

# AFRL

## SKYBORG: OPEN...RESILIENT...AUTONOMOUS

### What Is Skyborg?

Skyborg is an autonomous aircraft teaming architecture that will enable the Air Force to posture, produce and sustain mission sorties at sufficient tempo to produce and sustain combat mass in contested environments. This foundation will deliver unmatched combat capability per dollar by lowering the barriers to entry for industry and allowing continuous hardware and software innovation in acquisition, fielding and sustainment of critical mission systems. To fast track this game-changing capability, the Department of the Air Force designated Skyborg as one of three initial Vanguard programs in 2019. These priority initiatives integrate several technology components across multiple domains to create complex, multidisciplinary solutions. Marked by an enterprise-wide commitment, Vanguards deliver advanced capabilities that transform future operations with cutting-edge technologies. As autonomy technology matures, Skyborg will bring cutting-edge capabilities to the fight at a faster pace and lower cost.

### How Does the Technology Work?

Military pilots receive key information about their surroundings when teamed aircraft with integrated autonomy detect potential air and ground threats, determine threat proximity, analyze imminent danger, and identify suitable options for striking or evading enemy aircraft. Embedded within the teamed aircraft, complex algorithms and cutting-edge sensors enable the autonomy to make decisions based on established rules of engagement set by manned teammates. Field tests will ensure the algorithms' accuracy and verify that the system continuously operates within the constraints established during mission planning. Skyborg will not replace human pilots. Instead, it will provide them with key data to support rapid, informed decisions. In this manner, Skyborg will provide manned teammates with greater situational awareness and survivability during combat missions.



*A Skyborg conceptual design for a low cost Unmanned Combat Aerial Vehicle (UCAV). (Artwork courtesy of AFRL)*

### How Is the Air Force Advancing this Technology?

Skyborg has established an open approach to autonomy architecture, building a system that is portable across aircraft platforms, modular in its design to enable composition of multiple software applications, and adaptable to new capabilities and mission types. The Skyborg approach builds on a foundation of research and development across the DoD to build a scalable autonomy core architecture. Through a rapid experimentation campaign, the Skyborg system has been adapted for flight on mission-relevant aircraft and demonstrated initial capability to build warfighter trust and discover capability gaps in autonomous systems. The Skyborg Vanguard is a fully integrated team of AFRL and Air Force Life Cycle Management Center (AFLCMC) personnel to bridge the gap between development and acquisition. Forming these working relationships early will foster a seamless transition of products and knowledge as the Vanguard progress into an acquisition program.

### Why Is Skyborg Important to the Air Force?

Autonomous systems can significantly increase capability and be a force multiplier for the U.S. Air Force. By emphasizing future scalability through a portable, modular, and adaptable autonomy system, Skyborg represents a transformational way for the U.S. to prepare for potential engagements with near peer adversaries.

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