

Stenographic Transcript  
Before the

COMMITTEE ON  
ARMED SERVICES

**UNITED STATES SENATE**

TO RECEIVE TESTIMONY ON THE AMERICAN SMALL  
DRONE INDUSTRIAL BASE

Thursday, March 5, 2026

Washington, D.C.

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5  
6 U.S. Senate  
7 Committee on Armed Services  
8 Washington, D.C.  
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10 The committee met, pursuant to notice, at 9:30 a.m. in  
11 Room SD-G50, Dirksen Senate Office Building, Hon. Roger  
12 Wicker, chairman of the committee, presiding.

13 Committee Members Present: Senators Wicker  
14 [presiding], Rounds, Ernst, Scott, Budd, Reed, Shaheen,  
15 Blumenthal, Hirono, Kaine, King, and Kelly.  
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1           OPENING STATEMENT OF HON. ROGER WICKER, U.S. SENATOR  
2 FROM MISSISSIPPI

3           Chairman Wicker: The hearing will come to order.

4           The committee meets this morning to examine both the  
5 state of our small drone industrial base and the path to  
6 American leadership in drone production. This issue has  
7 profound implications for both our warfighting readiness and  
8 our future prosperity. I'm not really sure Americans  
9 understand that fully yet. It's also part of our broader  
10 effort to rebuild the American arsenal.

11           We're pleased to welcome three witnesses who are  
12 leading this effort within the Department; Mr. Owen West,  
13 senior advisor for Drone Dominance, Mr. Travis Metz, the  
14 Drone Dominance program manager, and Major General Stephen  
15 Marks, who is the director of the Defense Autonomous Warfare  
16 Group.

17           The war in Ukraine has forever changed the character of  
18 modern warfare, and demonstrated the growing importance of  
19 small unmanned systems, what we colloquially call drones.  
20 In particular, so-called Group 1 drones are now central to  
21 reconnaissance, targeting, and strike missions. These  
22 drones weigh less than 20 pounds, and are often purchased at  
23 low cost in very large numbers.

24           Both the American commercial drone industry and the  
25 Pentagon are years behind the curve in producing and



1 employing drones. Catching up is as necessary as it is  
2 difficult, but I believe we're finally on the cusp of  
3 charting a future for American Drone Dominance. To  
4 understand why we're so far behind, we must first  
5 acknowledge how we arrived here today.

6 The Chinese Communist Party correctly predicted this,  
7 that small drones would be a crucial technology for both  
8 military and commercial use, particularly in agriculture and  
9 other large scale industrial efforts. China used state  
10 subsidies in the tens of billions of dollars, predatory  
11 pricing practices, and state-directed control of key supply  
12 chains to capture more than 90 percent of the global non-  
13 military small drone market.

14 American drone companies were essentially forced out of  
15 the global market. Diminished commercial demand made  
16 American drones far more expensive than Chinese drones,  
17 anywhere from 5 to 25 times more expensive. This poses a  
18 difficult problem for U.S. military units and U.S.  
19 industries, who require cheap drones, but cannot buy from  
20 Chinese companies for fear of supply chain or software  
21 vulnerabilities.

22 As we've seen in the critical minerals and rare earths  
23 industry, fighting back against 21st century economic  
24 warfare like this requires creative solutions and thoughtful  
25 industrial policy. The United States is poised today to



1 enact both. Last year's Defense reconciliation law set  
2 aside \$2.5 billion to procure a range of small drones. Just  
3 over \$1 billion of that sum will be used specifically to  
4 purchase very small Group 1, first-person-view drones.

5 Our witnesses will discuss the competition process for  
6 this investment. At least it is hoped that we would -- I  
7 hope they'll also discuss our strategic use of loans to help  
8 industry rebuild supply chains quickly. We expect this will  
9 deliver 300,000 drones by next year. This steady demand  
10 signal, which must be continued for quite a few years, will  
11 serve as the anchor for America and her allies as we  
12 constitute our supply chains. So, we'll see what our  
13 witnesses say about that.

14 Investment is just the first step. The free world must  
15 band together to stop rewarding China's predatory practices  
16 in the small drone industry, and they should have been no  
17 surprise. Congress has taken important steps to address  
18 these concerns. The key example is section 1709 of the  
19 fiscal year 2025 NDAA, championed by Senator Rick Scott.  
20 This provision essentially banned the leading Chinese state-  
21 sponsored drone companies from selling in the United States.  
22 The Trump administration, led by FCC Chair Brendan Carr,  
23 implemented this law just before Christmas last year.

24 Success will require sustained attention to the supply  
25 chain across its full range of components. We took action



1 to address this in fiscal year 2026 NDAA. We directed the  
2 Pentagon to establish a working group to assess our small  
3 drone industrial base capacity. That group will then be  
4 asked to develop recommendations to strengthen the industry,  
5 and I anticipate there will be work across the country to  
6 support this effort from new drone designs coming from  
7 Oklahoma and California to component manufacturing in New  
8 Hampshire and Florida.

9 I welcome Major General Marques testimony as the  
10 director of the Defense Autonomous Warfare Group, or the  
11 DAWG, which is the correct pronunciation of the word in  
12 Mississippi, DAWG. While the Drone Dominance efforts focus  
13 on smaller Group 1, first-person-view drones, the DAWG will  
14 lead on larger one-way attack drones and small unmanned  
15 boats. Just a few days ago, America used one-way attack  
16 drones for the first time in combat in Iran, with Task Force  
17 Scorpion firing the Lucas drone, a reverse-engineered Shahed  
18 136.

19 I welcome the General's comments on what he plans to do  
20 to jump start these new areas of weapons, with the  
21 significant funding we provided for the DAWG in  
22 reconciliation. It is an absolute imperative that we make a  
23 game-changing investment in the next few months of low-cost  
24 munitions to complement our exquisite munitions. The  
25 American drone industry is essentially starting from near



1 zero, but today we are on a path to a strong drone industry  
2 that can support American military and commercial demand,  
3 thanks to a steady demand signal, thoughtful industrial  
4 policy, and close coordination with our allies and partners.

5 But we are looking to this panel today for leadership  
6 and insight. I look forward to hearing from our witnesses  
7 about the Department's plan to support this vital work. And  
8 I also look forward to hearing from my colleague and friend,  
9 Ranking Member Reed, who is recognized.

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1           STATEMENT OF HON. JACK REED, U.S. SENATOR FROM RHODE  
2 ISLAND

3           Senator Reed: Well, thank you very much, Mr. Chairman.  
4 And I want to thank the witnesses for appearing here today,  
5 and to discuss the Department of Defense Drone Dominance  
6 program.

7           The modern battlefield has evolved dramatically, and  
8 that's an understatement, and small unmanned aerial systems,  
9 or UAS, have become a defining feature of warfare. As we  
10 sit here today, the United States has engaged in major  
11 combat operations against Iran. Over the past several days  
12 American forces operating alongside Israel have conducted  
13 thousands of strikes against Iran, including the deployment  
14 of hundreds of one-way attack drones. Iran has retaliated  
15 with strikes across the region, including its own drone  
16 attacks that have resulted in American casualties. The data  
17 from Ukraine is even more sobering; more than half of all  
18 casualties on the battlefield are now attributed to UAS.  
19 What originated as a commercial technology has become a  
20 decisive military capability, and we must ensure the United  
21 States is not caught flat footed.

22           I appreciate the Department's recognition of this  
23 strategic imperative, the commitment of significant funding  
24 for the Drone Dominance program represents an investment in  
25 building both capability and capacity. The goal of fielding

1 hundreds of thousands of combat-ready drones by 2027 is  
2 ambitious, and I would like to understand how the Department  
3 intends to achieve it.

4 I have several questions about the program. First, in  
5 June, 2025, the President issued an executive order on Drone  
6 Dominance, which directed the Secretary of Defense to submit  
7 a report within 90 days, identifying programs that could be  
8 more cost effective or lethal if replaced by unmanned  
9 systems. I would like to know whether the report was  
10 submitted, and if so, what insights it provided to inform  
11 the Drone Dominance program.

12 Second, I would ask our witnesses to explain how the  
13 various service initiatives align with the broader  
14 Department strategy, and how any Drone Dominance program  
15 would transition to service management. Third, the  
16 requirement to eliminate Chinese subcomponents from the  
17 industry may prove technically challenging. China dominates  
18 not just finished drone systems, but critical components  
19 like motors and batteries. I would like to know the  
20 Department's assessment of American and allied supply  
21 capacity to meet this requirement, and at the intended scale  
22 and price point.

23 Finally, the committee established a small UAS  
24 industrial base working group precisely because we recognize  
25 the need for strategic coordination. There are a number of



1 programs and significant funding commitments underway, and I  
2 would ask the witnesses to explain how the working group is  
3 informing your approach. Is the Department building genuine  
4 industrial capacity, or are we creating demand that will  
5 outstrip supply?

6 The stakes are clear. Our potential adversaries are  
7 not waiting and neither should we. But speed cannot come at  
8 the expense of strategic coherence. This committee wants  
9 the Drone Dominance program to succeed, which is why we need  
10 direct answers about the challenges, risks, and path  
11 forward, and I look forward to your testimony, and thank you  
12 for your service to our nation. Thank you, Mr. Chairman.

13 Chairman Wicker: Thank you, Mr. Ranking Member. We'll  
14 now begin with statements. Who would like to go first? Mr.  
15 West, you are recognized.

16 Mr. West: Thank you.

17 Chairman Wicker: For 5 minutes or so.

18 Mr. West: Yes, sir.

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1 STATEMENT OF HONORABLE OWEN O. WEST, SENIOR ADVISOR  
2 FOR DRONE DOMINANCE, DEPARTMENT OF DEFENSE

3 Mr. West: Chairman Wicker, Ranking Member Reed, and  
4 members of the committee, thank you for the opportunity to  
5 speak with you today, along with Travis Metz, the program  
6 manager of Drone Dominance, and my collegiate classmate, and  
7 Major General Marks of the Defense Autonomous Warfare Group.  
8 We're here to testify about the Department's urgent effort  
9 to arm our troops with lethal drone technology that has  
10 proliferated across the world.

11 I want to thank this committee for its interest in  
12 small drones. Drones are the most significant battlefield  
13 innovation in generations. In Ukraine, as the two Senators  
14 just said, low-cost drones account for a staggering  
15 proportion of the casualties. In Iran, Colombia, Israel,  
16 Thailand, and Cambodia. This weapon system has altered the  
17 order of battle.

18 Seeing this change several years ago, our adversaries  
19 today produced these systems by the millions at low cost.  
20 For too long, the United States was hindered by self-imposed  
21 restrictions and bureaucratic red tape while our adversaries  
22 surged ahead. As Secretary Hegseth has stated, our major  
23 risk here is risk aversion. President Trump, Secretary  
24 Hegseth, and Congress have together ended this era of  
25 hesitation.

1           The President's executive order unleashing American  
2 Drone Dominance established a mandate to strengthen our  
3 domestic drone industrial base and deliver capabilities to  
4 our troops. Secretary Hegseth translated the President's  
5 directive into decisive action by unleashing U.S. military  
6 Drone Dominance, a memorandum in July of 2025.

7           The Department's mission under this directive is  
8 threefold. First, bolster the domestic manufacturing base.  
9 Second Armored Combat units and train as we expect to fight  
10 and third power a technological leapfrog via reconciliation  
11 funding that sat atop clear acquisition reform guidance.  
12 Congress set Drone Dominance in motion. The program  
13 operationalizes these directives to ensure our warfighters  
14 are swiftly armed to fight on the modern battlefield.

15           We are partnering with the Test Resource Management  
16 Center and Naval Surface Warfare Center Crane Division to  
17 execute this program and are working with our teammates,  
18 including DCMA, the Defense Contract Management Agency, and  
19 the DAWG, to integrate capabilities into the Department. We  
20 are leveraging America's world-leading engineers,  
21 entrepreneurs, and capital markets to buy competitively at  
22 scale and without delay. We are prioritizing Buy American  
23 to expand this nascent but vital domestic industry.  
24 Military operators are the designers and the judges to  
25 ensure drone capabilities deliver for the warfighters.

1           The Department is in debt to this committee and  
2 Congress for recognizing the importance of this issue and  
3 providing us the authorities and resourcing required to  
4 rapidly deliver combat power.

5           I look forward to your questions. Thank you.

6           [The prepared statement of Mr. West follows:]

7           [COMMITTEE INSERT]

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Chairman Wicker: Mr. Metz.

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1           STATEMENT OF MR. TRAVIS METZ, DRONE DOMINANCE PROGRAM  
2           MANAGER, DEPARTMENT OF DEFENSE

3           Mr. Metz: Thank you, Chairman Wicker, Ranking Member  
4           Reed, and the members of this committee for inviting me to  
5           speak with you today.

6           I joined the Department last summer, and have been  
7           working with Mr. West on the Drone Dominance program ever  
8           since. We've worked closely with the Defense Autonomous  
9           Working Group, represented here today by Major General Marks  
10          on the Drone Dominance program.

11          I bring long experience as a venture capitalist and  
12          entrepreneur, and I am committed to bringing that commercial  
13          mindset to the Drone Dominance program, incorporating  
14          market-based practices to incentivize the industrial base to  
15          deliver high performance small drones, at scale, to the  
16          warfighter, at a wartime pace.

17          The Drone Dominance program is the engine to unleash  
18          the American drone industrial base. It has two goals.  
19          First, scale U.S. supply chains for small drones, thereby  
20          reducing the cost of acquisition, and second, supply  
21          significant quantities of those drones to the military  
22          services now, to help fast forward their integration.

23          We've committed \$1.1 billion over the next 18 months to  
24          purchase drone systems. Consistent with Secretary Hegseth's  
25          mandate on acquisition reform, we are no longer buying based



1 on paper requirements. Rather, we are buying at scale based  
2 on live evaluation by the military services. I spent most  
3 of the last 2 weeks at Fort Benning, where we kicked off our  
4 four-phase program. We invited 25 drone vendors to compete  
5 with their drones in a test process that was executed and  
6 scored by military operators. That competition ended last  
7 Sunday, and we will be announcing and placing orders with  
8 the winning vendors.

9 Over the next few days, the winners will be given  
10 orders for a total of 30,000 small one-way attack drones,  
11 which will be delivered to military units over the next 5  
12 months. We will then run three more cycles of this on a  
13 six-month calendar raising quantities, lowering prices, and  
14 evaluating against more difficult mission tests.

15 There are two distinct aspects that are key to the  
16 program's success. First, it incorporates a clear demand  
17 signal to the industry for the next 18 months. We have  
18 posted quantities and prices up front, removing the Valley  
19 of Death by promising that if your system performs well, we  
20 will buy your units. Second, we are ensuring that the  
21 warfighter is at the center of that process. We have  
22 removed the bureaucratic filter. Warfighters who are the  
23 end users will be the primary evaluators. They will score  
24 systems based on ease of use and lethality in real time.

25 The Drone Dominance program is a case study for how the



1 Department can acquire at the speed of relevance. We're  
2 using actual purchases and the entrepreneurial spirit and  
3 capital of American industry to drive unit prices down while  
4 scaling production volumes up, ensuring that our forces have  
5 the quantity of consumable drones required for modern  
6 conflict.

7 Thank you for the funding to accomplish this. With  
8 your continued support for acquisition reform and sustained  
9 funding, we will ensure that the American warfighter never  
10 enters a fair fight.

11 I look forward to your questions.

12 [The prepared statement of Mr. Metz follows:]

13 [COMMITTEE INSERT]

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1 Chairman Wicker: Thank you, Mr. Metz. Major General  
2 Marks.

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1           STATEMENT OF MAJOR GENERAL STEVEN M. MARKS, USA,  
2           DIRECTOR, DEFENSE AUTONOMOUS WARFARE GROUP, DEPARTMENT OF  
3           DEFENSE

4           General Marks: Thank you, Senator, Chairman Wicker,  
5           Ranking Member Reed, and distinguished members of the  
6           committee, thank you for the opportunity to appear before  
7           you today.

8           I'm here to discuss how the Defense Autonomous Warfare  
9           Group, what we call the DAWG, is leveraging the critical  
10          reconciliation funding and expanded acquisition authorities  
11          you provided to prove out a new way of warfare. I am  
12          pleased to be joined today by other essential partners in  
13          this department-wide effort.

14          The character of warfare has fundamentally changed. As  
15          we are seeing play out in Ukraine and in the Middle East,  
16          autonomous systems are no longer emerging, they are a  
17          reality on the battlefield. Our adversaries understand  
18          this. They are not just buying new technology; they are  
19          creating entirely new organizations to master it.

20          A potent example is open-source reporting on Russia's  
21          Rubicon unit. This is not just a new drone squadron. It is  
22          a fundamentally new command structure, built outside of  
23          conventional doctrine to hunt and neutralize high value  
24          targets with devastating speed and effect.

25          The lesson is clear the decisive advantage in this new

1 era of autonomy comes from organizing to employ technology  
2 with focus and agility. The DAWG was established to unify  
3 the Department's efforts. Its mission is to work across the  
4 joint force to synchronize operational demand with technical  
5 innovation and industrial capacity.

6 What makes this model work is how we execute it. We  
7 have collapsed the distance between the warfighter and the  
8 developer. We have hand-selected experts, so engineers are  
9 working side by side with operators at the tactical edge,  
10 solving operational problems in real time. This ensures  
11 that the capabilities we develop are informed directly by  
12 battlefield needs, and that we remain responsible stewards  
13 of taxpayers' dollars.

14 This model is working. We are accelerating timelines  
15 and delivering capabilities through initiatives like Drone  
16 Dominance. Our objective is clear; to provide our  
17 warfighters with the tools to dominate the battlefield,  
18 deter our adversaries and, if necessary, defeat them. The  
19 security of our nation depends on it.

20 Thank you, and I look forward to your questions.

21 [The prepared statement of General Marks follows:]

22 [COMMITTEE INSERT]

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1 Chairman Wicker: Thank you very much. Mr. West, we'll  
2 start with you. There's \$1.1 billion, for small drone  
3 industrial base. Where are we going to get the money for,  
4 Group 2, the larger drones whose industrial base needs are  
5 more complex and of course, more expensive.

6 Mr. West: And, Senator, your question was, where are  
7 we going to get the money?

8 Chairman Wicker: Right. Well, you're looking at them,  
9 but so what's the plan, though? So, we're going to get it  
10 from the American taxpayer, of course. And it'll be money  
11 well spent --

12 Mr. West: Senator --

13 Chairman Wicker: -- if you do your work right. Yes.

14 Mr. West: It's an important question because the  
15 question is really about integration, and the palms and  
16 budgeting for the future. We're singularly focused in this  
17 effort in the Group 1 space. And our goal if you stepping  
18 back, if we listen to our four-star testimony from last  
19 spring's posture hearings, our four-star commanders  
20 acknowledged that they didn't have enough as a proportion of  
21 their spend on unmanned systems. And the basic problem they  
22 identified was price. We were paying \$30,000 or \$40,000 for  
23 this small Group 1, 10-inch UAS, where our adversaries, you  
24 know, pay about \$500. So, our goal here is to get this  
25 price down so we can scale Group 1.



1 Chairman Wicker: Group 1.

2 Mr. West: But this does -- this is a spectrum. So,  
3 many of the components found in Group 1; batteries, motors,  
4 ISR technologies are directly relevant to Group 2 and the  
5 bigger ones.

6 Chairman Wicker: Well, let's compare China's arsenal  
7 to the Group 1 and Group 2. Where are they and where do you  
8 think -- when do you think we'll get started and/or need to  
9 get started on Group 2? First thing, Chinese.

10 Mr. West: Senator, I'm highly informed on Group 1  
11 because this has been our effort. Group 2, however, if we  
12 look at some of the other systems, I will say that what  
13 we're establishing here is a framework, and I can turn this  
14 over to Travis, where if monies were to flow into the  
15 system, we can apply these to the Drone Dominance  
16 competition specs, and we aspire to do the same thing at  
17 Group 2 as we would on Group 1.

18 Chairman Wicker: Okay. So, your expertise is on Group  
19 1, and we need to have a later hearing on Group 2, perhaps.

20 Mr. West: We definitely need -- we need all layers.

21 Chairman Wicker: How soon?

22 Mr. West: Senator, as soon as we can get them. Right  
23 now, with Drone Dominance, we're moving so fast that we're  
24 getting many complaints that Travis has run over. But we  
25 aspire, by August, we're already starting to operationally



1 field some of the Group 1s as a result of our first  
2 gauntlet.

3 Chairman Wicker: Okay. Well, let me ask about that,  
4 Mr. Metz, because in your testimony, you said the  
5 warfighters are going to be the ultimate test experts.  
6 Where do you anticipate doing this? In real combat or  
7 warfighting, training in theater?

8 Mr. Metz: Yes, sir. Thank you for the question. So,  
9 the event that we just finished running at Fort Benning on  
10 Sunday, ran 14 days. We had approximately 100 members of  
11 our uniformed services, so primarily from the Army, the  
12 Marines, and from various units in SOCOM who both operated  
13 the drones that were being evaluated and had before the  
14 program, before the event kicked off, had helped us set up  
15 the actual mission tests.

16 So, the way that we evaluated the drones was through  
17 performance in missions that replicated the anticipated use  
18 of drones in combat. The scoring for the systems, the  
19 scoring against both the mission performance. So, sending a  
20 drone out 10 kilometers and hitting a target, for instance,  
21 you know, into the Georgia forest, the beautiful Georgia  
22 forest, was scored by the military operators. And then  
23 separately, we asked all of the military operators again,  
24 Army, SOCOM, Marines to evaluate the performance of the  
25 drones based on whether or not they would take it to war.



1 And we are buying based on those criteria, starting, you  
2 know, time now.

3 Chairman Wicker: And I wonder why, after 4 years of  
4 war, I wonder why Ukraine is still having to get so many  
5 Chinese drones.

6 Mr. Metz: Sir, the Ukrainians are moving very quickly  
7 to try to also extract themselves from Chinese supply  
8 chains. That is, you know, evidence -- more evidence than  
9 we could possibly need -- that we have to do the same.

10 Chairman Wicker: Thank you very much. More questions  
11 later. Senator Reed.

12 Senator Reed: Thank you very much, Mr. Chairman.  
13 Again, gentlemen, thank you. Let me first commend you on  
14 the Fort Benning test. That's, I think, exactly the right  
15 way to do things, and together with your input from  
16 industrial and a strategic standpoint, getting the troops to  
17 tell you what they need is very good. So, let me commend  
18 you.

19 We created in last year's NDAA, a small UAS working  
20 group. Can you give me the status, Mr. West, of that group  
21 now or General Marks?

22 Mr. West: Yes, sir. We have the director sitting to  
23 my right.

24 Senator Reed: Okay. That's the DAWG?

25 General Marks: That is the DAWG.



1 Senator Reed: Thank you.

2 General Marks: Thank you, Senator.

3 Senator Reed: I just want to get everything  
4 coordinated here.

5 General Marks: It is sometimes confusing.

6 Senator Reed: Well, it is, but thank you. One of the  
7 things that we're doing now is reacting to the immediate  
8 crisis that we're seeing in our supplies, etc. But the pace  
9 of change is so rapid. We have to start thinking ahead, and  
10 I hope you are, of systems which are almost completely  
11 autonomous. The infantrymen are not there, but the system's  
12 there. Are we doing any of that work, like trying to leap  
13 ahead of the bad guys rather than just match them?

14 General Marks: So, Senator, thank you.

15 Senator Reed. Yes, sir.

16 General Marks: Going back to your first question on  
17 the NDAA 2026 Section 914. So, the small UAS Industrial  
18 Working Group is chaired by the Deputy Secretary of War, and  
19 then I am the director of that board. We've built cross-  
20 functional teams, reps from Defense Innovation Unit, the  
21 Industrial Base Policy, the Economic Defense Unit, and then  
22 the Office of Strategic Capital. We are due to provide a  
23 briefing to the Deputy Secretary of War by the end of this  
24 month in order to have the report back to the Defense  
25 committees by 1st April.



1           Senator Reed: Thank you. That clarifies it. But to  
2 the point of are we looking ahead, and have a parallel sort  
3 of what do we need, 3 years or 3 months from now, Mr. West  
4 or General?

5           Mr. West: Senator, you have identified what it will  
6 take for us to perform the technological leapfrog that  
7 Secretary Hegseth has initiated. The United States has the  
8 best AI scientists in the world, and you're also correct  
9 that the rate of change on the battlefield is astonishing.  
10 So, I can turn it over to Travis to talk about the iterative  
11 process. You know, we're now at a competition every 6  
12 months. There's the potential to shrink that window, but  
13 what we want to do is get to that rate of change ultimately  
14 by the second or third competition, plow in autonomy so that  
15 by 2027, we have operational lethal drones that are capable  
16 of dominating on any battlefield.

17           Senator Reed: Mr. Metz, please.

18           Mr. Metz: Yes, sir. As Mr. West mentioned, we're  
19 running these competitions every 6 months, so phase 2 will  
20 kick off in August of this year. The missions that are  
21 designed at each of these competitions will increase in  
22 difficulty, primarily to increasing difficulty, and go up in  
23 terms of volumes and go down in terms of prices.

24           The difficulty of the missions, in particular for phase  
25 2, will require the drone companies to start to build out



1 the technology that reduces the sort of cognitive load on  
2 the pilots, and deals with the fact that the warfare, the  
3 battlefield for drones is very complex in terms of the  
4 electronic warfare elements. So, drones that are starting  
5 to build out the capabilities to do things where the pilot  
6 doesn't have to fly it, you know, instant time now is a  
7 critical part of our phase 2.

8 Senator Reed: No, absolutely. One aspect of this  
9 which has to be considered is command and control. If  
10 you've got a lot of autonomous systems out there, there's an  
11 increased chance for miscalculation. So, what are you  
12 doing? Because that requires more than just buying a piece  
13 of equipment from a drone manufacturer. It's integrating it  
14 into the command-and-control system. You have 28 seconds,  
15 Mr. Metz.

16 Mr. Metz: Yes, sir.

17 [Laughter.]

18 Mr. Metz: It's a topic that requires 28 hours, I  
19 think. The operators are on the loop on this 100 percent of  
20 the time. We've integrated the Office of the General  
21 Counsel to make sure that every step along the way here we  
22 address the laws of armed conflict and all the other laws  
23 that we impose, quite properly, on ourselves to make sure  
24 that we have full control of these systems.

25 Senator Reed: Thank you.



1 Chairman Wicker: Thank you, Senator Reed. Senator  
2 Fischer.

3 Senator Fischer: Thank you, Mr. Chairman. Mr. West,  
4 obviously, these drones are only going to be useful if our  
5 service members are prepared to use them. So, how's the  
6 Department incorporating unmanned warfare into the combat  
7 training of our troops as they're preparing logistically and  
8 operationally how to face the realities of fighting with  
9 these drones?

10 Mr. West: Senator, it's a terrific question. I'd like  
11 General Marks to weigh in as well, but, you know, we are  
12 going to start to deliver small drones in volumes that will  
13 require the services to establish training hubs, schooling,  
14 and, obviously, there are doctrinal changes that are already  
15 under underway. So, the question, as bureaucrats, that we  
16 have is to how do we ensure that there's sustainment for the  
17 drones, and that we aren't -- we're delivering the drones  
18 that the services want to use in combat, and that the  
19 services are prepared to absorb and inhale. And I think  
20 General Marks will have better expertise than I do.

21 Senator Fischer: General?

22 General Marks: Thank you, Senator, for the question.  
23 So, Drone Dominance, powered by the DAWG insights, ensures  
24 the systems we procure meet warfighter demands. So, the  
25 DAWG connects those capabilities to operational and service



1 modernization efforts. So, we have to be tied at the hip  
2 with the services and sharpening that tip of the joint force  
3 spear.

4 We, through the DAWG efforts, what we do is have the  
5 operators working with the engineers, working with the  
6 acquisition professionals, and they run it through the  
7 systems, through their paces, stress testing every step of  
8 the way. Ultimately, they will develop the doctrine for  
9 employing these systems, and then it will be required by the  
10 services to train the larger force.

11 Senator Fischer: How quickly do you think you can get  
12 the drones out to these men and women. Mr. Metz?

13 Mr. Metz: Senator, the for phase 1 of the drone  
14 program on the small UAS will be delivering drones this  
15 month.

16 Senator Fischer: General Marks, how's the Department  
17 coordinating efforts to make sure that we don't just have  
18 the offensive drone capabilities, but how are we going to be  
19 able to train and be able to field the counter-drone systems  
20 as well? I'm sure you have plans for that.

21 General Marks: Thank you, Senator. Well, actually, we  
22 focus, in the DAWG, on the offensive side of the house where  
23 the JIATF, the Joint Interagency Task Force 401, led by  
24 Brigadier General Matt Ross, is the ones that are working on  
25 the counter-UAS, and working through the development and



1 then also the training piece of that, of that capability.

2 Senator Fischer: Are the drones --

3 Mr. West: The Senate -- sorry to interrupt you,  
4 Senator.

5 Senator Fischer: Are the drones that you're working on  
6 now, though, they can be used both offensively and  
7 defensively, right?

8 Mr. Metz: Yes, ma'am. Many of the counter strategies  
9 that we're seeing evolve across battlefields around the  
10 world are using small drones as a kinetic force, as a  
11 counter. In our phase 2, in August, where we'll -- we  
12 intend to buy another 50,000 or 60,000 drones. The Joint  
13 Interagency Task Force 401, that General Marks mentioned,  
14 which is coordinating the counter-UAS strategies inside the  
15 Department, will be part of that gauntlet attempting to  
16 knock down all the drones that are -- you know, our vendors  
17 are actually putting up in the air, and the ambition is to  
18 iterate jointly with them as we go forward with the program.

19 Senator Fischer: Mr. West, were you going to add  
20 anything to that?

21 Mr. West: No, Travis was my college coxswain. So, he  
22 usually does the talking and I do the rowing.

23 Chairman Wicker: That's not what I heard.

24 Senator Fischer: As you look at Ukraine, and,  
25 obviously, they've shown all of us how war is changing, but

1 as you're looking at their experience in manufacturing  
2 drones, how are you incorporating that? Whoever wants it?

3 Mr. Metz: I appreciate the question, Senator. So, the  
4 goal of the Drone Dominance program, fundamentally, is to  
5 build a U.S. industry around small drones. Today, the best  
6 drones in the world in terms of battlefield capacity and in  
7 terms of their scalability at the manufacturing level, are  
8 in Ukraine.

9 And so, recognizing my time is about to run out, the  
10 one of -- we can speak more about this, but one of the goals  
11 of the program was to convince some of the most  
12 sophisticated drone companies in the world to bring  
13 manufacturing here, so that we have the benefit for the  
14 warfighters of the best systems at scale.

15 Senator Fischer: And have you convinced them?

16 Mr. Metz: With your demand signal. So, we have -- you  
17 know, we're going to place orders, and those orders are  
18 bringing these companies to the U.S. to manufacture in the  
19 U.S.

20 Senator Fischer: Thank you.

21 Chairman Wicker: Senator Shaheen.

22 Senator Shaheen: Well, thank you. I'd like to follow-  
23 up on Senator Fischer's point and the issue that both  
24 Senators Wicker and Reed raised in their opening statement  
25 about the efforts in Ukraine.



1           Senator Blumenthal and I were in Odessa about 2 weeks  
2 ago, and we were in a room that was about a sixth of the  
3 size of this room, and it was filled with drones. This is  
4 an example of a couple of those. They were ranging in size,  
5 as you can see from, very small, you know, maybe a square  
6 foot to quite large, the size of a snowblower. And we asked  
7 who's making those drones, and are any of them in the coming  
8 from the U.S.? And they said no. And we said why? Because  
9 what the U.S. is doing costs too much and it's not  
10 technologically advanced enough.

11           And that was troubling. But what was even more  
12 troubling was to hear from virtually -- as part of that  
13 trip, I also visited several countries in Eastern Europe,  
14 and virtually every member of our military who briefed us  
15 said that we are we do not have anyone in Ukraine taking  
16 advantage of the technological advancements that are  
17 happening there, and that Ukraine has become -- and I said  
18 this to Colby earlier this week in testimony, I said what we  
19 heard was that Ukraine had become a bad word in the  
20 Pentagon.

21           So, you're talking about 6 months as being expedited  
22 scheduling. What they were talking about in Ukraine was  
23 iterating those drones every 2 weeks because of warfare. I  
24 don't know how we think we're going to compete if we're  
25 talking about an every 6-months schedule, and we're looking

1 at our adversaries who are iterating on a weekly basis.

2 And I applaud the effort that's underway, the Drone  
3 Dominance program, I voted for that in the NDAA. I thought  
4 it was important, but it doesn't feel to me like there is a  
5 sense of urgency about what our challenge is. So, I'd like  
6 for you to respond to that.

7 Mr. West: Senator, we feel that same sense of urgency.  
8 You know, we are morally committed to this effort, like  
9 Travis, to discuss the results at best --

10 Senator Shaheen: So, why aren't we taking advantage of  
11 the technological advancements that the Ukrainians have  
12 made? I noticed that Prime Minister Starmer has asked them  
13 to help with what's going on in the Middle East right now.  
14 Why are we not trying to take more advantage of that?

15 Mr. Metz: Senator, we are. We specifically, built a  
16 framework and invited the best Ukrainian FPV drone companies  
17 in the world to come to our competition on the basis that  
18 their battlefield technology is proven and they have proven  
19 they know how to scale. In the long-term, the commitment  
20 from those businesses is to relocate, so the core  
21 manufacturing to the U.S. Those drone companies came to the  
22 competition, and a few of them are likely to get --

23 Senator Shaheen: Right. I saw that two of them have  
24 been down selected for phase 1. I understand that, but  
25 again, I find it troubling that our service members who are



1 in the region don't seem to have the understanding that we  
2 are really interested in what's going on there and are  
3 trying to get that information.

4 I want to switch to another question, because the U.S.  
5 market has only one company that produces drone propulsion  
6 motors, and that's ePropelled in Laconia, New Hampshire.  
7 It's one of the most glaring deficits in our domestic  
8 market, as I'm sure you all know. And the fact that it only  
9 exists in New Hampshire, right now is one of the keys to  
10 ensuring that we can do the drone build out that we need to  
11 do.

12 Many of our Defense suppliers in New Hampshire have  
13 benefited from the Submarine Supplier Development Funding,  
14 through the Navy and the maritime industrial base context.  
15 So, can you share whether the Department is thinking about  
16 supporting capital investments that can help companies like  
17 ePropelled, as they're looking at the investments they need  
18 to make in order to build out the supply chain that we're  
19 going to need?

20 Mr. Metz: Thank you, Senator, for the question. I've  
21 met multiple times with Nick, the CEO of ePropelled. I  
22 think it is a wonderful example of where we are headed. He  
23 is building brushless motors in New Hampshire, and he has --  
24 is a supplier to a number of the drone companies that will  
25 be receiving orders from this. And I do think that he is a



1 candidate for both continued demand signal from us and  
2 further support from the Department of War.

3 Senator Shaheen: So, I'm out of time, but if you could  
4 speak to the help that we might be able to provide small  
5 businesses for investments that we're going to need in order  
6 to build that --

7 Chairman Wicker: Go ahead and do that.

8 Senator Shaheen: -- that would be appreciated.

9 Chairman Wicker: Go ahead and do that.

10 Mr. West: So, Senator, one of the things that we hope  
11 to shine a light on are supply chain constraints. And two  
12 of our colleagues in the Department stand at the ready, the  
13 Office of Strategic Capital and IBAS, to do direct lending  
14 to firms like ePropelled. We first met Nick months ago, and  
15 this is a great example of an American small business that's  
16 going to get ready to scale on behalf of our defense.

17 Senator Shaheen: And we are going to be able to help  
18 some of those small companies as they look at what they need  
19 to do to build out?

20 Mr. Metz: Yes, ma'am.

21 Senator Shaheen: Thank you.

22 Chairman Wicker: IBAS stands for?

23 Senator Reed: Interesting, but --

24 [Laughter.]

25 Mr. West: Industrial Base -- Senator, I'm going to



1 have to defer to my colleagues behind me, and I'm -- there's  
2 so many acronyms as I've returned to the Pentagon, I'm going  
3 to struggle with --

4 Chairman Wicker: You know, there are a lot of  
5 acronyms, but they --

6 Mr. West: They are a terrific unit that stands at the  
7 ready to lend, and they have incredible and deep expertise  
8 specifically in batteries and motors.

9 Chairman Wicker: Shall we put Senator Shaheen's  
10 photograph in the record. Is there objection? Without  
11 objection, so ordered.

12 [The information referred to follows:]

13 [COMMITTEE INSERT]

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1 Chairman Wicker: Senator Rounds.

2 Senator Rounds: Thank you, Mr. Chairman. First, thank  
3 you for the discussion so far, and I think it's very, very  
4 appropriate that we do it at this time. Several years ago,  
5 I met a gentleman by the name of John Antle who wrote a book  
6 called Seven Seconds to Die with regard to the Nagorno-  
7 Karabakh War in 2020, and the use of drones at that time, by  
8 Azerbaijan to, literally, take out over 1,000 pieces of  
9 equipment in about a 43-day period of time. It was the  
10 beginning of the end of Armenia being able to control a  
11 section between the two countries called Nagorno-Karabakh.

12 In it, he laid out just exactly how effective, 5 years  
13 ago, the use of drones had become. And with it, he talked  
14 about the ability for those drones to operate almost  
15 independently, and laid out the guidelines for what we  
16 consider to be a human in the loop or a human over the loop  
17 with regard to the autonomous use of those drones.

18 He wrote a second book, detailing the Ukrainian war  
19 and, you know, called Next War, in which he identified the  
20 advanced use of drones and what they were doing. And in  
21 fact, he made very clear in it that the advancements made  
22 were substantial. I think we are behind in our application  
23 of some types of drones, particularly the type 1 drones, the  
24 small, less expensive drones. And yet, it is dominating the  
25 battlefield in Ukraine today.

1           But I'd like to talk just a little bit in terms of the  
2 speed at which drones are being incorporated into the day-  
3 to-day activities, and how fast we have to be able to update  
4 them. Senator Shaheen mentioned it, and I think it's  
5 critical that we impress that we need drones that are almost  
6 modular.

7           Mr. Metz, can you talk a little bit about the focus,  
8 moving forward, in terms of what might be effective today,  
9 may, within a two-week period of time on the battlefield, be  
10 ineffective and how that happens?

11          Mr. Metz: Thank you, Senator, I appreciate that  
12 question. One Of the goals of the program is to make sure  
13 that we scale the actual physical manufacturing of the  
14 systems. But the technology stacks that are increasingly  
15 integrated into the systems, as you correctly pointed out,  
16 need to be on a rhythm that is far faster than the 6 months  
17 for the physical drones. And they are. So, we will have  
18 tech stacks inside of these systems that honestly, often may  
19 have models retrained on a nightly or weekly basis.

20          I'm a deep optimist around the capabilities of the U.S.  
21 entrepreneur class around those technology stacks, and we  
22 saw that at Fort Benning this week. Some of the ability to,  
23 on-the-fly, modify the systems that were helping the  
24 soldiers hit these targets out 10 kilometers, and I  
25 mentioned it before, in particular, because of the nature of



1 the Georgia forest, which is a very difficult RF  
2 environment. But the ability of these companies on-the-fly  
3 to manage the technology is was impressive.

4 Senator Rounds: And let's just talk about that a  
5 little bit. This is a good way to gather public support for  
6 the need to move as rapidly as possible. You're talking  
7 about a drone that may very well be radio-controlled. And I  
8 think that's what most people think they are is as radio-  
9 controlled, but it doesn't take long for an adversary to  
10 figure out a way to stop that communication so you can move  
11 to a different frequency. Perhaps you can change from  
12 frequency to frequency, and you can become advanced in doing  
13 that. But at some stage of the game, the adversary has  
14 already figured out how to stop that. So, the next step on  
15 the line, and what many of them use right now, is a fiber  
16 optic line. Can you talk a little bit about what's  
17 happening in that regard?

18 Mr. Metz: Yes, sir. We in fact tested fiber optic  
19 drones at Fort Benning last week. They performed well. As  
20 you well point out, they help you manage a complex RF  
21 environment. That's just one strategy amongst many to  
22 manage the complicated sort of comms environment.

23 One of the key principles of the framework that we've  
24 set up for phase 1 going forward is we are -- our goal is  
25 not to tell industry how to solve the problem. Our goal is

1 to set up battle-realistic missions on which to test the  
2 drones, and then ask industry to solve those problems. Even  
3 in phase 1, the one that we just ran, we saw multiple  
4 different strategies for solving the problem; so fiber  
5 optics, some automated target recognition for the last 100  
6 meters, things like that.

7 Senator Rounds: And then, finally, any of these drones  
8 will have to be utilizable operable by our young men and  
9 women in the battlefield, not just one expert in a  
10 particular area, but the vast majority of our young men and  
11 women are going to have to be trained on how to use these if  
12 they're in the front lines. Right?

13 Mr. Metz: Yes, sir. And Mr. West talked about this  
14 before. One of the keys for the testing that we did at Fort  
15 Benning was it was not -- these were being tested by our  
16 operators, given a total of two hours of training on each  
17 drone system. Now, they are experienced operators, but they  
18 had not seen most of these systems before. That is a proxy  
19 for are these drones capable of being used by our Marines,  
20 our soldiers, and our other service members?

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

22 Chairman Wicker: Thank you very much. Senator  
23 Blumenthal.

24 Senator Blumenthal: Thanks, Mr. Chairman. Thanks for  
25 holding this hearing on such a really critical topic. Thank



1 all of you for being here today, and I respect the work that  
2 you're doing.

3 I must say, I share Senator Shaheen's sense of urgency  
4 and impatience. Having made nine trips to Ukraine in the  
5 last 4 years, and having watched their drone industry grow  
6 literally in real time while we were watching, and they're  
7 showing us what they are doing in response to what they're  
8 hearing and seeing on the battlefield, and then visiting one  
9 of their forward detection positions on the Black Sea, in  
10 Odessa, and having that picture. And we have more pictures,  
11 which we can put in the record of all the variations of  
12 drones that they are seeing from their adversaries and that  
13 they are doing themselves literally again in real time.

14 I wonder whether the scope of our efforts here matches  
15 the challenge that this Nation faces. You know, \$1 billion,  
16 even \$2 billion seems totally inadequate to what is  
17 necessary. Ukraine is spending multiples of that amount.  
18 Obviously, they're at war. They have support from our  
19 industry. And I wonder if you could just comment on whether  
20 you think the scale and magnitude of our efforts is adequate  
21 to match the challenges that we have. I don't know whether  
22 that's a question for Mr. West or for one of the other  
23 witnesses.

24 Mr. West: Senator, it is our obligation to learn as  
25 much as we can from the Ukrainian battlefield.



1 Senator Blumenthal: Have you been to Ukraine?

2 Mr. West: Senator, I was there twice in 2018, but not  
3 since.

4 Senator Blumenthal: Have you been, Mr. Metz?

5 Mr. Metz: No, sir, I've not.

6 Senator Blumenthal: I don't know how you can run this  
7 program without having visited Ukraine. I know that sounds  
8 like an exaggeration, but it is absolutely true. You know,  
9 I'm not a drone expert, but I will tell you to walk through  
10 the assembly line of their drone manufacturing facility, as  
11 I've done on a number of occasions, and watching how they  
12 have grown their industry and how they're thinking about  
13 unmanned aerial and undersea warfare. Now, there are a  
14 number of -- I know you're talking to American  
15 entrepreneurs. Have you talked to Eric Schmidt?

16 Mr. West: Senator, I think I think Mr. Metz, is well  
17 positioned to answer your question. It's very important --  
18 before he does and talks about how we've incorporated the  
19 top Ukrainian drone companies in this competition, I would  
20 like to say that the United States companies performed very  
21 well. I think it's fair to say they outperformed our  
22 expectations, you know, not having been tested, many of them  
23 on a live battlefield. But, Travis, can you go over exactly  
24 how we plan to incorporate exactly what the Senator is  
25 talking about?



1 Mr. Metz: Yeah. So, I would like to go to Ukraine.  
2 Many members of the team that is helping me run the Drone  
3 Dominance program have been Ukraine to evaluate the range of  
4 drones. I have talked to Mr. Schmidt and many members of  
5 his team about their experiences on the battlefield in  
6 Ukraine, and we do not disagree with you about the need to  
7 bring the best drone technology in the world, tested on the  
8 battlefield to the U.S. warfighter.

9 Many of many of the U.S. companies that are now  
10 competing in our program have, in fact, been to Ukraine to  
11 test their product, Mr. Schmidt being a good example of  
12 that. But we also have some of the largest Ukrainian -- the  
13 successful the companies in Ukraine that have successfully  
14 iterated to scale. They are competing in this program. So,  
15 I feel I feel that we do have the benefit of the technology  
16 advancements that they have perpetuated on the battlefield.

17 Senator Blumenthal: Well, I'm glad to hear that. But  
18 I have to say, with all good intentions and you have not  
19 only intentions, but you have the intellectual and expertise  
20 and other capacity. I don't doubt yours. I question  
21 whether our country is sufficiently committed, and the  
22 magnitude of this effort, I think, has to be on the scale  
23 and scope of what we did up with nuclear arms when we were  
24 behind in that area of warfare or what we did in space  
25 exploration. I think it will take really an effort on a



1 scale that we haven't matched so far. My time has expired.

2 Thanks, Mr. Chairman.

3 Chairman Wicker: Thank you, Senator Blumenthal.

4 Senator Hirono.

5 Senator Hirono: Thank you, Mr. Chairman.

6 Mr. Metz, while much of the focus has been on  
7 accelerating procurement and deployment of small drones, an  
8 equally important but less discussed issue is the need to  
9 develop a comprehensive plan for how we sustain these  
10 systems. As you know, on average, about 70 percent of our  
11 weapons systems total life cycle is -- cost is sustainment,  
12 including the logistics, maintenance, storage, training, and  
13 software updates to remain operational.

14 How are you thinking about sustainment issues from your  
15 position at DOD, and are you coordinating with the military  
16 services to ensure that they are developing long-term  
17 sustainable sustainment plans for these new systems? So, if  
18 we're looking to procure or have what is it, a goal of  
19 300,000 drones, where are they all going to be stored? How  
20 long will they be stored? Do they become obsolete? What is  
21 the thinking about those issues?

22 Mr. Metz: Thank you, Senator. It's an excellent  
23 question. So, one of the key things to have in mind about  
24 these systems is that they are intended to be tradable,  
25 consumable systems. So, we would expect the vast bulk of



1 the systems that we're delivering as part of the Drone  
2 Dominance program to be used in realistic training exercises  
3 by the members of the military. We think the volume  
4 required for appropriate training is in the hundreds of  
5 thousands per year to consume.

6 The U.S. Army, the U.S. Marine Corps, and various units  
7 of SOCOM are deeply integrated into their own dominance  
8 program, meaning members of the of the key positions in each  
9 of those services was at the Fort Benning event, with a goal  
10 of developing the sustainment plans in both the short-term  
11 and the medium-term.

12 So, in the short-term, we will be delivering drones  
13 starting this month to roughly 17 different military units,  
14 and there is a plan in place across each of those for those  
15 drones to be used in realistic training exercises. In the  
16 long-term, those same military service departments will be  
17 developing their own, you know, TTP and other doctrine to be  
18 able to sustain the drones. We don't expect them to sit on  
19 the shelf for very long.

20 Senator Hirono: What's very long? To be used within a  
21 year?

22 Mr. Metz: Months.

23 Senator Hirono: Months. So, where are these drones to  
24 be used? Are you expecting most of them are going to be  
25 used in the war with Iran.



1           Mr. Metz: In the short-term, I would expect most of  
2 the small one-way attack drones that we're developing to be  
3 used in actual live training exercises from the U.S. Army  
4 and the U.S. Marines.

5           Senator Hirono: So, we're going to be using these  
6 drones for live training exercises. So, these are not in  
7 actual conflict situations? They're going to be using  
8 actual drones for exercises.

9           Mr. Metz: So, I think I assume if there was a need to  
10 use these particular types of weaponized drones in combat,  
11 they would be used that way as well.

12          Senator Hirono: Yes, I understand that. But the only  
13 place where, as far as I know, we're in conflict right now  
14 is Iran. For you, again, a contingency in the Indo-Pacific  
15 will stress drone capabilities and present specific  
16 challenges, including the vast distances associated with  
17 this AOR. So, in the testing that you did at Fort Benning,  
18 was there somebody from INDOPACOM at those tests, or will  
19 they be there since they obviously need to make sure that  
20 the drones that you are developing are going to be used in  
21 the various AORs? And I would say INDOPACOM presents  
22 particular challenges of distance, etc.

23          Mr. Metz: Senator, I think the challenges of the  
24 distances in the INDOPACOM region mean that many of the  
25 drone platforms that we're testing in the first-person



1 drones don't apply for many of the missions. So, I think  
2 Major General Marks might be better positioned to answer  
3 that question.

4 Senator Hirono: General, in particular, I do want to  
5 mention that Admiral Paparo has seen the use of the  
6 usefulness of drones in his AOR, and he also had mentioned,  
7 using 3D printers to create these drones. Have you been in  
8 discussions with Admiral Paparo?

9 General Marks: Actually, yes, Senator. Not me  
10 personally, but attended his commanders conference last  
11 week. That was one of the topics that we discussed. Yeah,  
12 I think, you know, we have to look at drones or one-way  
13 attack platforms that can go a lot further than what we  
14 currently are designing. For the DAWG effort, I would  
15 appreciate and be happy to engage with you and the committee  
16 in a classified setting.

17 Senator Hirono: The Marine Corps recently developed  
18 its first 3D printing drone program, and I do note that, Mr.  
19 West, you mentioned that the cost of the drone in U.S. is  
20 \$10,000 versus \$500. I mean, I hope that we are rapidly  
21 decreasing the cost to acquire the million drones that is  
22 one of our goals in a number of years. Thank you, Mr.  
23 Chairman.

24 Chairman Wicker: General Marks, it is correct that you  
25 and Admiral Paparo are exactly of the same page on this



1 issue of drones. Is that correct?

2 General Marks: That is correct, Senator.

3 Chairman Wicker: Thank you very much. Senator Budd.

4 Senator Budd: Thank you, Chairman. It's a fascinating  
5 subject. I appreciate you all being here. Very insightful.

6 Mr. West, let's talk about China and drone supply  
7 chains, if you will. You know, I've met CEOs who say they  
8 can't buy brushless motors or IR cameras from non-Chinese  
9 company at scale. So, how do we best address this supply  
10 chain vulnerability, and are there any other common  
11 components that are hard to find outside of China?

12 Mr. West: Thank you, Senator. I'll let Mr. Metz  
13 address our off-ramp, on-ramp, which is the key to your  
14 question. In other words --

15 Senator Budd: He seemed most excited to answer the  
16 question. So, thank you, but go ahead, please.

17 Mr. West: He is excited because he's deep on this.  
18 And the basic question is, first of all, the NDAA, has  
19 strict rules over the seven odd critical components that may  
20 not come from covered countries. But like so many of our  
21 weapons systems, many of the subcomponents that you're  
22 addressing do today come from China. So, as we try to  
23 scale, we are balancing trying to onshore all of these  
24 components. We mentioned a company called ePropelled in New  
25 Hampshire that is making brushless motors here as we come up



1 --

2 Senator Budd: And let me just jump in. Is that at  
3 scale? They're able to make them at scale, Mr. Metz?

4 Mr. Metz: No, but they will. The demand signal we're  
5 providing is giving them orders time now that will cause  
6 them to be able to bring in further capital and scale their  
7 manufacturing.

8 Senator Budd: Thank you. Mr. West. Did you have  
9 additional thoughts? Okay, great. Thank you. Mr. West,  
10 are there any non-traditional funding methods that you're  
11 considering to increase production as well as ensure supply  
12 chain independence, for example, the Office of Strategic  
13 Capital's credit financing, or the Defense Production Act  
14 Title 3? Mr. West?

15 Mr. West: Yes, sir. Both the Industrial Base  
16 Analysis, and Sustainment Division, and the Office of  
17 Strategic Capital stand ready to act as soon as the supply  
18 chain constraints are illuminated as a result of having this  
19 largest order ever in Group 1. This will stress our  
20 domestic supply chain as you outlined, and will illuminate  
21 where they can come in for things like direct lending and  
22 other support invoking their authorities.

23 Senator Budd: Yeah, thanks for that. Mr. Metz, what  
24 specific requirements has your program established to ensure  
25 that our drones can operate in a GPS-denied environment, and



1 will these be department-wide or service-driven  
2 requirements?

3 Mr. Metz: Senator, we're running a joint acquisition  
4 program that will in phase 2, which begins this August, will  
5 be testing drones against a full counter -- in a full  
6 counter-UAS environment, so denial of GNSS, denial of comms  
7 in many different formats. We are not being prescriptive  
8 with the companies about how they solve those challenges,  
9 because we want the entrepreneurs both that we're bringing  
10 in from outside of the United States and entrepreneurs in  
11 the U.S., to innovate across those particular problems.

12 But the Joint Interagency Task Force 401, which is the  
13 group inside of the Pentagon that's tasked with coordinating  
14 all of our counter-UAS efforts, will be a core partner in  
15 August, and their goal is to knock down all the drones.

16 Senator Budd: Thank you. Mr. West, all three of you,  
17 how are you ensuring that the Department and the individual  
18 services are working together and efficiently, and not  
19 duplicating efforts to boost small UAS production? It seems  
20 like every -- in open sources I read every week or so,  
21 there's a new effort, a new program, a new department  
22 working on this issue. How do we make sure we're not  
23 duplicating effort?

24 Mr. West: Senator, there are two components to this.  
25 At the top, we're connected with the general officers, and I



1 can talk -- General Marks address this aspect in terms of  
2 their sustainment plans and their doctrinal changes. At the  
3 grassroots, we've collected the best operators from across  
4 the joint force. They all know one another. You know,  
5 these pilots are all as obsessed as we are at getting United  
6 States' capabilities in this Group 1 up and at the very top  
7 of the globe on any battlefield. And so, there's a natural  
8 integration that's taking place.

9 But the bottom line is, because of your reconciliation  
10 funding, we've been able to apply this, in a very specific  
11 group, and centralize this to depress these prices, to  
12 ultimately get the services the drones that they want.

13 General Marks: So, Senator, thank you for the  
14 question. So, we have in DAWG, the Defense Autonomous  
15 Warfare Group, have trained service members from all the  
16 services, and work directly with the forward commands to  
17 show them how we've come up against problems and how we are  
18 developing different techniques, tactics, and procedures to  
19 actually operate the system. So, we are working with all  
20 the services on this.

21 Senator Budd: Thank you.

22 Chairman Wicker: Thank you, Senator Budd. Senator  
23 King and then Senator Scott.

24 Senator King: Thank you very much, Mr. Chairman.

25 I would like to see a chart of number of units produced



1 per month and price from the Ukrainian industry versus what  
2 we're projecting. You mentioned, that there have been --  
3 you put out, effectively, a bid with a proposed price. I  
4 want to see the numbers. And if you could give -- can you  
5 give us that off the top of your head? What are the -- how  
6 many of them are the Ukrainians producing a month, and what  
7 do they cost versus what are we projecting for this section  
8 1 production that you're now bidding?

9 Mr. Metz: Yes, Senator. And if you'll indulge me,  
10 it's an honor to take a question from you. I grew up in  
11 Pittston, Maine, on the banks of the mighty Kennebec River.

12 Senator King: Wow.

13 Mr. Metz: Also, a fellow sugar loafer, and also have  
14 sat next to you at the Bag and Kettle Restaurant, home of  
15 the best burger in the world.

16 Senator King: Well, this is Maine. Everyone is  
17 connected in one way or another.

18 Mr. Metz: So, it's an excellent question. So, the  
19 Ukrainians last year built roughly 4.5 million drones in  
20 this site.

21 Senator King: Wow.

22 Mr. Metz: Well, they built four and half million  
23 drones in total, 4.4 million of them were this in this size  
24 range. We think they'll build about 6 million this year.  
25 So, 500,000 a month. Historically, most of the Ukrainian



1 drones are made from components that are primarily from  
2 China, although as I mentioned before, they are also  
3 concerned about their supply chain vulnerabilities on that.  
4 We think their per unit pricing is, depending on the nature  
5 of the FPV, somewhere between probably \$500 on the low end,  
6 and maybe in the low thousands on the high end. Our program  
7 is designed to over these 6-month cycles to lower prices. I  
8 think it's from --

9 Senator King: What are the prices?

10 Mr. Metz: So, we're going to pay \$5,000 per drone in  
11 phase 1, the ones that we're going to place orders with this  
12 week. We intend by the end of this program, our goal is to  
13 get down to less than \$2,000 for a one-way kamikaze attack  
14 drone.

15 Senator King: So, you understand why?

16 Mr. Metz: Yes, that's a legitimate question. They're  
17 doing it for \$500 to \$1,000.

18 Mr. Metz: Yeah.

19 Senator King: -- we're talking about \$5,000, but do  
20 you believe there's a realistic path to getting down under  
21 \$2,000?

22 Mr. Metz: I do. I'm optimist about the efficacy of  
23 the sort of American industrial base when given a good  
24 framework and given real orders to go achieve it. I am  
25 confident that we will scale the prices down. Where the



1 exact end point is, I think is hard to know a priori. It's  
2 fair to say that I would not expect, given the way that the  
3 U.S. economy works in terms of labor rates and so forth, I  
4 would not expect us to match Chinese drone prices.

5 Senator King: I understand that, but my experience  
6 with large scale contracting is if you establish a number  
7 upfront, miraculously the companies find a way to meet it  
8 rather than waiting for them to give you the number.

9 Completely different question, defense. We've been  
10 talking about creating drones. What about defense for  
11 drones? I mean, that's -- are we talking about directed  
12 energy? Is that part of DAWG is looking at how to defend  
13 against these weapons, because our adversaries are going to  
14 be building them to at scale. General?

15 General Marks: For the DAWG, I'm not going to be able  
16 to get into specifics just because of the classification.

17 Senator King: I understand that, but is defense part  
18 of it, part of your mission?

19 General Marks: It would be. It is. I don't know what  
20 Drone Dominance is doing as it pertains to the defense and  
21 protection of these systems.

22 Senator King: Well, I would hope that that's part of  
23 what we're talking about here, because --

24 Chairman Wicker: Mr. West, you want to weigh in there?

25 Mr. West: Senator, yes. The Joint Interagency Task



1 Force 401 is tasked with our counter-UAS, and we've invited  
2 them to the second gauntlet. And the basic goal is to  
3 integrate both offense and defense going forward so that  
4 both technologies can come up simultaneously since there's  
5 so much overlap. Bottom line is in gauntlet 2, in August,  
6 we hope that our counter-UAS can knock down many of the  
7 drones.

8 Senator King: Are you looking at directed energy as  
9 part of the counter-UAS?

10 Mr. West: Yes, sir.

11 Senator King: I would hope so, because that's \$0.50 a  
12 shot. And that's something that we have been woefully slow  
13 to move on.

14 Mr. West: Sir, you are cost conscious and we are very  
15 cost conscious.

16 Senator King: I'm delighted to hear that. The Wounded  
17 Warrior Project has pointed out to me that drone injuries  
18 are different than IED injuries. Their head and upper body,  
19 as opposed to lower extremities. I hope that's not  
20 necessarily part of your mission, but I hope that that's  
21 something that the Department is looking at about the nature  
22 of injuries and the training necessary.

23 Final question, are you working on underwater  
24 capabilities as well, underwater autonomous?

25 General Marks: Senator, I'm not able to go into much



1 depth on what we are doing in the undersea environment, but  
2 I would request and welcome a closed session so we can  
3 discuss it in greater detail.

4 Senator King: Thank you very much. Thank you very  
5 much, gentlemen. This is critically important work. I  
6 appreciate the work you're doing. Thank you, Mr. Chairman.

7 Chairman Wicker: Do any of you want to weigh in on the  
8 question about upper body injuries and what Senator King has  
9 learned from the Wounded Warrior program? Any of you have  
10 any insight on that?

11 General Marks: I mean, it's something that definitely  
12 we have to go and look at. Senator, I'd be interested to  
13 know a little bit more about that, but that is something  
14 that we've got to address as we continue, as we continue to  
15 scale out these autonomous systems.

16 Chairman Wicker: Well, for whoever's listening in at  
17 DOD and VA, it's the point that the Senator's made that  
18 someone needs to look at. So, thank you for raising that,  
19 Senator King.

20 Senator King: Mr. Chairman, something like 75 percent  
21 of the casualties in Ukraine are caused by drones. And so,  
22 this is going to be very serious.

23 Chairman Wicker: That's important information --

24 Senator King: Thank you.

25 Chairman Wicker: -- Senator. Senator Scott.



1           Senator Scott: Mr. Chairman, thank you kind words  
2 earlier.

3           Senator Scott: Thank each of you for being here today.  
4 I'm glad President Trump and the Department of War are  
5 prioritizing this. For years, I and others have made it a  
6 goal to get the government to stop purchasing Communist-made  
7 drones to protect our national security. Let's be clear,  
8 Communist China is our enemy. They've chosen, not the  
9 people, the government of Communist China has chosen to be  
10 our enemy, and we should not rely on them for absolutely  
11 anything, much less issues of national security.

12           In past NDAA's, I and others have fought for my  
13 American Security Drone Act to prohibit the purchasing of  
14 drones from several entities, which was a huge step to get  
15 this done in the fiscal year 2025 NDAA. I want to thank the  
16 chairman and the ranking member. I fought and secured a  
17 provision that allowed for the blacklisting of known bad  
18 actors, DJI Auto, to phase them out of the market.

19           This was a huge win for our national security, and I  
20 was thrilled to see President Trump and Chairman Carr move  
21 forward with fully implementing this provision. But we're  
22 not even close to being done yet. We have to keep fighting  
23 to ensure Communist China has absolutely zero role in our  
24 drone supply or anywhere in our military, which is critical  
25 to American safety. That means unleashing American

1 manufacturing in the drone industry and many others.

2         So, let's talk about the Blue UAS program, which, as  
3 you know, is intended to keep commercial drones free of  
4 parts made by adversarial nations like Communist China.  
5 This list has traditionally been viewed as safe, but it is a  
6 well-known fact that they often have ties to CCP-owned  
7 companies that continue to find loopholes in our laws to  
8 infiltrate our markets. Mr. Metz, what steps can Congress  
9 take next to get Communist China completely out of our drone  
10 supply chain?

11         Mr. Metz: Senator, thank you for the question. So,  
12 for the Drone Dominance program, our phase 1 deliveries will  
13 all be that are delivered to the troops, will all be NDAA-  
14 compliant. Going forward from there, the program will be  
15 more prescriptive than the NDAA in terms of not allowing  
16 various components to be included in the systems that we  
17 procure with the long-term goal of building a drone supply  
18 chain that is American.

19         So, for instance, in phase 2, so that's -- we'll be  
20 placing orders in August for phase 2, we will not be  
21 allowing any Chinese batteries and motors in phase 2 in  
22 addition to other restrictions that will be imposing that  
23 are above and beyond the current statutory restrictions.

24         Senator Scott: Mr. Metz, the threat CCP drones and  
25 parts pose extend beyond just drones, but things like

1 cameras that could be outfitted to the drone. In recent  
2 days, we've seen our International Trade Commission side  
3 with Chinese camera producers over GoPro, an American  
4 company, which will allow China to continue to sell their  
5 spy cameras in our country. This completely undermines our  
6 markets, harms American companies, and creates a total of  
7 vulnerability for Americans data to still end up in the  
8 hands of our enemy. To truly stop Communist China's  
9 influence of this market and protect our safety, wouldn't  
10 you agree we must also address these vulnerabilities, Mr.  
11 West?

12 Mr. West: Senator, yes, and thank you for championing  
13 this legislation, which has done so much for our domestic  
14 industrial base. It's very important.

15 Senator Scott: So, how are we going to get -- how are  
16 we going to make sure there's no equipment purchased or used  
17 by the Department of War that has zero ties to Communist  
18 China manufacturers and work with the FCC?

19 Mr. West: Senator, the one crucial step that we've  
20 taken is to migrate the Blue List that you invoked from DIU  
21 to the Defense Contract Management Agency. Now, why was  
22 this done? Number one, they have the scale in terms of the  
23 numbers and the real expertise to ensure that if you make  
24 the Blue List, you're NDAA-compliant. But as you mentioned,  
25 this is difficult stuff. In other words, you have to



1 examine the bill of materials, you have to examine the  
2 capital stack, and you have to autopsy these drones, rip  
3 them apart and get down to the subcomponent level, and then  
4 build up the expertise to understand where exactly these  
5 things are coming from.

6 So, as Travis said, you know, we aspire to have a more  
7 aggressive on-ramp for American components than the NDAA so,  
8 ultimately, by -- deep in 2027, these drones are American or  
9 allied.

10 Senator Scott: Do you think everybody's taken  
11 seriously that we cannot rely on Communist China for  
12 anything in our military?

13 General Marks: Yes, I do.

14 Senator Scott: Thank you. Thank you, Chairman.

15 Chairman Wicker: Thank you, Senator. Senator Kelly.

16 Senator Kelly: Thank you, Mr. Chairman.

17 Just to, you know, comment on or on Senator King's  
18 question about injuries. Last March, I was in Ukraine at a  
19 military hospital. I met with 10 Ukrainian service members  
20 who were severely injured. 9 out of 10 were injured by  
21 FPVs, so first-person view drones, and the one that was not,  
22 was injured by a landmine that we thought was placed by a  
23 drone. So, none of them were injured by artillery, even  
24 though that's still -- you know, it's still on the  
25 battlefield. So, obviously, going forward here, drone



1 technology is going to be such a significant part of ground  
2 combat.

3         So, General Marks, I want to ask you something, I  
4 think, that is going to define warfare now for the rest of  
5 our lives for generations, and that's the role of artificial  
6 intelligence in what we've seen play out here over the last  
7 several days, but certainly into the future. It's going to  
8 be a new feature of combat operations in many different  
9 ways, but specifically, the LUCAS, the Low-cost Unmanned  
10 Combat Attack System. Those drones deployed in Operation  
11 Epic Fury have documented autonomous anti-jamming, and I  
12 believe also some swarming capability. So, my question is  
13 about what's underneath all of that. Are AI systems being  
14 used to assist in targeting decisions during this operation.

15         General Marks: So, Senator, thank you for the  
16 question. I am familiar with the LUCAS system. At this  
17 level, open hearing, I'm not able to go into great depth of  
18 what is inside of the LUCAS system, but I will be willing to  
19 get on your calendar, the committee's calendar and provide  
20 you a classified briefing.

21         Senator Kelly: Okay. So, my next question is kind of  
22 irrelevant there because I was going to ask about who  
23 validated the systems, who safeguarded them, and what human  
24 oversight exists at the moment a drone selects or confirms a  
25 target. So, let's do that in a closed session as well.



1 But I also want to just, state for the record here that  
2 companies like Anthropic and others in the AI industry have  
3 published their own safety frameworks of how advanced AI  
4 systems should be deployed. But Congress has not yet set  
5 any kind of clear statutory framework for how AI can be used  
6 in lethal military operations. There's a DOD directive,  
7 directive 3,000.09, which requires what is called,  
8 "Appropriate levels of human judgment over the use of  
9 force." But that language doesn't necessarily mean a human  
10 is involved at the moment a target is selected or engaged.

11 So, before we rapidly scale up production and field  
12 more of these systems that have AI incorporated into their  
13 capability, we need a clear answer on this at the moment. A  
14 drone identifies and confirms a target. Whether or not a  
15 human has to make the final decision to strike the target,  
16 or can a system execute the engagement autonomously once  
17 it's been activated? These are questions we haven't yet  
18 dealt with here in Congress, and we need to, so just  
19 General, I just want to get your thoughts on that,  
20 independent of what LUCAS or any other system can do.

21 General Marks: Thank you, Senator, for the question.  
22 Any system, any capability that the Department procures, has  
23 to comply and be compliant with the law of armed conflict.  
24 I would say that any commander that deploys these systems,  
25 just like any weapon system, it has to comply with those,

1 the law of armed conflict.

2 Senator Kelly: I am not sure that the law of armed  
3 conflict has dealt with this issue. So, LUCAS might not be  
4 exactly clear. And that's why I think it's up to us, Mr.  
5 Chairman, that, you know, we take this issue of human humans  
6 in the loop seriously and create the framework that DOD will  
7 apply to these systems with regards to their autonomous  
8 nature and the ability for a system to make a decision on  
9 targeting the enemy. Thank you.

10 Chairman Wicker: Thank you, Senator Kelly. We'll now  
11 begin round two of our questioning, and I recognize Senator  
12 Reed.

13 Senator Reed: Yes, thank you, Mr. Chairman.

14 I just have one question. We've talked a lot about  
15 deploying lethal drones as quickly as possible, etc., and  
16 doing so in a training environment so that all of our forces  
17 can be very familiar with them. Is there any work going on  
18 to develop training simulators? At some point we're going  
19 to be asking ourselves why are we using them at Fort Benning  
20 when we need them elsewhere? Mr. West and Mr. Metz?

21 Mr. West: Senator, the simulators are key for two  
22 reasons. First, it allows us to scale, the training so that  
23 our troops don't have to have their hands on the joysticks,  
24 and fly actual expensive drones. In other words, with some  
25 software that exactly replicates the flight parameters of



1 the specific drone system we can cycle through in a room  
2 like this and learn how to fly and fairly quickly.

3 Senator Reed: Well, I'm going, back to the notion of  
4 in the field where you've got E1, and E4, and E5 hands on  
5 simulating that. They have it. I mean, we learned a long  
6 time ago how to make blanks so that we could go out there  
7 and shoot at each other, but not hurt each other  
8 necessarily. And I think we want to get to that scale of  
9 realistic training, rather than sitting in an air-  
10 conditioned van and pretend, you know, doing it that way.

11 Mr. West: Senator, Secretary Hegseth has called for  
12 the use of drones in every exercise starting this year.

13 Senator Reed: No, but I --

14 Chairman Wicker: Did you understand that? The  
15 question is; are we using simulators in training for both  
16 offensive and defensive use of drones.

17 Mr. Metz: Senator, the answer is yes. So, just this  
18 Monday down at Fort Benning, we demonstrated a simulator for  
19 a number of the drone platforms. We would intend to use  
20 that as part of the training part of the schoolhouse.

21 Senator Reed: In the field?

22 Mr. Metz: Yes, sir. And I should only add one of the  
23 benefits of driving the cost down and making these systems  
24 truly consumable is you can then transition to actual  
25 physical use of them without worrying about the long-term



1 costs of that.

2 Senator Reed: Thank you.

3 Chairman Wicker: Further questions? The record will  
4 remain -- but the questions for the record will be due to  
5 the committee within 2 business days of the conclusion of  
6 this hearing, which is occurring right now. We are  
7 adjourned.

8 [Whereupon, at 10:54 a.m., the hearing was adjourned.]

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