

The Case Against a Cargo Unmanned Aircraft System

BY CAPTAIN ANDREW P. BETSON

Would the military really benefit from the procurement of an unmanned aircraft system specifically designed for delivering supplies to troops in remote and dangerous locations?

More than a decade of continuous combat on noncontiguous battlefields has revealed shortcomings and inefficiencies in the U.S. military's set of vehicles, organizations, and doctrine. Some of these shortcomings have been addressed through the increasing use of unmanned aircraft systems (UASs). While they are best known as surveillance enablers and for their counterterrorism role (epitomized by strikes aimed at Al Qaeda and Taliban targets in the Federally Administered Tribal Areas of Pakistan), UASs are sometimes seen as a potential solution to logistics challenges faced in some of the world's harshest terrain.

This article will address why using UASs for logistics is a concern for U.S. forces, state some of the military's considerations for using logistics UASs, examine how UASs would be integrated into the Army logistics system, and outline some problems with the concept. Although unmanned technological integration is currently popular, it is not sensible for the Army to pursue a supply-oriented UAS when the funds for such a project could be used to augment current rotary-wing assets.

Why UASs?

The main reason that UASs are being considered for materiel resupply is the terrain and enemy situation in eastern Afghanistan. For example, a company at Forward Operating Base (FOB) Tillman on the Afghanistan-Pakistan border relies almost entirely on aerial resupply because of a combination of dismal infrastructure and dangerous threat conditions. The requirement for aerial resupply in the region doubles in the winter months as the weather further limits ground transportation capability. The spring thaw, however, does not necessarily mean a reprieve since bridges may be washed out by melting snow, further isolating units.

Although logisticians can build a supply warehouse to compensate for weather delays, this does not always mean that supplies make their way to the Soldier. When

a patrol leaves FOB Tillman, for instance, it is limited to the supplies it can carry. When conditions change and the unit needs an emergency supply of water or ammunition, it is forced to seize high ground and wait on a helicopter or on the rare low-cost, low-altitude aerial resupply system. If enemy contact caused the condition, one can understand the appeal of an aircraft that can provide precise resupply while not placing a pilot at risk of being shot down.

The operational environment in Afghanistan also serves as a model for future conflict for the United States. It seems likely that conflicts involving ground forces will be unconventional (or hybrid) and take place in areas that lack advanced, modern infrastructure. Logisticians in such an environment typically lack a safe rear area characteristic of more conventional combat along more definable fronts. Even the existence of fairly modern railroads and highways does not eliminate the threat to such lines of communications posed by irregular fighting elements.

Considering a UAS for Logistics

The Army considers combined arms maneuver and wide area security as the main uses of a UAS, but it has further considered procuring a UAS capable of conducting tactical resupply. Field Manual Interim 4-93.2, The Sustainment Brigade, states, for instance, "The increased use of UASs as a supply distribution platform is of growing importance."

Although not doctrine, other sources for Army research and vision also mention a future role for distribution UASs. The Army Unmanned Aircraft Center of Excellence's 2010 concept paper, "U.S. Army Roadmap for Unmanned Aircraft Systems," defines efforts in the near term (5 years) to explore technologies to support sustainment and cargo operations. Official sources for research topics, such as the Army War College, suggest a UAS capable of carrying 60 pounds of supply to be considered as a tactical enabler.

The Army and Marine Corps have taken preliminary steps to implement this concept. Since 2008, both have observed demonstrations for an unmanned helicopter capable of carrying 3 tons at sea level and 2 tons at 15,000 feet. Lockheed Martin's optionally manned K-MAX helicopter is currently being tested by the Army and the Marine Corps in Afghanistan. It can operate for 12 hours and fly approximately 95 miles per hour with a load. Proponents argue that each K-MAX in the air reduces the number of trucks in dangerous supply convoys and that 16 to 20 K-MAX aircraft theoretically could handle the resupply mission in Afghanistan.

Why Not UASs?

The prevailing attraction of unmanned systems and the desire to keep as many people out of harm's way as possible support embracing a cargo UAS for future supply distribution. Organizational considerations and lift capacities, however, reveal why this should not be the case.

The successful performance of surveillance UASs, such as the RQ-11 Raven and RQ-7 Shadow, support the further implementation of similar platforms for other uses. The Raven and Shadow are lightweight systems that can be launched in austere locations (and even by hand in the case of the Raven). This allows the systems to be decentralized within the defense framework. Shadows are brigade-level assets belonging to the military intelligence company of a brigade's special troops battalion. Ravens are further decentralized, assigned to infantry companies (although some maneuver battalion commanders centralize them at the battalion level). This decentralization provides effective responsiveness for surveillance and reconnaissance.

The size of a UAS capable of carrying a worthwhile load of cargo could not be decentralized like these surveillance UASs. Lockheed's K-MAX, for instance, weighs 7,000 pounds (without a load), is 52 feet long, and has a wingspan of 48 feet. That makes it longer than both the Army's scout helicopter, the OH-58D Kiowa Warrior, and its attack helicopter, the AH-64D Apache Longbow. Such an aircraft requires an airfield and significant maintenance in a hangar. This, combined with pilot training requirements, would eliminate the potential to task-organize them in a sustainment brigade, let alone within a combat brigade.

The lift capacity of a UAS does not come close to that of existing cargo delivery options. Stating that a cargo UAS takes troops off the road incorrectly implies that the lift capacity approaches that of existing ground distribution capabilities. Assuming that cargo UASs would have to be organized outside of the combat brigades, the comparative distribution units would be those within the combat sustainment support battalions in the sustainment brigade. Light-medium and medium truck companies provide 190-ton and 395-ton capaci-

ties, respectively, for single lifts. The dramatic difference in lift capacity weakens the argument that a cargo UAS capability could replace or eliminate ground convoys.

When compared with current tactical aerial delivery vehicles, the K-MAX model fails to measure up. Assuming a combat patrol needs supplies and that Air Force delivery systems are unavailable, Army and Marine Corps helicopters are the delivery platform of choice. The K-MAX has only a 2-ton capacity, while a UH-60 Blackhawk helicopter can lift 4.5 tons and a CH-47 Chinook carries 13 tons.

These arguments seem to reinforce the idea that the capacity of the cargo UAS should be limited to 60 pounds. Perhaps the assumption is that limiting its capacity to 60 pounds of cargo would allow the UAS to be similar in size to the Shadow or Raven, and therefore, it could be decentralized. Although some examples can surely be given for needing a UAS to deliver only 60 pounds worth of cargo (such as a maintenance part to recover a vehicle), most circumstances would require much more than 60 pounds of cargo. To resupply a standard infantry platoon of 30 Soldiers, a 60-pound load would include approximately 1 bottle of water per person or just less than 2 magazines of unlinked 5.56-millimeter ammunition per person. This hardly demonstrates a revolutionary means of tactical resupply.

Although the concept of UASs continues to entice visionaries of future warfare and those interested in limiting Soldiers' exposure to danger, the comparative lift capacity and the organizational considerations for UASs capable of carrying a useful load make the procurement of a new cargo UAS seem ill advised. The military should continue to explore modifications to its current fleet to allow existing aircraft to be flown remotely.

One cannot forget, however, that any time an unmanned system is shot down, the sensitive technology and materiel on board demands its urgent recovery or destruction. Instances with downed UASs during operations in Iraq and Afghanistan have revealed that this often requires a patrol of troops on the ground—a risky task for recovering something that was meant to take troops out of harm's way.

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