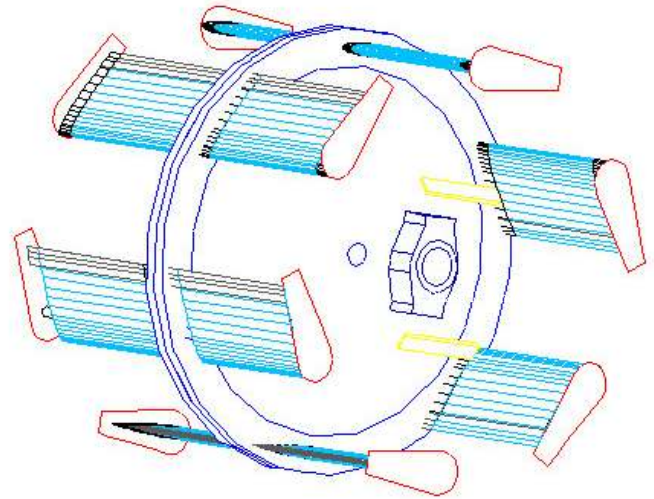


Half the power – Double the Thrust

The SKYBOAT Project by AEROTUBE TECHNOLOGY adapted new propulsion system

- *Each input Horsepower results in eleven pounds of output thrust rather than three.*
- *Propeller speeds read in hundreds of revolutions per minute rather than thousands.*
- *So quiet you can hardly hear it at maximum speeds.*
- *Able to redirect thrust anywhere within a 360-degree field of regard, almost instantly.*



These are the capabilities of the Cycloidal Propeller, now in development by Bosch Aerospace Inc. based in Huntsville, Alabama.

Real time testing has qualified the computer models, and systems have been evaluated for customers with a wide range of power output requirements from 40 - 16,000 lb. of thrust. The system is under continued development for the Navy, culminating

in a VTOL UAV equipped with three cycloidal units, capable of helicopter-like control but unprecedented attitude ability contained within a much smaller package.

Already an established propulsion system in marine applications, the cycloidal propeller is being developed for aviation where it shows great potential for high-maneuverability, low speed vehicles such as VTOL and lighter than air.

CYCLOIDAL



A cycloidal propeller seen here in action, running at approximately 300rpm on its test stand. This is one of the most recent evaluation models with carbon fiber components.

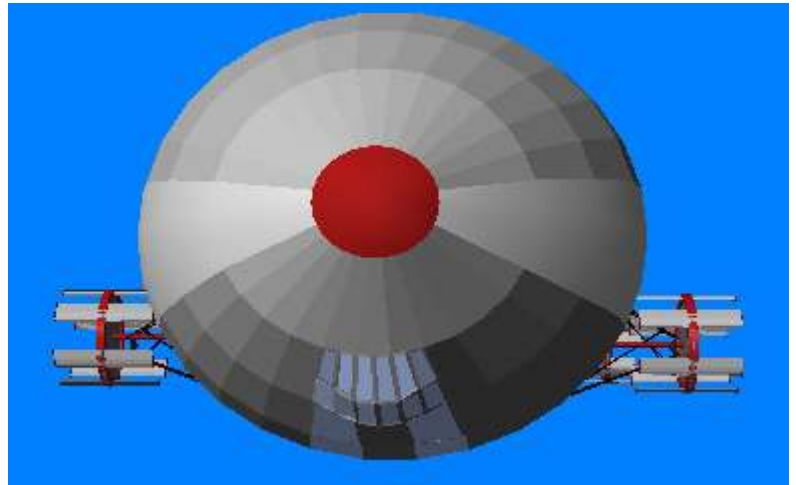
Picture by Bosch Aerospace Inc.

The SKYBOAT Project by AEROTUBE TECHNOLOGY LLC

Engine output is 70 HP, transmitted through a reduction gearbox and transfer case to two cycloidal props mounted on SKYBAOT a 140-foot long Lighter Than Air (LTA) vehicle.

The computer model would expect a six-foot diameter blade system to produce over 500 pounds of thrust at 320 rpm.

The Power input requirement to the blades is 33.5 horsepower each. These numbers are a computer estimation but are based on actual test data taken from a slightly smaller four foot diameter system previously run.



Skyboat 3D rendering with 4 cycloidal propeller system

The first prototype propeller was designed to run at 650rpm and develop 350 pounds of thrust from a four-foot diameter system.

The increase to a six-foot system will increase the output thrust and the engine torque required to drive it but the benefits of lower blade speeds will make for a propulsion system with a longer service life due to significant reductions in mechanical loading.

Total engine power (estimated):	70hp @ 5500
Total Torque (estimate):	67 lb/ft @ 5500
Total gear reduction:	17:1
Input power:	33.556 hp x 2
Output from 2 props @ 320rpm ea:	630-1024.59 lb.
Total torque required after gearing:	1101.52 lb/ft
Torque available @ 5500rpm (est):	1136.34 lb/ft



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