

AT-10 VTOL UAS



The AT-10 is a versatile small UAS designed for significant range and payload capacity with operation from shipboard and austere airfields. It is vertical takeoff and landing capable, and can also take off and land as a fixed-wing aircraft from short fields. It transitions to fixed-wing forward flight for climb and cruise, and can quickly transition from forward flight to hover to observe nimble ground targets.

Electric motors driving twin propellers are powered with batteries or by a generator or fuel cells for long duration flight. The AT-10 presents less rotor strike hazard than helicopters do, and is smaller and requires less power than helicopters with similar range, payload, and duration.

Capabilities

- **Autonomous vertical takeoff, landing: No catapult or arresting gear**
- **Land under GPS, DGPS, or optical beacon guidance**
- **Loiter in hover or low-power, low noise forward flight**
- **Patrol at 15,000 feet fully loaded**
- **Heavy fuel generator supplying electric propulsion system**
- **Landing gear built into flight surfaces: No retracts needed**
- **36" by 10" by 10" payload bay**
- **Accommodates up to 9" EO/IR turret and 30 lb payload**
- **Max Speed: 135 kt Vne, 125 kt max level**
- **Climb: 1200 fpm SL**
- **Ceiling: 15,000 ft**

The Future of Small Unmanned Air Systems

The next generation of small unmanned air systems will feature the range, endurance, and sensory capabilities of Predator-class aircraft with satellite communication and video in vehicles that can be carried in a van or truck and need no runway or catapult, at one-twentieth to one-fiftieth the cost of a Predator. In addition to EO/IR sensors, radar and SAR systems now exist that can be carried by small air vehicles.

Acuity is seeking R&D funding to complete development of the AT-10 to create an operational vertical takeoff and landing UAS based on electric and fuel/electric hybrid propulsion capable of transitioning to fast, efficient forward flight. The AT-10 prototype has been flown in forward and hovering flight. The complete air system will consist of

- A vehicle using hybrid electric propulsion, capable of VTOL and efficient forward flight.
- Flight control hardware and software for vertical and forward flight.
- A power management system providing electricity for propulsion and payloads.
- Satellite control and video links for small UAS.
- State of the art batteries and electric motors for propulsion.
- On-board heavy fuel small engine based generator or fuel cell, per mission requirements.
- Industry standard ground station for flight operations, with a simulator for operator training.



Specifications

Wing Area:	9.5 sq ft
Wingspan:	9.3 ft
Fuselage Length:	8 ft
Payload Bay:	10" by 10" (3" corner radii) by 36", plus camera turret space in nose
Camera, comm, other payload:	30 lb
Batteries, Fuel:	40 lb
Max Gross Weight:	120 lb Forward Takeoff, 100 lb Vertical Takeoff
Max Range Cruise Speed:	83 kt
Max Endurance Loiter Speed:	58 kt
Stall Speed:	53 kt
Cruise Fuel Consumption:	3.75 lb/hr
Loiter Fuel Consumption:	1.75 lb/hr