

Stenographic Transcript
Before the

Subcommittee on Airland

COMMITTEE ON
ARMED SERVICES

UNITED STATES SENATE

TO RECEIVE TESTIMONY ON ARMY MODERNIZATION IN
REVIEW OF THE DEFENSE AUTHORIZATION REQUEST FOR
FISCAL YEAR 2025 AND THE FUTURE YEARS DEFENSE
PROGRAM

Wednesday, May 15, 2024

Washington, D.C.

ALDERSON COURT REPORTING
1029 VERMONT AVE, NW
10TH FLOOR
WASHINGTON, DC 20005
(202) 289-2260
www.aldersonreporting.com

1 TO RECEIVE TESTIMONY ON ARMY MODERNIZATION IN REVIEW OF THE
2 DEFENSE AUTHORIZATION REQUEST FOR FISCAL YEAR 2025 AND THE
3 FUTURE YEARS DEFENSE PROGRAM

4
5 Wednesday, May 15, 2024

6
7 U.S. Senate

8 Subcommittee on Airland

9 Committee on Armed Services

10 Washington, D.C.

11
12 The subcommittee met, pursuant to notice, at 4:00 p.m.
13 in Room SR-232A, Russell Senate Office Building, Hon. Mark
14 Kelly, chairman of the subcommittee, presiding.

15 Committee Members Present: Kelly [presiding],
16 Blumenthal, Peters, Duckworth, Cotton, Ernst, Scott, and
17 Mullin.

1 OPENING STATEMENT OF HON. MARK KELLY, U.S. SENATOR
2 FROM ARIZONA

3 Senator Kelly: The Subcommittee on Airland will come
4 to order.

5 I want to welcome Mr. Doug Bush, Assistant Secretary of
6 the Army for Acquisition, Logistics and Technology; General
7 James Rainey, the Commanding General of the Army Futures
8 Command; and General Karl Gingrich, Deputy Chief of Staff
9 for Army in the G-8.

10 I want to welcome our witnesses. Thank you for your
11 service, thank you for your willingness to appear before us
12 today.

13 As we meet today to review the Department of the Army's
14 investment and modernization strategy as presented in the
15 Fiscal Year 2025 budget request, it is important to note
16 that the Army remains heavily engaged, supporting Ukraine in
17 its fight against the Russian invasion, conducting complex
18 operations in the Middle East, and increasing training and
19 exercises in the Indo-Pacific. I would like to acknowledge
20 the work soldiers are doing across the globe and express our
21 gratitude to them and their families for the vital role they
22 play.

23 Through all of its endeavors, the Army is working to
24 increase its readiness, accelerate its modernization, and
25 improve its interoperability with allies and partners. The

1 Army seeks to do this by focusing on four key areas:
2 warfighting, delivering ready combat forces, continuous
3 transformation, and strengthening the profession. We look
4 forward to discussing modernization in this context.

5 I have had multiple opportunities to travel to Ukraine
6 and the Middle East over the past 3 1/2 years. Each trip
7 has shown me the importance of a modern and ready Army.
8 Operations in Ukraine and the Middle East continue to
9 demonstrate the need for ground combat forces in effective
10 multi-domain operations as well as the power of joint and
11 coalition operations.

12 They also provide an illustration of the complexities
13 the joint force would face if compelled to conduct similar
14 operations in a larger and contested maritime theater. I
15 recently returned from a bi-partisan delegation to INDOPACOM
16 where I had the opportunity to see firsthand how our forces
17 are preparing. The Army will play a critical role in the
18 defense of Guam and in enabling any future combat operations
19 in the Pacific. This is why the Army remains focused on its
20 six modernization priorities: Long Range Precision Fires;
21 Next Generation Combat Vehicles; Future Vertical Lift;
22 Network; Air and Missile Defense; and Soldier Lethality.

23 In the last year, the Army has made notable adjustments
24 in some of these portfolios as it makes tough decisions to
25 balance force modernization with maintaining enduring

1 capabilities. Today, the Subcommittee seeks to better
2 understand how the Army will address remaining gaps moving
3 forward.

4 In its networking programs, the Army has shifted from a
5 plan to insert modernized capabilities in 2-year "capability
6 sets" to a more iterative, agile approach consistent with a
7 necessary emphasis on continuous transformation. The
8 Subcommittee supports this approach and looks forward to
9 learning how the Army will balance iterative modernization
10 while seeking big steps forward in efforts such as: long-
11 range hypersonics, directed energy, mid-range missile
12 capability and human-machine integrated formations.

13 With submission of the 2025 National Defense
14 Authorization Act we recognize that the Army is required to
15 operate with a largely flat budget. At the same time, the
16 Army's munitions support to Ukraine and Israel has exposed
17 capacity limitations in our industrial base.

18 Mr. Bush, we have had occasion to discuss this work
19 before, and today I would appreciate an update on how the
20 Army is using the replenishment of these items as well as
21 its own investments to build future capacity. Further, we
22 are interested in how the Army is employing recently
23 authorized multiyear procurement authorities as well as your
24 assessment of any additional resources or flexibilities that
25 would further improve munitions development and production.

1 Finally, the rapid growth of unmanned aerial systems
2 creates an urgent need for the Army to develop and field its
3 own broad range of UAS, and also the ability to defeat
4 similar systems at scale. We recognize the Army's
5 investments in these capabilities and look forward to better
6 understanding how to accelerate these efforts.

7 It is in the nation's best interest to avoid going to
8 war with a near peer adversary, and the best way to do that
9 is to outpace on the cutting edge, while continuing to
10 modernize current capabilities in a manner that makes clear
11 to our adversaries that they cannot beat us on the
12 battlefield. We must do this to meet challenges in the
13 Indo-Pacific, in Europe, and in the Middle East. We would
14 like to better understand how the Army is balancing risk
15 between newer modernization priorities and supporting
16 enduring programs.

17 The Yuma Proving Ground in Arizona has been a proud
18 host for signature efforts like Project Convergence, which
19 plays an important role in guiding Army modernization
20 activity. We applaud the Army's work in this area, as such
21 events inform and accelerate not only Army programs but
22 joint and coalition operations as well. The Subcommittee is
23 interested in an assessment of this year's Project
24 Convergence and the capability and capacity of current
25 testing and training facilities to support the modernized

1 force to include the Army National Guard and Army Reserves,
2 which are critical components of the Total Army.

3 The Army continues to make significant progress in its
4 modernization efforts, but the environment only grows in
5 complexity. I have great confidence in all of you and look
6 forward to a productive year as we continue to field the
7 world's best Army.

8 I will now recognize our Ranking Member, Senator
9 Cotton.

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

1 OPENING STATEMENT OF HON. TOM COTTON, U.S. SENATOR
2 FROM ARKANSAS

3 Senator Cotton: Thank you, Senator Kelly. Thanks to
4 our witnesses for being here today. The goal of Army
5 modernization is to get the very best vehicles, munitions,
6 and weapons so our soldiers can defeat the nation's
7 adversaries in combat, which makes that combat less likely
8 in the first place.

9 To prepare our soldiers the Army has to contend with
10 limiting factors like cost, wait, obsolescence, and
11 sustainment, among others, and of course it does not help
12 that the Biden administration has once again cut the Army's
13 budget for another year.

14 Fortunately, I believe that General George has taken
15 some steps to put the service on the right track. For
16 example, Project Convergence demonstrates how the Army is
17 adjusting to the modern battlefield. This combined joint
18 exercise showed that the continuous transformation is
19 becoming a reality in our Army. I look forward to hearing
20 about lessons learned from the latest iteration of Project
21 Convergence.

22 During a visit to Fort Campbell this past year I saw
23 firsthand how the Army is transforming one of its best
24 fighting formations. Second Brigade, 101st Airborne is now
25 the first experimental brigade designed to be more

1 tactically mobile. I was particularly impressed by the
2 brigade's new infantry squad vehicles. I would ask our
3 witnesses to provide more examples of lessons learned from
4 the 101st and other modernized units, including the light
5 brigade combat teams in the 10th Mountain and 25th Infantry
6 Divisions.

7 Since this same hearing last year, the Army has made
8 significant changes in its modernization portfolio. The
9 Army has cancelled the Future Attack Reconnaissance Aircraft
10 program, based on lessons learned from Ukraine about
11 survivability. The Army has pivoted the Extended Range
12 Cannon Artillery program towards open competition, stressing
13 the Army's focus on developing a longer-range artillery. I
14 would like to also hear more about these and other major
15 program changes.

16 When adjusted for inflation, the Army's budget proposes
17 to cut funding by over 2 percent compared to the fiscal year
18 2024 enacted levels. As a result, the Army has also
19 submitted more than \$2 billion worth of unfunded priorities,
20 including funding for counter-unmanned aerial systems, a
21 fancy way of saying counter-drone warfare, munitions, and
22 military construction. All of the chief's unfunded
23 priorities will help modernize the Army, and I hope this
24 Subcommittee and the full Committee will look to include as
25 many as possible in this year's Defense Authorization Act.

1 I thank our witnesses for their appearance once again,
2 and I look forward to your testimony.

3 Senator Kelly: We will now recognize the witnesses for
4 their statements, starting with Secretary Bush.

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

1 STATEMENT OF THE HON. DOUGLAS R. BUSH, ASSISTANT
2 SECRETARY OF THE ARMY FOR ACQUISITION, LOGISTICS, AND
3 TECHNOLOGY

4 Mr. Bush: Chairman Kelly, Ranking Member Cotton, and
5 distinguished members of the Senate Armed Service Committee
6 Subcommittee on Airland, good afternoon. Thank you for the
7 invitation to appear before you to discuss the Army's
8 modernization program and the resources requested in the
9 President's budget for fiscal year 2025.

10 I am pleased today to be joined by my teammates,
11 General James Rainey, the Commanding General of Army Futures
12 Command, and Lieutenant General Karl Gingrich, the Army
13 Deputy Chief of Staff, G-8. We appreciate you making our
14 written statement part of the record for today's hearing.

15 With your support, the Army's fiscal year 2025 budget
16 request puts us on a path to equip today's soldiers with
17 modern equipment while we invest in the technologies and
18 systems necessary to build the Army of 2030 and beyond. The
19 budget request before you reflects the Army's comprehensive
20 approach to modernize, allowing us to adapt to challenge of
21 an unpredictable era, an era marked by rapid and disruptive
22 technological change and great power competition.

23 As the Chairman noted, it represents our sustained
24 commitment to our key modernization portfolios: Long-Range
25 Fires, Next Generation Combat Vehicles, Future Vertical Lift

1 Systems, Network, Air and Missile Defense, Soldier
2 Lethality, and Synthetic Training Environment, while also
3 investing in All-Domain Sensing and Contested Logistics.

4 It also continues modernization and procurement of our
5 enduring platforms and equipment that will remain in the
6 force for years to come, that has to stay up with the
7 potential threats.

8 Mr. Chairman, in the invitation for the hearing you
9 asked us to provide, in brief, an update of our
10 modernization efforts as they relate to ongoing operations
11 in the Asia-Pacific region, as well as across the globe. I
12 will do that briefly and then in questions we can go deeper.

13 The fiscal year 2025 budget request fully recognize the
14 Army's role in the Indo-Pacific. In terms of material, the
15 request includes sustained investments in key missile
16 programs such as Patriot, as well as other air missile
17 defense, including, for example, the Lower Tier Air and
18 Missile Defense Sensor, the new radar for the Patriot and
19 other systems, as well as the Indirect Fire Protection
20 Capability Increment 2, another critical system to add to
21 our air defense capability.

22 Second, the hearing invitation asked us to address any
23 significant portfolio adjustments made in the formation of
24 the budget. Mr. Chairman, both yourself and the Ranking
25 Member noted the biggest change, which was the proposed

1 realignment of aviation funding out of the Future Attack
2 Reconnaissance Aircraft and into continued production of the
3 Black Hawk M model and going into production for the CH-47F
4 Block II, as well as acceleration of unmanned aircraft. And
5 we are happy to talk more about the reasons for that and how
6 things are going as we do Q&A. But that was our one biggest
7 change.

8 Although the Ranking Member mentioned the extended
9 range cannon artillery, which is also significant, we still
10 need the range. We want to try to get at it in a different
11 way, and thank you for your support for letting us continue
12 on that path.

13 Third, the hearing invitation asked us for an update on
14 Army efforts to expand production of critical munitions.
15 Thanks to supplemental funding, in particular, and thank you
16 and all the members for providing the supplemental bill,
17 which was absolutely critical to the Army's current and
18 future readiness, we are going to dramatically expand
19 production across the board for both precision munitions,
20 things like Patriot -- and the supplemental included
21 specifically a \$750 million investment to increase
22 production of Patriot -- and other things like conventional
23 munitions, including 155 artillery and other conventional
24 munitions. All of those things are now fully funded and on
25 track, thanks to passage of the supplemental, and we are

1 making it happen. We are now in that phase, and I look
2 forward to talking to you about that in more detail.

3 Fourth, the hearing invitation noted the proliferation
4 of unmanned systems that we are seeing in Ukraine, and you
5 asked us to provide an update on our efforts in that regard.
6 The Army is taking significant steps to address this rapidly
7 evolving threat against our troops, particularly in U.S.
8 Central Command and working with our allies there. There is
9 over \$400 million in the fiscal year 2025 request for
10 procurement of our two lead programs of record, M-LIDs and
11 FS-LIDs, and \$140 million for research and development of
12 various directed energy systems.

13 In addition, the supplemental bill passed by Congress
14 provides us with an opportunity to do further work in
15 CENTCOM based on urgent needs, getting equipment to them
16 right now as that theater is, of course, the most under
17 threat from this capability.

18 We are also using authorities provided by Congress,
19 including a new one in the NDAA, to let us rapidly move
20 money around to address threats. We used that authority in
21 October to put hundreds of additional Coyote inceptors on
22 contract because of the scale of attacks we were seeing on
23 our troops after October 7th. That kind of flexibility is
24 exactly what we ask for support for in the future, as well.

25 Finally, the invitation asked that we provide an update

1 on the Army's establishment of cross-functional teams in
2 contested logistics and all the main sensing as well as
3 Project Convergence. With your support I will ask General
4 Rainey to provide that update in his opening statement.

5 In closing, I want to say thank you on behalf of the
6 Army for this Subcommittee's very strong support of the Army
7 in the fiscal year 2024 bill and the supplemental, and we
8 look forward to answering your questions.

9 [The prepared statement of Mr. Bush follows:]

10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

1 Senator Kelly: Thank you, Mr. Secretary. General
2 Rainey.

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

1 STATEMENT OF GENERAL JAMES E. RAINEY, COMMANDING
2 GENERAL, UNITED STATES ARMY FUTURES COMMAND

3 General Rainey: Chairman Kelly, Ranking Member Cotton,
4 distinguished members of the Subcommittee, thank you for
5 your continued support to our Army's soldiers, civilians,
6 and families. I appreciate the invitation to appear before
7 you today alongside Honorable Doug Bush, Lieutenant General
8 Karl Gingrich, great teammates, as well as opportunity to
9 talk about the work the Army is doing on continuous
10 transformation.

11 We are in the midst of the most disruptive period and
12 technological change in the profession of arms in at least
13 the last 100 years, maybe ever, and the Army recognizes we
14 have a responsibility to invest in systems needed to build
15 the Army of 2030, of 2040, but at the same time be ready to
16 fight tonight, and make sure our soldiers are absolutely as
17 prepared as possible.

18 Army modernization remains on track due to Secretary
19 Wormuth and General George's consistent prioritization and
20 the tremendous teamwork across the Army staff, the
21 Secretariat, TRADOC, Army Materiel Command Force Com, and
22 especially our commanders that are forward -- General
23 Williams and his team, General Flynn and his team, General
24 Frank and his team in CENTCOM, and the input they provide
25 back to us as we try and modernize and transform.

1 Additionally, our cross-functional teams remain one of
2 the indisputable success stories, and in my opinion proof
3 positive that the Army made a wise decision standing up AFC
4 almost 6 years ago now.

5 As Honorable Bush said in remarks today, I would like
6 to take the opportunity to highlight the two CFTs that AFC
7 has stood up since the last time I addressed this Committee
8 last year, the Contested Logistics Cross-Functional Team and
9 All-Domain Sensing Cross-Functional Team.

10 The Contested Logistics CFT in Huntsville, Alabama,
11 reached full operating capacity in October of 2023. The
12 Army challenged this CFT with finding ways to make our
13 formations lighter and more sustainable while also
14 increasing their lethality and survivability. Seven months
15 into this, the team is already making significant progress.
16 They have four key portfolios -- precision sustainment,
17 human machine integrated supply and distribution systems,
18 advanced power, and demand reduction. These portfolios also
19 present challenges to industry as well as Army, so AFC
20 continues to work closely with our private sector partners,
21 from startups to multinational corporations, to apply their
22 lessons learned to the tactical logistics challenge.

23 In partnership with the United States Marine Corps and
24 the Navy, the Contested Logistics CFT is working on a joint
25 abbreviated capability to develop and document on an

1 autonomous watercraft and resupply vessels that grew out of
2 our partnership in Project Convergence. This autonomous
3 watercraft provides a smaller, lower cost, unmanned
4 capability that will enable greater operational endurance
5 and reach for both the Army and the Joint Force, especially
6 in INDOPACOM.

7 The team is also exploring technologies on regenerative
8 power, alternative fuel source power production, and
9 emerging battery chemistries. They are exploring ways to
10 utilize advanced manufacturing, alternative fuels, and new
11 materials that reduce weight and delivery time of required
12 repair parts, energy resupply, and items like food and
13 water.

14 The funding requested in the fiscal year 2025 budget
15 reflect these priorities, accomplishments, and the resources
16 needed to maintain our momentum, and me and my team are
17 always available to provide more detailed briefings to
18 Senators, their staffers, or to host anyone who wants to
19 come to our facilities down in Huntsville to have a much
20 deeper conversation on these efforts.

21 Most recently, the Army announced the All-Domain
22 Sensing Cross-Functional Team, which has a small
23 headquarters here in Washington, D.C., with the main body of
24 the organization remaining in Huntsville, Alabama. And this
25 cross-functional team is not a new build, new soldiers. It

1 is capitalizing on the success of the Assured Position
2 Navigation and Timing CFT, which stood up, basically solved
3 that problem, has been able to transition it to our
4 teammates in Mr. Bush's organization, so continuing to
5 evolve the cross-functional teams. This cross-functional
6 team evolution allowed the Army to transfer all the
7 experience and expertise to a new set of challenges. By
8 keeping all that talent in place they contribute to our
9 initial success.

10 So they are just getting started, but we have scoped
11 the All-Domain Sensing Cross-Functional Team portfolio to
12 address multi-sensor dominance, so not just Army sensor but
13 across the Joint Force, sensing architecture, and advanced
14 processing and dissemination to facilitate successful
15 understanding and decision-making in multi-domain
16 operations.

17 The battlefield has become increasingly transparent,
18 and the U.S. Army must remain on the forefront of these
19 technologies and their military applications. The work of
20 these two new CFTs, as well as the incredible efforts from
21 the rest of the transformation enterprise, was on display in
22 February and March of this year during Project Convergence
23 Capstone 4, which, as you know, was an Army-hosted but
24 wholly joint and combined experiment. We had all the
25 services, six different allies and partners, and also for

1 the first time incorporated OSD's guide experimentation
2 effort, wholly integrated into Project Convergence. It was
3 hosted by our Marine Corps teammates at Camp Pendleton and
4 then also at the National Training Center in California.
5 This experiment tested our latest developments in offensive
6 and defensive fire integration, joint command and control,
7 contested logistics, and developments in human-machine
8 integrated formations and next-generation command and
9 control, as well as counter-UAS efforts, both on the joint
10 side and on the Army-specific side. We pushed the bounds of
11 our network capabilities as we worked to design and
12 implement the resilient, data-centric systems needed to
13 operate on the modern battlefield as a joint force.

14 We had about two dozen professional staff members
15 attend Project Convergence, which we truly appreciate. I
16 would like to take this opportunity to invite anybody that
17 would like to come out to Capstone 5, which is schedule for
18 March and April of 2025. We would be glad to host anybody
19 who is interested.

20 For the Army to capitalize on the technological
21 advances made by our CFTs and the lessons we are learning
22 from watching what is going on in the world and also during
23 our experimentation campaign, we believe we need greater
24 institutional agility. Specifically, as you heard General
25 George testify on April 18th, we need increased flexibility

1 to fund and field the unmanned systems, counter-UAS, and
2 electronic warfare systems. This increased flexibility will
3 allow us to rapidly integrate critical technologies more
4 quickly into our combat formations so that our number one
5 asymmetric advance, the American soldier, has everything
6 they need to fight and win our nation's war.

7 In closing, I want to thank you for your commitment to
8 the soldiers serving our nation. Thank you for your time,
9 and I look forward to your questions.

10 [The prepared statement of General Rainey follows:]

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

1 Senator Kelly: Thank you, General Rainey. General
2 Gingrich.

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

1 STATEMENT OF LIEUTENANT GENERAL KARL H. GINGRICH, USA,
2 DEPUTY CHIEF OF STAFF, G-8, UNITED STATES ARMY

3 General Gingrich: Good afternoon. Thank you, Chairman
4 Kelly, Ranking Member Cotton, and the distinguished members
5 of the Senate Armed Services Committee Subcommittee on
6 Airland, for the opportunity to appear and testify regarding
7 the Army's fiscal year 2025 modernization effort. A special
8 thank you to all the Committee members for your enduring
9 support to our soldiers, civilians, and their families.
10 They play a vital role in our nation's defense, a position
11 they have maintained faithfully for nearly 249 years.

12 Our request for investments in modernization for fiscal
13 year 2025 is synchronized with the Secretary of the Army's
14 operational imperatives, which seek to place
15 transformational capabilities in the hands of our soldiers
16 to allow our Army to dominate in the land domain. As we
17 learn lessons from the modern battlefield, our Army must
18 transform continuously to be better prepared to defeat an
19 evolving array of threats.

20 Our investments will allow the Army to become leaner,
21 more agile, and most importantly, more lethal. These
22 investments will strengthen deterrence in the Indo-Pacific
23 and other regions critical to our nation's security. As the
24 linchpin of the Joint Force in the Indo-Pacific, these
25 investments will contribute directly to the Joint Force's

1 ability to deter, and when called upon, fight and win
2 decisively.

3 As we transform for the future fight we are making
4 generational investments while working with a sense of
5 urgency to continuously transform. We remain committed to
6 our signature modernization priorities, essential to the
7 Army's broader transformation efforts.

8 Army formations are transforming and modernizing
9 rapidly through teamwork, engaged senior leadership, process
10 refinement, and the authorities and resources you provide
11 the Army. We continue to modernize responsibly, maintaining
12 readiness now, while continuing to transform at a pace
13 informed by the available resources.

14 For several years, the Army ruthlessly prioritized its
15 modernization portfolio. We have eliminated, reduced, and
16 divested legacy capabilities, enabling investments in higher
17 priority modernization programs. As such, we ask for your
18 continued support of the requested resources essential to
19 maintaining and sustaining the Army's modernization path.

20 In closing, I would like to offer thanks to you and
21 your staff and Committee who professionally facilitate the
22 engagement necessary to advance our shared commitment to the
23 defense of our nation. Again, thank you for the opportunity
24 to appear, and I look forward to your questions.

25 [The prepared statement of General Gingrich follows:]

1 Senator Kelly: Thank you, General. Again, thank all
2 of you for your service and being here to testify today.

3 I am going to start with General Rainey. General, in
4 your opening comments you mentioned how this is the biggest
5 or greatest transition an Army has had to make in, I think
6 you said, 100 years, or maybe ever. And I agree with you.
7 It is a steep hill we are trying to climb here.

8 I am concerned that our ability to test some of these
9 new capabilities, ranging from new electronic warfare
10 systems to directed energy, which you mentioned, to
11 hypersonics, are constrained by the current limitations in
12 our ability to conduct open air as well as hardware in the
13 loop and simulated tests and evaluation and experimentation.
14 Facilities like the Electronic Proving Ground at Fort
15 Huachuca in Arizona and the Yuma Proving Ground, which often
16 hosts Project Convergence, are crucial to the Army's
17 efforts.

18 General Rainey, how is the Army ensuring that it has
19 sufficient capacity and capability to proceed on its
20 modernization requirement at the pace that our National
21 Defense Strategy demands?

22 General Rainey: Thank you for that question. So if I
23 could take it in two parts, the ability to test is one of
24 the critical steps in the ability to transform, just like
25 requirements and acquisition, as you know, Senator Kelly.

1 So being able to do that in an innovative, fast way that
2 keeps pace, so that we are not waiting on tests. And we are
3 innovating two different ways there, and there are resources
4 applied in our budget to fully modernize Army Test and
5 Evaluation Command, because if we do not do that we are
6 going to end up with modernized equipment and waiting around
7 for old-fashioned testing.

8 I think maybe more important than that is the other
9 part of the question about being able to train the force.
10 So one of the things that keeps me awake is, because I
11 believe we will deliver all these modernization efforts, but
12 we cannot train with them then it is almost pointless,
13 right. We are the best Army in the world because of our
14 people and the way we train. So that is something that we
15 are passionate about.

16 So places like the John Fox Range at Huachuca, and that
17 being a world-class training environment where we can train
18 in different domains than we have traditionally is something
19 that is essential, and that is a priority for General George
20 and the Secretary, and not to speak for my teammate, General
21 Brito, but the person who is responsible for Fort Huachuca
22 has a laser focus on that one. Camp Grayling, Michigan, is
23 another place, looking cross-COMPO. Some of the best
24 facilities we have are not in COMPO 1. They are in COMPO 2.
25 So it is a great opportunity to work across the total force.

1 Senator Kelly: Has there been any, that you are aware
2 of, any limitations on access to ranges or facilities that
3 have impacted a timeline for any kind of development
4 programs, because you have not had access to a place to test
5 the new equipment?

6 General Rainey: I am not aware of a specific example
7 yet, but as we modernize and increase the fielding of these
8 capabilities we are going to need to grow our ability to
9 both test and train. So not yet but it is a potential thing
10 if we do not continue to invest in it.

11 Senator Kelly: I was down at the U.S. Naval Test Pilot
12 School about a month ago, of which I am a graduate, and it
13 was really interesting. I was talking to the commanding
14 officer, and he said he either had there now or a student
15 that was coming from the Army, not a helicopter pilot, but a
16 guy that is an Abrams tank commander or officer, that is
17 going to go through the flight test engineering program at
18 the Naval Test Pilot School, just to be able to better learn
19 how to conduct developmental tests. If it works out well it
20 might be something that you would consider expanding upon.

21 Do you have plans to enhance any of the test capability
22 or leverage some of these areas like Yuma Proving Ground or
23 Fort Huachuca, to get further capacity?

24 General Rainey: Yes, we do, both capacity and then
25 also testing is expensive. So within the fiscal stewardship

1 aspect of this we believe there is an opportunity to use
2 simulation to a much greater extent than we currently are,
3 and we have facilities at Aberdeen Proving Ground, the
4 National Simulation Center that is a Fort Leavenworth. So
5 it is not just making the John Fox Range awesome and making
6 Camp Grayling awesome, and being able to train at Fort
7 Bliss, Texas, is how do you link them together and do 100
8 reps in simulation, so when you do test we are getting the
9 max effect for the dollars and soldiers that we actually
10 use.

11 Senator Kelly: You mentioned Capstone 5. You said it
12 was going to be in March or April?

13 General Rainey: March and April.

14 Senator Kelly: And where will that be?

15 General Rainey: Right now it will be spread across not
16 just the United States but we are going to link it
17 distributively to INDOPACOM all the way out to the
18 Philippines in an exercise, also into CENTCOM and EUCOM for
19 the joint portion, so distributed command and control modes.
20 And then the Army portion will be primarily at the National
21 Training Center, but as you know we use Yuma Proving
22 Grounds, Fort Bliss, and other places for both lead-up
23 events to it and then to distribute the experiment.

24 Senator Kelly: Thank you, General. Senator Cotton.

25 Senator Cotton: Mr. Bush, I want to talk about the

1 IVAS system. It is kind of like a bad penny. It keeps
2 turning up, but it costs a lot more than a cent, hundreds of
3 millions of dollars per year.

4 The Army bought 10,000 copies of the first two
5 variants, which made soldiers sick and did not work. Those
6 systems, I presume, will never see combat. Now the Army is
7 asking for \$250 million to buy 3,000 of the latest IVAS
8 iteration, Version 1.2, that is still not guaranteed to fix
9 these problems. The Army recently tested 10 of these units
10 with one squad from the 10th Mountain. Has the Army tested
11 IVAS 1.2 with any platoon or company-sized element yet?

12 Mr. Bush: Senator, not yet, but that is coming
13 imminently, larger-scale tests. There is a plan to move
14 from squad to platoon to company as we progress with testing
15 1.2, to determine, your question, of whether or not it is
16 worth spending those procurement dollars on.

17 So I would not say we know for sure, but I believe we
18 have a plan to inform such a decision, if members provide
19 the funds.

20 Senator Cotton: Could you provide an actual timeline
21 to flesh out your answer, "imminently"?

22 General Rainey: Third quarter of fiscal year 2024, so
23 late summer is when we are going to get our hands on 1.2,
24 and make sure that it goes through the rigor of soldiers
25 using it and getting their feedback, Senator.

1 Senator Cotton: Third quarter of fiscal year 2024, if
2 I am not mistaken, would be April, May, or June. Is that
3 correct?

4 General Rainey: Yes, Senator. I will come back to you
5 with the exact date we are going to get 1.2 and the way
6 ahead for who is going to test it and where.

7 Senator Cotton: Today is May 15th, so that is 46 days
8 until the end of the third quarter. So you expect to
9 conduct tests with IVAS 1.2, at platoon and company-size
10 elements, by June 30th?

11 General Rainey: To be clear, Senator, I believe that
12 is the time we are scheduled to receive it, and I will have
13 to come back to you, if I may, on the plan to get the
14 soldiers' touch points and platoon and company.

15 Senator Cotton: To receive the systems --

16 General Rainey: To receive the systems.

17 Senator Cotton: -- not to test them at the platoon and
18 company level.

19 General Rainey: Correct.

20 Senator Cotton: So you will receive the systems by
21 June 30th.

22 General Rainey: Yes.

23 Senator Cotton: Okay. Do we know a timeline for when
24 we will test them with platoon and company-sized elements?

25 Mr. Bush: It is over the remainder of this year, sir.

1 Senator Cotton: Fiscal year or calendar year?

2 Mr. Bush: Calendar year, sir, in a series of events.

3 And I apologize for not having it to hand, but we can
4 provide it by the end of today, a detailed schedule for you.

5 Senator Cotton: Okay. So you will have them delivered
6 by June 30th, and you expect to test them with platoon and
7 company-sized elements by the end of 2024 calendar year.

8 Mr. Bush: Yes, sir.

9 Senator Cotton: Thank you. My understanding, from the
10 results, is that soldiers who have tested these latest
11 systems could not read or open a lock in low light. Most
12 soldiers had cable malfunctions. The remote keys got stuck.
13 The mission shield is not ballistically rated. There are
14 other issues. I could go on but my time is running short.

15 General Rainey, do you think these systems are going to
16 prove suitable for combat use once you start testing them?

17 General Rainey: Senator, I don't know. I am very
18 interested in receiving 1.2. We have high expectations that
19 it is going to be much better than what we have received and
20 tested so far. When it comes to IVAS, as a former
21 infantryman, I realize the potential. I mean, if it works
22 it is a legitimate 10x upgrade to our most important
23 formations. But if it is does not work then I think we
24 would have to take a very hard look at whether we continue
25 down that path or use that money for other critical aspects

1 of our night vision strategy, because we have to make sure
2 the entire Army can own the night, and there are other very
3 good systems, like ENVG, for example, that have demonstrated
4 really strong supports.

5 Senator Cotton: Well, in a big old Federal budget, and
6 even in a DoD budget, \$250 million is not a lot, but the
7 Army is not the Navy or the Air Force, and \$250 million buys
8 a lot of other stuff for you that is needful.

9 Mr. Bush, do you think at this stage we should go
10 forward with the \$250 million purchase of 3,000 units when
11 only 10 have been tested so far?

12 Mr. Bush: Sir, I do support the President's budget
13 because I will give the Chief and Secretary the option, if
14 testing goes well, to keep this capability on track. But
15 there is an "if" there, and, of course, we would not make
16 such a decision without informing them of the test results
17 so they can make the call. But I would ask the Committee's
18 support to consider that funding so that if it does work out
19 it does provide improved capability for infantry forces,
20 which is greatly needed.

21 With regard to the specific problems, sir, I think this
22 1.2 is designed to get at the three major flaws you pointed
23 out, which are all very well-articulated. The one that
24 concerned me the most was the form factor, meaning how a
25 soldier wears it. The first version I agree was not

1 something that was usable in an infantry context. This
2 version, I believe, gets at that very much, and is much
3 closer to what our soldiers are used to wearing with night
4 vision devices they wear, but does more than just night
5 vision. However, sir, it is a new technology, and it may
6 not work out, but we are hopeful that it will.

7 Senator Cotton: Yeah, I share those concerns. More
8 than once soldiers have wondered who could have possibly
9 designed an article of clothing or a piece of equipment that
10 they are expected to wear on long marches or riding in small
11 vehicles or jumping out of an aircraft. Thank you.

12 Senator Kelly: Senator Mullin.

13 Senator Mullin: Thank you, Chairman, and thank you
14 guys for being here.

15 General, I see that you had shoulder surgery?

16 General Rainey: Yes, Senator.

17 Senator Mullin: How long ago?

18 General Rainey: Three weeks.

19 Senator Mullin: Well, thank you for being here. I
20 have had multiple shoulder surgeries, and it is never a fun
21 process. Enjoy the rehab. If someone does not make you cry
22 they are not doing their job right.

23 So anyway, thank you guys so much.

24 General Rainey, I want to start with you. Has the
25 Army's Future Command mission changed since sequestration?

1 General Rainey: I would not say changed fundamentally.
2 I would say expanded, Senator. So the initial start of Army
3 Futures Command was almost totally focused on modernization,
4 so materiel only. Secretary Wormuth adjusted that, in my
5 opinion, in a broader context, so the overall responsibility
6 to transform the Army, not just modernize.

7 So I have a part of the modernization responsibility
8 for the Army, and that is determining the requirements and
9 working closely with Mr. Bush and his team to do
10 acquisition. At the same time, General George, when he
11 became the Chief of Staff of the Army, assigned all of his
12 major commands a responsibility and designated AFC as the
13 Army lead for transformation.

14 None of those things are holy within my organization,
15 but the overall responsibility to work closely with Mr. Bush
16 and his team, General Gingrich and his team on materiel, but
17 also work with General Brito to make sure that the training
18 organization and leadership of all those critical aspects
19 all come together in a way that makes sure the Army can
20 continue to dominate the land domain.

21 Senator Mullin: So would you say that the Army is kind
22 of rescoping the command base on the change of mission then?

23 General Rainey: I don't know if I would use the word
24 "rescoping" but adapting.

25 Senator Mullin: Should it be looking at rescoping?

1 General Rainey: I am very comfortable with what I am
2 accountable for to the Secretary and Chief, the resources
3 that I have that accomplish my mission and the relationships
4 and teamwork that I have. So my answer would be no,
5 Senator.

6 Senator Mullin: Okay. Good enough.

7 Secretary Bush, how effective has the Directed Energy
8 Maneuverable Short-Range Air Defense prototypes proven in
9 the field?

10 Mr. Bush: Sir, so we have deployed --

11 Senator Mullin: And by the way, I would have used the
12 acronym but I do not know how to pronounce it.

13 Mr. Bush: Yes, sir. So we have deployed the
14 prototypes. That was a request from CENTCOM, and we have
15 done that, and we are learning a tremendous amount because
16 of that. I think what we are finding is where the
17 challenges are with directed energy at different power
18 levels. So that power level, 50 kilowatts, is proving
19 challenging to incorporate into a vehicle that has to move
20 around constantly. It is the heat dissipation, the amount
21 of electronics, kind of the wear and tear of a vehicle in a
22 tactical environment versus a fixed site.

23 Senator Mullin: Right.

24 Mr. Bush: However, sir, that learning, though, on
25 those prototypes is informing all of our other prototyping

1 efforts in directed energy. We have deployed other systems
2 at lower power levels that are proving successful -- 20
3 kilowatts, for example, in some fixed-site type setups. And
4 then we have still to be delivered some higher power, 300
5 kilowatt systems that would also be more of a fixed-site
6 type defense but maybe capable against a cruise missile, not
7 just a UAV.

8 So, sir, I think all this prototyping is going to tell
9 us how to get a real directed energy system actually in the
10 real Army as soon as we can.

11 Senator Mullin: So, the change, is that coming
12 directly from the soldiers in the field? Is that the
13 feedback they are giving you, saying this is the issues we
14 are having?

15 Mr. Bush: Yes, Senator. I mean, there is, of course,
16 no better feedback than that. They will tell you
17 everything, and they are not worried about your feelings.
18 So we are getting that feedback, which is what we need.

19 And as I mentioned, we are learning that directed
20 energy in a lab environment or in a test range is different
21 from a truly deployable, tactical environment. But it is
22 the future, and we are committed to it as part of our
23 overall counter-UAS approach.

24 Senator Mullin: So what do you figure the benefits are
25 from some of the high energy lasers versus the high-powered

1 microwaves?

2 Mr. Bush: Yes, sir. So the lasers, they key
3 technology is really the ability to control the beam and
4 keep it on the target, get it on the target and keep it on
5 the target long enough to have the effect.

6 Senator Mullin: Well, that is good for one-on-one, but
7 the swarms that you are seeing, it is not effective.
8 Correct?

9 Mr. Bush: So, Senator, to your point about, high-
10 powered microwave has the potential to give you kind of an
11 area weapon versus a precision weapon against drones. What
12 we are learning there is it is kind of like how do you apply
13 that tech in a safe way on a battlefield where other things
14 are flying around, including our aircraft, and how do you
15 target it using other systems like a radar, to make sure you
16 are point it at the right place and it has the effect.

17 I would say the high-powered microwave systems are
18 showing promise. We have four prototypes now. We are
19 learning from them. And I think if they show enough promise
20 they could be part of a layered approach that looks at both
21 approaches, the lasers and microwaves.

22 Senator Mullin: So you see them working together and
23 deployed on the same battlefield?

24 Mr. Bush: Potentially, sir. I think for fixed-site
25 defense, for example, the high-powered microwave systems

1 could make a lot of sense because they do not have to move
2 around. But they give you a capability that individual
3 laser systems do not.

4 Senator Mullin: Thank you. My time is running out.
5 Thank you so much.

6 Senator Kelly: Senator Ernst.

7 Senator Ernst: Thank you, Mr. Chair, and thank you,
8 gentlemen, for being here today and for your testimony, and
9 just making sure that our force of today is ready for the
10 fight of tomorrow. So truly appreciate that.

11 Mr. Bush, we had a really great conversation earlier in
12 my office, and I would love to get that on the record today.
13 This is important to me because, as you are aware, the focus
14 of our conversation was the Iowa Army Ammunition Plant. And
15 last year the Army announced plans to increase 155 artillery
16 munitions production, and their focus was to be on the Iowa
17 Army Ammunition Plant.

18 During a recent SASC hearing, Army Chief of Staff
19 General George stressed the need to bolster our organic
20 industrial base and push forward with the Army's investment
21 in establishing the future artillery complex in Middletown,
22 Iowa.

23 So Mr. Bush, may I have your assurance that this
24 construction is still proceeding to meet the Army's targeted
25 production of 155 millimeter artillery around?

1 Mr. Bush: Yes, Senator, I will.

2 Senator Ernst: Thank you. And given the magnitude of
3 this project, particularly as our allies are relying on us
4 to lead and serve as the arsenal of democracy worldwide, the
5 supply of munitions remains a crucial factor, especially
6 when it comes to that 155. Can you commit to keeping me
7 informed with any updates or issues through the
8 modernization efforts at the Iowa Army Ammunition Plant?

9 Mr. Bush: Yes, Senator, absolutely.

10 Senator Ernst: Thank you very much. And Mr. Bush, as
11 you know, our supply chains are very much linked to all
12 different defense acquisitions, and the vulnerabilities in
13 the U.S. defense supply chains are particularly due to
14 China's dominance in critical minerals and certain
15 technologies.

16 Can you provide us some of the insights into how the
17 U.S. Army's acquisition processes are currently working to
18 mitigate these challenges?

19 Mr. Bush: Yes, Senator. So I think if I could start
20 with critical minerals. The OSD, through funding provided
21 by Congress for Defense Production Act investments has been
22 making those targeted investments in having both mining and
23 processing capacity for certain critical minerals in the
24 United States, and that has been a huge initiative, and a
25 very important one, strongly supported by Congress. I can

1 get you more details on projects that have already been
2 awarded, and now that we have 2024 funding again, what they
3 have planned to do. But we, of course, support all of that.

4 With regard to the Army and our responsibility for
5 conventional ammunition across DoD, we have the task from
6 the fiscal year 2023 NDAA -- sorry, fiscal year 2024 NDAA
7 -- to ensure that all of our supply chains for
8 subcomponents, including baseline chemicals, by 2028, are
9 completely either in the United States or with friendly
10 countries, and we are on a path to do that. That will
11 require some continued investment, but it is critical to
12 avoid any dependence on potential enemies for production of
13 ammunition.

14 Senator Ernst: Well, I do appreciate that because as
15 we look to the civilian sector, as well, most of that mining
16 and refining happens outside of the United States. So the
17 Hardrock Act, I believe, is what you were referencing,
18 through the NDAA, but making sure that we have enough for
19 our own national defense. So thank you for that.

20 How does the U.S. Army assess the impact of these
21 supply chain vulnerabilities on the timelines and
22 operational readiness?

23 Mr. Bush: So, Senator, the way we have mitigated in
24 the past, and are doing now, in some cases, where
25 downstream, for example, there might be an unfriendly

1 country that provides us materials, we stockpile. So the
2 goal of that stockpiling needed by time in an emergency or
3 if that source became untenable to produce somewhere else or
4 to get it from another ally. And we have done that across
5 the board, which has allowed us, as part of this ramp-up, to
6 stay on track.

7 However, and Congress has provided the funds,
8 especially in the last supplemental, we are now, just for
9 155, over \$4 billion of investments in America, frankly, in
10 production capacity. Those kinds of investments -- and we
11 have also gotten them for precision weapons like Patriot and
12 other things -- are foundational for the future, not just
13 this emergency.

14 I think what we have learned from this ramp-up is the
15 longest pole in the tent of increasing production is the big
16 machine tools and some of the critical materials that are
17 refined and take time. Those things you need stockpiled or
18 you need additional capacity you can localize quickly, on
19 hand, and not building it from scratch, which is what we are
20 doing now.

21 So if I had one lesson learned, ma'am, it would be that
22 for the next time around we need to have more of that ready
23 to go so we are not building new buildings. We are just
24 activating cold sites.

25 Senator Ernst: Absolutely. I think there are 18

1 minerals that are listed that we are supposed to, as the
2 United States, have on stockpile for our national defense,
3 and we have depleted those over decades. So glad to know
4 that we are working on that. I would love to visit with you
5 more at a future point about some of that. But I appreciate
6 the time, and again, gentlemen, thank you very much for
7 being here today.

8 Thank you, Mr. Chair.

9 Senator Kelly: Senator Blumenthal.

10 Senator Blumenthal: Thank you, Mr. Chairman. Mr.
11 Secretary, I think it was about 3 months ago the Army
12 announced the cancellation of the Future Attack
13 Reconnaissance Aircraft, FARA, as it is known, following
14 about 15 years of planning and investment, more than \$1
15 billion in the X-2 technology, to replacing the aging Apache
16 and Kiowa helicopters. The Army said it was necessary for
17 your service to be capable in the 21st century. For more
18 than a decade, the industrial base relied on the FARA as a
19 long-term program that enabled companies to recruit the most
20 capable and technically invested workforce in the nation, or
21 at least one of them.

22 So this decision has shaken the industrial base to its
23 core. Hundreds of engineers are going to be without work.
24 Probably they will be employed elsewhere, but the Army will
25 not be able to get them back. And my two questions are,

1 number one, is the FARA decision irreversible? And second,
2 what will be done to develop FARA's X-2 technology?

3 Mr. Bush: Senator, from an acquisition and contracting
4 perspective the existing OTA agreements that are actually
5 tailing off but still under work right now with our two
6 vendors, those will just end naturally later this year. So
7 we would have to have a new contract award to continue with
8 the program in some way.

9 To your second question, right now the U.S. Army does
10 not have a plan to invest in that particular technology for
11 that capability. But I would say that that technology, in
12 my view, if effective, could have a future in unmanned
13 aircraft, for example, that might be something the Army
14 would very much be interested in, depending on the way it
15 was used.

16 Senator Blumenthal: The decision on FARA followed the
17 decision on FLRAA, which was questionable in my view, both
18 as to the cost and the capability. The relevant companies
19 decided not to challenge it. Obviously it is part of what
20 we need to assess going forward in the National Defense
21 Authorization Act.

22 But what will the Army do to retain and support the
23 workforce that will be displaced as a result of the FARA
24 termination?

25 Mr. Bush: Yes, sir. So I think as part of the larger

1 decision, and it was a difficult decision, on FARA -- and I
2 would, if I could, defer to General Rainey on the
3 operational aspects of why that judgment call was made
4 -- from an industrial base standpoint the continuation of
5 Black Hawk production was our primary focus to retain
6 capacity and talent, as you mentioned, to just do rotorcraft
7 well, not just build them but design them. Number one, sir.

8 Number two is we are still, thanks to Congress, we are
9 supporting providing the fiscal year 2024 funding for FARA,
10 even though the program was ending, has allowed us to invest
11 that in the teams. Between the two teams we have had them
12 nominate good work to do with that workforce right now, that
13 helps other Army agencies and programs, and we are embarking
14 on that work.

15 Senator Blumenthal: Can you assure us about the
16 commitment to the Black Hawk program?

17 Mr. Bush: Senator, we are 100 percent committed, as
18 the Secretary said, to that follow-on multiyear of a better
19 Black Hawk than we have now. So that research work will go
20 into that new, better Black Hawk, that will go into
21 production in that multiyear.

22 Senator Blumenthal: You will need the engineers
23 displaced from the FARA program for that work on the Black
24 Hawk program. Is that what you are saying?

25 Mr. Bush: Sir, some of that would be up to the

1 contractor, of course, but we need the talent to be able to
2 make a better Black Hawk, yes, because if we are going to go
3 into production for 120 more aircraft we want it to be the
4 best possible one.

5 Senator Blumenthal: But it will not be 400.

6 Mr. Bush: Sir, there will potentially be workforce
7 impacts. Yes, sir.

8 Senator Blumenthal: So it might be near that number.

9 Mr. Bush: Sir, I have heard numbers in that range.

10 Senator Blumenthal: Thank you. Thank you very much,
11 Mr. Chairman.

12 Senator Kelly: Senator Peters.

13 Senator Peters: Thank you, Mr. Chairman. Thank you,
14 gentlemen, for being here today and for your service to our
15 country. We appreciate you.

16 Secretary Bush and General Rainey, the Infantry Squad
17 Vehicle is a proven platform that clearly demonstrates how
18 leveraging the existing commercial products, which we talked
19 about just before the hearing here, General, leads to both
20 schedule procurement and cost efficiencies. The Army has
21 recognized the ISV's value by including \$44 million in
22 procurement funding on the unfunded priority list to
23 supplement the President's \$34 million request.

24 So my question for both of you is given the request for
25 an additional \$44 million for the Infantry Squad Vehicle,

1 can Congress conclude that the Army needs to field the ISV
2 more rapidly than originally planned, and how does this
3 acceleration of the platform help the Army achieve its
4 latest force design initiatives?

5 Mr. Bush: Senator, if I could start on the kind of
6 budget part and let General Rainey, if I could, let him talk
7 about operations.

8 Senator Peters: That would be great.

9 Mr. Bush: From a budget standpoint, yes sir, it is
10 proving to be a very good vehicle. We are investing in it.
11 I would also add that the recently passed supplemental, I
12 expect some of that funding to end up buying ISVs because we
13 are sending Ukraine older things. That is one of our best,
14 newest platforms, and we will use some of that supplemental
15 funding to buy vehicles sooner than even the 2025 budget
16 being approved.

17 Senator Peters: Good. General?

18 General Rainey: Senator, the feedback is we have
19 started fielding the ISV from our operating forces, not in
20 touch points but actually fielding it to our brigade combat
21 teams, has been overwhelmingly positive. The 2nd Brigade of
22 the 101st, because of the way they are coming in, instead of
23 peanut butter, slicing them all over the Army, we are
24 massing them on one of our brigades, and that brigade is
25 experimenting with the motorized infantry brigade combat

1 team. Based on what we have learned from Ukraine and now
2 the technology, it is finally to the point where we can
3 bring a system like the ISV to bear.

4 So how many we buy and as fast as we buy I would defer
5 to Mr. Bush, but as an infantryman and as a transformation
6 guy, I would like to see them fielded to as many of our
7 infantry brigade combat teams as we can, as fast as we can.

8 Tactical mobility is something that has eluded the
9 light infantry force for a long time, and this is a great
10 capability.

11 Senator Peters: Great. Great. Thank you for your
12 assessment.

13 General Gingrich, the fiscal year 2025 budget request
14 for the Stryker family of vehicles, comprising 8 Stryker
15 brigade combat teams, proposes a reduction of \$210 million
16 for fiscal year 2024, enacted level, limiting procurement to
17 basically 51 vehicles. This many hinder the Army's plan to
18 modernize the half brigade each year, which would impact
19 training and fielding schedules of these units.

20 So my question for you, General, this substantial
21 reduction in funding for the Stryker combat vehicles impacts
22 a significant portion of the Army's deployed inventory.

23 What is the rationale behind decreasing the budget for these
24 vehicles, and how does this reduction align with the Army's
25 overall modernization goals?

1 General Gingrich: Thank you, Senator, for that, and
2 you are absolutely right. Fifty-one Strykers is in the
3 fiscal year 2025 request.

4 I think I would best characterize this as one of the
5 hard decisions that we had to make. Based off the
6 priorities that were established by the Secretary and the
7 Chief, the resources that are allocated, we had to carefully
8 balance sort of today's risk in an enduring platform like
9 the Stryker with some of our more modern programs that are
10 under development but will bring game-changing technology.

11 So I would call this one of high regret that we had to
12 do, but we thought through the risk and thought this was an
13 appropriate place for now. We are not walking away from the
14 Stryker, just buying a little time and space so that we can
15 address other priorities, sir.

16 Senator Peters: So what do you see as the future?

17 General Gingrich: I see the Stryker in Army formations
18 for quite some time. It is a very versatile vehicle, not
19 only as an infantry troop transport but also some of the
20 other technologies that we are bringing in, that it could be
21 the base platform. So I think the Stryker will be in our
22 inventory for a long time, Senator.

23 Senator Peters: Great. Thank you, General. Thank
24 you, Mr. Chairman.

25 Senator Kelly: Senator Duckworth.

1 Senator Duckworth: Good timing, huh? Thank you, Mr.
2 Chairman and Ranking Member. I appreciate having this
3 hearing today.

4 The Organic Industrial Base, or OIB, is the backbone of
5 the Army sustainment capabilities. The Army's industrial
6 base comprises 23 depots, arsenals, ammunition plants that
7 manufacture to maintain critical materiel support for the
8 warfighters across the Joint Force. And these highly
9 technical facilities and skilled workforce help to generate
10 readiness and operational capability throughout the Army.

11 Illinois has had the privilege of being home to Rock
12 Island Arsenal, which has supported this nation since 1862
13 -- we are very proud of it -- and continues to play an
14 essential role in our national security, contributing to the
15 Army's efforts to accelerate 155 shell production, for
16 example.

17 As the Army executes its 15-year modernization
18 implementation plan it must continue to use and partner with
19 the 14 DoD Advanced Manufacturing Institutes across the
20 country, including institutes like MxD, located in Chicago,
21 which will help enable the use of advanced technologies in
22 other continuous improvements across the Army's OIB.

23 Assistant Secretary Bush, you know I have been talking
24 about Rock Island since our time together on the House Armed
25 Services Committee. Maintaining global leadership in

1 advanced manufacturing is vital for ensuring the strength of
2 our OIB. How can the Army strengthen its relationship with
3 DoD's Advanced Manufacturing Institutes, such as MxD, and
4 our additional resources needed to do so?

5 Mr. Bush: Thanks, Senator. I think Congress has shown
6 leadership in pushing all the services and the Army to look
7 more real terms at advanced manufacturing, and as you know,
8 Rock Island is our center of excellence for that. It is
9 where we have the most 3D printing machines. We have one of
10 the biggest in the world there, that Congress was able to
11 provide us.

12 There is good work going on to do the hard work of
13 figuring out which parts we can make with those machines and
14 then also make those things even more forward in the field.
15 So the idea of being able to print parts, so to speak,
16 forward is the idea.

17 I think we need to continue to stay at it. We are
18 also, though, counting on industry, because they are also
19 moving, if you go to any modern factory they are starting to
20 use these techniques, as well, to work with them to get this
21 done.

22 So I think it is a question of just staying at it,
23 staying up with industry, and, though, having government
24 expertise like we have at Rock Island, so we know what we
25 are looking at. Otherwise you can be told all sorts of

1 things but not know what is real, and the folks of Rock
2 Island know.

3 Senator Duckworth: So in addition to that, Secretary
4 Bush and General Gingrich, a challenge that will hinder
5 modernization of our OIB is the mix of legacy and modern
6 equipment -- you touched on that just a little bit -- and a
7 lack of data connectivity with systems. How does this
8 impact our production capabilities for critical materials,
9 which is those 155 rounds, and what recommendations do you
10 have to strengthen the Army's OIB?

11 Mr. Bush: Senator, if I could start and let General
12 Gingrich help, I think on the ammunition part of the organic
13 industrial base, the investments we have been able to make,
14 thanks to support from Congress, both before the Ukraine
15 conflict and since it started, are going to leave us with a
16 generational improvement in the ammunition part of the
17 organic industrial base. I would not say that about the
18 rest. And if I have a concern it is about our other depots
19 and our ability to keep them modern, good places to work,
20 and busy, given the resources we have, so that if there is a
21 major mobilization for a large-scale conflict those depots,
22 which are an insurance policy, can meet the need. I do
23 worry about that.

24 I think we have provided members with a list of ideas
25 for potential adds for all the depots, not just the ammo

1 ones. That could certainly help. And also just continuing
2 to work with us to make sure we know when we are doing
3 something we should not be doing at those depots, meaning we
4 are not investing the right way. That input from members is
5 vital to know, so we get on the right track.

6 Senator Duckworth: General?

7 General Gingrich: Senator, I would offer a couple of
8 things. I think the balancing between legacy and
9 modernization, as you lay out, I would say it is actually
10 balancing between enduring and modernization, because
11 frankly, we have walked away from a lot of legacy systems
12 that are no longer relevant on the battlefield. And I think
13 155 falls into that enduring capability for the foreseeable
14 future.

15 I think that is what the two gentlemen to my right,
16 along with myself, try to balance, is that balance between
17 enduring and modernization, and try to get that balance just
18 right, to acceptable risk levels.

19 The second thing I would say is we have invested quite
20 heavily, through our base budget, and with your support, as
21 well as supplemental appropriations that you have provided,
22 we have invested in our organic industrial base, especially
23 the ammunition.

24 And we are going to, frankly, my last point, is we are
25 going to need your support in the foreseeable future. As we

1 build this capacity and we struggle with budgets, we may
2 look for congressional help to maximize that capacity that
3 we are building.

4 Senator Duckworth: Okay. Thank you.

5 Looking to the Indo-Pacific, you know, that region is
6 going to require the ability to rapidly deploy military
7 forces, equipment, and supplies to the region, both within
8 CONUS and OCONUS. As the Army Service Component Command to
9 TRANSCOM, the military service deployment distribution
10 command, SDDC, plays a vital role in the efficient flow of
11 resources delivering readiness and lethality at speed across
12 surface distribution network nodes.

13 Assistant Secretary Bush, General Rainey, and General
14 Gingrich, a toss-up ball. Concerning SDDC's role as the
15 global intermodal surface connection and its mission to
16 seamlessly link the joint deployment and the distribution
17 enterprise with Army Materiel Command's materiel enterprise,
18 what specific efforts is the Army undertaking to prioritize
19 and modernize SDDC's capabilities? Because again, we are
20 going to have to push all this stuff out there, and if they
21 are not modernized efficiently we are not going to be able
22 to meet the need.

23 General Rainey: Thank you, Senator. You obviously
24 have a deep understanding of this complicated challenge, and
25 I would add that there is a good chance, depending on who we

1 fight, that it will be contested --

2 Senator Duckworth: Yes --

3 General Rainey: -- inside the United States. We are
4 not going to get a free pass until we show up in the South
5 Pacific. So everything the Army is working on in terms of
6 contested logistics is holistic, so SDDC is as important as
7 the watercraft unit that is going to cross the beach in
8 INDOPACOM. So I think we do have a holistic. We are doing
9 several things, tabletop exercises, bringing the enterprise
10 together. Army Futures Command is hosting a contested
11 logistics event June 12th down in Austin, and SDDC has been
12 invited, and we will make sure they are represented there.
13 So we have to transform together.

14 It all comes down to the challenge of we have to be
15 able to position supplies, not the old iron mountains, but
16 we have to distribute resources, ammunition, throughout the
17 South Pacific. The limitation on that is the ability to
18 protect it, so things like high powered microwave, IFPC,
19 offensively.

20 So it is a very, very complicated problem. We are
21 working very hard on our watercraft strategy, autonomous and
22 robotic supply, working with the Joint Force, because as you
23 know this is not an Army -- we do Title 10 for the Joint
24 Force, but TRANSCOM, the whole enterprise is going to be
25 involved in this.

1 I feel like it is a very hard problem that we have a
2 pretty solid understanding of the complexity of, and we have
3 a whole lot of work to do to make sure that General Flynn
4 and Admiral Paparo get the resources they need in a very,
5 very tough environment to do logistics.

6 Senator Duckworth: And on tabletop exercises, is that
7 going to include some of our friends and allies, as well?
8 Because we are not going to be able to do this on our own.

9 General Rainey: In the INDOPACOM ones they do. Yes,
10 Senator. Not currently. The one in Austin that I referred
11 to is focused on linking up joint teammates, Army teammates,
12 and the best industry partners we have in Contested
13 Logistics, because in a lot of areas the private sector is
14 ahead of autonomous watercraft, for example, the offshore
15 oil industry is ahead of where the Army is. So we are
16 trying to make those connections. But I will take that in
17 mind for the next iteration.

18 Senator Duckworth: Thank you.

19 Mr. Bush: Senator, if I could just add, I just want to
20 thank the folks who work there. They work some miracles
21 supporting Ukraine and Israel. America has many
22 superpowers, but Logistics is one of them, and you have to
23 have people who know how to do that, and we do it better
24 than anyone in the world. And I have been stunned by how
25 quickly we can do things when we have the resources.

1 Senator Duckworth: Yes. Thank you. Thank you,
2 Chairman.

3 Senator Kelly: Thank you. We will go to a second
4 round of questions here.

5 I got to see firsthand part of a logistics training, I
6 guess, essentially, to the border between Poland and
7 Ukraine. There were some things that stood out. One was,
8 Secretary Bush, you mentioned the 3D printing. We sent them
9 a couple of printers, I think they are using in Ukraine now
10 to print some parts. The other thing that stood out to me
11 was the telemaintenance, kind of like telehealth but we are
12 doing telemaintenance.

13 General, you mentioned as part of the cross-functional
14 team I think you mentioned regenerative power and advanced
15 power. I would like you to comment a little bit on that.
16 Obviously, to folks that follow this it is pretty obvious
17 that one of the most challenging things for an Army to do is
18 to move fuel forward. That long logistic train to get fuel
19 forward where it is needed is complicated. So I am
20 interested in hearing a little bit about the regenerative
21 and advanced power stuff that you had just mentioned in your
22 opening statement.

23 General Rainey: Thank you, Chairman. So fuel and ammo
24 are the two things that are the most important thing in
25 taking care of our casualties coming back, so those three

1 pieces are just non-negotiable, essential things if you are
2 going to have a good military. So that is why we chose
3 those. In fuel, specifically, the biggest opportunity in
4 the near term is to not move fuel that we do not have to,
5 which sounds like a "no kidding," right? But our current
6 systems, our tanks and Bradleys, are dependent on verbal and
7 digital reports of how much fuel they have.

8 And if you think about any car in America has the
9 ability to tell you all kinds of stuff with sensors. So the
10 near-term opportunity is to put systems that generate those
11 databased reportings off of our vehicles so that our great
12 sustainers are moving only the absolute amount of fuel they
13 need, which takes unnecessary convoys off the roads. So
14 that would be the example of demand reduction.

15 And then our science and technology, we have numerous
16 ongoing efforts to come up with alternatives to batteries,
17 lower the weight, longer shelf life, light, solar. We just
18 put an incredible new weapon into our light infantry
19 formations, but it is 3 pounds heavier. So that means 4
20 pounds have to come off the back of that soldier, and the
21 biggest opportunity to do that is make them not carry 3
22 days' worth of radios. How do we turn that into one radio?
23 And that is primarily in the research and development, S&T
24 space, but will rapidly turn into a requirement document
25 from that CFT, move over to Honorable Bush's professionals

1 to acquire it then.

2 Senator Kelly: Thank you. Secretary Bush, we
3 obviously learned a lot here from ground operations that the
4 Ukrainians are conducting against the Russians. But this is
5 at a time when we are trying to rebuild our force for
6 conflict in the Western Pacific, which, by the way, I do not
7 think it is not inevitable, and we want to avoid it, and in
8 my view the best way to avoid it is to make sure that we
9 have a force that no adversary feels they can beat. But we
10 have a lot of lessons learned from Ukraine.

11 Is there anything that stands out that we will apply to
12 INDOPACOM, that we have learned in Ukraine, that might be
13 applicable in one way or the other, or maybe not, to
14 conflict in the Western Pacific?

15 Mr. Bush: Senator, if I could start and then have
16 General Rainey chime in, if that is okay. I would point to
17 two. When this Army modernization wave started, two of the
18 initial focuses were long range fires and air defense.
19 Those two capabilities are proving absolutely critical in
20 Ukraine. So air defense is not just tactical but a
21 strategic level difference whether you can do it or not, to
22 protect your facilities and your people. So we are seeing
23 the need for advanced air defense systems in Ukraine, which
24 I believe underscores very good decisions made before I
25 arrived, to focus on that in the early kind of first wave of

1 the Army's current modernization efforts. That is number
2 one.

3 With regard to long range fires, I think it is the
4 same. We have seen in Ukraine mass precision at range has
5 fundamentally altered the battlefield for both sides. The
6 Army's investments there also apply to the Pacific. And
7 again, that is where our procurement dollars are now. They
8 are in air defense and long range fires, in terms of this
9 wave of modernization. And it was very thoughtful of the
10 people who realized that those things needed to be first,
11 and I think Ukraine is showing they were right.

12 But General Rainey can offer much more.

13 General Rainey: Thank you, Chairman. Obviously I am
14 very proud of the Army. We have actually had people
15 collecting observations and lessons learned around Ukraine
16 before the Russians invaded, our partners in TRADOC, and we
17 take that very seriously.

18 One of the most interesting things, I think, is what is
19 not changing. So while we are a joint force -- that is the
20 only way we fight -- but the fact that war is still a
21 contest between humans and the resolve of the Ukrainian
22 people, the importance of leadership, that tells me that
23 preserving our people, so maintaining an all-volunteer force
24 is as important to the future of war as some of the
25 technological solutions.

1 And while, again, joint, there are fascinating things
2 happening in space. There are fascinating things happening
3 in the cyber domain. But the land domain remains absolutely
4 relevant, you know, the tough fighting.

5 And the third one is while the technological stuff is
6 disruptive and fascinating -- so Industrial Age warfare did
7 not stop and then we start this high tech warfare. So HE
8 155 is still the indisputable, number one killer of both
9 Ukrainians and Russians on the battlefield.

10 But to answer your specific question, the ubiquitous
11 sensing, the thing that is the most alarming is that on the
12 future battlefield the absolute saturation of sensors is
13 making it almost impossible to hide, and a lot of our
14 tactics and doctrine are based on maneuvering and hiding.
15 When you couple that with a good enemy that has precision-
16 guided munitions, so now you are confronted with the problem
17 of pretty much guaranteed you are going to be observed by an
18 enemy that can hit you, and in China, they have a magazine
19 depth advantage that even if you defend yourself you are
20 eventually going to run out of munitions.

21 So that is the absolute problem that we are facing in
22 INDOPACOM or Russia or anywhere else that we fight, and that
23 is what we are working very hard on. Mr. Bush covered, you
24 know, it is a combination of defensive and offensive fires.
25 We have absolutely got to get better at defending ourselves,

1 counter-UAS, but the United States Army is best when it is
2 not playing defense at the point of need. So we need to
3 protect our tanks and especially our light infantry
4 formations. But what we are best at is sensing where the
5 ground control stations are, sensing where their EWs are
6 emitting from, and then employing ruthless Army offensive
7 fires, joint fires, to destroy them as opposed to waiting
8 until it is on top of you to try and defend yourself.

9 Senator Kelly: I want to come back to the long range
10 fire question, but for now I want to turn it over to Senator
11 Cotton.

12 Senator Cotton: Mr. Bush, I am glad to see that the
13 budget requests 230 Precision Strike Missiles Increment 1,
14 the surface variant, but last year's NDAA directed the Army
15 to submit a plan to procure 400 PrSM per year. Budget
16 documents show that PrSM Increment 1 procurement peaks in
17 fiscal year 2027 at only 296. What are the Army's options
18 to increase PrSM Increment 1 procurement over the future
19 years' defense plan?

20 Mr. Bush: Senator, in the near term it will be the
21 supplemental replenishment funding. So as you know, we
22 provided ATACMS missiles. The replacement is going to be
23 PrSM Increment 1's. So that will give us a pool of funding
24 to aggressively maximize that production rate in the near
25 term.

1 In the long term, sir, it is going to require our
2 investment across the FYDP to prioritize that system. But I
3 can tell you it is a very high priority for the Secretary
4 and Chief to get that much improved capability at scale as
5 fast as we can.

6 Senator Cotton: This investment across the FYDP sounds
7 like more money. How much more money are we talking about?

8 Mr. Bush: Senator, the goal is to maximize that
9 production capacity. I could get back to you with a
10 hypothetical delta between what you see across the out years
11 and then what we believe the maximum you could put in those
12 years would be. This is the kind of thing we are doing
13 right now as you build a '26 budget. But I would be happy
14 to show you the math and what it looks like, based on what
15 we know now.

16 Senator Cotton: Please do. That would be helpful. I
17 am also concerned about PrSM Increment 2, the land-based
18 anti-ship variant. Can you explain the delay in procurement
19 in the budget's request of only 10 Increment 2 missiles?

20 Mr. Bush: Senator, one thing to keep in mind with
21 Increment 2 is that it is a fundamentally new missile in
22 that the seeker is entirely different, which changes the
23 design of the front end of the missile. So while we call it
24 an increment, it is a substantially different weapon.

25 The reason for the timeline it is on is we have needed

1 the science and technology work on the seeker to prove out
2 of the labs. It has. What you see now is our first steps
3 to actually getting to production, and we just have to get
4 through testing, sir, to make sure it works.

5 I agree. Having more of those as part of a family of
6 PrSM systems we can shoot out of HIMARS, especially in
7 INDOPACOM, would be a very good thing, to put lots of
8 Chinese ships at risk.

9 Senator Cotton: Thank you.

10 Senator Kelly: Just a couple of more questions. As
11 you were talking about artillery, it occurs to me that just
12 like air-to-air missile systems, the length of the stick is
13 critical. I mean, who has the bigger stick in the fight?
14 You know, we think about that a lot in air-to-air combat,
15 and certainly the same is true with artillery. And I think
16 some of the Russian artillery outrages our 155 millimeter.

17 We had the 70-kilometer extended range cannon in
18 development. That program recently ended.

19 General Rainey, the Army has referenced a Tactical
20 Fires Study as informing the decisions related to long range
21 fires. How has that study informed and validated the Army's
22 decision, and to the extent that you can talk here in an
23 open setting, what is the plan beyond, you know, where do we
24 go from here, essentially on longer range artillery?

25 I was at Project Convergence a couple of years ago and

1 I saw what I think was about a 40-kilometer shot, which was
2 pretty impressive. It hit the vehicle dead on. But I want
3 to find out what are we thinking here, going forward.

4 General Rainey: Thank you, Chairman. The Tactical
5 Fires Study, unlike a lot of studies that are directed, that
6 was actually an internal Army thing that I started as the
7 AFC Commander, mainly because the success of our long range
8 fires efforts, which are in really good shape and one of the
9 highlights of our modernization, started with a detailed
10 analytic effort, and I thought it just made sense to do that
11 same thing on the tactical side. Plus the absolutely
12 observations coming out of Ukraine. So it was a prudent
13 effort.

14 Any lack of communication is entirely my
15 responsibility. So we have sent people over, and I am
16 available, at a secret level, to go into whatever level of
17 detail would be necessary.

18 But at this level your point about the range is
19 fascinating. First of all, the requirement for extended
20 range artillery remains valid. The prototyping effort that
21 we went through was incredibly informative, and we learned a
22 lot from it.

23 One of the most interesting things is just by focusing
24 on the round itself we got over halfway from 30 to 70, and I
25 can share that range. It has been a long time since we have

1 updated things like propellant and energetics. Industry is
2 very good at it. And at the same time, big, heavy, armored
3 Paladins are costly. We have a lot of great systems now.

4 So one of the big findings is let's innovate at the
5 round. Let's work with industry and see what kind of range
6 we can get without having to redo the barrels, which makes
7 you redo the turret, which makes the platform.

8 Another one is we need to continue to upgrade our
9 armored Paladins that we have, both their auto-loaders, ammo
10 carriers. Some of our partners and allies have some
11 phenomenal armored artillery systems, and we have a plan
12 that Mr. Bush could explain about how we are going to invest
13 in that.

14 Mobile Howitzer, our NATO allies and watching the
15 battlefield in Europe, there are some very good wheeled
16 Howitzers that are having great effect in a place like
17 Europe where the road systems are pretty mature, for
18 example.

19 There is also autonomous. Another one of our partners
20 has a very capable autonomous and robotic cannon that I
21 would like to look at. So we are going to invest in that.

22 Our mortar systems, we have had the same three mortar
23 systems the entire time I have been an infantry officer, and
24 we are having great success with one of them, and we are
25 going to expand that extended range and lethality efforts to

1 the other one.

2 And then the biggest thing probably with our tactical
3 fires is capability is nice, but unlike precision munitions
4 where it is sinking a handful of ships or closing a piece of
5 ground, the most important thing in tactical fires is not
6 just capability but it is capacity, the capability and
7 capacity. So range and the ability to concentrate. And no
8 rounds are cheap, and every dollar matters, but traditional
9 HE 155, if you can put 50 of those on a formation as opposed
10 to paying hundreds of thousands of dollars to kill one tank
11 at a time, so capability and capacity. And the sum of those
12 efforts is what we are doing to innovate in the tactical
13 fires space.

14 And I would love a chance to come back and lay out the
15 physics and ranges and things like that.

16 Senator Kelly: I will take you up on that.

17 Senator Cotton, anything else?

18 Well, thank you, all three of you, for being here. Was
19 there anything that you expected to hear from us that we
20 maybe did not ask that you think should be mentioned here in
21 this open hearing? Secretary Bush?

22 Mr. Bush: Well, Senator, you alluded to it. I just
23 would want to say that the Chief's unfunded priority list
24 has some counter-UAS and UAS on there that I would highly
25 recommend to members. In a classified setting I think we

1 could tell you a story about CENTCOM counter-UAS that is
2 actually a pretty good news story. The Army, very quietly,
3 did the diligent work for years, because we have been under
4 attack by various people in the Middle East, that is
5 protecting our troops right now, with Congress' support. So
6 the Army, I believe, has the most capable counter-UAS
7 systems available. With more resources we could go even
8 faster.

9 So, sir, I would be happy to, if of interest, give
10 members options on what those things might be, starting with
11 the Chief's list.

12 Senator Kelly: Okay. We will set that up. And I am
13 going to submit some other questions for the record on
14 electronic warfare, CJADC-2, and some air missile defense
15 questions.

16 And with that the hearing is concluded.

17 [Whereupon, at 5:25 p.m., the subcommittee was
18 adjourned.]

19

20

21

22

23

24

25

WORD INDEX

< \$ >

\$1 42:14**\$140** 13:11**\$2** 8:19**\$210** 47:15**\$250** 29:7 32:6,
7, 10**\$34** 45:23**\$4** 41:9**\$400** 13:9**\$44** 45:21, 25**\$750** 12:21

< 1 >

1 26:24 61:13,
16, 18**1.2** 29:8, 11, 15,
23 30:5, 9 31:18
32:22**1/2** 3:6**10** 29:9 32:11
54:23 62:19**10,000** 29:4**100** 16:13 25:6
28:7 44:17**101st** 7:24 8:4
46:22**10th** 8:5 29:10**10x** 31:22**120** 45:3**12th** 54:11**14** 49:19**15** 1:5 42:14**155** 12:23 38:15,
25 39:6 41:9

49:15 51:9

52:13 60:8

63:16 66:9

15th 30:7**15-year** 49:17**18** 41:25**1862** 49:12**18th** 20:25**1's** 61:23

< 2 >

2 8:17 11:20
26:24 62:17, 19,
21**20** 36:2**2023** 17:11 40:6**2024** 1:5 8:18
14:7 29:22 30:1
31:7 40:2, 6

44:9 47:16

2025 1:2 2:15

4:13 10:9, 15

11:13 13:9

18:14 20:18

23:7, 13 46:15

47:13 48:3

2027 61:17**2028** 40:8**2030** 10:18

16:15

2040 16:15**21st** 42:17**23** 49:6**230** 61:13**249** 23:11**25th** 8:5**26** 62:13**296** 61:17**2nd** 46:21**2-year** 4:5

< 3 >

3 3:6 42:11

57:19, 21

3,000 29:7 32:10**30** 64:24**300** 36:4**30th** 30:10, 21

31:6

3D 50:9 56:8

< 4 >

4 19:23 57:19**4:00** 1:12**400** 45:5 61:15**40-kilometer**

64:1

46 30:7

< 5 >

5 20:17 28:11**5:25** 67:17**50** 35:18 66:9**51** 47:17

< 6 >

6 17:4

< 7 >

70 64:24**70-kilometer**

63:17

7th 13:23

< 8 >

8 47:14

< A >

abbreviated

17:25

Aberdeen 28:3**ability** 5:3 24:1

25:8, 12, 23, 24

27:8 37:3 51:19

53:6 54:17 57:9

66:7

able 19:3 26:1,

9 27:18 28:6

42:25 45:1

50:10, 15 51:13

53:21 54:15

55:8

Abrams 27:16**absolute** 57:12

60:12, 21

absolutely 12:17

16:16 39:9

41:25 48:2

58:19 60:3, 25

64:11

accelerate 2:24

5:6, 21 49:15

acceleration

12:4 46:3

acceptable 52:18**access** 27:2, 4**accomplish** 35:3**accomplishments**

18:15

accountable 35:2**achieve** 46:3**acknowledge**

2:19

acquire 58:1**Acquisition** 2:6

10:2 25:25

34:10 39:17

43:3

acquisitions

39:12

acronym 35:12**Act** 4:14 8:25

39:21 40:17

43:21

activating 41:24	AFC 17:3, 6, 19 34:12 64:7	allies 2:25 13:8 19:25 39:3 55:7 65:10, 14	18
activity 5:20	afternoon 10:6 23:3	allocated 48:7	anyway 33:23
actual 29:20	Age 60:6	allow 21:3 23:16, 20	Apache 42:15
adapt 10:20	agencies 44:13	allowed 19:6 41:5 44:10	apologize 31:3
adapting 34:24	aggressively 61:24	allowing 10:20	appear 2:11 10:7 16:6 23:6 24:24
add 11:20 46:11 53:25 55:19	agile 4:6 23:21	alluded 66:22	appearance 9:1
addition 13:13 51:3	agility 20:24	all-volunteer 59:23	applaud 5:20
additional 4:24 13:21 41:18 45:25 50:4	aging 42:15	ally 41:4	applicable 58:13
Additionally 17:1	ago 17:4 27:12 33:17 42:11 63:25	alongside 16:7	applications 19:19
address 4:2 11:22 13:6, 20 19:12 48:15	agree 25:6 32:25 63:5	altered 59:5	applied 26:4
addressed 17:7	agreements 43:4	alternative 18:8, 10	apply 17:21 37:12 58:11 59:6
adds 51:25	ahead 30:6 55:14, 15	alternatives 57:16	appreciate 4:19 10:13 16:6 20:15 38:10 40:14 42:5 45:15 49:2
adjourned 67:18	Air 3:22 11:1, 16, 17, 21 25:12 32:7 35:8 58:18, 20, 23 59:8 67:14	America 41:9 55:21 57:8	approach 4:6, 8 10:20 36:23 37:20
adjusted 8:16 34:4	Airborne 7:24	American 21:5	approaches 37:21
adjusting 7:17	Aircraft 8:9 12:2, 4 33:11 37:14 42:13 43:13 45:3	ammo 51:25 56:23 65:9	appropriate 48:13
adjustments 3:23 11:23	Airland 1:8 2:3 10:6 23:6	Ammunition 38:14, 17 39:8 40:5, 13 49:6 51:12, 16 52:23 54:16	appropriations 52:21
administration 7:12	air-to-air 63:12, 14	amount 35:15, 20 57:12	approved 46:16
Admiral 55:4	Alabama 17:10 18:24	analytic 64:10	April 20:18, 25 28:12, 13 30:2
advance 21:5 24:22	alarming 60:11	announced 18:21 38:15 42:12	architecture 19:13
advanced 17:18 18:10 19:13 49:19, 21 50:1, 3, 7 56:14, 21 58:23	align 47:24	answer 29:21 35:4 60:10	area 5:20 37:11
advances 20:21	All-Domain 11:3 17:9 18:21 19:11	answering 14:8	areas 3:1 27:22 55:13
advantage 60:19		anti-ship 62:18	ARIZONA 2:2 5:17 25:15
adversaries 5:11 7:7		anybody 20:16,	ARKANSAS 7:2
adversary 5:8 58:9			
aerial 5:1 8:20			

Armed 1:9 10:5
23:5 49:24
armored 65:2, 9,
11
arms 16:12
ARMY 1:1 2:6,
7, 9, 16, 23 3:1, 7,
17, 19, 23 4:2, 4,
9, 14, 20, 22 5:2,
14, 19, 21 6:1, 2,
3, 7 7:4, 9, 16, 19,
23 8:7, 9, 11, 18,
23 10:2, 11, 12,
18 12:14 13:6
14:6 16:2, 9, 13,
15, 18, 20, 21
17:3, 12, 19 18:5,
21 19:6, 12, 18
20:20 23:2, 16,
17, 20 24:8, 11,
14 25:5, 18 26:4,
13 27:15 28:20
29:4, 6, 9, 10
32:2, 7 34:2, 6, 8,
11, 13, 19, 21
36:10 38:14, 15,
17, 18 39:8 40:4,
20 42:11, 16, 24
43:9, 13, 22
44:13 45:20
46:1, 3, 23 48:17
49:5, 10, 17 50:2,
6 53:8, 17, 18
54:5, 10, 23
55:11, 15 56:17
58:17 59:14
61:1, 6, 14 63:19
64:6 67:2, 6
Army-hosted
19:23

Army's 2:13
4:16 5:4, 20
7:12 8:13, 16
10:7, 15, 19
11:14 12:17
14:1 16:5 23:7,
13 24:7, 19
25:16 33:25
38:20, 24 39:17
47:17, 22, 24
49:5, 15, 22
51:10 59:1, 6
61:17 63:21
Army-specific
20:10
array 23:19
arrived 58:25
arsenal 39:4
49:12
arsenals 49:6
article 33:9
Artillery 8:12,
13 12:9, 23
38:15, 21, 25
63:11, 15, 16, 24
64:20 65:11
Asia-Pacific
11:11
asked 11:9, 22
12:13 13:5, 25
asking 29:7
aspect 28:1
aspects 31:25
34:18 44:3
assess 40:20
43:20
assessment 4:24
5:23 47:12
assigned 34:11

Assistant 2:5
10:1 49:23
53:13
assurance 38:23
assure 44:15
Assured 19:1
asymmetric 21:5
ATACMS 61:22
Attack 8:9 12:1
42:12 67:4
attacks 13:22
attend 20:15
Austin 54:11
55:10
authorities 4:23
13:18 24:10
authority 13:20
AUTHORIZATI
ON 1:2 4:14
8:25 43:21
authorized 4:23
auto-loaders 65:9
autonomous
18:1, 2 54:21
55:14 65:19, 20
available 18:17
24:13 64:16
67:7
aviation 12:1
avoid 5:7 40:12
58:7, 8
awake 26:10
award 43:7
awarded 40:2
aware 27:1, 6
38:13
awesome 28:5, 6
< B >
back 16:25 30:4,
13 42:25 56:25

57:20 61:9 62:9
66:14
backbone 49:4
bad 29:1
balance 3:25
4:9 48:8 52:16,
17
balancing 5:14
52:8, 10
ball 53:14
ballistically 31:13
barrels 65:6
base 4:17 34:22
38:20 42:18, 22
44:4 48:21 49:4,
6 51:13, 17
52:20, 22
based 8:10
13:15 47:1 48:5
60:14 62:14
baseline 40:8
basically 19:2
47:17
batteries 57:16
battery 18:9
battlefield 5:12
7:17 19:17
20:13 23:17
37:13, 23 52:12
59:5 60:9, 12
65:15
beach 54:7
beam 37:3
bear 47:3
beat 5:11 58:9
becoming 7:19
behalf 14:5
believe 7:14
20:23 26:11
28:1 29:17
30:11 33:2

40:17 58:24
62:11 67:6
benefits 36:24
best 5:7, 8 6:7
7:5, 23 26:13, 23
45:4 46:13 48:4
55:12 58:8 61:1,
4
better 4:1 5:5,
14 23:18 27:18
31:19 36:16
44:18, 20 45:2
55:23 60:25
beyond 10:18
63:23
Biden 7:12
big 4:10 32:5
41:15 65:2, 4
bigger 63:13
biggest 11:25
12:6 25:4 50:10
57:3, 21 66:2
bill 12:16 13:13
14:7
billion 8:19
41:9 42:15
bi-partisan 3:15
bit 51:6 56:15,
20
Black 12:3 44:5,
16, 19, 20, 23
45:2
Bliss 28:7, 22
Block 12:4
Blumenthal 1:16
42:9, 10 43:16
44:15, 22 45:5, 8,
10
board 12:19
41:5

body 18:23
bolster 38:19
border 56:6
bought 29:4
bounds 20:10
Bradleys 57:6
brief 11:9
briefings 18:17
briefly 11:12
Brigade 7:24, 25
8:5 46:20, 21, 24,
25 47:7, 15, 18
brigades 46:24
brigade's 8:2
bring 47:3 48:10
bringing 48:20
54:9
Brito 26:21
34:17
broad 5:3
broader 24:7
34:5
budget 2:15
4:15 7:13 8:16
10:9, 15, 19
11:13, 24 18:14
26:4 32:5, 6, 12
46:6, 9, 15 47:13,
23 52:20 61:13,
15 62:13
budgets 53:1
budget's 62:19
build 4:21
10:18 16:14
18:25 44:7 53:1
62:13
Building 1:13
41:19, 23 53:3
buildings 41:23
Bush 2:5 4:18
9:4 10:1, 4 14:9

16:7 17:5 28:25
29:12 30:25
31:2, 8 32:9, 12
34:9, 15 35:7, 10,
13, 24 36:15
37:2, 9, 24 38:11,
23 39:1, 9, 10, 19
40:23 43:3, 25
44:17, 25 45:6, 9,
16 46:5, 9 47:5
49:23 50:5 51:4,
11 53:13 55:19
56:8 58:2, 15
60:23 61:12, 20
62:8, 20 65:12
66:21, 22
Bush's 19:4
57:25
busy 51:20
butter 46:23
buy 29:7 46:15
47:4
buying 46:12
48:14
buys 32:7

< C >
cable 31:12
calendar 31:1, 2,
7
California 20:4
call 32:17 44:3
48:11 62:23
called 24:1
Camp 20:3
26:22 28:6
campaign 20:23
Campbell 7:22
cancellation
42:12
cancelled 8:9

Cannon 8:12
12:9 63:17
65:20
capabilities 4:1,
5 5:5, 10 20:11
23:15 24:16
25:9 27:8 49:5
51:8 53:19
58:19
capability 4:5,
12 5:24 11:20,
21 13:17 17:25
18:4 25:19
27:21 32:14, 19
38:2 43:11, 18
47:10 49:10
52:13 62:4 66:3,
6, 11
capable 36:6
42:17, 20 65:20
67:6
capacity 4:17, 21
5:24 17:11
25:19 27:23, 24
39:23 41:10, 18
44:6 53:1, 2
62:9 66:6, 7, 11
capitalize 20:20
capitalizing 19:1
Capstone 19:23
20:17 28:11
car 57:8
care 56:25
carefully 48:7
carriers 65:10
carry 57:21
cases 40:24
casualties 56:25
cent 29:2
CENTCOM
13:15 16:24

28:18 35:14
67:1
Center 20:4
28:4, 21 50:8
Central 13:8
century 42:17
certain 39:14, 23
certainly 52:1
63:15
CFT 17:10, 12,
24 19:2 57:25
CFTs 17:6
19:20 20:21
CH-47F 12:3
chain 40:21
chains 39:11, 13
40:7
Chair 38:7 42:8
chairman 1:14
10:4, 23 11:8, 24
16:3 23:3 33:13
42:10 45:11, 13
48:24 49:2 56:2,
23 59:13 64:4
challenge 10:20
17:22 43:19
51:4 53:24
54:14
challenged 17:12
challenges 5:12
17:19 19:7
35:17 39:18
challenging
35:19 56:17
chance 53:25
66:14
change 10:22
11:25 12:7
16:12 34:22
36:11

changed 33:25
34:1
changes 8:8, 15
62:22
changing 59:19
characterize 48:4
cheap 66:8
chemicals 40:8
chemistries 18:9
Chicago 49:20
Chief 2:8 10:13
23:2 32:13
34:11 35:2
38:18 48:7 62:4
chief's 8:22
66:23 67:11
chime 58:16
China 60:18
China's 39:14
Chinese 63:8
chose 57:2
civilian 40:15
civilians 16:5
23:9
CJADC-2 67:14
classified 66:25
clear 5:10 30:11
clearly 45:17
climb 25:7
closely 17:20
34:9, 15
closer 33:3
closing 14:5
21:7 24:20 66:4
clothing 33:9
coalition 3:11
5:22
cold 41:24
collecting 59:15
Com 16:21

combat 3:2, 9,
18, 21 7:7 8:5
10:25 21:4 29:6
31:16 46:20, 25
47:7, 15, 21
63:14
combination
60:24
combined 7:17
19:24
come 2:3 11:6
18:19 20:17
30:4, 13 34:19
57:16, 20 61:9
66:14
comes 31:20
39:6 54:14
comfortable 35:1
coming 27:15
29:12 36:11
46:22 56:25
64:12
Command 2:8
10:12 13:8 16:2,
21 20:6, 8 26:5
28:19 33:25
34:3, 22 53:8, 10
54:10
commander
27:16 64:7
commanders
16:22
Commanding
2:7 10:11 16:1
27:13
commands 34:12
Command's
53:17
comment 56:15
comments 25:4

commercial
45:18
commit 39:6
commitment
10:24 21:7
24:22 44:16
committed 24:5
36:22 44:17
Committee 1:9,
15 8:24 10:5
17:7 23:5, 8
24:21 49:25
Committee's
32:17
communication
64:14
companies 42:19
43:18
company 29:14
30:14, 18
company-size
30:9
company-sized
29:11 30:24
31:7
compared 8:17
compelled 3:13
competition 8:12
10:22
completely 40:9
complex 2:17
38:21
complexities 3:12
complexity 6:5
55:2
complicated
53:24 54:20
56:19
COMPO 26:24
Component 53:8
components 6:2

comprehensive
10:19
comprises 49:6
comprising 47:14
concentrate 66:7
concern 51:18
concerned 25:8
32:24 62:17
Concerning
53:14
concerns 33:7
conclude 46:1
concluded 67:16
conduct 3:13
25:12 27:19
30:9
conducting 2:17
58:4
confidence 6:5
conflict 51:15,
21 58:6, 14
confronted 60:16
Congress 13:13,
18 39:21, 25
41:7 44:8 46:1
50:5, 10 51:14
67:5
congressional
53:2
connection 53:15
connections
55:16
connectivity 51:7
consider 27:20
32:18
consistent 4:6
16:19
constantly 35:20
constrained
25:11

construction
8:22 38:24
contend 7:9
contest 59:21
contested 3:14
11:3 14:2 17:8,
10, 24 20:7 54:1,
6, 10 55:12
context 3:4 33:1
34:5
continuation 44:4
continue 3:8
6:6 12:11 24:11
27:10 31:24
34:20 43:7
49:18 50:17
65:8
continued 12:2
16:5 24:18
40:11
continues 6:3
11:4 17:20
49:13
continuing 5:9
19:4 24:12 52:1
continuous 3:2
4:7 7:18 16:9
49:22
continuously
23:18 24:5
contract 13:22
43:7
contracting 43:3
contractor 45:1
contribute 19:8
23:25
contributing
49:14
control 20:6, 9
28:19 37:3 61:5
CONUS 53:8

conventional
12:22, 23 40:5
Convergence
5:18, 24 7:16, 21
14:3 18:2 19:22
20:2, 15 25:16
63:25
conversation
18:20 38:11, 14
convoys 57:13
copies 29:4
core 42:23
corporations
17:21
Corps 17:23
20:3
correct 30:3, 19
37:8
cost 7:10 18:3
43:18 45:20
costly 65:3
costs 29:2
Cotton 1:16 6:9
7:1, 3 10:4 16:3
23:4 28:24, 25
29:20 30:1, 7, 15,
17, 20, 23 31:1, 5,
9 32:5 33:7
61:11, 12 62:6,
16 63:9 66:17
counter-drone
8:21
counter-UAS
20:9 21:1 36:23
61:1 66:24 67:1,
6
counter-
unmanned 8:20
counting 50:18
countries 40:10

country 41:1
45:15 49:20
couple 52:7
56:9 60:15
63:10, 25
course 7:11
13:16 32:15
36:15 40:3 45:1
covered 60:23
Coyote 13:21
creates 5:2
critical 3:17 6:2
11:20 12:14, 17
21:3 23:23
25:24 31:25
34:18 39:14, 20,
23 40:11 41:16
49:7 51:8 58:19
63:13
cross 54:7
cross-COMPO
26:23
cross-functional
14:1 17:1, 8, 9
18:22, 25 19:5,
11 56:13
crucial 25:16
39:5
cruise 36:6
cry 33:21
current 5:10, 24
12:17 25:11
57:5 59:1
currently 28:2
39:17 55:10
cut 7:12 8:17
cutting 5:9
cyber 60:3

< D >

<p>D.C 1:10 18:23 data 51:7 databased 57:11 data-centric 20:12 date 30:5 days 30:7 57:22 dead 64:2 decade 42:18 decades 42:3 decided 43:19 decision 17:3 29:18 32:16 42:22 43:1, 16, 17 44:1 63:22 decision-making 19:15 decisions 3:24 48:5 58:24 63:20 decisively 24:2 decreasing 47:23 deep 53:24 deeper 11:12 18:20 defeat 5:3 7:6 23:18 defend 60:19 61:8 defending 60:25 DEFENSE 1:2, 3 3:18, 22 4:13 8:25 11:1, 17, 18, 21 23:10 24:23 25:21 35:8 36:6 37:25 39:12, 13, 21 40:19 42:2 43:20 58:18, 20, 23 59:8 61:2, 19 67:14</p>	<p>defensive 20:6 60:24 defer 44:2 47:4 delay 62:18 delegation 3:15 deliver 26:11 delivered 31:5 36:4 delivering 3:2 53:11 delivery 18:11 delta 62:10 demand 17:18 57:14 demands 25:21 democracy 39:4 demonstrate 3:9 demonstrated 32:3 demonstrates 7:16 45:17 Department 2:13 dependence 40:12 dependent 57:6 depending 43:14 53:25 depleted 42:3 deploy 53:6 deployable 36:21 deployed 35:10, 13 36:1 37:23 47:22 deployment 53:9, 16 depots 49:6 51:18, 21, 25 52:3 depth 60:19 Deputy 2:8 10:13 23:2</p>	<p>design 20:11 44:7 46:4 62:23 designated 34:12 designed 7:25 32:22 33:9 destroy 61:7 detail 13:2 64:17 detailed 18:17 31:4 64:9 details 40:1 deter 24:1 determine 29:15 determining 34:8 deterrence 23:22 develop 5:2 17:25 43:2 developing 8:13 development 4:25 13:11 27:3 48:10 57:23 63:18 developmental 27:19 developments 20:5, 7 devices 33:4 difference 58:21 different 12:10 19:25 26:3, 18 35:17 36:20 39:12 62:22, 24 difficult 44:1 digital 57:7 diligent 67:3 directed 4:11 13:12 25:10 35:7, 17 36:1, 9, 19 61:14 64:5 directly 23:25 36:12</p>	<p>discuss 4:18 10:7 discussing 3:4 displaced 43:23 44:23 display 19:21 disruptive 10:21 16:11 60:6 dissemination 19:14 dissipation 35:20 distinguished 10:5 16:4 23:4 distribute 28:23 54:16 distributed 28:19 distribution 17:17 53:9, 12, 16 distributively 28:17 divested 24:16 Divisions 8:6 doctrine 60:14 document 17:25 57:24 documents 61:16 DoD 32:6 40:5 49:19 DoD's 50:3 doing 2:20 16:9 33:22 40:24 41:20 52:2, 3 54:8 56:12 62:12 66:12 dollar 66:8 dollars 28:9 29:3, 16 59:7 66:10 domain 23:16</p>
---	--	--	--

34:20 60:3
domains 26:18
dominance
 19:12 39:14
dominate 23:16
 34:20
Doug 2:5 16:7
DOUGLAS 10:1
downstream
 40:25
dozen 20:14
dramatically
 12:18
drones 37:11
Duckworth 1:16
 48:25 49:1 51:3
 52:6 53:4 54:2
 55:6, 18 56:1
due 16:18 39:13

< E >
earlier 38:11
early 58:25
East 2:18 3:6, 8
 5:13 67:4
edge 5:9
effect 28:9 37:5,
 16 65:16
effective 3:9
 35:7 37:7 43:12
efficiencies 45:20
efficient 53:10
efficiently 53:21
effort 20:2 23:7
 64:10, 13, 20
efforts 4:10 5:6,
 18 6:4 11:10
 12:14 13:5
 18:20 19:20
 20:9 24:7 25:17
 26:11 36:1 39:8

49:15 53:18
 57:16 59:1 64:8
 65:25 66:12
either 27:14
 40:9
electronic 21:2
 25:9, 14 67:14
electronics 35:21
element 29:11
elements 30:10,
 24 31:7
eliminated 24:15
eluded 47:8
embarking 44:13
emergency 41:2,
 13
emerging 18:9
emitting 61:6
emphasis 4:7
employed 42:24
employing 4:22
 61:6
enable 18:4
 49:21
enabled 42:19
enabling 3:18
 24:16
enacted 8:18
 47:16
endeavors 2:23
ended 63:18
endurance 18:4
enduring 3:25
 5:16 11:5 23:8
 48:8 52:10, 13,
 17
enemies 40:12
enemy 60:15, 18
energetics 65:1
energy 4:11
 13:12 18:12

25:10 35:7, 17
 36:1, 9, 20, 25
engaged 2:16
 24:9
engagement
 24:22
engineering
 27:17
engineers 42:23
 44:22
enhance 27:21
Enjoy 33:21
ensure 40:7
ensuring 25:18
 50:1
enterprise 19:21
 53:17 54:9, 24
entire 32:2
 65:23
entirely 62:22
 64:14
ENVG 32:3
environment 6:4
 11:2 26:17
 35:22 36:20, 21
 55:5
equip 10:16
equipment 10:17
 11:5 13:15 26:6
 27:5 33:9 51:6
 53:7
era 10:21
Ernst 1:16 38:6,
 7 39:2, 10 40:14
 41:25
especially 16:22
 18:5 39:5 41:8
 52:22 61:3 63:6
essential 24:6, 18
 26:19 49:14
 57:1

essentially 56:6
 63:24
established 48:6
establishing
 38:21
establishment
 14:1
EUCOM 28:18
Europe 5:13
 65:15, 17
evaluation 25:13
 26:5
event 54:11
events 5:21
 28:23 31:2
eventually 60:20
evolution 19:6
evolve 19:5
evolving 13:7
 23:19
EWs 61:5
exact 30:5
exactly 13:24
example 7:16
 11:17 27:6 32:3
 36:3 37:25
 40:25 43:13
 49:16 55:14
 57:14 65:18
examples 8:3
excellence 50:8
executes 49:17
exercise 7:18
 28:18
exercises 2:19
 54:9 55:6
existing 43:4
 45:18
expand 12:14, 18
 65:25

expanded 34:2
expanding 27:20
expect 30:8
 31:6 46:12
expectations
 31:18
expected 33:10
 66:19
expensive 27:25
experience 19:7
experiment
 19:24 20:5
 28:23
experimental
 7:25
experimentation
 20:1, 23 25:13
experimenting
 46:25
expertise 19:7
 50:24
explain 62:18
 65:12
exploring 18:7, 9
exposed 4:16
express 2:20
Extended 8:11
 12:8 63:17
 64:19 65:25
extent 28:2
 63:22

< F >

face 3:13
facilitate 19:14
 24:21
facilities 5:25
 18:19 25:14
 26:24 27:2 28:3
 49:9 58:22

facing 60:21
fact 59:20
factor 32:24
 39:5
factors 7:10
factory 50:19
faithfully 23:11
falls 52:13
families 2:21
 16:6 23:9
family 47:14
 63:5
fancy 8:21
far 31:20 32:11
FARA 42:13, 18
 43:1, 16, 23 44:1,
 9, 23
FARA's 43:2
fascinating 60:1,
 2, 6 64:19
fast 26:1 47:4, 7
 62:5
faster 67:8
February 19:22
Federal 32:5
feedback 29:25
 36:13, 16, 18
 46:18
feel 55:1
feelings 36:17
feels 58:9
field 5:2 6:6
 21:1 35:9 36:12
 46:1 50:14
fielded 47:6
fielding 27:7
 46:19, 20 47:19
Fifty-one 48:2
fight 2:17 16:16
 21:6 24:1, 3
 38:10 54:1

59:20 60:22
 63:13
fighting 7:24
 60:4
figure 36:24
figuring 50:13
Finally 5:1
 13:25 47:2
find 64:3
finding 17:12
 35:16
findings 65:4
Fire 11:19 20:6
 61:10
Fires 3:20
 10:25 58:18
 59:3, 8 60:24
 61:7 63:20, 21
 64:5, 8 66:3, 5,
 13
first 7:8, 25
 20:1 29:4 32:25
 58:25 59:10
 63:2 64:19
firsthand 3:16
 7:23 56:5
FISCAL 1:2
 2:15 8:17 10:9,
 15 11:13 13:9
 14:7 18:14 23:7,
 12 27:25 29:22
 30:1 31:1 40:6
 44:9 47:13, 16
 48:3 61:17
fix 29:8
fixed 35:22
fixed-site 36:3, 5
 37:24
flat 4:15
flaws 32:22

flesh 29:21
flexibilities 4:24
flexibility 13:23
 20:25 21:2
flight 27:17
flow 53:10
FLRAA 43:17
flying 37:14
Flynn 16:23
 55:3
focus 8:13
 26:22 38:13, 16
 44:5 58:25
focused 3:19
 34:3 55:11
focuses 58:18
focusing 3:1
 64:23
folks 51:1 55:20
 56:16
follow 56:16
followed 43:16
following 42:13
follow-on 44:18
follows 14:9
 21:10 24:25
food 18:12
force 3:13, 25
 6:1 11:6 16:21
 18:5 19:13
 20:13 23:24
 26:9, 25 32:7
 38:9 46:4 47:9
 49:8 54:22, 24
 58:5, 9 59:19, 23
forces 3:2, 9, 16
 32:19 46:19
 53:7
Force's 23:25
forefront 19:18

foreseeable 52:13, 25	fully 11:13 12:24 26:4	2, 3, 7, 19, 22, 23 20:24 21:10 22:1 23:1, 3 24:25 25:1, 3, 18, 22 26:19, 20 27:6, 24 28:13, 15, 24 29:22 30:4, 11, 16, 19, 22 31:15, 17 33:15, 16, 18, 24 34:1, 10, 16, 17, 23 35:1 38:19 44:2 45:16, 19 46:6, 17, 18 47:13, 20 48:1, 17, 23 51:4, 11 52:6, 7 53:13, 23 54:3 55:3, 9 56:13, 23 58:16 59:12, 13 63:19 64:4	34:16 47:13 48:1, 17 51:4, 12 52:7 53:14
form 32:24	fun 33:20		give 32:13 37:10 38:2 61:23 67:9
formation 11:23 66:9	fund 21:1		given 39:2 45:24 51:20
formations 4:12 7:24 17:13 20:8 21:4 24:8 31:23 48:17 57:19 61:4	fundamentally 34:1 59:5 62:21		giving 36:13
former 31:20	funded 12:24		glad 20:18 42:3 61:12
Fort 7:22 25:14 26:21 27:23 28:4, 6, 22	funding 8:17, 20 12:1, 15 18:14 32:18 39:20 40:2 44:9 45:22 46:12, 15 47:21 61:21, 23		global 49:25 53:15
Fortunately 7:14	funds 29:19 41:7		globe 2:20 11:11
forward 3:4 4:3, 8, 10 5:5 6:6 7:19 9:2 13:2 14:8 16:22 21:9 24:24 32:10 38:20 43:20 50:14, 16 56:18, 19 64:3	Further 4:21, 25 13:14 27:23		go 11:12 27:17 31:14 32:9 41:23 44:19, 20 45:2 50:19 56:3 63:24 64:16 67:7
foundational 41:12	FUTURE 1:3 3:18, 21 4:21 8:9 10:25 12:1, 18 13:24 24:3 33:25 36:22 38:21 41:12 42:5, 12 43:12 48:16 52:14, 25 59:24 60:12 61:18		goal 7:4 41:2 62:8
four 3:1 17:16 37:18	Futures 2:7 10:11 16:2 34:3 54:10		goals 47:25
Fourth 13:3	FYDP 62:2, 6		goes 29:24 32:14
Fox 26:16 28:5	< G >		going 5:7 12:3, 6, 18 20:22 25:3 26:6 27:8, 17 28:12, 16 29:23 30:5, 6 31:15, 19 36:8 42:23 43:20 45:2 50:12 51:15 52:24, 25 53:6, 20, 21 54:4, 7, 24 55:7, 8 57:2 60:17, 20 61:22 62:1 64:3 65:12, 21, 25 67:13
Frank 16:24	G-8 2:9 10:13 23:2		good 10:6 23:3 32:3 35:6 37:6 44:12 46:10, 17
frankly 41:9 52:11, 24	game-changing 48:10		
free 54:4	gaps 4:2		
friendly 40:9	General 2:6, 7, 8 7:14 10:11, 12 14:3 15:1 16:1,		
friends 55:7			
front 62:23			
FS-LIDs 13:11			
fuel 18:8 56:18, 23 57:3, 4, 7, 12			
fuels 18:10			
full 8:24 17:11			

49:1 50:12
 51:19 53:25
 57:2 58:24
 60:15 63:7 64:8
 65:2, 15 67:2
gotten 41:11
government
 50:23
graduate 27:12
gratitude 2:21
Grayling 26:22
 28:6
great 6:5 10:22
 16:8 26:25
 38:11 46:8 47:9,
 11 48:23 57:11
 65:3, 16, 24
greater 18:4
 20:23 28:2
greatest 25:5
greatly 32:20
grew 18:1
ground 3:9 5:17
 25:14, 15 27:22
 28:3 58:3 61:5
 66:5
Grounds 28:22
grow 27:8
grows 6:4
growth 5:1
Guam 3:18
guaranteed 29:8
 60:17
Guard 6:1
guess 56:6
guide 20:1
guided 60:16
guiding 5:19
guy 27:16 47:6
guys 33:14, 23

< H >

half 47:18
halfway 64:24
hand 31:3 41:19
handful 66:4
hands 23:15
 29:23
happen 13:1
happening 60:2
happens 40:16
happy 12:5
 62:13 67:9
hard 31:24 48:5
 50:12 54:21
 55:1 60:23
Hardrock 40:17
hardware 25:12
Hawk 12:3 44:5,
 16, 19, 20, 24
 45:2
headquarters
 18:23
hear 8:14 66:19
heard 20:24
 45:9
hearing 7:19
 8:7 10:14 11:8,
 22 12:13 13:3
 38:18 45:19
 49:3 56:20
 66:21 67:16
heat 35:20
heavier 57:19
heavily 2:16
 52:20
heavy 65:2
helicopter 27:15
helicopters 42:16

help 7:11 8:23
 46:3 49:9, 21
 51:12 52:1 53:2
helpful 62:16
helps 44:13
hide 60:13
hiding 60:14
high 31:18
 36:25 37:9
 48:11 54:18
 60:7 62:3
higher 24:16
 36:4
highlight 17:6
highlights 64:9
highly 49:8
 66:24
high-powered
 36:25 37:17, 25
hill 25:7
HIMARS 63:6
hinder 47:17
 51:4
hit 60:18 64:2
holistic 54:6, 8
holy 34:14
home 49:11
Hon 1:13 2:1
 7:1 10:1
Honorable 16:7
 17:5 57:25
hope 8:23
hopeful 33:6
host 5:18 18:18
 20:18
hosted 20:3
hosting 54:10
hosts 25:16
House 49:24
Howitzer 65:14
Howitzers 65:16

Huachuca 25:15
 26:16, 21 27:23
huge 39:24
huh 49:1
human 17:17
human-machine
 4:12 20:7
humans 59:21
hundreds 13:21
 29:2 42:23
 66:10
Huntsville 17:10
 18:19, 24
hypersonics 4:11
 25:11
hypothetical
 62:10

< I >

idea 50:15, 16
ideas 51:24
IFPC 54:18
II 12:4
Illinois 49:11
illustration 3:12
imminently
 29:13, 21
impact 40:20
 47:18 51:8
impacted 27:3
impacts 45:7
 47:21
imperatives
 23:14
implement 20:12
implementation
 49:18
importance 3:7
 59:22
important 2:15
 5:19 26:8 31:22

38:13 39:25
 54:6 56:24
 59:24 66:5
importantly
 23:21
impossible 60:13
impressed 8:1
impressive 64:2
improve 2:25
 4:25
improved 32:19
 62:4
improvement
 51:16
improvements
 49:22
inceptors 13:21
include 6:1 8:24
 55:7
included 12:20
includes 11:15
including 8:4, 20
 11:17 12:23
 13:19 37:14
 40:8 45:21
 49:20
incorporate
 35:19
incorporated
 20:1
increase 2:24
 12:21 27:7
 38:15 61:18
increased 20:25
 21:2
increasing 2:18
 17:14 41:15
increasingly
 19:17
incredible 19:20

57:18
incredibly 64:21
Increment 11:20
 61:13, 16, 18, 23
 62:17, 19, 21, 24
Indirect 11:19
Indisputable
 17:2 60:8
individual 38:2
Indo-Pacific
 2:19 5:13 11:14
 23:22, 24 53:5
INDOPACOM
 3:15 18:6 28:17
 54:8 55:9 58:12
 60:22 63:7
industrial 4:17
 38:20 42:18, 22
 44:4 49:4, 5
 51:13, 17 52:22
 60:6
industry 17:19
 50:18, 23 55:12,
 15 65:1, 5
inevitable 58:7
infantry 8:2, 5
 32:19 33:1
 45:16, 25 46:25
 47:7, 9 48:19
 57:18 61:3
 65:23
infantryman
 31:21 47:5
inflation 8:16
inform 5:21
 29:18
informative
 64:21
informed 24:13
 39:7 63:21

informing 32:16
 35:25 63:20
initial 19:9 34:2
 58:18
initiative 39:24
initiatives 46:4
innovate 65:4
 66:12
innovating 26:3
innovative 26:1
input 16:24 52:4
insert 4:5
inside 54:3
insights 39:16
Institutes 49:19,
 20 50:3
institutional
 20:24
insurance 51:22
integrate 21:3
integrated 4:12
 17:17 20:2, 8
integration 20:6
interest 5:7 67:9
interested 4:22
 5:23 20:19
 31:18 43:14
 56:20
interesting 27:13
 59:18 64:23
intermodal 53:15
internal 64:6
interoperability
 2:25
invaded 59:16
invasion 2:17
inventory 47:22
 48:22
invest 10:17
 16:14 27:10

43:10 44:10
 65:12, 21
invested 42:20
 52:19, 22
investing 11:3
 46:10 52:4
investment 2:14
 12:21 38:20
 40:11 42:14
 62:2, 6
investments 4:21
 5:5 11:15 23:12,
 20, 22, 25 24:4,
 16 39:21, 22
 41:9, 10 51:13
 59:6
invitation 10:7
 11:8, 22 12:13
 13:3, 25 16:6
invite 20:16
invited 54:12
involved 54:25
Iowa 38:14, 16,
 22 39:8
iron 54:15
irreversible 43:1
Island 49:12, 24
 50:8, 24 51:2
Israel 4:16
 55:21
issues 31:14
 36:13 39:7
ISV 46:1, 19
 47:3
ISVs 46:12
ISV's 45:21
items 4:20 18:12
iteration 7:20
 29:8 55:17
iterative 4:6, 9

its 2:17, 23, 24,
25 3:19 4:4, 21
5:2 6:3 7:23
8:8 24:14 25:19
42:22 46:3
49:17 50:2
53:15
IVAS 29:1, 7, 11
30:9 31:20

< J >

James 2:7
10:11 16:1
job 33:22
John 26:16 28:5
joined 10:10
joint 3:10, 13
5:22 7:17 17:24
18:5 19:13, 24
20:6, 9, 13 23:24,
25 28:19 49:8
53:16 54:22, 23
55:11 59:19
60:1 61:7
judgment 44:3
jumping 33:11
June 30:2, 10, 21
31:6 54:11

< K >

Karl 2:8 10:12
16:8 23:1
keep 32:14 37:4
51:19 62:20
keeping 19:8
39:6
keeps 26:2, 10
29:1
Kelly 1:14, 15
2:1, 3 7:3 9:3
10:4 15:1 16:3

22:1 23:4 25:1,
25 27:1, 11
28:11, 14, 24
33:12 38:6 42:9
45:12 48:25
56:3 58:2 61:9
63:10 66:16
67:12

key 3:1 10:24
11:15 17:16
37:2

keys 31:12

kidding 57:5

kill 66:10

killer 60:8

kilowatt 36:5

kilowatts 35:18
36:3

kind 13:23 27:3
29:1 34:21
35:21 37:10, 12
46:5 56:11
58:25 62:12
65:5

kinds 41:10 57:9

Kiowa 42:16

know 19:23
25:25 28:21
29:17 30:23
31:17 34:23
35:12 39:11

42:3 49:23 50:7,
24 51:1, 2 52:2,
5 53:5 54:23
55:23 60:4, 24
61:21 62:15
63:14, 23

known 42:13

< L >

lab 36:20

labs 63:2

lack 51:7 64:14

land 23:16
34:20 60:3

land-based 62:17

largely 4:15

larger 3:14
43:25

larger-scale
29:13

large-scale 51:21

laser 26:22 38:3

lasers 36:25
37:2, 21

late 29:23

latest 7:20 20:5
29:7 31:10 46:4

lay 52:9 66:14

layered 37:20

lead 13:10
34:13 39:4

leadership 24:9
34:18 49:25
50:6 59:22

leads 45:19

lead-up 28:22

leaner 23:20

learn 23:17
27:18

learned 7:20
8:3, 10 17:22
41:14, 21 47:1
58:3, 10, 12

59:15 64:21

learning 4:9
20:21 35:15, 24
36:19 37:12, 19

leave 51:15

Leavenworth
28:4

legacy 24:16

51:5 52:8, 11

legitimate 31:22

length 63:12

lesson 41:21

lessons 7:20 8:3,
10 17:22 20:21
23:17 58:10
59:15

lethal 23:21

Lethality 3:22

11:2 17:14
53:11 65:25

letting 12:11

level 30:18
35:18 47:16

58:21 64:16, 18

levels 8:18

35:18 36:2
52:18

leverage 27:22

leveraging 45:18

Lieutenant

10:12 16:7 23:1
life 57:17

Lift 3:21 10:25

light 8:4 31:11
47:9 57:17, 18
61:3

lighter 17:13

limitation 54:17

limitations 4:17
25:11 27:2

limiting 7:10
47:16

linchpin 23:24

link 28:7, 16
53:16

linked 39:11

linking 55:11

list 45:22 51:24 66:23 67:11	lot 29:2 32:6, 8 38:1 52:11 55:3, 13 58:3, 10 60:13 63:14 64:5, 22 65:3	manufacture 49:7	20:14 23:4, 8 29:18 51:24 52:4 66:25 67:10
listed 42:1	lots 63:7	manufacturing 18:10 49:19 50:1, 3, 7	mentioned 12:8 25:4, 10 28:11 36:19 44:6 56:8, 13, 14, 21 66:20
little 48:14 51:6 56:15, 20	love 38:12 42:4 66:14	March 19:22 20:18 28:12, 13	met 1:12
localize 41:18	low 31:11	marches 33:10	Michigan 26:22
located 49:20	Lower 11:17 18:3 36:2 57:17	Marine 17:23 20:3	microwave 37:10, 17, 25 54:18
lock 31:11	< M >	maritime 3:14	microwaves 37:1, 21
logistic 56:18	ma'am 41:21	Mark 1:13 2:1	Middle 2:18 3:6, 8 5:13 67:4
Logistics 2:6 10:2 11:3 14:2 17:8, 10, 22, 24 20:7 54:6, 11 55:5, 13, 22 56:5	machine 17:17 41:16	marked 10:21	Middletown 38:21
Long 3:20 4:10 33:10, 17 37:5 47:9 48:22 56:18 58:18 59:3, 8 61:9 62:1 63:20 64:7, 25	machines 50:9, 13	mass 59:4	mid-range 4:11
longer 52:12 57:17 63:24	magazine 60:18	massing 46:24	midst 16:11
longer-range 8:13	magnitude 39:2	material 11:14	military 8:22 19:19 53:6, 9 57:2
longest 41:15	main 14:2 18:23	materials 18:11 41:1, 16 51:8	millimeter 38:25 63:16
Long-Range 10:24	maintain 18:16 49:7	Materiel 16:21 34:4, 16 49:7 53:17	million 12:21 13:9, 11 29:7 32:6, 7, 10 45:21, 23, 25 47:15
long-term 42:19	maintained 23:11	math 62:14	millions 29:3
look 3:3 5:5 6:5 7:19 8:24 9:2 13:1 14:8 21:9 24:24 31:24 40:15 50:6 53:2 65:21	maintaining 3:25 24:11, 19 49:25 59:23	matters 66:8	mind 55:17 62:20
looking 26:23 34:25 50:25 53:5	major 8:14 32:22 34:12 51:21	mature 65:17	minerals 39:14, 20, 23 42:1
looks 4:8 37:20 62:14	making 10:13 13:1 17:15 24:3 28:5 38:9 39:22 40:18 60:13	max 28:9	mining 39:22 40:15
loop 25:13	malfunctions 31:12	maximize 53:2 61:24 62:8	miracles 55:20
	Maneuverable 35:8	maximum 62:11	Missile 3:22 4:11 11:1, 15, 16,
	maneuvering 60:14	mean 31:21 36:15 63:13	
	manner 5:10	meaning 32:24 52:3	
		means 57:19	
		meet 2:13 5:12 38:24 51:22 53:22	
		Member 6:8 10:4 11:25 12:8 16:3 23:4 49:2	
		Members 1:15 10:5 12:16 16:4	

18 36:6 62:21,
23 63:12 67:14
Missiles 61:13,
22 62:19
mission 31:13
33:25 34:22
35:3 53:15
mistaken 30:2
mitigate 39:18
mitigated 40:23
mix 51:5
M-LIDs 13:10
mobile 8:1
65:14
mobility 47:8
mobilization
51:21
model 12:3
modern 3:7
7:17 10:17
20:13 23:17
48:9 50:19 51:5,
19
**MODERNIZATI
ON** 1:1 2:14, 24
3:4, 20, 25 4:9
5:15, 19 6:4 7:5
8:8 10:8, 24
11:4, 10 16:18
23:7, 12 24:6, 15,
17, 19 25:20
26:11 34:3, 7
39:8 47:25
49:17 51:5 52:9,
10, 17 58:17
59:1, 9 64:9
modernize 5:10
8:23 10:20
16:25 24:11
26:4 27:7 34:6
47:18 53:19

modernized 4:5
5:25 8:4 26:6
53:21
modernizing 24:8
modes 28:19
momentum 18:16
money 13:20
31:25 62:7
month 27:12
months 17:14
42:11
mortar 65:22
motorized 46:25
Mountain 8:5
29:10
mountains 54:15
move 13:19
29:13 35:19
38:1 56:18 57:4,
25
moving 4:2
50:19 57:12
Mullin 1:17
33:12, 13, 17, 19
34:21, 25 35:6,
11, 23 36:11, 24
37:6, 22 38:4
multi-domain
3:10 19:15
multinational
17:21
multiple 3:5
33:20
multi-sensor
19:12
multiyear 4:23
44:18, 21
munitions 4:16,
25 7:5 8:21
12:14, 19, 23, 24

38:16 39:5
60:16, 20 66:3
MxD 49:20 50:3
< N >
nation 21:8
24:23 42:20
49:12
National 4:13
6:1 20:4 25:20
28:4, 20 40:19
42:2 43:20
49:14
nation's 5:7 7:6
21:6 23:10, 23
NATO 65:14
naturally 43:6
Naval 27:11, 18
Navigation 19:2
Navy 17:24 32:7
NDAA 13:19
40:6, 18 61:14
near 5:8 45:8
57:4 61:20, 24
nearly 23:11
near-term 57:10
necessary 4:7
10:18 24:22
42:16 64:17
need 3:9 5:2
12:10 20:23, 25
21:6 27:8 36:18
38:19 41:17, 18,
22 43:20 44:22
45:1 50:17
51:22 52:25
53:22 55:4
57:13 58:23
61:2 65:8
needed 16:14
18:16 20:12

32:20 41:2 50:4
56:19 59:10
62:25
needful 32:8
needs 13:15
46:1
Network 3:22
11:1 20:11
53:12
networking 4:4
never 29:6
33:20
new 8:2 11:18
13:19 18:10, 25
19:7, 20 25:9
27:5 33:5 41:23
43:7 44:20
57:18 62:21
newer 5:15
newest 46:14
news 67:2
next-generation
20:8
nice 66:3
night 32:1, 2
33:3, 4
nodes 53:12
nominate 44:12
non-negotiable
57:1
notable 3:23
note 2:15
noted 10:23
11:25 13:3
notice 1:12
number 21:4
43:1 44:7, 8
45:8 59:1 60:8
numbers 45:9
numerous 57:15

< O >

observations

59:15 64:12

observed 60:17**obsolescence** 7:10**obvious** 56:16**Obviously** 43:19

53:23 56:16

58:3 59:13

occasion 4:18**occurs** 63:11**OCONUS** 53:8**October** 13:21,

23 17:11

offensive 20:5

60:24 61:6

offensively 54:19**offer** 24:20 52:7

59:12

Office 1:13

38:12

officer 27:14, 16

65:23

offshore 55:14**OIB** 49:4, 22

50:2 51:5, 10

oil 55:15**Okay** 30:23

31:5 35:6 53:4

58:16 67:12

old 32:5 54:15**older** 46:13**old-fashioned**

26:7

once 7:12 9:1

31:16 33:8

one-on-one 37:6**ones** 52:1 55:9**ongoing** 11:10

57:16

open 8:12 25:12

31:11 63:23

66:21

OPENING 2:1

7:1 14:4 25:4

56:22

operate 4:15

20:13

operating 17:11

46:19

operational 18:4

23:14 40:22

44:3 49:10

operations 2:18

3:8, 10, 11, 14, 18

5:22 11:10

19:16 46:7 58:3

opinion 17:2

34:5

opportunities 3:5**opportunity** 3:16

13:14 16:8 17:6

20:16 23:6

24:23 26:25

28:1 57:3, 10, 21

opposed 61:7

66:9

option 32:13**options** 61:17

67:10

order 2:4**organic** 38:19

49:4 51:12, 17

52:22

organization

18:24 19:4

34:14, 18

originally 46:2**OSD** 39:20**OSD's** 20:1**OTA** 43:4**outpace** 5:9**outrages** 63:16**outside** 40:16**overall** 34:5, 15

36:23 47:25

overwhelmingly

46:21

< P >

p.m 1:12 67:17**pace** 24:12

25:20 26:2

Pacific 3:19

54:5, 17 58:6, 14

59:6

Paladins 65:3, 9**Paparo** 55:4**part** 10:14 26:9

34:7 36:22

37:20 41:5

43:19, 25 46:6

51:12, 16 56:5,

13 63:5

particular 12:15

43:10

particularly 8:1

13:7 39:3, 13

partner 49:18**partners** 2:25

17:20 19:25

55:12 59:16

65:10, 19

partnership

17:23 18:2

parts 18:12

25:23 50:13, 15

56:10

pass 54:4**passage** 12:25**passed** 13:13

46:11

passionate 26:15**path** 10:16

12:12 24:19

31:25 40:10

Patriot 11:16, 18

12:20, 22 41:11

paying 66:10**peaks** 61:16**peanut** 46:23**peer** 5:8**Pendleton** 20:3**penny** 29:1**people** 26:14

55:23 58:22

59:10, 14, 22, 23

64:15 67:4

percent 8:17

44:17

period 16:11**person** 26:21**perspective** 43:4**Peters** 1:16

45:12, 13 46:8,

17 47:11 48:16,

23

phase 13:1**phenomenal**

65:11

Philippines 28:18**physics** 66:15**piece** 33:9 66:4**pieces** 57:1**Pilot** 27:11, 15,

18

pivoted 8:11**place** 7:8 19:8

23:14 26:23

27:4 37:16

48:13 65:16

places 26:16 28:22 51:19	policy 51:22	Present 1:15 17:19	problems 29:9 32:21
plan 4:5 29:13, 18 30:13 43:10 47:17 49:18 61:15, 19 63:23 65:11	pool 61:23	presented 2:14	proceed 25:19
planned 40:3 46:2	portfolio 8:8 11:23 19:11 24:15	preserving 59:23	proceeding 38:24
planning 42:14	portfolios 3:24 10:24 17:16, 18	President's 10:9 32:12 45:23	process 24:9 33:21
plans 27:21 38:15	portion 28:19, 20 47:22	presiding 1:14, 15	processes 39:17
Plant 38:14, 17 39:8	Position 19:1 23:10 54:15	presume 29:6	processing 19:14 39:23
plants 49:6	positive 17:3 46:21	pretty 55:2 56:16 60:17 64:2 65:17 67:2	procure 61:15
platform 45:17 46:3 48:8, 21 65:7	possible 8:25 16:17 45:4	primarily 28:20 57:23	procurement 4:23 11:4 13:10 29:16 45:20, 22 47:16 59:7 61:16, 18 62:18
platforms 11:5 46:14	possibly 33:8	primary 44:5	produce 41:3
platoon 29:11, 14 30:9, 14, 17, 24 31:6	potential 11:7 27:9 31:21 37:10 40:12 51:25	print 50:15 56:10	production 4:25 12:2, 3, 14, 19, 22 18:8 38:16, 25 39:21 40:12 41:10, 15 44:5, 21 45:3 49:15 51:8 61:24 62:9 63:3
play 2:22 3:17 23:10 49:13	Potentially 37:24 45:6	printers 56:9	productive 6:6
playing 61:2	pounds 57:19, 20	printing 50:9 56:8	products 45:18
plays 5:19 53:10	power 3:10 10:22 17:18 18:8 35:17, 18 36:2, 4 56:14, 15, 21	priorities 3:20 5:15 8:19, 23 18:15 24:6 48:6, 15	profession 3:3 16:12
Please 62:16	powered 37:10 54:18	prioritization 16:19	professional 20:14
pleased 10:10	Precision 3:20 12:19 17:16 37:11 41:11 59:4 60:15 61:13 66:3	prioritize 53:18 62:2	professionally 24:21
Plus 64:11	prepared 14:9 16:17 21:10 23:18 24:25	prioritized 24:14	professionals 57:25
point 37:9, 16 42:5 47:2 52:24 58:16 61:2 64:18	preparing 3:17	priority 24:17 26:19 45:22 62:3 66:23	PROGRAM 1:3 8:10, 12, 15 10:8 27:17 42:19 43:8 44:10, 16, 23, 24 63:18
pointed 32:22		private 17:20 55:13	programs 4:4 5:16, 21 11:16
pointless 26:12		privilege 49:11	
points 30:14 46:20		Probably 42:24 66:2	
Poland 56:6		problem 19:3 54:20 55:1 60:16, 21	
pole 41:15			

13:10 24:17
 27:4 44:13 48:9
progress 6:3
 17:15 29:14
Project 5:18, 23
 7:16, 20 14:3
 18:2 19:22 20:2,
 15 25:16 39:3
 63:25
projects 40:1
proliferation
 13:3
promise 37:18,
 19
pronounce 35:12
proof 17:2
propellant 65:1
proposed 11:25
proposes 8:16
 47:15
protect 54:18
 58:22 61:3
protecting 67:5
Protection 11:19
prototypes 35:8,
 14, 25 37:18
prototyping
 35:25 36:8
 64:20
proud 5:17
 49:13 59:14
prove 31:16
 63:1
proven 35:8
 45:17
provide 3:12
 8:3 11:9 13:5,
 25 14:4 16:24
 18:17 24:10
 29:18, 20 31:4

32:19 39:16
 50:11
provided 13:18
 39:20 41:7
 51:24 52:21
 61:22
provides 13:14
 18:3 41:1
providing 12:16
 44:9
Proving 5:17
 25:14, 15 27:22
 28:3, 21 35:18
 36:2 46:10
 58:19
PrSM 61:15, 16,
 18, 23 62:17
 63:6
prudent 64:12
purchase 32:10
pursuant 1:12
push 38:20
 53:20
pushed 20:10
pushing 50:6
put 7:15 13:21
 57:10, 18 62:11
 63:7 66:9
puts 10:16

< Q >
Q&A 12:6
quarter 29:22
 30:1, 8
question 25:22
 26:9 29:15 43:9
 45:24 47:20
 50:22 60:10
 61:10
questionable
 43:17

questions 11:12
 14:8 21:9 24:24
 42:25 56:4
 63:10 67:13, 15
quickly 21:4
 41:18 55:25
quietly 67:2
quite 48:18
 52:19

< R >
radar 11:18
 37:15
radio 57:22
radios 57:22
Rainey 2:7
 10:11 14:4 15:2
 16:1, 3 21:10
 22:1 25:3, 18, 22
 27:6, 24 28:13,
 15 29:22 30:4,
 11, 16, 19, 22
 31:15, 17 33:16,
 18, 24 34:1, 23
 35:1 44:2 45:16
 46:6, 18 53:13,
 23 54:3 55:9
 56:23 58:16
 59:12, 13 63:19
 64:4
ramp-up 41:5, 14
Range 3:20
 4:11 5:3 8:11
 12:9, 10 26:16
 28:5 36:20 45:9
 58:18 59:3, 4, 8
 61:9 63:17, 20,
 24 64:7, 18, 20,
 25 65:5, 25 66:7
ranges 27:2

66:15
ranging 25:9
Ranking 6:8
 10:4 11:24 12:8
 16:3 23:4 49:2
rapid 5:1 10:21
rapidly 13:6, 19
 21:3 24:9 46:2
 53:6 57:24
rate 61:24
rated 31:13
rationale 47:23
reach 18:5
reached 17:11
read 31:11
readiness 2:24
 12:18 24:12
 40:22 49:10
 53:11
ready 3:2, 7
 16:15 38:9
 41:22
real 36:9, 10
 50:7 51:1
realignment 12:1
reality 7:19
realize 31:21
realized 59:10
really 27:13
 32:4 37:3 38:11
 64:8
reason 62:25
reasons 12:5
rebuild 58:5
RECEIVE 1:1
 30:12, 15, 16, 20
received 31:19
receiving 31:18
recognize 4:14
 5:4 6:8 9:3

11:13	relationships	requirement	5, 15, 18 57:5
recognized 45:21	35:3	25:20 57:24	59:11 62:13
recognizes 16:13	relevant 43:18	64:19	67:5
recommend	52:12 60:4	requirements	rigor 29:24
66:25	relied 42:18	25:25 34:8	risk 5:14 48:8,
recommendations	relying 39:3	rescoping 34:22,	12 52:18 63:8
51:9	remain 11:5	24, 25	road 65:17
Reconnaissance	17:1 19:18 24:5	research 13:11	roads 57:13
8:9 12:2 42:13	remainder 30:25	44:19 57:23	robotic 54:22
record 10:14	remaining 4:2	Reserves 6:1	65:20
13:10 38:12	18:24	resilient 20:12	Rock 49:11, 24
67:13	remains 2:16	resolve 59:21	50:8, 24 51:1
recruit 42:19	3:19 16:18 39:5	resources 4:24	role 2:21 3:17
redo 65:6, 7	60:3 64:20	10:8 18:15	5:19 11:14
reduce 18:11	remarks 17:5	24:10, 13, 18	23:10 49:14
reduced 24:15	remote 31:12	26:3 35:2 48:7	53:10, 14
reduction 17:18	repair 18:12	50:4 51:20	Room 1:13
47:15, 21, 24	replacement	53:11 54:16	rotorcraft 44:6
57:14	61:22	55:4, 25 67:7	round 56:4
referenced 63:19	replacing 42:15	responsibility	64:24 65:5
referencing 40:17	replenishment	16:14 34:5, 7, 12,	rounds 51:9
referred 55:10	4:20 61:21	15 40:4 64:15	66:8
refined 41:17	reportings 57:11	responsible 26:21	run 60:20
refinement 24:10	reports 57:7	responsibly 24:11	running 31:14
refining 40:16	represented	rest 19:21 51:18	38:4
reflect 18:15	54:12	result 8:18	Russell 1:13
reflects 10:19	represents 10:23	43:23	Russia 60:22
regard 13:5	reps 28:8	results 31:10	Russian 2:17
32:21 40:4 59:3	REQUEST 1:2	32:16	63:16
regarding 23:6	2:15 10:16, 19	resupply 18:1, 12	Russians 58:4
regenerative	11:13, 15 13:9	retain 43:22	59:16 60:9
18:7 56:14, 20	23:12 35:14	44:5	ruthless 61:6
region 11:11	45:23, 24 47:13	returned 3:15	ruthlessly 24:14
53:5, 7	48:3 62:19	REVIEW 1:1	
regions 23:23	requested 10:8	2:13	< S >
regret 48:11	18:14 24:18	riding 33:10	S&T 57:23
rehab 33:21	requests 61:13	right 7:15 13:16	safe 37:13
relate 11:10	require 40:11	26:13 28:15	SASC 38:18
related 63:20	53:6 62:1	33:22 35:23	saturation 60:12
relationship 50:2	required 4:14	37:16 43:5, 9	saw 7:22 64:1
	18:11	44:12 48:2 52:4,	

<p>saying 8:21 36:13 44:24</p> <p>scale 5:4 13:22 62:4</p> <p>schedule 20:17 31:4 45:20</p> <p>scheduled 30:12</p> <p>schedules 47:19</p> <p>School 27:12, 18</p> <p>science 57:15 63:1</p> <p>scoped 19:10</p> <p>Scott 1:16</p> <p>scratch 41:19</p> <p>SDDC 53:10 54:6, 11</p> <p>SDDC's 53:14, 19</p> <p>seamlessly 53:16</p> <p>Second 7:24 11:22 43:1, 9 52:19 56:3</p> <p>secret 64:16</p> <p>Secretariat 16:21</p> <p>Secretary 2:5 9:4 10:2 15:1 16:18 23:13 26:20 32:13 34:4 35:2, 7 42:11 44:18 45:16 48:6 49:23 51:3 53:13 56:8 58:2 62:3 66:21</p> <p>sector 17:20 40:15 55:13</p> <p>security 23:23 49:14</p> <p>see 3:16 29:6 33:15 37:22 47:6 48:16, 17</p>	<p>56:5 61:12 62:10 63:2 65:5</p> <p>seeing 13:4, 22 37:7 58:22</p> <p>seek 23:14</p> <p>seeker 62:22 63:1</p> <p>seeking 4:10</p> <p>seeks 3:1 4:1</p> <p>seen 59:4</p> <p>Senate 1:7, 13 10:5 23:5</p> <p>SENATOR 2:1, 3 6:8 7:1, 3 9:3 15:1 22:1 25:1, 25 27:1, 11 28:11, 14, 24, 25 29:12, 20, 25 30:1, 4, 7, 11, 15, 17, 20, 23 31:1, 5, 9, 17 32:5 33:7, 12, 13, 16, 17, 19 34:2, 21, 25 35:5, 6, 11, 23 36:11, 15, 24 37:6, 9, 22 38:4, 6, 7 39:1, 2, 9, 10, 19 40:14, 23 41:25 42:9, 10 43:3, 16 44:15, 17, 22 45:5, 8, 10, 12, 13 46:5, 8, 17, 18 47:11 48:1, 16, 22, 23, 25 49:1 50:5 51:3, 11 52:6, 7 53:4, 23 54:2 55:6, 10, 18, 19 56:1, 3 58:2, 15 61:9, 10, 12, 20 62:6, 8, 16, 20</p>	<p>63:9, 10 66:16, 17, 22 67:12</p> <p>Senators 18:18</p> <p>sending 46:13</p> <p>senior 24:9</p> <p>sense 24:4 38:1 64:10</p> <p>Sensing 11:3 14:2 17:9 18:22 19:11, 13 60:11 61:4, 5</p> <p>Sensor 11:18 19:12</p> <p>sensors 57:9 60:12</p> <p>sent 56:8 64:15</p> <p>sequestration 33:25</p> <p>series 31:2</p> <p>seriously 59:17</p> <p>serve 39:4</p> <p>service 2:11 7:15 10:5 25:2 42:17 45:14 53:8, 9</p> <p>Services 1:9 19:25 23:5 49:25 50:6</p> <p>serving 21:8</p> <p>set 19:7 67:12</p> <p>sets 4:6</p> <p>setting 63:23 66:25</p> <p>setups 36:3</p> <p>Seven 17:14</p> <p>shaken 42:22</p> <p>shape 64:8</p> <p>share 33:7 64:25</p> <p>shared 24:22</p> <p>shelf 57:17</p>	<p>shell 49:15</p> <p>shield 31:13</p> <p>shifted 4:4</p> <p>ships 63:8 66:4</p> <p>shoot 63:6</p> <p>short 31:14</p> <p>Short-Range 35:8</p> <p>shot 64:1</p> <p>shoulder 33:15, 20</p> <p>show 37:19 54:4 61:16 62:14</p> <p>showed 7:18</p> <p>showing 37:18 59:11</p> <p>shown 3:7 50:5</p> <p>sick 29:5</p> <p>side 20:10 64:11</p> <p>sides 59:5</p> <p>signature 5:18 24:6</p> <p>significant 6:3 8:8 11:23 12:9 13:6 17:15 47:22</p> <p>similar 3:13 5:4</p> <p>simulated 25:13</p> <p>simulation 28:2, 4, 8</p> <p>sinking 66:4</p> <p>sir 30:25 31:2, 8 32:12, 21 33:5 35:10, 13, 24 36:8 37:2, 24 43:25 44:7, 25 45:6, 7, 9 46:9 48:15 62:1 63:4 67:9</p>
---	---	--	---

<p>site 35:22</p> <p>sites 41:24</p> <p>six 3:20 19:25</p> <p>skilled 49:9</p> <p>slicing 46:23</p> <p>small 18:22 33:10</p> <p>smaller 18:3</p> <p>solar 57:17</p> <p>Soldier 3:22 11:1 21:5 32:25 57:20</p> <p>soldiers 2:20 7:6, 9 10:16 16:5, 16 18:25 21:8 23:9, 15 28:9 29:5, 24 30:14 31:10, 12 33:3, 8 36:12</p> <p>solid 55:2</p> <p>solutions 59:25</p> <p>solved 19:2</p> <p>soon 36:10</p> <p>sooner 46:15</p> <p>sorry 40:6</p> <p>sort 48:8</p> <p>sorts 50:25</p> <p>sounds 57:5 62:6</p> <p>source 18:8 41:3</p> <p>South 54:4, 17</p> <p>space 48:14 57:24 60:2 66:13</p> <p>speak 26:20 50:15</p> <p>special 23:7</p> <p>specific 27:6 32:21 53:18 60:10</p>	<p>specifically 12:21 20:24 57:3</p> <p>speed 53:11</p> <p>spending 29:16</p> <p>spread 28:15</p> <p>squad 8:2 29:10, 14 45:16, 25</p> <p>SR-232A 1:13</p> <p>Staff 2:8 10:13 16:20 20:14 23:2 24:21 34:11 38:18</p> <p>staffers 18:18</p> <p>stage 32:9</p> <p>standing 17:3</p> <p>standpoint 44:4 46:9</p> <p>stands 58:11</p> <p>start 25:3 31:16 33:24 34:2 39:19 46:5 51:11 58:15 60:7</p> <p>started 19:10 46:19 51:15 58:17 64:6, 9</p> <p>starting 9:4 50:19 67:10</p> <p>startups 17:21</p> <p>STATEMENT 2:1 7:1 10:1, 14 14:4, 9 16:1 21:10 23:1 24:25 56:22</p> <p>statements 9:4</p> <p>STATES 16:2 17:23 23:2 28:16 39:24 40:9, 16 42:2</p>	<p>54:3 61:1</p> <p>stations 61:5</p> <p>stay 11:6 41:6 50:17</p> <p>staying 50:22, 23</p> <p>steep 25:7</p> <p>steps 4:10 7:15 13:6 25:24 63:2</p> <p>stewardship 27:25</p> <p>stick 63:12, 13</p> <p>stockpile 41:1 42:2</p> <p>stockpiled 41:17</p> <p>stockpiling 41:2</p> <p>stood 17:7 19:2 56:7, 10</p> <p>stop 60:7</p> <p>stories 17:2</p> <p>story 67:1, 2</p> <p>strategic 58:21</p> <p>strategy 2:14 25:21 32:1 54:21</p> <p>strength 50:1</p> <p>strengthen 23:22 50:2 51:10</p> <p>strengthening 3:3</p> <p>stressed 38:19</p> <p>stressing 8:12</p> <p>Strike 61:13</p> <p>strong 14:6 32:4</p> <p>strongly 39:25</p> <p>struggle 53:1</p> <p>Stryker 47:14, 21 48:9, 14, 17, 21</p> <p>Strykers 48:2</p> <p>stuck 31:12</p> <p>student 27:14</p> <p>studies 64:5</p>	<p>Study 63:20, 21 64:5</p> <p>stuff 32:8 53:20 56:21 57:9 60:5</p> <p>stunned 55:24</p> <p>Subcommittee 1:8, 12, 14 2:3 4:1, 8 5:22 8:24 10:6 16:4 23:5 67:17</p> <p>Subcommittee's 14:6</p> <p>subcomponents 40:8</p> <p>submission 4:13</p> <p>submit 61:15 67:13</p> <p>submitted 8:19</p> <p>substantial 47:20</p> <p>substantially 62:24</p> <p>success 17:2 19:1, 9 64:7 65:24</p> <p>successful 19:14 36:2</p> <p>sufficient 25:19</p> <p>suitable 31:16</p> <p>sum 66:11</p> <p>summer 29:23</p> <p>superpowers 55:22</p> <p>supplement 45:23</p> <p>supplemental 12:15, 16, 20, 25 13:13 14:7 41:8 46:11, 14 52:21 61:21</p> <p>supplies 53:7 54:15</p>
---	--	--	--

supply 17:17 39:5, 11, 13 40:7, 21 54:22	23:13 Synthetic 11:2 system 11:20 29:1 36:9 47:3 62:2 systems 5:1, 4 8:20 10:18 11:1, 19 13:4, 12 16:14 17:17 20:12 21:1, 2 25:10 29:6 30:15, 16, 20 31:11, 15 32:3 36:1, 5 37:15, 17, 25 38:3 51:7 52:11 57:6, 10 58:23 63:6, 12 65:3, 11, 17, 22, 23 67:7	talk 12:5 16:9 28:25 46:6 63:22 talked 45:18 talking 13:2 27:13 49:23 62:7 63:11 tank 27:16 66:10 tanks 57:6 61:3 target 37:4, 5, 15 targeted 38:24 39:22 task 40:5 team 16:23, 24 17:8, 9, 15 18:7, 16, 22, 25 19:6, 11 34:9, 16 47:1 56:14 teammate 26:20 teammates 10:10 16:8 19:4 20:3 55:11 teams 8:5 14:1 17:1 19:5 44:11 46:21 47:7, 15 teamwork 16:20 24:9 35:4 tear 35:21 tech 37:13 60:7 technical 49:9 technically 42:20 techniques 50:20 technological 10:22 16:12 20:20 59:25 60:5 technologies 10:17 18:7 19:19 21:3	39:15 48:20 49:21 Technology 2:6 10:3 33:5 37:3 42:15 43:2, 10, 11 47:2 48:10 57:15 63:1 telehealth 56:11 telemaintenance 56:11, 12 tell 36:8, 16 57:9 62:3 67:1 tells 59:22 tent 41:15 term 57:4 61:20, 25 62:1 termination 43:24 terms 11:14 50:7 54:5 59:8 test 25:8, 23 26:4 27:4, 9, 11, 17, 18, 21 28:8 30:6, 17, 24 31:6 32:16 36:20 tested 20:5 29:9, 10 31:10, 20 32:11 testify 20:25 23:6 25:2 TESTIMONY 1:1 9:2 38:8 testing 5:25 26:7 27:25 29:14 31:16 32:14 63:4 tests 25:13 26:2 27:19 29:13 30:9 Texas 28:7
supported 39:25 49:12 supporting 2:16 5:15 44:9 55:21 supports 4:8 32:4 supposed 42:1 sure 16:16 29:17, 24 32:1 34:17, 19 37:15 38:9 40:18 52:2 54:12 55:3 58:8 63:4 surface 53:12, 15 61:14 surgeries 33:20 surgery 33:15 survivability 8:11 17:14 sustainable 17:13 sustained 10:23 11:15 sustainers 57:12 sustaining 24:19 sustainment 7:11 17:16 49:5 swarms 37:7 synchronized	< T > tabletop 54:9 55:6 tactical 17:22 35:22 36:21 47:8 58:20 63:19 64:4, 11 66:2, 5, 12 tactically 8:1 tactics 60:14 tailing 43:5 take 17:6 20:16 25:23 31:24 41:17 55:16 59:17 66:16 taken 7:14 takes 57:13 talent 19:8 44:6 45:1		

Thank 2:10, 11 7:3 9:1 10:6 12:11, 15 14:5 15:1 16:4 21:7, 8 22:1 23:3, 8 24:23 25:1, 22 28:24 31:9 33:11, 13, 19, 23 38:4, 5, 7 39:2, 10 40:19 42:6, 8, 10 45:10, 13 47:11 48:1, 23 49:1 53:4, 23 55:18, 20 56:1, 3, 23 58:2 59:13 63:9 64:4 66:18	43:25 48:4, 21 50:5, 17, 22 51:12, 24 52:8, 12, 15 54:8 56:9, 14 57:8 58:7 59:3, 11, 18 63:14, 15 64:1 66:20, 25 thinking 64:3 Third 12:13 29:22 30:1, 8 60:5 thought 48:12 64:10 thoughtful 59:9 thousands 66:10 threat 13:7, 17 threats 11:7 13:20 23:19 three 32:22 33:18 56:25 65:22 66:18 Tier 11:17 time 4:15 16:15 17:7 18:11 20:1 21:8 30:12 31:14 34:10 38:4 41:2, 17, 22 42:6 47:9 48:14, 18, 22 49:24 58:5 64:25 65:2, 23 66:11 timeline 27:3 29:20 30:23 62:25 timelines 40:21 Timing 19:2 49:1 Title 54:23 today 2:12, 13 4:1, 19 7:4	10:10 16:7 17:5 25:2 30:7 31:4 38:8, 9, 12 42:7 45:14 49:3 today's 10:14, 16 48:8 told 50:25 TOM 7:1 tomorrow 38:10 tonight 16:16 tools 41:16 top 61:8 toss-up 53:14 Total 6:2 26:25 totally 34:3 touch 30:14 46:20 touched 51:6 tough 3:24 55:5 60:4 track 7:15 12:25 16:18 32:14 41:6 52:5 traditional 66:8 traditionally 26:18 TRADOC 16:21 59:16 train 26:9, 12, 14, 17 27:9 28:6 56:18 training 2:18 5:25 11:2 20:4 26:17 28:21 34:17 47:19 56:5 TRANSCOM 53:9 54:24 transfer 19:6 transform 16:25 23:18 24:3, 5, 12	25:24 34:6 54:13 transformation 3:3 4:7 7:18 16:10 19:21 24:7 34:13 47:5 transformational 23:15 transforming 7:23 24:8 transition 19:3 25:5 transparent 19:17 transport 48:19 travel 3:5 tremendous 16:20 35:15 trip 3:6 troop 48:19 troops 13:7, 23 67:5 true 63:15 truly 20:15 36:21 38:10 try 12:10 16:25 52:16, 17 61:8 trying 25:7 55:16 58:5 turn 57:22, 24 61:10 turning 29:2 turret 65:7 two 13:10 17:6 19:20 20:14 25:23 26:3 29:4 42:25 43:5 44:8, 11 52:15 56:24 58:17, 19 type 36:3, 6
---	---	---	---

< U >

U.S 1:7 2:1 7:1
13:7 19:18
27:11 39:13, 17
40:20 43:9

UAS 5:3 66:24

UAV 36:7

ubiquitous 60:10

Ukraine 2:16

3:5, 8 4:16 8:10

13:4 46:13 47:1

51:14 55:21

56:7, 9 58:10, 12,

20, 23 59:4, 11,

15 64:12

Ukrainian 59:21

Ukrainians 58:4

60:9

underscores

58:24

understand 4:2

5:14

understanding

5:6 19:15 31:9

53:24 55:2

undertaking

53:18

unfriendly 40:25

unfunded 8:19,

22 45:22 66:23

unit 54:7

UNITED 16:2

17:23 23:2

28:16 39:24

40:9, 16 42:2

54:3 61:1

units 8:4 29:9

32:10 47:19

unmanned 5:1

12:4 13:4 18:3

21:1 43:12

unnecessary

57:13

unpredictable

10:21

untenable 41:3

update 4:19

11:9 12:13 13:5,

25 14:4

updated 65:1

updates 39:7

upgrade 31:22

65:8

urgency 24:5

urgent 5:2 13:15

USA 23:1

usable 33:1

use 28:1, 10, 21

31:16, 25 34:23

46:14 49:18, 21

50:20

utilize 18:10

< V >

valid 64:20

validated 63:21

value 45:21

variant 61:14

62:18

variants 29:5

various 13:12

67:4

vehicle 35:19, 21

45:17, 25 46:10

48:18 64:2

Vehicles 3:21

7:5 8:2 10:25

33:11 46:15

47:14, 17, 21, 24

57:11

vendors 43:6

verbal 57:6

versatile 48:18

Version 29:8

32:25 33:2

versus 35:22

36:25 37:11

Vertical 3:21

10:25

vessels 18:1

view 43:12, 17

58:8

vision 32:1 33:4,

5

visit 7:22 42:4

vital 2:21 23:10

50:1 52:5 53:10

vulnerabilities

39:12 40:21

< W >

wait 7:10

waiting 26:2, 6

61:7

walked 52:11

walking 48:13

want 2:5, 10

12:10 14:5 21:7

28:25 33:24

45:3 55:19 58:7

61:9, 10 64:2

66:23

wants 18:18

war 5:8 21:6

59:20, 24

warfare 8:21

21:2 25:9 60:6,

7 67:14

warfighters 49:8

warfighting 3:2

Washington

1:10 18:23

watching 20:22

65:14

water 18:13

watercraft 18:1,

3 54:7, 21 55:14

wave 58:17, 25

59:9

way 5:8 8:21

12:11 26:1, 14

28:17 30:5

34:19 35:11

37:13 40:23

43:8, 14 46:22

52:4 58:6, 8, 13

59:20

ways 17:12 18:9

26:3

weapon 37:11

57:18 62:24

weapons 7:6

41:11

wear 33:4, 10

35:21

wearing 33:3

wears 32:25

Wednesday 1:5

weeks 33:18

weight 18:11

57:17

welcome 2:5, 10

well 3:10 4:20,

23 5:22 11:11,

16, 19 12:4

13:24 14:2 16:8

17:19 19:20

20:9 25:12

27:19 32:5, 14

33:19 37:6
 40:14, 15 44:7
 50:20 52:21
 55:7 66:18, 22
well-articulated
 32:23
went 64:21
Western 58:6, 14
wheeled 65:15
wholly 19:24
 20:2
Williams 16:23
willingness 2:11
win 21:6 24:1
wise 17:3
witnesses 2:10
 7:4 8:3 9:1, 3
wondered 33:8
word 34:23
work 2:20 4:18
 5:20 13:14 16:9
 17:20 19:19
 26:25 29:5
 31:23 32:18
 33:6 34:15, 17
 42:23 43:5
 44:12, 14, 19, 23
 50:12, 20 51:19
 52:2 55:3, 20
 63:1 65:5 67:3
worked 20:11
workforce 42:20
 43:23 44:12
 45:6 49:9
working 2:23
 13:8 17:24 24:4
 34:9 37:22
 39:17 42:4 54:5,
 21, 22 60:23
works 27:19
 31:21 63:4

world 20:22
 26:13 50:10
 55:24
world-class 26:17
world's 6:7
worldwide 39:4
Wormuth 16:19
 34:4
worried 36:17
worry 51:23
worth 8:19
 29:16 57:22
written 10:14

< X >

X-2 42:15 43:2

< Y >

Yeah 33:7
YEAR 1:2 2:15
 3:23 6:6 7:13,
 22 8:7, 17 10:9,
 15 11:13 13:9
 14:7 17:8 18:14
 19:22 23:7, 13
 29:3, 22 30:1, 25
 31:1, 2, 7 38:15
 40:6 43:6 44:9
 47:13, 16, 18
 48:3 61:15, 17
YEARS 1:3 3:6
 11:6 16:13 17:4
 23:11 24:14
 25:6 42:14
 61:19 62:10, 12
 63:25 67:3
year's 5:23 8:25
 61:14
Yuma 5:17
 25:15 27:22

28:21