

ROTORTALES

OF THE HUMMINGBIRD HELICOPTER

Fall 2022



Spotlight On Safety

This issue is about safety and what sets the Hummingbird helicopter apart from other experimental kit helicopters as well as certified designs. Thorough engineering and meeting FAA design standards makes the Hummingbird one of the safest helicopters available.

The following lists some of the extensive design testing completed on the Hummingbird;

- The fuel system is designed to the latest occupant safety and post-crash fire FAA regulations for Part 27 certified commercial rotorcraft.
- Transmission/Rotor containment in order to protect occupants.
- Seat mounting structure designed to collapse in the event of hard landing.
- Shock absorbing struts assist in the event of hard landing.
- Epoxy resins for composite components meet FAA fire resistant regulations.
- The firewall meets FAA Part 27 regulations.
- The fuel bladder is protected by 370 lb. puncture resistant liner.
- In the event of engine failure the blade pitch is automatically reduced to assist with pilot reaction time.
- FAA approved windshield & installation with wide area visibility, chin windows and sun roof.
- Lycoming aviation powerplant with excellent performance margins.
- Components tested to FAA standards for fatigue life substantiation.
- No mast bumping or flight restriction during maneuvers or wind gusts.

The following tests, analysis, and reports were performed during FAA

certification and by Vertical Aviation Technologies;

- Nose/Windshield structural analysis and FAA approval of new fuselage nose
- Cowling structural analysis
- Horizontal and vertical stabilizer structural analysis
- Tail cone support structural analysis/Finite Element Analysis
- IO-540 engine mount structural analysis/Finite Element Analysis
- Oil tank structural analysis
- Fan blade structural and containment analysis
- Mixing unit structural analysis
- Electrical load analysis
- Safety assessment

- Service life expectancy of the main rotor blade
- Pressure test of fuel bladder
- Maneuvering flight condition static test
- Drop test for ground loading conditions
- Static test of control system
- Seat and safety belt static test
- Main rotor pylon test of centrifugal unbalance
- Landing gear drop test
- Transmission main shaft test
- Transmission structural test



Airspeed Calibration



Autorotation Data Point

- Battery installation report
- Stabilizer load tests
- Endurance tests
- Cooling tests
- Performance tests
- Engine crankshaft torsional vibration test
- Engine calibration test
- Engine detonation test
- Oil tank pressure test
- Carbon monoxide test

- Fuel flow test
- Fuel tank calibration
- Exhaust back pressure test
- Handling Qualities test
- Height Velocity test
- Airspeed calibration
- Night flight
- Compass swing
- General casting tests
- Tail rotor endurance life substantiation



Hover Out Of Ground Effect 600' Data Point



Cooling Climb Test

- Rotorhead structural test with stress coat

- Tail pylon, intermediate, and tail gearbox strength substantiation

- Tail shaft critical speed
- Critical Whirling speed of main shaft
- Stress and motion survey of twisted rotor blades
- Stress and motion survey of rotary dampers
- Ground resonance test
- Taxiing on rough surface test
- Environmental tests of rotary dampers
- Physical and structural characteristics of main rotor blade extrusion
- Static test fittings
- Endurance life of main rotor blade retention
- Stress survey of blade lock
- Endurance life of tail rotor blade retention
- Fuselage static test
- Distribution of applied loads on aircraft for all design conditions.
- Operating manual performance calculations
- Ground test program
- 100 hour tie down endurance test
- Cabin vibration survey

So ask yourself, do I really need a certified helicopter with all of the strings attached for the type of flying I enjoy when a Hummingbird offers the same or better engineering, safety, performance and costs. Fly anywhere with no restrictions. Build it yourself while learning every aspect of it, maintain it yourself, make changes with no FAA involvement. Bring back the fun factor!

Oh, and the Hummingbird has no 12 year calendar inspection or 2200 hour overhaul and no mast bumping!

Air Conditioning

An electric air conditioning system is in the works in our R&D department, 14,000 BTU, 33 lbs., and uses less than 45 amps. Stay tuned!

IO-540 Retrofit Kit

Convert your 260L or LS7 powered Hummingbird with the new Lycoming IO-540. We have retro kits available. Go from 260 h.p. to 320 h.p. real quick. Contact us for further information.

New Interior Option

An interior option is now available. See our website @www.vertical-aviation.com under sales and options for pricing. It will include eight covered cushions that can include leather, side and ceiling panels, and carpet.

Newsletter List and Special Pricing

It has come to our attention that many past contacts were eliminated from our newsletter list. You have been added back. So welcome again. For those that were not on the list you were missing out on a discounted kit at \$199,000.00 including the engine.

As follows:

- Hummingbird 300L Kit
- New 320 horsepower six cylinder IO-540 fuel injected Titan aviation engine

with cold air induction system, lightweight starter, lightweight alternator & oil filter option.

- Wheeled landing gear with shock absorbing struts.
- Right rear fourth door option.
- Carbon fiber tail blades.
- Prebent angles.
- Engine cooling system baffles premade.

This kit has the latest 300L updates and modifications including new horizontal and vertical stabilizers, driveshaft cover, engine vented cowling. This is the classic Hummingbird kit with the 2022 300L modifications.

Discounted price - \$199,000.00. This is \$34,375.00 off the regular price.

We also have one Quickbuild at half price - \$33,375.00 Regular price is \$66,750.00

Contact us at sales@vertical-aviation.com or call 407-322-9488.

Investors Welcome

Since the purchase of the Sikorsky Type Certificate we are seeking qualified investors. Contact us at sales@vertical-aviation.com or call 407-322-9488.



Spacious Four Passenger Cabin: Quiet and very comfortable with an incredible 950lb useful payload.



Fully Articulated Rotor Head: This three bladed system is exceptionally smooth, with excellent auto-rotation characteristics.

IO-540 Engine.

Wheeled Landing Gear: Improved performance during take-off, landing and taxi operations. This is typically a feature only found on multi-million dollar helicopters.

Vertical Aviation Technologies, Inc.

CERTIFIED DESIGN AT A

HOMEBUILT PRICE

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Vertical Aviation Technologies, Inc., located in Sanford, Florida, is the manufacturer of the Hummingbird helicopter. The company was founded by Bradley G. Clark in 1987. We have sold over 350 helicopters worldwide from commercial helicopter operators to governments. We have an excellent reputation with the FAA and never had a fatality in any helicopter we have built or sold including the Hummingbird. Currently, Vertical Aviation Technologies, Inc. produces the Hummingbird S-52 series helicopters.

Vertical Aviation Technologies: Making the world more accessible.

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