Cycloidal Propellers

This document (updated 24 Apr 2022) is for information about cycloidal propellers (CPs, also called cyclorotors) and their collective control for cyclogyro & cyclocopter aircraft but needed for airships. First awareness of them was from interaction with Roy Gibbens. However, he sadly died 20 Feb 2013. Interesting articles about his work are provided in the Airship Association's Mar 2003 Journal No: 139.

Youtube Videos:

Roy Gibbens	1	Introduction to the Cycloidal Propeller
Hu Yu Singapore and China	2	The tethered flight of cyclogyro
	3	Test flight of cyclogyro in countryside
	4	The cyclogyro fly
	5	Test Flight of cyclogyro
	6	Paddle-wing plane takes flight
Moble Benedic MD and TX USA	7	Cycloidal Rotor Aircraft (Cyclocopter or Cyclogyro)
	8	Cyclocopter micro air vehicle- University of Maryland
	9	Quad Cyclocopter Flight - University of Maryland
	10	Texas A&M- Moble Benedict, Aerospace Engineering
S Korea	11	Stable Hover Flight of Cyclocopter
Information	12	Cyclogyro
Nicholas Rehm	13	Cycloidal Rotor Drone: The Cyclocopter
Pitch Aeronautics	14	Up-Close and Touch-Based Drone for Robotic Tasks
Cyclo Tech	15	First Free Flight
eVTOL Innovation	16	CycloRotor: the future of eVTOL Electric Propulsion
Electric Aviation	17	The Engineering of ARF's Cyclocar VTOL

Hu Yu, who developed model Cyclocopters that flew with CPs, was a graduate researcher 2008 in Singapore. He subsequently developed bigger and better arrangements in China, where he now is an Associate University Professor.

Moble Benedict's research at the Maryland University also was well advanced (Thesis: mainthesis.dvi (cpb-us-e1.wpmucdn.com)). He now is an Assistant Professor at Texas A&M University. Nonetheless, it appears his focus is on rather small drones known as micro air vehicles (MAVs) for military rather than commercial aircraft purposes.

Other people, such as in S Korea, also have working models.

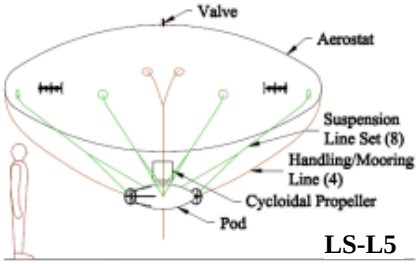
An issue was finding/getting businesses to develop them commercially, needing outlets – such as aircraft developers to buy, install and use them. However, most aircraft are unidirectional and don't need vectored thrust arrangements. Aircraft with vectored thrust (like the V22 Osprey) use swivelling screw propellers, probably because CPs weren't commercially available. The market for CPs thus wasn't obvious and not easy to develop, particularly when people use other methods. Nonetheless, since first writing this document (2018) there now are new businesses producing CP's, as shown in the extended list.

Airships are one of the few aircraft that usefully would benefit from them, including existing types (if they were modified). One of the reasons airships haven't yet become successful (except for limited uses) is because CPs still aren't commercially available. With CPs, which enable rapid thrust vectoring, airships would have better control and thus gain ability to do things they otherwise don't perform well at. Other developers likely then also would seize the opportunity to use them in new aircraft designs.

It should be noted that aircraft developers normally don't design/produce propellers or power and auto-control systems but do work cooperatively with suppliers for them.

LuffShips has numerous designs incorporating CPs, beginning with LTA drones – as shown right. These thus offer a way for businesses to supply us where, with an order for say 100 LTA drones, would be a CP production line situation worth fulfilling.

Please contact us as bellow if you can provide them.



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