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**U.S. House of Representatives Armed Services Committee**

**“Fielding Technology and Innovation: Industry Views on Department of Defense  
Acquisition”**

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Chairman Rogers, Ranking Member Smith, members of the Committee, thank you for the opportunity to appear before you today. I am the President and General Manager of Global Government at Skydio, which is the largest manufacturer of small drones outside of China and the world leader in aerial robotics. This hearing takes place at a critical time in the evolution of aviation that is transforming the character of war. The last century of aviation was gas powered and largely crewed; the next century will be electric and largely uncrewed. This paradigm shift will fundamentally change the way airpower is employed and wars are fought.

Skydio was founded in 2014 based on the core belief that AI and autonomy—America’s asymmetric advantage—represented the future of flight. Skydio’s world-leading autonomy has unleashed exponential growth and is now transforming multiple industries. Skydio shipped its first drone in late-2019, and since then, we have delivered over 45,000 dual-use drones to more than 2,000 customers. Skydio is proud to serve every branch of the U.S. military, every Five Eyes military, and over a dozen allied and partner militaries around the world.

I have been fortunate to witness firsthand many of the changes we are seeing in air power and modern warfare. Prior to joining private industry, I served over 25 years as a combat veteran fighter pilot (F-16), commander, and staff officer at Headquarters US Air Force and the Joint Staff. In my testimony that follows, I will expand on the incredible lessons Skydio is learning from our work in Ukraine, explain what these lessons mean for the future, and offer recommendations to strengthen the acquisition and employment of drones throughout the force.

**I. Skydio Autonomy and Scalability: Serving the US Department of Defense**

Skydio’s success serving the Department of Defense (DOD) is a product of two core strengths: autonomy and manufacturing scale. Skydio autonomy makes our drones easy to fly and extremely hard to crash, turning every drone operator into an expert pilot. Autonomy removes the cognitive burden of piloting the system, allowing our drones to conduct intelligence, surveillance and reconnaissance (ISR) overwatch and other tasks while the ground operator focuses on other tasks and mission execution.

We bet early and big on computer vision and AI, but we also bet early and big on the tight integration of hardware, software, and manufacturing. Last year we opened a new manufacturing facility in California ten times larger than our last facility. We can now produce over 1,000 drones per month, with plans to scale far beyond that, to support our servicemembers across every branch of DOD and our allies and partners. We believe our manufacturing capacity and scalability exceeds any small drone company outside of China and is essential to deterring—and if necessary prevailing—in a great power conflict.

Our autonomy and manufacturing scale is making an impact for the Department of Defense. We are proud to be a part of two programs of record: the U.S. Army's Short Range Reconnaissance (SRR) program and the Marine Corps' Short Range Short Endurance (SR/SE) program. To date, we have delivered thousands of drones for the Army's SRR program, and thousands more for the Marine Corps' SR/SE program. Both programs aim to integrate small, smart drones at the unit level, providing organic ISR capability previously unavailable to front-line forces. This capability makes a life or death difference.

Although existing U.S. military procurement programs focus on single drones flown by single operators, DOD and Skydio are investing significant resources in breaking that paradigm, enabling a single operator to control multiple systems. Skydio plays a key role in DOD's Artificial Intelligence for Small Unit Maneuver (AISUM) program, focused on developing the technology and tactics necessary for operators to control fleets of robots in the air and on the ground. Multi-agent operations offer the ultimate asymmetric advantage, augmenting the reach and awareness of human teams and providing extraordinary situational awareness. We recently hired a world-class team of engineers that developed some of the foundational technology behind human-machine teaming. This is the future of drones, both for warfare and commercial use cases. We will continue to invest in industry-leading, multi-agent capabilities.

Beyond the traditional ISR operations enabled by small, smart drones, Skydio is widening the aperture of drone use-cases for our defense customers. While front-line use cases remain critically important, the next frontier for the military's use of drones is simple but significant: we believe drones will revolutionize the way DOD secures installations and inspects equipment. Skydio is the leading Western provider of drones for infrastructure inspection. We've seen the way smart drones transform the way commercial companies secure their facilities, inspect and monitor their infrastructure, and track inventory in warehouses. In that arena, DOD is behind the power curve, continuing to rely on humans to perform monotonous, routine tasks that could easily be augmented by flying robots. People will always have a role. But people become much more effective when they can lean on robotic teammates to perform routine, repetitive tasks—from inspecting a military power facility to patrolling a base perimeter. Along with empowering people, robotic teammates curb costs and increase efficiency.

Some of this work is happening now. Our drones have the ability to autonomously build a digital model of almost any structure, a feature known as 3D Scan. Enterprise customers use it to build models of bridges, power plants, and dams. Increasingly, defense users are finding value. The Ukrainian government uses Skydio 3D Scan to build rapid digital models of civilian sites damaged by Russian forces, creating compelling evidence for war crimes prosecutions and accelerating reconstruction efforts while protecting investigators. In the U.S., Skydio drones recently deployed with a Navy Arleigh Burke-class destroyer to support rapid battle damage assessments. We have demonstrated methods of transforming the inspection of military aircraft, including the B-52 and C-17, using the same fundamental technology. Instead of taking days or hours to manually inspect these critical assets, drones can do the same work—with higher fidelity and better data capture—in hours and minutes. Traditional inspection of a C-17 Globemaster aircraft by three Airmen can take up to eight hours. Autonomous aircraft drone inspection cuts that time by 90% to just 40 minutes. This technology will transform military readiness and keep our planes in the air and our ships at sea, deterring our adversaries and ensuring rapid response for contingencies around the globe.

Remote operations are the future of drone operations. Skydio developed the Skydio Dock, which allows operators to conduct remote drone operations from almost anywhere, automate tasks, and gain rapid, real-time situational awareness. Dock and remote operations are already being implemented across the critical infrastructure industry for automated asset inspection. Dozens of public safety agencies now operate the same technology to respond to 911 calls in a paradigm shift known as Drone as First Responder (DFR). DOD invented the remote operation of large drones but has yet to remotely operate small, smart platforms. Remote operations promises to significantly improve installation security and readiness CONUS and OCONUS, enabling the autonomous inspection of facilities and ranges, warehouses, and base perimeters, along with emergency response missions.

## **II. Pulling the Future Forward: Ukraine as a Case Study for Drones in Warfare**

To understand the future of drones and warfare, look no further than Ukraine. Necessity has pulled forward the future of drones, turning small drones—once considered toys—into critical tools on the battlefield. I have seen that future firsthand, traveling twice this year to Ukraine, where Skydio employs full-time employees. Past wars featured large and expensive drones supported by dozens of people. That paradigm is gone. Now, small teams field small, cost-effective drones. And commanders would not dream of conducting operations without them. This section discusses the transformation we're witnessing in Ukraine and what it means for the future of war and our own security.

### **a. Standing with Ukraine**

Within hours of Russian tanks crossing the Ukrainian border in February 2022, Skydio began fielding requests for drones. Within days, Skydio had donated hundreds of drones, calling major enterprise customers to let them know their shipments would be delayed because their drones were going to Kyiv.

Since then, we have deployed more small, dual-use drones to Ukraine than any other company outside of China. The vast majority were purchased and provided by the U.S. government. Earlier this year we passed extremely demanding electronic warfare tests conducted by Ukraine's Ministry of Defense and Ministry of Internal Affairs. We believe we are the only American and allied drone company in our class to pass those tests, reflecting months of work across our engineering teams to make our products resilient in contested or congested environments. Skydio's core competency is GPS-denied, vision-based navigation. That skill—common to all of our platforms and customer verticals—gives us an inherent advantage.

To serve our customers, we have hired full-time employees in Ukraine, stood up customer support services, and translated our operating software into Ukrainian. Our U.S.-based team members have completed 30+ trips to Ukraine.

At a high level, Ukraine is pioneering the military application of drones of all sizes. On the battlefield, small, dual-use drones form the cornerstone of the kill chain, gathering real-time information critical to decision making. Almost nothing on the battlefield happens without a drone in the air. In general, soldiers only fire artillery, launch armed first-person-view (FPV) drones, or maneuver with the benefit of information gathered by drones, often small, dual-use drones. Operational and tactical commanders monitor dozens—sometimes hundreds—of drone feeds, orchestrating action in real time.

Without a drone in the air, a soldier is a "[dead man walking](#)." For American audiences, the role played by small drones in Ukraine is profound and initially hard to grasp. In Ukraine, drones have democratized ISR, enabling everyone—including front-line soldiers—to have their own eye in the sky, without competing for scarce aerial resources controlled by higher headquarters. It is a dramatically different landscape from tactics the U.S. military developed during the Global War on Terror, where total air superiority enabled commanders to rely on multi-million-dollar, high-flying systems, and front-line soldiers typically did not need to carry their own aerial ISR capabilities. Great power conflict flips the script.

## b. Ukraine's Lessons for Modern Warfare

Three lessons learned in Ukraine merit discussion:

1. *More is more.* In wars of technology attrition, the side that has access to, and the capability to build drones and autonomous systems at scale gains a strategic advantage. Ukraine loses thousands of drones a month, with some [estimates](#) as high as 10,000. Many of those are small, dual-use ISR drones made by DJI and other Chinese companies. Those drones are fundamentally hostile to Ukraine's interests. Chinese drones use software to prevent takeoff in Ukraine. If the drone does manage to take off, surveillance technology produced by DJI enables Russian forces to identify—and target—the operator within seconds. To defeat these measures, Ukrainian operators must perform surgery on the drone, installing features that trick the drone into believing it is in a country without geofencing. Getting it wrong is a death sentence.

But the most serious limitation associated with Chinese drones is supply. China has used trade as a weapon of war. In the early days of the war, Chinese drones were plentiful. DJI and Autel publicized their strong opposition to Ukraine's use of their products, but Ukraine and its supporters managed to buy huge stocks from global resellers. Things appear to be changing. In September 2023, China issued novel export controls on small drones, evidently aimed at strangling Ukraine's primary source of supply, illustrating the country's "no limits" [partnership](#) with Russia. Based on first-hand accounts, those controls have started to take effect, making it more difficult and more expensive for Ukraine to replenish Chinese systems.

2. *Communication resilience is table stakes.* In Ukraine, the electronic warfare (EW) environment is constantly changing, often every few weeks. This dynamic EW environment requires constant iteration and software updates. But AI is the true antidote in an EW environment. AI enables drones and autonomous systems to operate without traditional communications links to a controller or GPS. We recently released a new product, the Skydio X10, that embodies the improvements from our work in Ukraine and elsewhere around the world. Skydio X10 features a next-generation NVIDIA AI processor to detect and avoid obstacles and process information, coupled with the most advanced thermal camera on a small drone. An external radio antenna we designed increases range and reliability. Advanced software features make the system more resilient in the face of radio frequency and GPS-jamming that is a hallmark of the modern battlefield. Built on that strong foundation of software-defined technology, Skydio X10 passed demanding operational tests in Ukraine against high-end electronic warfare, leading Ukraine to request thousands of units to replace Chinese-made drones. Those same capabilities make the drone resilient in enterprise and public safety use cases.

3. *Drones must be democratized.* In Ukraine, every soldier—from the frontline ground troops, to top commanders at headquarters—is monitoring, and reliant on, a drone in the air. In the trenches of the front line, small ISR drones flying overhead enable squad-level troop movements and identify targets for kamikaze and first-person view (FPV) drone strikes. Behind the front lines, kilometers away, mid- and long-range drones are conducting broader battlefield surveillance and reconnaissance. Feeds from these drones are provided to brigade headquarters for operational commanders to direct battlefield maneuvers and call for fire.

Ukraine’s experience shows that drones must be democratized. The integration of drones throughout every troop echelon can determine the difference between success and failure at the tactical and operational level. Unlike the wars of the past, drones cannot be limited to select units. Operating a drone is as basic—and as important—as operating a rifle. We should not limit drone training to select troops. It must become a shared skill. Some drones are larger and harder to fly and will remain the purview of specialized forces, but every soldier should know how to employ small, unit-level systems.

These lessons from Ukraine serve as a wakeup call. We need to train and equip our forces for the next fight, not the last. I’ve had the privilege of sharing these lessons with our partners in DOD, and I know they are working around the clock to make the changes we need. The only question is whether they have the funding—and the mandate—necessary to meet this challenge.

### **III. Building the Future Force: Recommendations for Accelerating Drone Procurement**

Although I believe the Defense Department is committed to internalizing the lessons learned in Ukraine, much work remains. Open source projections [suggest](#) that the U.S. military’s existing stockpiles of drones would last less than two months at the rate of attrition to that faced in Ukraine. Investments are needed in several areas to ensure we have the requisite number of capable drones for modern warfare. DOD and Congress—with its power of the purse—are necessary to make that a reality.

I have three primary recommendations: (1) surge American drones to Ukraine; (2) integrate drones at every level of the military; and (3) utilize non-traditional procurement pathways for drone acquisition. I expand on these three recommendations below.

1. *Surge American Drones to Ukraine.* The United States should surge drones to Ukraine, in particular the small, dual-use ISR drones critical to Ukraine’s ability to defend itself. Despite Ukraine’s desperate need for these systems and the benefits it would provide to our own military, to date, DOD has not provided small, dual-use ISR drones to Ukraine.

- a. Delivering American small drones to Ukraine does much more than aid in Ukraine's defense. In fact, it is essential to strengthening our own defense. Deploying American-made small drones to Ukraine results in battle-tested products capable of operating in great power conflict. The sooner we learn and adopt these lessons, the stronger our deterrent posture becomes, and the more likely our enemies will think twice before threatening America and our allies.
  - b. Surging drones to Ukraine will naturally enhance the American drone industry's ability to scale manufacturing and offer secure alternatives to the unsecure Chinese drones that dominate the global market. Scalability not only drives down the cost of the systems—which indeed benefits the American military—but sets the foundation for American industry to meet the extraordinary requirements that will face the United States in a time of conflict.
2. *Integrate drones at every level of the military.* Every soldier should have access to attritable, autonomous ISR drones. That will require meaningful increases to existing programs. Dramatically increasing procurement levels, supporting the development of adjacent capabilities, and expanding procurement pathways will put the entire U.S. military on the right path to ensuring the force is properly equipped for modern warfare.
- a. *Scale drones across the military.* To date, existing programs have purchased thousands of drones. As Ukraine has demonstrated, that is a fraction of the amount of systems needed for a protracted great power conflict. Without significant increases—and the establishment of additional, similar programs—the U.S. military will not have the required mass of drones to be decisive on the battlefield.
  - b. *Extend strategic stockpiling to include drones.* Stockpiling munitions remains essential, but is no longer sufficient. The Defense Department should expand stockpiling to include capabilities necessary to close the kill chain, beginning with small, unit-level drones and expanding to other attritable, autonomous systems. Congressional leadership could play a key role.
  - c. *Support next-generation wireless capabilities.* Chinese-made drones often contain advanced wireless solutions based on custom silicon developed by Chinese companies, including those sanctioned by the U.S., such as Huawei. Custom-silicon wireless solutions offer greater range and reliability in a smaller, lighter form factor. Congress should ensure that the DOD supports the development of a silicon-based wireless solution for small drones and other robotics. Those solutions would benefit the entire drone and robotics ecosystem—not just a single company—and would enable a key enhancement in autonomous military systems for our nation's warfighters.

3. *Support the use of existing and novel acquisition authorities and pathways.* Drones and robotic systems improve at a stunningly rapid pace. Acquisition practices need to keep up. Acquisition pathways that provide for speed and flexibility should always be a highest priority when integrating these capabilities throughout the force.
  - a. *Use the fastest existing pathways.* Defense Logistics Agency's Tailored Logistics Support (TLS) Program represents a promising, rapid pathway for drone acquisition. This \$33 billion indefinite delivery, indefinite quantity (IDIQ) provides optionality for specific capabilities, rapid obligation of funds and 4-6 weeks in average processing time. It can also be used across procurement, operations and maintenance (O&M), and research and development accounts.
  - b. *Leverage O&M funding for Group 1 sUAS.* Authorizing O&M dollars for drone purchases will facilitate system replacement for operating forces, expanded training with small drones, and ensure that units can adopt drone capabilities across use cases, such as base security and asset inspection and maintenance.
  - c. *Adopt portfolio-based acquisition.* Over time, DOD should consider adopting portfolio based acquisition practices. Commercial off-the-shelf (COTS) technologies, like drones, represent a potential area to focus on first. As drone technology continues to advance, portfolio-based acquisition would provide the services with far greater flexibility, allowing units to onramp and offramp technology at speed and scale. If something works well and serves key operational needs within the portfolio, DOD would buy more. If it doesn't work well or no longer meets a need, DOD could easily cancel it. This is not to suggest there is no place for programs of record. They can play a valuable role, but need not govern every mission requirement and technology area. In areas with fast-moving technology, portfolio-based practices would enable the Department to equip forces at the speed of innovation.

## **Conclusion**

The best day to begin preparing for the future is today. To ensure our nation deters or prevails in a great power conflict, we should surge American drones to support our Ukrainian allies, scale drones capable of performing in a contested environment across our own military, and adopt accelerated acquisitions pathways. In 27 years of military service, I watched our nation rise to the occasion countless times. I am confident we will do it again.