Air Mobility Command Ponders ‘On Aircraft’ Counter Drone Capability

By John Knowles

The US Air Force’s Air Mobility Command has issued a Request for Information (RFI) for “On-Aircraft Counter-Small Unmanned Aerial System (C-sUAS)” solutions that could be used to improve aircrew situational awareness when operating near drones and to defend large aircraft against Group 1 and 2 UAS that could pose threats to the aircraft

The RFI seeks responses about C-UAS systems that can provide “the functional ability to detect, track, and identify sUAS (passive and/or active detection methods); and/or defeat sUAS threats or hazards (kinetic and/or non-kinetic means).” It also states, “Of primary interest is providing on-aircraft C-sUAS capability during critical phases of fixed-wing flight operations below 16,000 feet, with an objective capability for aircraft ground operations (taxi, parked with power on the aircraft, etc.).

According to a C-sUAS Concept of Operations (CONOPS) released by AMC on June 18, AMC believes that its aircraft are at risk from sUAS in a variety of situations and locations beyond the scope of area defense systems primarily positioned to defend airfields. The CONOPS problem statement says, “Small UASs of concern include small drones (primarily Groups 1 and 2) where the operator has no intent to harm aircraft (hazards), drones used to disrupt air and ground operations (surveilling sensitive missions, flying over restricted areas, etc.) without intent to cause aircraft damage, or drones used to intentionally attack aircraft in the air or on the ground.” (In several instances during the Russia-Ukraine war, for

example, FPV drones have been used to attack aircraft on the ground.)

In terms of airborne operations, the CONOPS states, “During flight operations, areas of most concern are on approach and landing (below 10,000 feet) and takeoff and climb (up to 10,000 feet). These are the more critical phases of flight where maneuverability is extremely limited. Additionally, AMC aircraft frequently conduct flight operations below 16,000 feet in the air littoral which is within the ceiling of many Group 2 drones. Due to limited maneuverability, the system will need to be able to defeat the UAS to reduce hazards to the aircraft.” It adds, “An onboard drone detection system that alerts aircrew to the presence of drones and provides drone location and numbers is a desired capability to enhance flight safety. A capability with similar functionality as a Traffic Collision and Avoidance System (TCAS) to visually display drone locations to allow aircrew to avoid the threat. Additionally, an onboard counter drone capability which could mitigate hazards to flight operations is highly desired. Since crews are task-saturated during these flight profiles, the system should require very minimal crew interaction to detect and defeat the threat/hazard UAS.”

The CONOPS also addresses sUAS threats when aircraft are on the ground. “AMC aircraft are vulnerable on the ground while taxiing and when parked. Numerous operations occur on parked AMC aircraft to include VIP arrival and departure, aeromedical patient removal and loading, hazardous cargo loading/unloading, troop/evacuee loading/unloading, etc. If the airfield has a robust C-sUAS defeat capability, it will likely provide adequate coverage for aircraft on the ground and may provide some limited protection to aircraft landing or taking off.”

In terms of c-UAS solutions, the CONOPS recognizes that some AMC aircraft, such as C-130 and C-17 cargo aircraft have ramps to facilitate roll-on / roll-off C-UAS systems, while other

aircraft, such as tankers and VIP aircraft do not have ramps and will require more portable C-UAS solutions. The CONOPS does not explain the likelihood of aircraft modifications to install a C-UAS system on the aircraft or, more importantly, to mount antennas in various positions around the aircraft's skin in order to achieve optimal antenna coverage.

Large aircraft operate in a variety of environments – from combat to disaster zones to civilian airports – and the CONOPS addresses C-UAS considerations, such as interference and fratricide. "In a combat environment, there are several ground-based capabilities currently available to detect and defeat drones. The concerns with collateral damage and interference with communication and navigation systems are less important in combat environments. Collateral effects and interference issues become vastly more challenging if the aircraft is operating out of an international airport or regional airports during peacetime or humanitarian operations. During humanitarian operations, friendly drones may be in use to assess damage, provide surveillance, or deliver aid. It would be counter-productive to defeat these drones, so [C-UAS] systems deploying some type of friendly drone detection with discernment not to attack blue drones would be beneficial."

The CONOPS concludes by stating, "AMC requires effective options that don't involve significant prior ground support, can effectively defend against future drone threats, and can operate in civilian peacetime environments."

The RFI states that AMC is interested in concepts or technologies that represent "…full or partial on-aircraft C-sUAS capability solutions. Partial capability solutions could include those that only satisfy a sub-set of the desired C-sUAS functions (e.g., only detect, track, and identify sUAS; no defeat); or are otherwise limited (e.g., operable only in-flight or during certain environmental conditions)."

The C-UAS CONOPS and RFI represent a significant development

for AMC. For several decades, its aircraft have been equipped with limited RF EW capabilities, and AMC’s survivability philosophy has mostly focused on situational awareness and operating from sanctuary whenever possible. The threat posed by Group 1 and 2 drones, combined with the anti-access strategies of potential adversaries such as China and Russia, is driving AMC to re-think its approach to aircraft survivability and mission resilience.

Responses to the C-UAS RFI are due by August 28. The Notice ID is 2024-AMC_cUAS_RFI. The points of contact are Joe Parker, (618) 256-8971, e-mail joseph.parker.15@us.af.mil, and Mr. Jim Holder, (618) 229- 1330, e-mail james.holder.9.ctr@us.af.mil.