

ASN# \_\_\_\_\_  
NOAA UAS Working Group  
Marine debris surveys, Northwestern Hawaiian Islands

## **Description of Aircraft System** (Revised 8/6/2007)

The unmanned aircraft system (UAS), *ATI Resolution*, will provide an aerial perspective to aid vessels involved in at-sea clean-up of derelict fishing gear and other marine debris. The airframe, control system, and base station are developed by Airborne Technologies Inc. (ATI) of Wasilla, Alaska. The system is based on proven technologies which are commonly used by manufacturers and suppliers serving the market for small unmanned aircraft.

A typical mission will involve daylight deployment of the UA with a minimum sky ceiling of 1500 ft and winds less than 15kts. The UA will be hand launched from a ship or small boat and immediate autonomous control will be engaged with a pre-designed survey route programmed into the UAS. If necessary, flight control can be taken over by the operator when the UA is within line-of-sight. New waypoints and search patterns can be uploaded to the UA on-the-fly. Upon reaching survey altitude, the UA will go into cruise mode and start image acquisition.

The airframe is a “flying wing” design made of composite material over a foam core (Figure 1). A center section houses the electronics and propulsion system. The approximate empty weight of the airframe is 5 lbs. The wing core is cut out of lightweight foam using a CNC machine. Carbon spars are added and fiberglass, carbon fiber, and Kevlar cloth with a wet lay-up is vacuum bagged over the core. The two wing halves are joined to the composite center section and are removable for transportation.

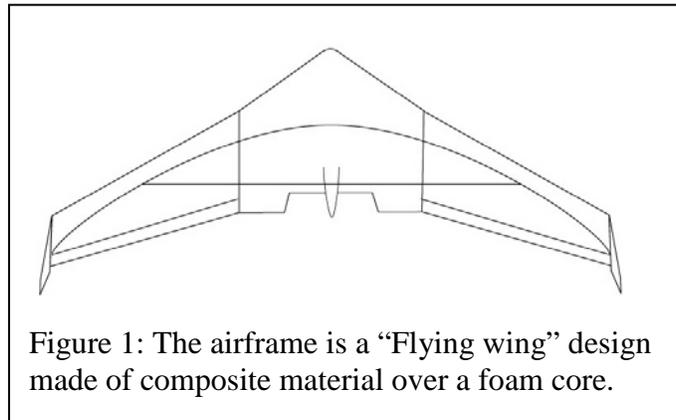


Figure 1: The airframe is a “Flying wing” design made of composite material over a foam core.

This method of construction allows for a lightweight yet strong design. The electric motor is mounted in the rear of the center section with a pusher style prop.

### General specifications:

- Gross Takeoff Wt: 10 lbs
- Wing span less than 8 ft.
- 1-2 hr endurance range at cruise setting
- Electric motor
- Simple user interface and operation
- Flight following software with operator capable input
- Hand launch from ship

- Recover at sea

The following performance specifications are based on thresholds set by the flight computer. The airframe itself is capable of exceeding these limits.

- Climb Rate: 500 Feet/Minute
- Descent Rate: 500 Feet/Minute
- Turn Rate: 5 degrees per second
- Cruise Speed (KIAS): 20-70 kts
- Operating Altitudes: 3000 ft
- Approach Speed (KTS): 25-30 kts