

Sky Hook Kitten Diesel Powered VTOL-UAV Helicopter



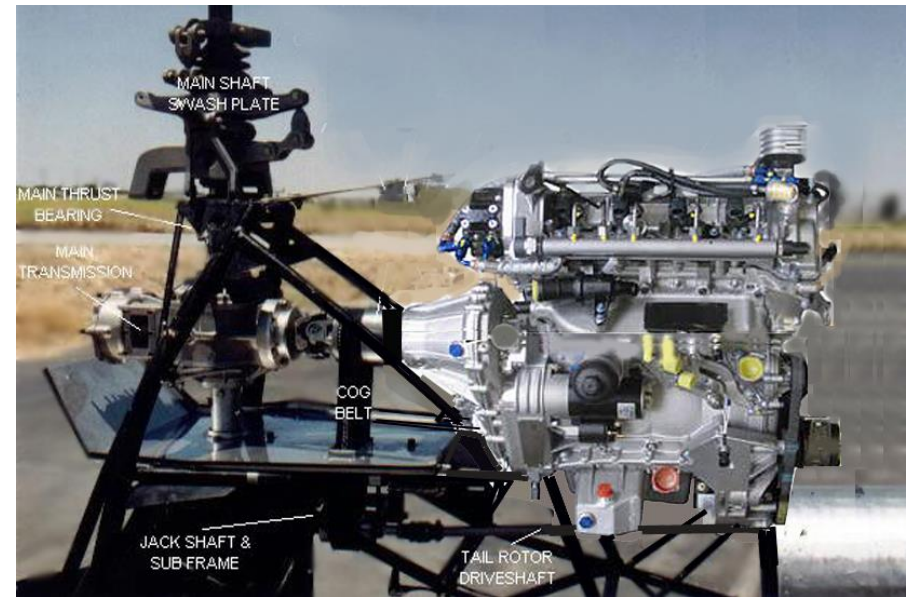
THE KITTEN DIESEL VTOL-UAV OBJECTIVES:

- Provide a rugged, quiet and cost effective all-weather, diesel powered VTOL-UAV helicopter designed for Surveillance, like a kitten capable of seeing in the dark and at great distances, born to be very curious. The KITTEN can also light up the sky and get your massage out.
Puma Aero Marine of Florida has developed an inexpensive, quiet, reliable and environmentally friendly VTOL-UAV (drone helicopter) using a rotor system that has been in operation in a two-man helicopter for decades.
- The KITTEN is designed to be easily operated by anyone with computer gaming skills. The KITTEN VTOL-UAV receives its commands from a computer keyboard and override control by a fly by wire joystick. Operation could be from any operational base, dispatch center, mobile based unit, a vessel or carry around hand held unit.

KITTEN VTOL-UAV Overview:

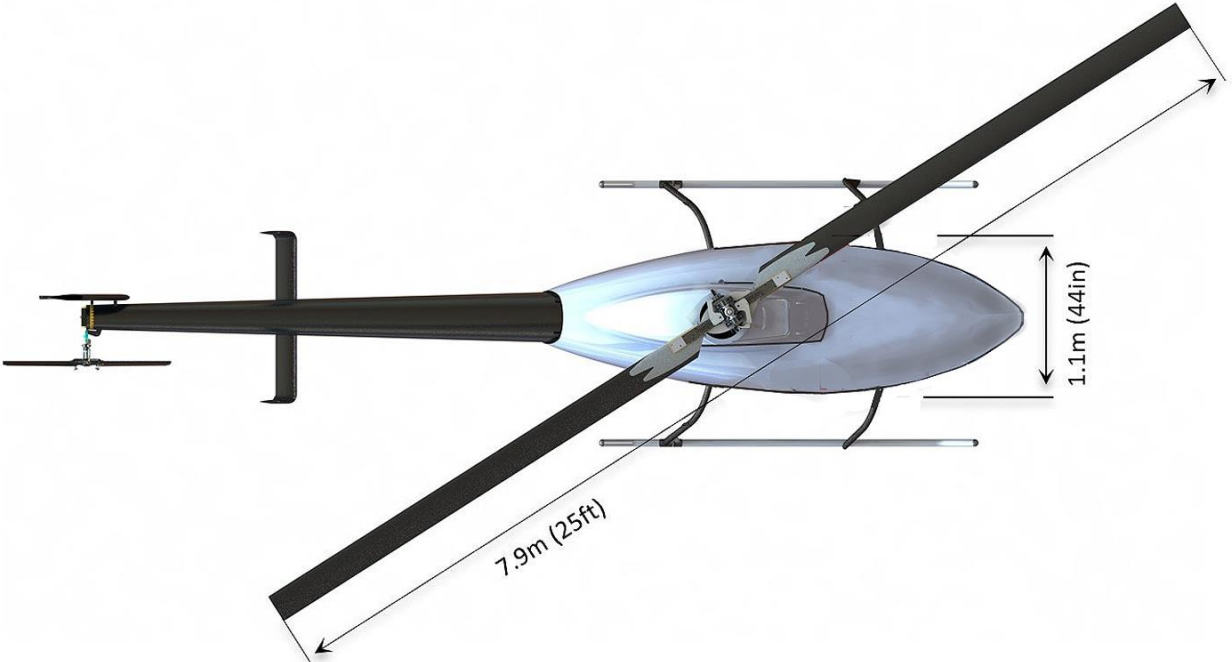
A rotor system tried and in operation in a two-man helicopter since 1980 with thousand of flight hours. The Continental Motors CD-155 liquid cooled diesel power package provides the ultimate in efficiency and reliability. This engine may be fueled with either Jet-A fuel or Ultra-low-sulfur diesel (ULSD) burning about 22 liters/per flight hour. (5.8 GPH) providing the KITTEN with a 6-hour flight endurance.

- The KITTEN has an extremely low operating cost of about \$110 USD per hour vs. \$950 USD for a manned helicopter of the same size. Plus, the KITTEN is easy to set-up and simple to operate for the “average person” with only minimal training required.
- The KITTEN VTOL-UAV receives its commands from a computer joystick and keyboard. The operator could be at any operational base, law enforcement dispatch center and/or mobile based unit.
- Training a Clients VTOL-UAV operators and maintenance staff is provided with three months of on-site training, while tailoring the client operating software for their mission(s), The “KITTEN” is designed to be easily operated by anyone with computer gaming skills.
- Operators VTOL-UAV training will be conducted onsite, utilizing a computer based comprehensive fight simulations. The VTOL-UAV operators should have a working knowledge of PC based computers. (Clients/Operators do NOT require any piloting skill as a prerequisite). Maintenance staff VTOL-UAV training for maintaining and repairing the VTOL-UAV and her major components will be in the classroom and through on the job training. Maintenance crews must have a working knowledge of PC based computers.
- Powered with a CD-155 Diesel turbocharged piston engine by Continental Motors Group and made in Germany. The CD-155 is a liquid cooled diesel engine for aviation with a maximum power of 114 kW (155 hp). The CD-155 turbocharged 4-cylinder in-line engine is EASA and FAA certified. The engine has a time between replacement (TBR) of 2,100 hr.
- Lighting from the sky provide by LED Flood Light, 50W/5700Lumen, 5000K
- Communication with Long Range Acoustic Device (LRAD) 1,200-watt PSAir32N siren and loud hailer system (non-lethal crowd control)



The Kitten

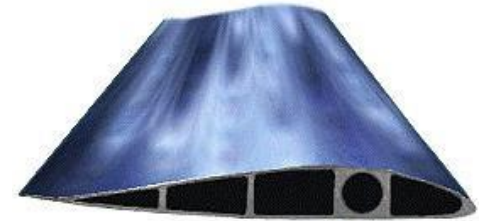
Surveillance VTOL-UAV
Diesel Powered



The Kitten Diesel VTOL-UAV SPECIFICATION

GENERAL CHARACTERISTICS:

- Simple to Operate: VTOL-UAV drone helicopter at “Very Low Cost”
- Fuselage chromoly tubing steel welded frame with reinforced Kevlar/Carbon Fiber hand-layup vacuum infused composite skin.
- Main Rotor Diameter blade: 25 feet (7.9 m meter)
- Tail Rotor Diameter: 50 inches (1.2 meter)
- Blades: Extruded-aluminum rotor blades (NACA 0012 Airfoil)
- Endurance – 6 flight hours mission capability
- Fuel: Diesel and/or Jet-A Capacity 136.2 liters (36 US gallons)
- Operating speed zero to normal operating speed 87 knots
- Data Link Range – line of sight from any repeater
- Power – Continental Motors CD-155 Turbocharged Diesel 114 kW (155 hp)
- Quiet rotor system and engine
- Retractable skids
- Auto Pilot – by Micro Pilot provides:
 - Fly by wire
 - WAAS GPS
 - Mission Program flight plans
 - Terrain Awareness & Warning System (TAWS)
 - Collision Avoidance System (CAS)
 - PID feedback loops for camera gyro-stabilization



PERFORMANCE:

- Hover in Ground Effect (HIGE) 9,000 feet
- Hover Out of Ground Effect (HOGE) 7,500 feet
- Service Ceiling 11,000 feet
- Rate of Climb 900 FPM
- Operating speed zero to normal operating speed of (90 mph) 87 knots
- Endurance – 6 flight hours mission capability
- Max IAS Sea Level – Standard Day (120 mph) 100 knots

BASIC DIMENSIONS:

- **Length:** 22 ft (6.71 m)
- **Rotor diameter:** 25 ft (7.62 m)
- **Height:** 103 inches (2.6 m)
- **Tail Rotor Diameter:** 50 inches (1.2 meter)
- **Skid Width:** 72 in. (1.8 meters)
- **Empty weight:** 1,170 lbs. (530 kg)
- **Useful load:** 1010 lbs. (458 kg)
- **Max. takeoff weight:** 1,630 lb (739 kg)

MAJOR FEATURES:

- Shaft Driven Tail Rotor: (With Cog Belt Drive)
- Reinforced Tail Boom with Cherry Max Rivets
- Retractable skids: (Optional, to provide unobstructed view for the sensors if required)
- New 28-volt aircraft battery
- Alternator 1,680 Watt/ 60 Amp
- Dual electric fuel systems
- External Battery Connection: (GPU)
- Electric Coolant Pump
- Auxiliary electric cooling fan for engine heat exchanger
- Operator's POV (Point of View) Mounted in the nose, a fixed mounted FLIR day and night camera for the drone's operator
- CAM 220 fixed payload camera (Full HD color by day/B&W by night) provides a view at the payload in-flight at pick and drop off.
- Low RPM, High Temp Coolant and Low Oil Pressure Warning Systems
- Transponder and WAAS GPS ADS-B out and in linked back to the operator



Autopilot:

MicroPilot's Helicopter Drone Autopilot provides extraordinary user definability.

- Integrated GPS (including GPS receiver, gyros, all sensors and GPS antenna)
- Autonomous takeoff and landing supported by AGL
- User definable PID feedback loops (for camera stabilization etc)
- RPV and UAV modes
- Change altitude at waypoint, change airspeed at waypoint
- User definable holding patterns
- User definable error handlers (loss of GPS, low battery etc.)
- Equipped with an ultrasonic altitude sensor, supports autonomous takeoff and landing
- 150 mips RISC processor accommodates your current needs and tomorrow's requirements
- GPS waypoint navigation with altitude and airspeed hold
- Powerful command sets
- Fully integrated with 3-axis gyros/accelerometers, GPS, pressure altimeter, pressure airspeed sensors, all on a single circuit board
- Extensive data logging and telemetry collects the data you need
- Includes HORIZON^{mp} ground control software.

Optional Equipment- (Sky Hook):

- Airframe cargo-hook PN: 099-196-351 capacity 272 kg.
- Sling Assembly w/ Remote Release Swivel Hook for Helicopter 15,000 lb length 2.74m WLL NSN 1670-00-123-7030

Maintenance:

- Easier system maintenance, with "black box" or cable change out/swap program
- Detailed diagnostic codes downloaded to a PC for quick, easy troubleshooting
- Dependable diesel power, direct injection requires no tune-ups.

Overhaul and Replacement:

Major Components (Engine, transmission, rotor-head & rotor blades) require overhaul and/or replacement every 2,100 flight hours. (Approximate cost is \$105.00 USD per hour of operation).

Every 2,100 flight hours, the Puma is required to be sent to an authorized facility for overhaul.

- Overhaul or Replacement: Engine, transmission, rotor head and accessories
- New Components: Rotor blades and batteries
- Upgrades: All current software upgrades are made

Spares:

Recommended spare parts required for equipment installed on the VTOL-UAV.

Warranty:

All fabrication work is unconditionally guaranteed for 12 months. Installed equipment by Manufacturer's Standard Warranty guaranteed for 500 hours of flight.

Support:

Provisions made to provide tools and equipment to support the VTOL-UAV operation. All specialty tools and maintenance manuals to include but not limited to operational flight software provision for particular missions.



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