

Stenographic Transcript
Before the

Subcommittee on Strategic Forces

COMMITTEE ON
ARMED SERVICES

UNITED STATES SENATE

TO RECEIVE TESTIMONY ON THE DEPARTMENT OF DEFENSE
SPACE ACTIVITIES IN REVIEW OF THE DEFENSE
AUTHORIZATION REQUEST FOR FISCAL YEAR 2024 AND THE
FUTURE YEARS DEFENSE PROGRAM

Tuesday, May 2, 2023

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3 FOR FISCAL YEAR 2024 AND THE FUTURE YEARS DEFENSE PROGRAM
4

5 Tuesday, May 2, 2023
6

7 U.S. Senate

8 Subcommittee on

9 Strategic Forces,

10 Committee on Armed Services

11 Washington, D.C.
12

13 The subcommittee met, pursuant to notice, at 4:45
14 p.m., in Room 222, Russell Senate Office Building, Hon.
15 Angus S. King, Jr., chairman of the subcommittee,
16 presiding.

17 Subcommittee Members Present: Senators King
18 [presiding], Gillibrand, Rosen, Kelly, Fischer, Rounds,
19 Cramer, and Tuberville.
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1 OPENING STATEMENT OF HON. ANGUS S. KING, JR., U.S.
2 SENATOR FROM MAINE

3 Senator King: [Technical problems] -- for the
4 Strategic Forces subcommittee of the United States
5 committee on Armed Services. The hearing today is on U.S.
6 Space Force and programs in review of the defense
7 authorization request for fiscal year 2024 and future
8 years. I want to thank our witnesses today for agreeing to
9 appear before us, and I thank you for your service and your
10 testimony.

11 The purpose of today's hearing is to examine the
12 fiscal year 2024 budget of the Space Force, a separate
13 Title 10 service, which was authorized in the fiscal year
14 2020 National Defense Authorization Act. Mr. Plumb, you
15 all have finished up the Space Policy Review. In February,
16 we had a classified full committee brief on it with
17 Secretary Hicks.

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

23 I would like to know how we can ensure our Guardians
24 are equipped to have space assets to train with them for a
25 conflict in space. For fiscal year 2024, the Space Force

1 budget is \$30 billion, a \$3.7 billion increase over last
2 year's enacted budget, or a 14.7 percent increase over
3 fiscal year 2022.

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

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

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

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1 STATEMENT OF HON. DEB FISCHER, JR., U.S. SENATOR FROM
2 NEBRASKA

3 Senator Fischer: Thank you, Mr. Chairman. Dr. Plum,
4 Mr. Calvelli, and General Thompson, thank you all for being
5 here today and for sharing your perspective with this
6 subcommittee. And thank you each for your many years of
7 service.

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

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

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

23 I would also like to better understand how the Space
24 Force is being incorporated into the combatant commands to
25 ensure they have access to the full range of space

1 expertise. Thank you, Mr. Chairman.

2 Senator King: Secretary Plumb.

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1 STATEMENT OF HON. JOHN F. PLUMB, ASSISTANT SECRETARY
2 OF DEFENSE FOR SPACE POLICY

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

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

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

22 China ultimately seeks to challenge our ability to
23 conduct joint operations in the Indo-Pacific. Russia is
24 developing, testing, and fielding its own counter space
25 systems, including both ground and space based kinetic,

1 anti-satellite weapons. Their goal is to degrade or deny
2 U.S. space systems.

3 And as Senator King pointed out, President Biden's
4 \$33.3 billion space budget for this fiscal year 24 invests
5 in the capabilities necessary to meet these challenges and
6 is roughly 15 percent over the fiscal year 2023
7 investments.

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

20 My office remains laser focused on the three
21 priorities that I briefed to this committee before, which
22 is space control, space cooperation, and space
23 classification. On space control, the department will
24 protect and defend our national security interests from the
25 growing scope and scale of space and counterspace threats,

1 and we will protect our -- protect and defend our
2 servicemen and women in harm's way from space enabled
3 threats.

4 For space cooperation, we are investing in
5 relationships with allies, partners, and commercial space.
6 These partnerships are an enduring strength and an
7 asymmetric advantage that our competitors cannot hope to
8 match.

9 And for space classification, the department is
10 working at the highest levels to remove barriers to sharing
11 information with our allies and to strengthen our ability
12 to communicate really with ourselves across the U.S.
13 government. Our competitors have watched us.

14 They have learned from us. They have stolen from us.
15 And they have developed capabilities to hold us at risk.
16 But they are not ready for us. They aren't' ready for us
17 today, and with Congressional support for the national
18 security space investments in the president's budget, they
19 will not be ready for us tomorrow.

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

23 [The prepared statement of Mr. Plumb follows:]
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1 STATEMENT OF HON. FRANK CALVELLI, ASSISTANT SECRETARY
2 OF THE AIR FORCE FOR SPACE ACQUISITION AND INTEGRATION

3 Mr. Calvelli: Chairman King, Ranking Member Fischer,
4 and distinguished members of the committee, thank you for
5 inviting me to testify before you today. We continue to
6 face an unprecedented strategic competitor in China and our
7 space environment continues to become more congested and
8 contested.

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

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

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

25 As we transition to the to this architecture, we

1 continue to deliver new, credible capabilities to our
2 warfighters. Over the last year and a half, the Space
3 Systems Command delivered to new geosynchronous space
4 situational awareness satellites, a new space based
5 infrared missile warning satellite, and a new GPS 3
6 satellite.

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

12 As the Assistant Secretary of the Air Force for Space
13 Acquisition Integration, I am focused on adding speed to
14 our acquisitions and delivering programs on schedule and on
15 cost. I also recognize I inherited several troubled
16 programs that are behind schedule and overrun on costs, and
17 I am paying close attention to these programs.

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

24 In October 2022, I issued strategic acquisition
25 guidance to the workforce outlining nine space acquisition

1 tenants. These tenants form the basis of a new direction
2 for space acquisition, and emphasize speed and program
3 management discipline, while addressing the fundamental
4 issues that slow up space acquisition.

5 I am committed to using all the tools and authorities
6 Congress has provided to help speed space acquisition.
7 That includes the use of Section 804 middle tier of
8 acquisition pathway, use of other transactional
9 authorities, and use of the Space Acquisition Council to
10 ensure collaboration and integration while avoiding
11 duplication of effort across the entire national security
12 space enterprise.

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

15 [The prepared statement of Mr. Calvelli follows:]

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Senator King: General Thompson.

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1 STATEMENT OF GENERAL DAVID D. THOMPSON, USSF, VICE
2 CHIEF OF SPACE OPERATIONS

3 General Thompson: Chairman King, Ranking Member
4 Fischer, and distinguished members of the subcommittee, it
5 is an honor to appear before you today on behalf of the
6 Secretary of the Air Force, Chief of Space Operations, and
7 14,000 Guardians around the world executing our missions.

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

14 Space access is increasingly threatened by a number of
15 hostile actors who are developing and deploying
16 counterspace weapons to threaten U.S. systems in every
17 orbital regime, on the ground and in cyberspace. We
18 continue to respond to these challenges through three lines
19 of effort, fielding combat ready forces, amplifying the
20 Guardian spirit, and partnering to win.

21 A combat ready force requires personnel, training, and
22 equipment, simple by description by description, but
23 complex in execution. We need innovative operational
24 concepts, survivable platforms, highly trained personnel,
25 validated tactics, actionable intelligence, decisive

1 command and control, fortified networks, suitable
2 facilities, and perpetual sustainment and modernization.

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

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

18 This is the essence of the Guardian spirit. Finally,
19 we do not propose to accomplish this alone. The third
20 tenet to our success is partnering to win. The Space Force
21 is pursuing and strengthening relationships across the
22 Department of Defense, within the rest of the U.S.
23 government, with traditional defense industry and the
24 rapidly growing commercial sector, with longstanding
25 allies, and with new partners who share the vision of a

1 stable, peaceful space domain.

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

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

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

17 [The prepared statement of General Thompson follows:]

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1 Senator King: Thank you very much. Following up on
2 your last comment, you talked about the Authorization Act.
3 How about a budget? Would a continuing resolution be a
4 problem for the priorities that you all have identified?

5 General Thompson: Senator King, it would. As a
6 specific example, as you noted, our budget has grown by
7 almost \$4 billion and includes --

8 Senator King: That would be gone -- and that would be
9 gone and that would be the solution.

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

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

21 General Thompson: Yes, sir, I do.

22 Senator King: Thank you, Mr. Plumb, every question I
23 think of has a classified side to it, so we have to be
24 careful. This is an open hearing. But our adversaries are
25 not only putting up satellites for traditional

1 communications intelligence work but are -- have a military
2 aspect. Is that correct?

3 Mr. Plumb: Absolutely correct. They are putting up
4 systems to attack our satellites and they are putting up
5 systems to help them target our Joint Force.

6 Senator King: And isn't it true that in a conflict,
7 this would be the first -- the first beachhead would be
8 space, to try to blind us, in effect?

9 Mr. Plumb: There are many people that think that sir.
10 I mean, that is certainly one theory of how a conflict
11 might progress.

12 Senator King: In your budget, which you outline
13 -- you went down, and I didn't -- I may have missed it, but
14 I didn't hear a specific line for R&D. Is that part of
15 your --

16 Mr. Plumb: It is. I didn't have a specific call out
17 but -- in dollar size in my statement. But there is
18 significant science and technology, and research and
19 development investment.

20 Senator King: Because if ever there was an area that
21 would require ongoing R&D investment, it would seem to me
22 this one.

23 Mr. Plumb: Yes, sir. And many of those are, of
24 course, classified.

25 Senator King: And we talked about -- you talked about

1 resilience, and one of the key strategies is proliferation.
2 In case of a conflict, what would be the relationship
3 between our Strategic Forces and the commercial satellite
4 industry?

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

11 Do we have similar relationships with the commercial
12 satellite industry?

13 Mr. Plumb: So, senator, let me just take that in two
14 parts. You asked about Strategic Forces. When you say
15 that I hear nuclear. As far as --

16 Senator King: I wasn't using it in that sense.

17 Mr. Plumb: Okay. So, for that, that would be really
18 an inherently government problem to make sure nuclear
19 command control is protected. As far as relationship with
20 commercial industry and how can we ensure access to their
21 products, to their imagery, just for an example, through a
22 conflict?

23 I will just say the Secretary of Defense, the Deputy
24 Secretary are both invested in this question. They have
25 tasked really all of us and more, including NRO, to look at

1 this and get back to them on ways to go forward. A lot of
2 those answers are currently in the way different contracts
3 are structured.

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

9 Senator King: Thank you.

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

17 Senator King: General Thompson, you touched on this.
18 One of your tenants is partnering to win. Space strikes me
19 as an area where cooperation with allies would have value
20 instead of having to reinvent everything, we do every
21 launch. Is that an ongoing process to develop a kind of
22 space Five Eyes, if you will?

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

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

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

10 Senator King: Senator Fischer.

11 Senator Fischer: Thank you, Mr. Chairman. Secretary
12 Plumb, I appreciated our conversation yesterday about the
13 problem of over classification, particularly with respect
14 to intelligence derived from space-based programs.

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

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

23 Mr. Plumb: Thank you, Senator. I do share your
24 concerns. And also know the right answer when told. As
25 far as how to share classified information better, first of

1 all, I deeply appreciated our conversation yesterday on
2 this.

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

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

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

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

1 And --

2 Senator King: Not the 21-year-old National Guardsman

3 --

4 Senator Fischer: No, Senator King, but with the
5 people that need to know -- with the people that need to
6 know who are with us in the event that we would need to
7 rely on our allies even more. What steps are you taking
8 right now to change that culture of over classification?
9 Or what do you believe should be the first steps?

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

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

24 I think that is the right place to start from where I
25 sit. There can be other bilateral pieces, but to be able

1 to do a multilateral operation would really be, I think, a
2 real testament to our ability to show that we have moved
3 past legacy systems and sharing plans.

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

10 General Thompson: Yes, Senator Fischer. Actually, we
11 established the first three of our Space Force component
12 commands late last year. The first one was with Indo-
13 Pacific Command and Admiral Aquilino in November, rapidly
14 followed by Space Force -- or by U.S. forces Korea and U.S.
15 Central Command.

16 We focused on those three areas first, as you might
17 imagine, because of the pacing challenge and the fight we
18 are in today in the Middle East. We have also been deeply
19 engaged with U.S. European Command. We are in the final
20 stages of working with them.

21 In that regard, it is not just a matter of U.S.
22 commands because of the need to establish that in Europe or
23 after an overseas force structure request. But we have
24 also been from the beginning of the Ukraine conflict, our
25 Guardians who are out there have been working both with our

1 forces and with NATO allies in terms of integrating space
2 capabilities effectively.

3 Senator Fischer: Do you feel good about the progress
4 that you have made there?

5 General Thompson: I do.

6 Senator Fischer: Do you feel that you have learned
7 some good lessons?

8 General Thompson: Absolutely. Yes, Senator. I think
9 we have learned some that we could share here. I think our
10 force design moving toward proliferation is proving to be
11 valid. I think we have learned a lot about the integration
12 of commercial capabilities.

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

17 Senator Fischer: Thank you.

18 Senator King: Senator Tuberville.

19 Senator Tuberville: General Thompson, you know, as we
20 look at the national security launch schedule, do you feel
21 confident that the schedule is going to keep us ahead of
22 China?

23 General Thompson: Senator, from the standpoint of
24 national security needs, absolutely. I will tell you,
25 though, our launch ranges are at this point in time about

1 at their limit. We have actually -- we are actually
2 approaching, I think, 16 we had in -- launches in 2022.

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

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

13 Senator Tuberville: Would you like to answer that
14 Secretary Calvelli?

15 Mr. Calvelli: I disagree with what -- I totally agree
16 with General Thompson's statement, so -- he is correct.

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

23 General Thompson: Well, Senator, and that is a
24 reflection of our nature for a very, very long time,
25 because we have bought so many -- for so many years, we

1 bought a relatively small number of very sophisticated
2 satellites.

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

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

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

17 Senator Tuberville: But we see China moving faster.
18 You see us being able to catch up, you know --?

19 General Thompson: I do. And I would tell you that in
20 the last several years, I have gone from very concerned to
21 confident that we can given that we stay on the trajectory
22 we are on.

23 Senator Tuberville: Mr. Secretary, for the evaluation
24 criteria you recently released in the draft request for the
25 proposal for phase three of the National Security Space

1 Launch Program, properly cites table performances, past
2 performances as top criteria to choose your next launch
3 providers for your five-year block back cost is a secondary
4 factor.

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

9 Senator Tuberville: The nice thing about the phase
10 three strategy is that includes dual lanes and two separate
11 contracting approaches. Lane one consists of about half
12 the launches, is for more than two providers.

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

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

23 Senator Tuberville: Thank you. Secretary Plumb, U.S.
24 policy is to have at least two space launch vehicles to
25 launch DOD and NRO satellites. Space has changed a lot in

1 the last 20 years since the law was written in 2004.

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

5 Mr. Plumb: Senator, thank you for the question. I
6 know the laws are in this, too. I am aware of a study from
7 some time ago that suggested three would be better. I
8 -- the NSL is really the purview of my colleagues here.
9 But generally speaking, I do think that getting to the
10 place where you can have more providers to certain orbits,
11 if not all of them, is a good step in the right direction.

12 Senator Tuberville: He has handed it off to you then,
13 Secretary.

14 Mr. Calvelli: You know, I really -- and actually
15 enjoyed our conversation this morning. You have given me
16 some things to think about and I can get back to you on
17 that.

18 Senator Tuberville: Thank you. Thank Mr. Chair.

19 Senator King: Senator Cramer

20 Senator Cramer: Thank you, Mr. Chairman. And thanks
21 to all of you for being here. General Thompson, you will
22 be disappointed, I know, if I didn't bring up PARCS radar
23 modernization.

24 As I listened to Secretary Calvelli talk about the
25 transition and, of course, this wonderful piece about the

1 transition to a more modern architecture, during that
2 transition, some legacy pieces need to be improved upon.

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

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

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

18 The second piece is to continue to evaluate how they
19 fit into our overall space domain awareness enterprise.
20 Those sensors play a tremendous role in keeping track of
21 all the objects in orbit.

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

1 going to modernize.

2 Senator Cramer: You know, that is a good point. And
3 Secretary, you can follow up, but as I think about, I
4 think, are we talking about something that is like a
5 stopgap during the transition, or are we talking about
6 something that becomes a dynamic part of the future? And I
7 suspect that is part of what you are still trying to
8 discover, but.

9 Mr. Calvelli: Yes, thanks to Congress, there was an
10 upward of \$3 million in '23 that we are using to help
11 digitize some components. And I think you will find in our
12 '24 POM, a \$6.4 million additional dollars to continue to
13 renovate the PARCS radar systems.

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

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

21 The acquisition timeline. The timeline is going to
22 get back to that -- I know all of you have something to say
23 about that, particularly rapid acquisition. As I said this
24 morning in the briefing, I mean, the reason we stood up
25 Space Force -- not the reason, but we still have Space

1 Force and SDA specifically with some ability -- a white
2 sheet of paper, like I like to say, a white sheet of paper,
3 not bound to too many traditions.

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

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

14 Mr. Calvelli: The trick is to quit building big,
15 right --

16 Senator Cramer: Yes.

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

23 So, from contract start to launch in about three
24 years. And then what we will find by doing that is not
25 only will we gain speed, but we will do technology refresh

1 dramatically faster because every three years or updating
2 the technology.

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

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

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

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

24 And I think that has been the tendency for large,
25 exquisite systems, which has added cost and time. When we

1 try to move faster, we are going to have to have some
2 tolerance for failure in there so we can keep moving fast.

3 Senator Cramer: Well, that is where the R&D question
4 was -- you know, again, all of this has to work together.
5 We don't want to ever stop innovating, obviously. Wasn't
6 it Napoleon that said, the logical conclusion of defense is
7 defeat? Being a Viking fan, I am very familiar with the
8 concept. But yes, we want you to be nimble with
9 appropriate oversight, and I hear you loud and clear.
10 Thank you.

11 Senator King: Senator Rounds is returning from the
12 vote. And Senator Fischer.

13 Senator Fischer: Thank you, Mr. Chairman. Secretary
14 Calvelli, to follow up on the acquisition discussion that
15 we had here, you have some tools that are available with
16 -- to be able to utilize that rapid acquisition like the
17 OTA and mid-tier acquisition.

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

21 Senator Cramer: [Technical problems] -- so making
22 sure that we have our ground systems, our software systems
23 in place is really critical to speed. And we have a
24 history, unfortunately, of delivering satellites to orbit
25 and not having the ground or the user equipment ready to

1 go.

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

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

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

16 Mr. Calvelli: I do. And I think also --

17 Senator Fischer: Is that going to be your main focus
18 or are you looking at other areas as well?

19 Mr. Calvelli: For software? I think taking advantage
20 of cloud computing is important, especially commercial
21 clouds. There are a lot of great environments out there
22 from commercial companies, and the intelligence community
23 has done a lot of great work in cloud computing, and the
24 Department Defense is moving in that direction as well.

25 I think again, moving software into small, manageable

1 pieces is something to help out. So, you get into the fact
2 where you run applications on the cloud environment, as
3 opposed to building your own solutions.

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

9 Senator Fischer: Thank you.

10 Senator King: One point on cloud, I think all of us
11 assume that there is greater security in the cloud because
12 it is a larger entity.

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

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

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

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

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

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

15 Mr. Plumb: Thank you, Senator. And I would just say
16 thank you also for your continued conversation on spectrum.

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

24 And so, to be able to have an understanding of all of
25 that and be able to pick out which pieces could be a threat

1 in one time or attract pieces of interest is hard. The
2 kind of legacy systems that we have, that we publish, these
3 two elements are not suitable for that job, and I think the
4 department is looking hard at this.

5 And I might ask General Thompson if he has --

6 General Thompson: Senator, a couple of things in that
7 regard. First of all, I will start by saying that nobody
8 does, and nobody can do space domain awareness today the
9 way U.S. Space Force and Armed Forces to U.S. Space Command
10 do. However, you are right, and the Commander of U.S.
11 Space Command is right, it is not good enough for what we
12 need. And so, a couple of things we are doing in that
13 regard.

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

18 Senator Rounds: Specifically, the area that we are
19 concerned with.

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

25 Senator Rounds: Thank you. Secretary Calvelli, I

1 really appreciate our conversations earlier today. I would
2 like to just walk this through a little bit.

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

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

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

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

1 Mr. Calvelli: Yes, sir. The -- so on the good news
2 side, you know, the Space Force, we are writing what is
3 known as this capability description documents. We are
4 also writing the concept of employment. And we will own
5 those, and those match up with the JROC requirements, and
6 those will be allocated to the IC to execute.

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

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

18 So, from a speed perspective, it is a win for the
19 department. We are going to control the requirements. We
20 will control milestone decision authority. And it should
21 be a really great partnership that is going to enable us to
22 get capability to the warfighter much faster than we had
23 originally planned.

24 Senator Rounds: So, in plain English, priority will
25 be for the tactical needs when lives are at stake.

1 Mr. Calvelli: Correct.

2 Senator Rounds: Thank you. Thank you, Mr. Chairman.

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

6 Senator Rounds: Well, I would just add one -- here is
7 Senator Gillibrand right now, so I will defer to Senator
8 Gillibrand as she is ready to go.

9 Senator Gillibrand: Yes.

10 [Laughter.]

11 Senator Rounds: If --

12 Senator Gillibrand: Questions -- okay. At the start
13 of Russian's renewed invasion of Ukraine last year, Russian
14 forces targeted a satellite operation with a cyber-attack
15 to degrade communications during the initial invasion.

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

23 Mr. Plumb: Thank you, Senator. So, first of all, we
24 are looking throughout the department at how to engage and
25 maintain relationships with these commercial partners that

1 we have, and we are trying to develop more of those.

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

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

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

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

1 Senator Gillibrand: So, the example I used was an
2 international example. But if it happened to a U.S.
3 domestic provider for supplies for troops abroad, let's say
4 in Guam or in Hawaii, do you have the ability to be the
5 point person for those particular contracts with the
6 private sector?

7 Mr. Plumb: I do not have any contract authority.
8 Certainly, Secretary Calvelli has some, but I have no
9 contract authority.

10 Senator Gillibrand: So, I think it is -- we just had
11 a hearing on this topic about the first three months of a
12 cyber-conflict with China and how they would attack
13 critical infrastructure around the country, but also supply
14 chains and critical supply chains for the military.

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

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

25 Mr. Plumb: Madam Senator, I would say we already are,

1 and a lot of it driven by -- certainly, we have thought
2 about it for years, but Ukraine has definitely amped up the
3 understanding that on both sides as to what that would
4 really look like and the considerations.

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

9 Senator Gillibrand: I find in these conversations
10 that the DOD is more comfortable if these things are
11 happening abroad. But that same comfort level needs to be
12 if it is happening domestically, because if it is your
13 supply chain as warfighters, it is going to be a huge
14 problem.

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

23 Do you agree with that?

24 General Thompson: Ma'am, speaking from a standpoint
25 of commercial space companies, absolutely, and that is the

1 conversation we are having with them. I can't speak to the
2 larger supply chain and other elements of --

3 Senator Gillibrand: Secretary Plumb.

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

11 Senator Gillibrand: Secretary Calvelli.

12 Mr. Calvelli: I agree with you, ma'am. The more we
13 can share across the board in terms of these kind of things
14 across the private sector and with the government, the
15 faster we can respond.

16 Senator Gillibrand: Thank you. Thank you, Mr.
17 Chairman.

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

23 Senator Fischer: Two weeks.

24 Voice: A week?

25 Voice: Close of business, tomorrow?

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

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

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