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## U.S. Air Force Collaborative Combat Aircraft (CCA)

### What Are Collaborative Combat Aircraft (CCA)?

The U.S. Air Force is developing a new type of semiautonomous, uncrewed aircraft (UAV) called Collaborative Combat Aircraft. The Air Force contends that CCA is being created as a so-called “loyal wingman,” a large UAV that could fly alongside new and existing crewed fighter jets. The Air Force describes CCAs, powered by jet engines, as potentially able to fly alone or in small groups, and potentially equipped for a variety of missions, including air-to-air combat; air-to-ground combat; electronic warfare; targeting; and intelligence, surveillance, and reconnaissance. The Air Force says CCAs’ AI-driven software would enable collaboration with, and take direction from, human pilots and would serve to expand the fighter fleet and protect human pilots at a lower cost than current fighter jets. Air Force Secretary Frank Kendall stated that there is a “planning assumption” of 1,000 CCAs, a number derived by projecting the use of two CCAs for each of 500 advanced fighters.

CCAs are part of the service’s Next-Generation Air Dominance (NGAD) family of systems, which also may include a future crewed fighter platform, sensors, weapons, and more. The U.S. Air Force requested \$557.1 million in its FY2025 research, development, test, and evaluation (RDT&E) budget request for CCAs. Congress may approve, reject, modify, or choose not to act on the request.

### Changing Concept of Operations

Aircraft are expensive to develop, buy, and operate. Since the 1990s, the U.S. Air Force’s fleet has decreased, in part because of those costs. Kendall has stated CCAs would cost roughly one-third the price of crewed fighters. Service officials also indicate that training on CCAs would occur virtually, so the airframes themselves would fly less, potentially leading to lower maintenance and sustainment costs. The Air Force could therefore potentially purchase them in quantities large enough to buttress its fleet.

China’s use of anti-access/area-denial (A2/AD) capabilities, such as long-range missiles and sophisticated air defense systems, has challenged the U.S. Air Force’s ability to achieve air superiority (i.e., the ability to control a certain air space to conduct operations without interference from air and missile threats). A larger fleet that includes CCAs and crewed fighters could potentially help the Air Force to gain air superiority.

The Air Force is also pursuing a concept of operations—similar to those being implemented by other military services—called agile combat employment (ACE). Under the ACE concept, operations shift from large, centralized physical infrastructures to a network of dispersed locations.

CCAs in those dispersed locations could help the U.S. Air Force add sensors and weapons to its combat aircraft fleet. According to Commander of Air Combat Command General Kenneth S. Wilsbach, additional aircraft could cause confusion for enemy aircraft and assist the fight for air superiority. “You can create mass, and so many targets out in the battlespace that your adversary will have to worry about, and wonder, is that something that I have to use some munitions on,” Wilsbach said in 2023, when he was Commander of Pacific Air Forces.

### Initial Research and Development

The Air Force and Air Force Research Laboratory (AFRL) has conducted numerous efforts to develop and test autonomy, software, and modular upgradable platforms during the past decade. The Air Force has sought to develop a pipeline of technologies feeding into CCA, because the integration and employment of autonomous systems in flight is relatively new.

Those efforts include a project to refine underlying technologies such as digital engineering, agile software, and open mission systems. Another project put AI to the test in three converted F-16 aircraft. The project collected data and conducted artificial intelligence experiments to help teach pilots how autonomous software behaves and reduce risk for CCA. For yet another AFRL project, the service sought to demonstrate rapid development of a low-cost aircraft with an open software architecture. General Atomics Aeronautical Systems (GA-ASI) participated by designing, building, testing, and flying the experimental XQ-67A aircraft, which formed the basis for the company’s CCA bid.

### CCA Acquisition Strategy

As noted, Secretary Kendall stated that the Air Force is using a “planning assumption” of 1,000 CCAs when analyzing “basic organizational structures, training and range requirements, and sustainment concepts.” In January 2024, the service awarded initial contracts to five companies to design and build CCAs: Anduril, Boeing, GA-ASI, Lockheed Martin, and Northrop Grumman. In April, the Air Force announced that two of those companies—Anduril and GA-ASI—won contracts to build production-representative test articles. According to a press release announcing the contracts, the Air Force “is on track to make a competitive production decision for the first increment of CCA in fiscal year 2026 and field a fully operational capability before the end of the decade.” Kendall told Members of Congress that the Air Force anticipates ordering more than 100 CCAs for Increment 1 in the next five years.

The service says vendors not selected would still be eligible to compete for Increment 1 production contracts and future increments. Air Force officials have said that a contract for a second increment could be awarded in 2025.

**Increment 1**

**Figure 1. Anduril Fury**



**Source:** Anduril concept.

**Anduril**

In September 2023, Anduril purchased Blue Force Technologies (a small, North Carolina-based company), which had developed a large uncrewed aircraft called Fury. Anduril said it invested in Fury to make it “a high-performance, multi-mission” aircraft that could serve as CCA. Anduril also produces Lattice, an open systems software program that the company says can be used by multiple sensors and domains for command and control. The company has stated it intends to leverage Lattice software for Fury.

**Figure 2. GA-ASI XQ-67**



**Source:** GA-ASI concept.

**GA-ASI**

GA-ASI officials confirmed that the company based its CCA bid on the experimental XQ-67A platform, which emphasizes endurance rather than speed and maneuverability. The resulting XQ-67A flew for the first time on February 28, 2024. A GA-ASI official said in a June 2024 podcast that production of its first CCA has begun.

**Increment 2**

The Air Force has announced plans to start “initial activities” for Increment 2 in 2024. The service indicated it intends to work with more than 20 industry partners,

including those not initially selected for Increment 1. The Increment 2 award could be a more complicated platform that incorporates stealth technologies. The service has said it is exploring international partnerships on the CCA program.

**Funding Information**

In FY2024, Congress is providing the Air Force with \$2.3 billion for research and development of the service’s NGAD efforts. That total includes \$392 million to conduct CCA studies, award contracts, and begin risk-reduction efforts. According to one report, the service on June 28 asked [link requires paid subscription] Congress to shift an additional \$150 million to CCA in FY2024 “due to higher than planned costs.”

**Table 1. FY2025 NGAD Funding Request**  
(in \$ millions)

	FY2025	FY2026	FY2027	FY2028	FY2029
NGAD	2,749.2	3,189.3	3,741.9	4,201.4	5,723.1
CCA	557.2	494.9	1,654.6	3,046.3	3,106.3
Total	3,306.4	3,684.2	5,396.5	7,247.7	8,829.4

**Source:** Department of Defense FY2025 Budget Estimates, Air Force, Justification Book 2 of 4, Research, Development, Test & Evaluation, Air Force, p. 427.

**Legislative Activity**

The House Armed Services Committee, in its report on a FY2025 National Defense Authorization bill, H.Rept. 118-529, instructs the Air Force to draw on existing propulsion systems for CCA development to maximize affordability and minimize risk. The same report seeks a briefing on Air Force and Navy plans to incorporate modular open systems architecture standards into requirements for CCA.

**Issues for Congress**

The cost of CCAs is surpassing the FY2024 appropriations. Congress may consider whether or not to reprogram the funding, oversight of future cost growth, and oversight of the service to ensure requirements are achievable.

CCAs are intended to be semiautonomous, with humans involved in their operation. As AI-enabled software technology progresses, future CCAs may be able to respond faster and more effectively to battlefield changes than human operators. Members may consider the risks and benefits of relying more heavily on autonomy.

Congress may also consider whether the Air Force has adequately planned for testing and employment of CCAs in large numbers, as well as the challenges of storing and transporting hundreds of large UAS. Congress could also consider seeking a report from the Air Force on CCA storage and sustainment plans.

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