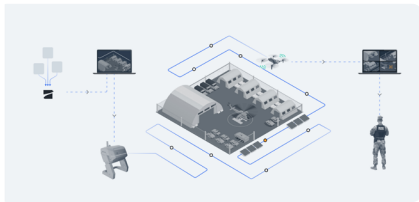


Base Defense with Autonomous Flight

Respond more quickly to threats, enhance manpower, and provide situational awareness for security forces



Operational small UAS Programs of Record are needed to enable sUAS across the enterprise, empowering wing commanders and subordinate leaders to:

- Capture data for better decision-making that can save lives.
- Maintain a force postured for rapid global mobility.
- Optimize readiness to overcome limited personnel and resources.
- Provide organic security for increasing and more diverse mission demands.



Reliable Perimeter Security Protects Lives and Mission Critical Assets

Gaps in perimeter security can also affect the safety of people and critical assets deeper inside the fence line, such as the [recent shooting at JBSA⁸](#), [intrusion at Quantico⁹](#), or the [breached gate at Tinker AFB.¹⁰](#)

Executive Summary

The Air Force is facing manpower challenges, increasing fatigue of security personnel, and a widening gap between the amount of base and facility security required for Agile Combat Employment.

Security Forces is the largest career field in the Air Force; it is also one of the most overworked. This is compounded by manning 12-hour shifts versus the recommended and proven shift duration of [8 hours¹](#). Providing leaders with new and innovative tools while improving procedures could result in a less manpower-intensive and a more comprehensive approach to base security that will [avoid levying additional burdens on SF members.²](#)

The amount of area to cover for both garrison and forward deployed facilities cannot be effectively patrolled or secured by personnel alone. To illustrate this point: MacDill AFB has seven miles of unsecured shoreline, Joint Base Andrews has a special focus on providing security for the President and senior leaders while also maintaining security for the remainder of the facility, Patrick Space Force Base has a waterfront and a boat security mission, and Joint Base Charleston has miles of riverine access that must be managed via joint USAF / Navy patrols.

The Challenge of Base Defense and Perimeter Security:

- Resource constraints: Traditional methods require costly investments in personnel and systems, forcing leaders to make [tradeoffs in safety and security.³](#)
- Limited coverage: The large footprint of CONUS installations, along with [challenges of providing security⁴](#) in contested environments limits timely and comprehensive response to incidents or threats.
- Lack of situational awareness: Disjointed systems have limited / delayed information, slowing or preventing accurate decision-making and [increasing security risks⁵](#) for the entire installation, assets, and mission.
- Safety risks: Dead zones, difficult to reach areas, and remote locations pose threats to critical or high-risk situations.

The old approach to solving the challenge:

- Manpower: Reassigning or shuffling personnel, increasing shift hours. ([Reducing unit capability and increasing fatigue⁶](#)).
- Logistics: [Investing in or assigning more equipment⁷](#), fencing, barriers, etc. (Increasing infrastructure and maintenance costs).
- Funding: Outsourcing portions of the security mission. (Increasing complexity and risks).
- Disjointed Procurement: Buying drones / docks that won't scale or solve for future requirements.
- Note: Alternative technologies can provide surveillance, detection, deterrence, and response to intrusions. However, they may have limitations, such as blind spots, slow reactions, high cost, and environmental interference (ex, stationary CCTVs, electric fencing, movement sensors, high-intensity lighting, etc.).

Benefits of Small UAS for Base Defense

Expand situational awareness:

Rapidly expand security coverage for large geographies, restricted areas, and / or perimeter security in a deployed or garrison environment, either pre-planned or on-demand.

Provide safer options for personnel:

Reduce personnel and resource burdens. Extend capabilities of security forces while reducing risks and increasing distributed situational awareness. Be a force multiplier for security missions.



Small UAS for Base Defense

Specifications / Requirements

- Mission-ready, out of the box
- Small UAS, 5 pounds or less
- Rapid deployment within seconds
- Reliable in all-weather environments
- Simple to operate, with minimal levels of proficiency or training time
- Robust GPU and platform processing power; engineered to meet current and future requirements
- Real-world proven communications, EW, and GPS-denied resiliency capabilities
- Portability and versatile form factor to fit into combat equipment, small compartment, or man-packable for airborne operations
- Capable of autonomous flight with active obstacle avoidance
- Configurable platform with optical, infrared, and thermal sensors, external communications, lighting and navigation option

Addressing Base Defense and Agile Combat Employment with Small UAS Operations

A versatile, safe, easy to fly small UAS with autonomous capabilities can augment overstressed Air Force Security Forces and enhance Agile Combat Employment by:

- Placing highly capable, reliable, software defined systems, enabled with robust AI, neural networks and deep machine learning in the hands of individual defenders. Designed to answer today's security challenges and grow with the enterprise to outpace future threats
- Conduct missions that can be planned, scheduled, or event-triggered. Executing autonomous skills, fly waypoint routes, or deliberate search and scan operations. Already combat tested and proven in C3E theaters today.
- Centralizing control to decentralize execution with remote drone operations solutions. Delivering secure, browser based asset-task management as a force multiplier for defenders in the field or in the fight.



An example of this type of combined human-machine team is [Project Base Oversight of Autonomous Response \(BOAR\)](#)¹⁴. Skydio solutions have played a leading role in this combined effort between the 88th Air Base Wing, Air Force Research Laboratory, Air Mobility Command, Air Force Installation Mission Support Center, and Air Force Materiel Command. The intent of BOAR is to create an enterprise C2 solution for unmanned, autonomy enabled operations on USAF installations. This program recommends the integration of small, unmanned aircraft systems into wing missions to improve effectiveness and readiness, increase efficiency, and enhance resilience. BOAR is currently evaluating the use of hand-launched sUAS, which has implications for a wider reaching program. The project also focuses on enabling operations beyond the visual line of sight, which is critical for expanding the operational envelope of unmanned systems in military contexts.

Small UAS for Enhanced US Air Force Base Defense

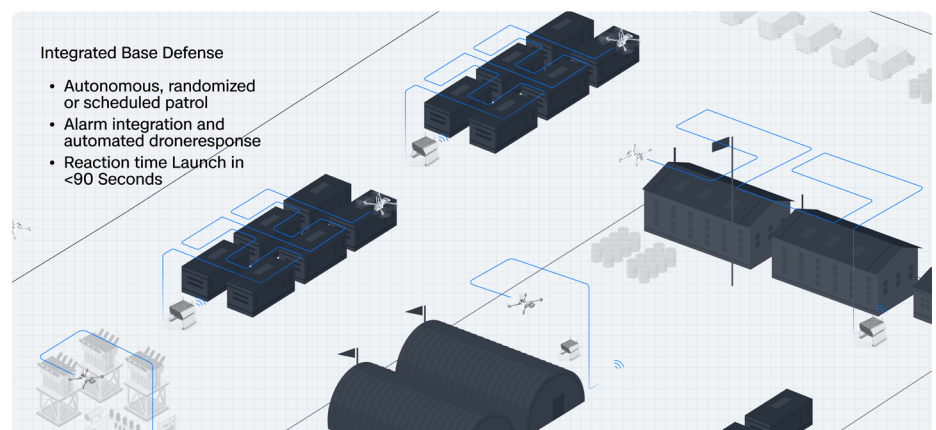
The following recommendations are provided when evaluating sUAS and the future of base defense. The system must:

Enable Comprehensive Data Collection: The drones' ability to capture and redistribute high-resolution visual and thermal data in real-time across a variety of networked systems to enhance the accuracy and timeliness of intelligence gathered, supporting better-informed decisions at the tactical, operational and strategic levels of decision making.

Leverage World Class Obstacle Avoidance: World class obstacle avoidance enhances the ability of security forces personnel to locate, access and secure physically complex environments via an aircraft able to operate in and around unknown areas with precision, agnostic of an operator's proficiency. This helps not only ensure mission accomplishment, but protects the Airman while mitigating risk of damage or loss to the drone as well.

Empower Rapid Deployment: Mission-ready systems that can be hand launched by a single operator in response to pre-planned missions or ad-hoc triggers in under 40 seconds. Bringing organic ISR down to the tactical level to solve for time critical problems and satisfy the demands of relevant OI's.

Implement Remote Operation and Safety: In the future, through a COTS remote operations-capable system, operators will be able to control drones from any location, minimizing the need for personnel to be in hazardous areas.



Contact sales@skydio.com today to learn more.

For more info: <https://www.skydio.com/solutions/defense/base-defense>

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¹https://www.airuniversity.af.edu/Portals/10/ASOR/Journals/Volume-2_Number-3/ASOR_Volume_2_Number_3..pdf ²<https://www.airandspaceforces.com/air-force-security-forces-reform/> ³https://www.airuniversity.af.edu/Portals/10/ASOR/Journals/Volume-2_Number-3/ASOR_Volume_2_Number_3..pdf ⁴https://www.af.mil/Portals/1/documents/2023SAF/OPERATIONAL_IMPARITIVES_INFOGRAPHIC.pdf ⁵https://www.rand.org/pubs/research_reports/RRA793-1.html ⁶<https://www.airandspaceforces.com/air-force-security-forces-reform/> ⁷<https://apps.dtic.mil/sti/tr/pdf/ADA357628.pdf> ⁸<https://www.foxnews.com/us/shooter-fires-jbsa-lackland-air-force-base-prompting-exchange-gunfire> ⁹<https://www.foxnews.com/us/suspected-human-smuggler-breaches-air-force-base-week-after-illegal-migrant-hops-fence> ¹⁰<https://www.koco.com/article/tinker-air-force-base-lockdown-driver-breached-gate/61614909> ¹¹<https://afresearchlab.com/technology/project-boar/>