

Aircraft System

The Hornet Maxi sUAS is produced and manufactured by Adaptive Flight Inc. located in Marietta, Ga. The system is comprised of five main components:

1. The Aircraft (vehicle core), also consists of:
 - a. Body
 - b. Main Rotor
 - c. Tail Rotor
 - d. Flight Control System
 - e. Landing Skids
2. Ground Control Station (GCS)
3. Payload Control Station (PCS)
4. Gimbaled Payload



Characteristic	Measurement
Dimensions	H 25" x L 91" Rotor Span: 72"
Operational Weight	Approx. 30lbs
Operational Range	4-6 nm
Operational Duration	3-4 hrs.
Maximum Altitude	9000 ft. AGL

Materials

The main frame of the UA is aluminum tube. The frame is both welded and bolted together. The outer shell is constructed of carbon fiber reinforced fiberglass and is bolted in place on the frame to aid in cooling of the engine via air ducts.

The rotor head is all aluminum with all steel bolts and linkages. The main rotor blades are weighted carbon fiber with a steel bolt at the attachment point.

The tail rotor yoke assembly is all aluminum as well and is uses the same type of blade as the main rotor.

The main fuel tanks are aluminum 1.5 L saddle tanks fitted at the center of gravity (CG) under the main rotor. There is one on each side. The header tank is mounted in front of the engine lower on the frame.

Aerial Vehicle

The Hornet UAS is controlled via a commercial off the shelf (COTS) U-blox GPS. The operator provides GPS waypoints for a mission plan in the Flight Planning mode, and then waypoints are performed during the Waypoint Flight mode. Operator can manually operate the Hornet during the Manual Flight mode by holding a direction desired on the controller joystick.

The FCS20 is attached under the main frame near the CG. It is housed in a rugged case and soft mounted to protect the sensors. This case also houses all the communication links and high-speed processors that are required for operation. The FC20's main job is to stabilize flight, navigate, and monitor for unsafe

operating conditions. It takes 1-2 minutes to warm up the core before flight operation can be attempted. The Hornet or rotor blades are attached to main rotor head via steel bolts. Control of the helicopter is achieved via 4 servos linked to a swash plate that is then linked to the fly bar and the main rotor arms.

The Landing Gear is designed to absorb energy on a landing and is specifically designed for hard landings to protect the vehicle core and avionics.

Command Station for the Hornet contains the Ground Control Station (GCS). The user controls the aerial vehicle using the map-based interface. Battery life for the GCS is 2-3 hours. It communicates via hardwire Ethernet to the Wave Relay Radio.

The Wave Relay provides a long distance communication link between the GCS and aerial vehicle and uses a BB2590 battery. This battery is military grade rechargeable battery that can act as a back up power system for the GCS or a primary power source if 110VAC is not available. The base station should be mounted at an elevated level to provide adequate line of sight (LOS).

The UA will be carrying a TASE 200 Gimbal camera under the nose to provide the payload operator and customer great visibility. The TASE 200 is a 360 deg. Pan and 180 deg. Tilt camera. It has two sensors including a Electro optical camera and a FLiR IR camera. They operator can actively switch between the 2 with the Payload Control Station (PCS).