of life and crucial to effective military operations in every other domain. Success in great power competition depends on access and freedom to operate in space while denying the same to potential adversaries.

Space access is increasingly threatened by a number of hostile actors who are

developing and deploying counterspace weapons to threaten U.S. systems in every orbital regime, on the ground and in cyberspace. We continue to respond to these challenges through three lines of effort, fielding combat ready forces, amplifying the Guardian spirit, and partnering to win.

A combat ready force requires personnel, training, and equipment, simple by description by description, but complex in execution. We need innovative operational concepts, survivable platforms, highly trained personnel, validated tactics, actionable intelligence, decisive command and control, fortified networks, suitable facilities, and perpetual sustainment and modernization.

These elements must be in place to deter adversaries and, if needed, prevail in conflict. The key to success in all of these areas is our people. Military and civilian Guardians are dedicated and determined. They are imbued with a deep sense of pride and purpose. But they must also be bold and innovative problem solvers who can overcome any obstacle and thrive in the current dynamic environment.

The Space Force must attract talented Americans who embody these principles. We must then amplify them and keep those Guardians on the field of play. To do so, our members must have challenging and rewarding work, the means to provide for their families, quality affordable care and living conditions, and acknowledgment from their leaders and all Americans that we value and respect who they are and what they do.

This is the essence of the Guardian spirit. Finally, we do not propose to accomplish this alone. The third tenet to our success is partnering to win. The Space Force is pursuing and strengthening relationships across the Department of Defense, within the rest of the U.S.

government, with traditional defense industry and the rapidly growing commercial sector, with longstanding allies, and with new partners who share the vision of a stable, peaceful space domain.

We seek partners who will be advocates for the space capabilities that they need and will hold us accountable to deliver them for them. The President's fiscal year 2024 budget request reaffirms the Space Force's commitment to a bold, threat informed shift.

It extends the pivot to resilient constellations, intelligence driven space domain awareness, aggressive cybersecurity, measured investment in space superiority, and combat credible forces anchored in a full spectrum test and training enterprise.

Your timely enactment of the fiscal year 2024 Defense Authorization Bill will enable the Space Force to remain the world's leader in space and to preserve freedom of action for the nation. Thank you for your continued partnership and support. I look forward to your questions.

SENATOR KING: Thank you very much. Following up on your last comment, you talked about the Authorization Act.

How about a budget? Would a continuing resolution be a problem for the priorities that you all have identified?

GENERAL THOMPSON: Senator King, it would. As a specific example, as you noted, our budget has grown by almost \$4 billion and includes –

SENATOR KING: That would be gone – and that would be gone and that would be the solution.

GENERAL THOMPSON: That would be gone. One example is that our missile warning, missile tracking enterprise is vital to tracking the hypersonic threats that are growing from Russia and **China**. That budget doubles from '23 to '24. We are on a path to rapidly field that by 2027. That schedule would immediately be called into question with a continuing resolution.

SENATOR KING: I asked the Secretary of Air Force this morning if a continuing resolution would be a threat to our national security. His answer was absolutely. Do you agree with that assessment?

GENERAL THOMPSON: Yes, sir, I do.

SENATOR KING: Thank you, Mr. Plumb, every question I think of has a classified side to it, so we have to be careful. This is an open hearing. But our adversaries are not only putting up satellites for traditional communications intelligence work but are – have a military aspect. Is that correct?

MR. PLUMB: Absolutely correct. They are putting up systems to attack our

satellites and they are putting up systems to help them target our Joint Force.

SENATOR KING: And isn't it true that in a conflict, this would be the first – the first beachhead would be space, to try to blind us, in effect?

MR. PLUMB: There are many people that think that sir.

I mean, that is certainly one theory of how a conflict might progress.

SENATOR KING: In your budget, which you outline – you went down, and I didn't – I may have missed it, but I didn't hear a specific line for R&D. Is that part of your –

MR. PLUMB: It is. I didn't have a specific call out but – in dollar size in my statement. But there is significant science and technology, and research and development investment.

SENATOR KING: Because if ever there was an area that would require ongoing R&D investment, it would seem to me this one.

MR. PLUMB: Yes, sir. And many of those are, of course, classified.

SENATOR KING: And we talked about – you talked about resilience, and one of the key strategies is proliferation.

In case of a conflict, what would be the relationship between our Strategic Forces and the commercial satellite industry?

Amazon is putting up a whole fleet, Starlink is up, and of course, there are multiple other private sector satellites. Is there a pre-established relationship? For example, in TRANSCOM, we have a relationship with the air – with airlines and shipping agencies that in time of conflict they will be available to us.

Do we have similar relationships with the commercial satellite industry?

MR. PLUMB: So, senator, let me just take that in two parts. You asked about Strategic Forces. When you say that I hear nuclear. As far as –

SENATOR KING: I wasn't using it in that sense.

MR. PLUMB: Okay. So, for that, that would be really an inherently government problem to make sure nuclear command control is protected. As far as

relationship with commercial industry and how can we ensure access to their products, to their imagery, just for an example, through a conflict?

I will just say the Secretary of Defense, the Deputy Secretary are both invested in this question. They have tasked really all of us and more, including NRO, to look at this and get back to them on ways to go forward. A lot of those answers are currently in the way different contracts are structured.

I don't know, Senator, if Mr. Calvelli would want to weigh in, but we are working on this across the department, and I will just offer that perhaps in late summer we could come back up and give you kind of a coordinated answer as to where we are along each component.

SENATOR KING: Thank you.

MR. CALVELLI: Yes, the folks at Space Systems Command are actually looking at sort of a craft like model for space and how we would take advantage of that, and trying to figure out which are the mission areas like SATCOM, or satellite communications, or even space domain awareness that we could take advantage of. So, like Secretary Plumb said, we are looking at that now.

SENATOR KING: General Thompson, you touched on this.

One of your tenants is partnering to win. Space strikes me as an area where cooperation with allies would have value instead of having to reinvent everything, we do every launch. Is that an ongoing process to develop a kind of space Five Eyes, if you will?

GENERAL THOMPSON: It is. In fact, Secretary Plumb hosts a forum that we call the Combined Space Operations Initiative that has been going on for more than a decade.

It includes not only the Five Eyes partner, but we have expanded to other like-minded allies, Germany and France and Japan and even folks like South Korea. And the idea is exactly that.

First of all, is not only do we not want to provide all the capabilities, we can no longer afford to provide all of the capabilities ourselves. So, in the area of combined operations and system acquisition and other things, we work with them consistently and continuously.

SENATOR KING: Senator Fischer.

SENATOR FISCHER: Thank you, Mr. Chairman. Secretary Plumb, I appreciated our conversation yesterday about the problem of over classification, particularly with respect to intelligence derived from space-based programs.

I think we have to strike a better balance between keeping our sources and methods protected and also then letting the American people know and understand the true nature and the severity of the threats that we face as a nation.

Do you share these concerns, and how can we – if you do, I hope you do, if you do, how do we then more effectively be able to share that information with allies?

MR. PLUMB: Thank you, Senator. I do share your concerns. And also know the right answer when told. As far as how to share classified information better, first of all, I deeply appreciated our conversation yesterday on this.

And I will just say here for the record that a lot of the issues we look at when we try to figure out how to do closer space cooperation, even with our closest allies, really comes down to the ability to share some types of classified information.

And a lot of classified information is not actually DOD originated. It often originates from different parts of the intelligence community, and so we need to be able to collaborate very closely with our partners in the IC to kind of break down these legacy barriers that really are legacy systems, not designed for fighting or for operationally relevant speeds, and find a way to be able to share those portions of those types of classified information that are needed for combined space operations.

So, we are working on it, but it is hard, and it does require a tight collaboration. But I do think that right now is the right time. We have got the right partners in the IC, and we have got a good collaboration, I would say, across the board here and working on it.

SENATOR FISCHER: I would be happy to work with you on that as well. I think the world we live in is going to require speed and in being able to share information, not just within our government, but with our allies as well.

And –

SENATOR KING: Not the 21-year-old National Guardsman –

SENATOR FISCHER: No, Senator King, but with the people that need to know – with the people that need to know who are with us in the event that we would need to rely on our allies even more. What steps are you taking right now to change that culture of over classification?

Or what do you believe should be the first steps?

MR. PLUMB: Senator, I have run a series of high-level meetings with Pentagon stakeholders on this. I have been out communicating with both the – not just Pentagon – government stakeholders on this. Been communicating with allies within the building, with my partners in the IC, and, you know, both here and at the White House, on the urgency of this. I am not the only person carrying this message and so I think it is gaining steam.

I think making sure that we have a way to develop a plan forward and understand that we can't – everything won't be solved at once, but we need to start with some test cases. I think from where I sit, and the General already referenced the combined space operations initiative that I chair.

I think that is the right place to start from where I sit. There can be other bilateral pieces, but to be able to do a multilateral operation would really be, I think, a real testament to our ability to show that we have moved past legacy systems and sharing plans.

SENATOR FISCHER: Thank you. General Thompson, how are Space Force's ongoing efforts to integrate itself with Joint Force progressing? I understand that Space Force is still in the process of establishing some component commands with the combatant commands, and can you provide us with an update on how that process is coming along?

GENERAL THOMPSON: Yes, Senator Fischer. Actually, we established the first three of our Space Force component commands late last year. The first one was with **Indo-Pacific Command** and Admiral Aquilino in November, rapidly followed by Space Force – or by U.S. forces Korea and U.S.

Central Command.

We focused on those three areas first, as you might imagine, because of the

pace challenge and the fight we are in today in the Middle East. We have also been deeply engaged with U.S. European Command. We are in the final stages of working with them.

In that regard, it is not just a matter of U.S.

commands because of the need to establish that in Europe or after an overseas force structure request. But we have also been from the beginning of the Ukraine conflict, our Guardians who are out there have been working both with our forces and with NATO allies in terms of integrating space capabilities effectively.

SENATOR FISCHER: Do you feel good about the progress that you have made there?

GENERAL THOMPSON: I do.

SENATOR FISCHER: Do you feel that you have learned some good lessons?

GENERAL THOMPSON: Absolutely. Yes, Senator. I think we have learned some that we could share here. I think our force design moving toward proliferation is proving to be valid. I think we have learned a lot about the integration of commercial capabilities.

And I think both on our side and on with commercial companies, I think we have some things to work on together there. But it has been a – we have learned a lot of lessons and work to do as a result of that interaction.

SENATOR FISCHER: Thank you.

SENATOR KING: Senator Tuberville.

SENATOR TUBERVILLE: General Thompson, you know, as we look at the national security launch schedule, do you feel confident that the schedule is going to keep us ahead of **China**?

GENERAL THOMPSON: Senator, from the standpoint of national security needs, absolutely. I will tell you, though, our launch ranges are at this point in time about at their limit. We have actually – we are actually approaching, I think, 16 we had in – launches in 2022.

The vast majority of those were actually commercial launches. And I think in order – if we were going to be able to meet the commercial sector with the growth that they forecast, we are going to need to make some more additional investments in our launch range.

We have got a legislative proposal to let them help share some of that cost burden. But I would say we are on a path today, and assuming that we can continue that path, the launch capacity of the nation will absolutely allow us to keep pace with **China**.

SENATOR TUBERVILLE: Would you like to answer that Secretary Calvelli?

MR. CALVELLI: I disagree with what – I totally agree with General Thompson's statement, so – he is correct.

SENATOR TUBERVILLE: General Thompson, we have got in this year's budget Space Force, \$19 billion for research and development, \$4.7 for procurement. If you had a crystal ball, how long is it going to take us to get balance set up? And I know there is a lot to, you know, space and, you know, this new frontier. We all know that.

GENERAL THOMPSON: Well, Senator, and that is a reflection of our nature for a very, very long time, because we have bought so many – for so many years, we bought a relatively small number of very sophisticated satellites.

For years, we have tended toward the research, development, test, and evaluation funding versus procurement. But I believe in the switch over to these proliferating constellations.

We have a force design right now for 120 low earth orbiting, about 16 medium Earth orbit satellites for missile warning, missile tracking. I think you will see as a result of that activity, we are going to probably shift a whole lot more to a smaller investment percentage in R&D and start ramping up production very quickly.

You will probably see the same thing in – as we work with the NRO on ground moving target indication, air moving target indication, and some of the other constellations as well.

SENATOR TUBERVILLE: But we see **China** moving faster.

You see us being able to catch up, you know –?

GENERAL THOMPSON: I do. And I would tell you that in the last several years, I have gone from very concerned to confident that we can given that we stay on the trajectory we are on.

SENATOR TUBERVILLE: Mr. Secretary, for the evaluation criteria you recently released in the draft request for the proposal for phase three of the National Security Space Launch Program, properly cites table performances, past performances as top criteria to choose your next launch providers for your five-year block back cost is a secondary factor.

Within the stated criterion by limiting, it to just two providers in the block, aren't you just creating another five-year block buy, you know, for the two incumbent carriers?

SENATOR TUBERVILLE: The nice thing about the phase three strategy is that includes dual lanes and two separate contracting approaches. Lane one consists of about half the launches, is for more than two providers.

In fact, we are anticipating ramping on to IDIQ approach, maybe 5 to 7, or 6 to 9 kind of providers that can launch more commercial like missions. And then lane two is very similar to what we have today in contract or phase two where we have got two providers that would be able to provide our most stressing, high energy, complex missions to orbit to a variety of orbits.

So, I am actually – given that we have got the two contracts rising two lanes, I think it opens up a more folks to be able to compete.

SENATOR TUBERVILLE: Thank you. Secretary Plumb, U.S. policy is to have at least two space launch vehicles to launch DOD and NRO satellites. Space has changed a lot in the last 20 years since the law was written in 2004.

Meanwhile, the demand for launch vehicles, commercial, civil, and defense, has skyrocketed. Would you like to see at least three space launch vehicles for assured access?

MR. PLUMB: Senator, thank you for the question. I know the laws are in this, too. I am aware of a study from some time ago that suggested three would be better. I – the NSL is really the purview of my colleagues here.

But generally speaking, I do think that getting to the place where you can have more providers to certain orbits, if not all of them, is a good step in the right direction.

SENATOR TUBERVILLE: He has handed it off to you then, Secretary.

MR. CALVELLI: You know, I really – and actually enjoyed our conversation this morning. You have given me some things to think about and I can get back to you on that.

SENATOR TUBERVILLE: Thank you. Thank Mr. Chair.

SENATOR KING: Senator Cramer

SENATOR CRAMER: Thank you, Mr. Chairman. And thanks to all of you for being here. General Thompson, you will be disappointed, I know, if I didn't bring up PARCS radar modernization.

As I listened to Secretary Calvelli talk about the transition and, of course, this wonderful piece about the transition to a more modern architecture, during that transition, some legacy pieces need to be improved upon.

And maybe I would start with you, and then, Secretary, you could follow up on what do you think – how do you see the PARCS integrating into this transition to the new architecture?

GENERAL THOMPSON: Senator Cramer, right now, our challenge with all of those, PARCS is one, we have got four other large ground-based radars, is understanding how they fit into the future.

The first is when you talk about missile warning and missile tracking and hypersonic vehicles, because we are no longer in an era of ballistic missiles, we are now in an era of maneuvering vehicles, we are going to have to understand how those warning systems contribute and how they need to be changed or perhaps improved to be able to adjust to that.

The second piece is to continue to evaluate how they fit into our overall space domain awareness enterprise.

Those sensors play a tremendous role in keeping track of all the objects in orbit.

What we need to do is understand how we are using them today and what improvements can be made to continue in the future. But right now, it is a matter of thoughtful design and investment before we commit large dollars to how we are going to modernize.

SENATOR CRAMER: You know, that is a good point. And Secretary, you can follow up, but as I think about, I think, are we talking about something that is like a stopgap during the transition, or are we talking about something that becomes a dynamic part of the future? And I suspect that is part of what you are still trying to discover, but.

MR. CALVELLI: Yes, thanks to Congress, there was an upward of \$3 million in '23 that we are using to help digitize some components. And I think you will find in our '24 POM, a \$6.4 million additional dollars to continue to renovate the PARCS radar systems.

SENATOR CRAMER: Yes, unless somebody has seen it, you almost can't believe what you are talking about in terms of just digitizing the images is a big deal.

So anyway, as you know, watch it carefully. Grateful that you were able to get some more money to do that. But at the same time, I am not advocating we waste it, so I appreciate the thoughtful approach.

The acquisition timeline. The timeline is going to get back to that – I know all of you have something to say about that, particularly rapid acquisition. As I said this morning in the briefing, I mean, the reason we stood up Space Force – not the reason, but we still have Space Force and SDA specifically with some ability – a white sheet of paper, like I like to say, a white sheet of paper, not bound to too many traditions.

And of course, the juxtaposition and the important role that the private sector in commercial space plays is both helpful to that, but we could do a lot to arm it as well. So maybe elaborate, Secretary, both Secretary Plumb, Secretary Calvelli on the acquisition timeline is, how we can be more helpful.

I want to be the guy that watches it, has appropriate oversight, but that doesn't get in the way and become the gotcha person. In other words, do it well, report regularly. If things need to change, yes, change quickly.

MR. CALVELLI: The trick is to quit building big, right –

SENATOR CRAMER: Yes.

MR. CALVELLI: Big satellites take time. It doesn't matter if you even have an existing design, big satellites take a long time to go build. And the fundamental model we need to drive to is to build much smaller systems, to use existing technology, and do it on about three year's center.

So, from contract start to launch in about three years. And then what we will find by doing that is not only will we gain speed, but we will do technology refresh dramatically faster because every three years or updating the technology.

Compared to today, where we might build a satellite over seven to nine years, and then upgrading that technology till the next block which is another seven to nine years. So, you are taking 15 years to upgrade the technology. We can move faster, get more on orbit, and upgrade technology faster by building smaller, and that is what we are driving to go do.

SENATOR CRAMER: Yes. Who would have ever thought that rockets and satellites would be a commodity? I mean, really with what you guys are doing in space, if that could be duplicated with the other systems that would do better than the other way around. Secretary Plumb.

MR. PLUMB: Yes, Senator. I would just add to what Mr. Calvelli said, which is, you asked how you could help, and I think, moving at speed is really important. I think it is going to unlock things we haven't even considered yet.

But we should also remember that if we are going to buy a lot more things and move faster, that some of those things may fail, and we cannot afford to have systems shut down because some small percentage of them failed.

And I think that has been the tendency for large, exquisite systems, which has added cost and time. When we try to move faster, we are going to have to have some tolerance for failure in there so we can keep moving fast.

SENATOR CRAMER: Well, that is where the R&D question was – you know, again, all of this has to work together.

We don't want to ever stop innovating, obviously. Wasn't it Napoleon that said, the logical conclusion of defense is defeat? Being a Viking fan, I am very familiar with the concept. But yes, we want you to be nimble with appropriate oversight,

and I hear you loud and clear.

Thank you.

SENATOR KING: Senator Rounds is returning from the vote. And Senator Fischer.

SENATOR FISCHER: Thank you, Mr. Chairman. Secretary Calvelli, to follow up on the acquisition discussion that we had here, you have some tools that are available with – to be able to utilize that rapid acquisition like the OTA and mid-tier acquisition.

Can you tell me how much focus is being given to software and ground systems on acquisition to help us better operate the satellites?

SENATOR CRAMER: [Technical problems] – so making sure that we have our ground systems, our software systems in place is really critical to speed. And we have a history, unfortunately, of delivering satellites to orbit and not having the ground or the user equipment ready to go.

And so, I put out, when I put out my guidance, one of my key things I put in there was deliver ground before a launch. And I think the way we do that is we need to get away from building very large software developments and break things up into more manageable pieces that can be more quickly done.

And I think when government tries to build large monolithic software systems, we all tend to struggle with that. So, build smaller.

SENATOR FISCHER: So, the history of the acquisition programs of the Air Force isn't necessarily a good one, you know, with overruns and late. So, do you feel confident that that program, if you build smaller ones, is going to be able to help?

MR. CALVELLI: I do. And I think also –

SENATOR FISCHER: Is that going to be your main focus or are you looking at other areas as well?

MR. CALVELLI: For software? I think taking advantage of cloud computing is important, especially commercial clouds. There are a lot of great environments out there from commercial companies, and the intelligence community has done

a lot of great work in cloud computing, and the Department Defense is moving in that direction as well.

I think again, moving software into small, manageable pieces is something to help out. So, you get into the fact where you run applications on the cloud environment, as opposed to building your own solutions.

I think that is a big help. And I think just a fundamental focus on program management discipline, which is basically really focusing the team on delivering on schedule and delivering on cost is an important facet of that as well.

SENATOR FISCHER: Thank you.

SENATOR KING: One point on cloud, I think all of us assume that there is greater security in the cloud because it is a larger entity.

I think we have to be careful with that assumption because even though it may be more secure, if an adversary penetrates that security, they hit the jackpot because there is so much data there.

So, cybersecurity has to be a high priority. Even though we are dealing with the cloud, we can't be lulled by the assumed cyber defenses of the cloud. Senator Rounds.

SENATOR ROUNDS: Thank you, Mr. Chairman. Dr. Plumb, first of all, I want to thank you for being one of the first leaders in the Department of Defense to speak out very publicly about the concern with the sale of certain portions of the electromagnetic spectrum, particularly that which is a 3.1 to 3.45 gigahertz, or the S-band area.

I appreciate what you have said. I think that gave a lot of other people confidence to speak up as well about how serious that part is, and the fact that we really need to get this assessment completed before we start deciding that we are going to sell parts of that asset, and I thank you for that.

I would also like to just ask, Dr. Plumb, the Commander of Space Command cited space domain awareness as the Command's top priority amid escalating threats from **China** and Russia in his March of 2022 testimony in front of the committee.

What is DOD's assessment of its current ability to maintain the space domain awareness required to predict potential adversary activity?

MR. PLUMB: Thank you, Senator. And I would just say thank you also for your continued conversation on spectrum.

On space domain awareness, I think we probably have agreement at this table, and I hope you will ask my colleagues here, that we need to be doing better. I think there is a recognition that, one, there is a lot more things in space now, and a lot more players in space now, and a lot more things that are maneuvering constantly in space now.

And so, to be able to have an understanding of all of that and be able to pick out which pieces could be a threat in one time or attract pieces of interest is hard. The kind of legacy systems that we have, that we publish, these two elements are not suitable for that job, and I think the department is looking hard at this.

And I might ask General Thompson if he has –

GENERAL THOMPSON: Senator, a couple of things in that regard. First of all, I will start by saying that nobody does, and nobody can do space domain awareness today the way U.S. Space Force and Armed Forces to U.S. Space Command do. However, you are right, and the Commander of U.S.

Space Command is right, it is not good enough for what we need. And so, a couple of things we are doing in that regard.

First is an increased number of sensors that we are putting in space to get a whole lot more data on what is happening. One example is the deep space advanced radar concept that operates in the 3 gigahertz band.

SENATOR ROUNDS: Specifically, the area that we are concerned with.

GENERAL THOMPSON: Correct. The second is using others' data, partners' and allies' commercial data. And then the third is really applying AI and machine learning to help sense and make sense of all that data so that we do exactly what you are describing.

SENATOR ROUNDS: Thank you. Secretary Calvelli, I really appreciate our conversations earlier today. I would like to just walk this through a little bit.

As I told General Saltzman this morning, I have gone on record many times regarding my concern about the DOD's approach to providing space based, ground and moving target indication capabilities to tactical DOD users, following the divestment of the JSTARS platform.

And we supported the divestment of that under the assumption that we would have this space capability available. I am even more concerned now as it is my understanding that funding for this capability was moved to the military intelligence program and out of Space Force funding lines.

This is a program that was developed for a tactical Title 10 mission executed by the Space Force in support of the Joint Force to provide target tracking in custody of immediate effects. This means life and death for folks on the front line.

Now, we do not have to get into the fine details here, but can you share with me how you are assuring that the JROC validated requirements are captured in the acquisitions process of a platform whose acquisition is executed by the intelligence community as opposed to the Title 10 DOD community? Will the DOD maintain milestone authority?

MR. CALVELLI: Yes, sir. The – so on the good news side, you know, the Space Force, we are writing what is known as this capability description documents. We are also writing the concept of employment. And we will own those, and those match up with the JROC requirements, and those will be allocated to the IC to execute.

So that is a good thing. The DOD will remain milestone in authority. I believe it is at the Secretary – Undersecretary to build a plans level for now. And the good news about this approach is this really fits my priority of speed, speed, and speed.

The IC had an existing design that we could scale up and we can get there years earlier with, and that was really a deciding factor for partnering with them. And also, the IC has other assets in their constellation that we need to augment and integrate in with at MTI to make it even more useful for the troops.

So, from a speed perspective, it is a win for the department. We are going to control the requirements. We will control milestone decision authority. And it

should be a really great partnership that is going to enable us to get capability to the warfighter much faster than we had originally planned.

SENATOR ROUNDS: So, in plain English, priority will be for the tactical needs when lives are at stake.

MR. CALVELLI: Correct.

SENATOR ROUNDS: Thank you. Thank you, Mr. Chairman.

SENATOR KING: Senator Rounds, you can continue if you wish. Senator Gillibrand is on the way. I just received a note. So, if you have further questions.

SENATOR ROUNDS: Well, I would just add one – here is Senator Gillibrand right now, so I will defer to Senator Gillibrand as she is ready to go.

SENATOR GILLIBRAND: Yes.

[Laughter.]

SENATOR ROUNDS: If –

SENATOR GILLIBRAND: Questions – okay. At the start of Russian’s renewed invasion of Ukraine last year, Russian forces targeted a satellite operation with a cyber-attack to degrade communications during the initial invasion.

Since then, Russia has targeted Starlink systems relied on by Ukraine. Increasingly, commercial providers play critical roles in our space program, and the Space Force is exploring the idea of a commercial augmentation space reserve. From a policy perspective at DOD, how should we approach hostile acts against U.S. commercial space assets?

MR. PLUMB: Thank you, Senator. So, first of all, we are looking throughout the department at how to engage and maintain relationships with these commercial partners that we have, and we are trying to develop more of those.

And one of the questions we have to be faced with is, how can we guarantee access to their products in a time of crisis or conflict? And we are looking at a number of ways we could do that and how we might do that. A lot of these pieces are being solved maybe contract by contract.

And we say one basic thing is being able to share threat information with commercial partners. We have some mechanisms for that, both through the NSA and through other places to allow us to share the classified level threat activities so they are aware, and our goal is to make sure that that is actionable.

In other words, it is no good to say Russia is interested in coming after Starlink. That doesn't tell Starlink anything useful, and they already know that. So, if we have specific information that they can take action on.

As we look at this across the department, there are efforts underway through the Air Force, through the Space Force – I am sorry, through the Department of the Air Force, through the Space Force in policy, at NRO, and I have already offered to some senators, but I am hoping to come back in late summer with an explanation of kind of where we are in all of those lines of effort. It is a new, but we are seized with this in the building.

SENATOR GILLIBRAND: So, the example I used was an international example. But if it happened to a U.S.

domestic provider for supplies for troops abroad, let's say in Guam or in Hawaii, do you have the ability to be the point person for those particular contracts with the private sector?

MR. PLUMB: I do not have any contract authority.

Certainly, Secretary Calvelli has some, but I have no contract authority.

SENATOR GILLIBRAND: So, I think it is – we just had a hearing on this topic about the first three months of a cyber-conflict with **China** and how they would attack critical infrastructure around the country, but also supply chains and critical supply chains for the military.

One thought that I have is that you should have MOUs in place in advance, that you can – you have agreements that they will not only share cyber intel, but they will work with you in a cyber-defense capacity.

And something like that with Starlink in advance of the Russian conflict would have meant that you could immediately go in, tell them what is happening, give them guidance, and make sure they can continue to do the work that is necessary for the defeat of Russia. Is that something that the DOD should look

at?

MR. PLUMB: Madam Senator, I would say we already are, and a lot of it driven by – certainly, we have thought about it for years, but Ukraine has definitely amped up the understanding that on both sides as to what that would really look like and the considerations.

And I would tell you, the General Counsel of the Department of the Air Force is helping us with the ideas of contractual, but other policy implications that they are also working with us to sort out.

SENATOR GILLIBRAND: I find in these conversations that the DOD is more comfortable if these things are happening abroad. But that same comfort level needs to be if it is happening domestically, because if it is your supply chain as warfighters, it is going to be a huge problem.

And so being able to be very facile with domestic targets that are being attacked by **China**, Russia, or Iran, to – that you need to do – to conduct defense or warfighting, you need to have the same ability to be able to reach out to those private sector participants, to say, we need your commitment and we need your first in line commitment in a time of war or at a time of adversarial attacks from a nation state.

Do you agree with that?

GENERAL THOMPSON: Ma'am, speaking from a standpoint of commercial space companies, absolutely, and that is the conversation we are having with them. I can't speak to the larger supply chain and other elements of –

SENATOR GILLIBRAND: Secretary Plumb.

MR. PLUMB: In one of my hats, ma'am, I also do cybersecurity and these pieces are also – we are working on this very same problem set with the defense industrial base and providers through cyber. And there is a good relationship being built there because you are correct, we need to be able to move fast and it is geography independent.

SENATOR GILLIBRAND: Secretary Calvelli.

MR. CALVELLI: I agree with you, ma'am. The more we can share across the

board in terms of these kind of things across the private sector and with the government, the faster we can respond.

SENATOR GILLIBRAND: Thank you. Thank you, Mr. Chairman.

SENATOR KING: I think Senator Gillibrand has a good point that these arrangements should be made in advance, not on the fly in the middle of conflict. MOUs, as she suggests – I commend that suggestion. This completes our hearing. We all have – how long until questions?

SENATOR FISCHER: Two weeks.

Voice: A week?

Voice: Close of business, tomorrow?

SENATOR KING: Close of business, Thursday afternoon for additional questions, additional statements from the witnesses. Thank you very much, gentlemen, for joining us today, and for the work that you are doing on behalf of our country. The hearing is adjourned.

[Whereupon, at 5:35 p.m., the hearing was adjourned.]