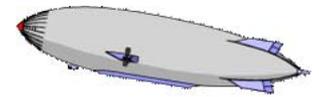


LTA Solutions

Lighter-than-air Technology

Cycloidal Propellers



This is for information about cycloidal propellers (CPs) and their collective control (needed by 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	https://www.youtube.com/watch?v=LcLi4ktZHG4
Hu Yu Singapore and China	2	https://www.youtube.com/watch?v=yuFLO9tKYpE
	3	https://www.youtube.com/watch?v=bPdczsY3sOQ
	4	https://www.youtube.com/watch?v=mEC1fhlyfIY
	5	https://www.youtube.com/watch?v=9ZYRii4MjLY
	6	https://www.youtube.com/watch?v=tmMChKqjwBQ
Moble Benedic MD and TX USA	7	https://www.youtube.com/watch?v=sF8TV2PVWII
	8	https://www.youtube.com/watch?v=nDhlehsYiGc
	9	https://www.youtube.com/watch?v=E9Jmg-0NGWc
S Korea Information	10	https://www.youtube.com/watch?v=nzkuZFmtD3Y
	11	https://www.youtube.com/watch?v=VEP4KYqkF4k
	12	https://www.youtube.com/watch?v=k8JpOzXwBV4

Hu Yu, who developed model Cyclocopters that flew with them, was a graduate researcher 2008 in Singapore. He subsequently developed bigger and better arrangements in China, where he now is an Associate University Professor. His designs perhaps are the best and most advanced. However, Moble Benedict's research at the Maryland University also is well advanced. Moble 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.

Moble Benedict Thesis:

<http://inderjit Chopra.umd.edu/files/2016/03/Benedict-PhD-2010-1v7dq7j.pdf>

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

One of the issues is finding/getting a business to develop them commercially, where they need outlets; aircraft developers who want to install and use them. The problem is that 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 isn't obvious, but won't easily develop if people who need them use other methods – so there's a chicken and egg situation.

Airships are one of the few aircraft existing 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 cycloidal propellers aren't commercially available. With cycloidal propellers, which enable responsive 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 employ them in new aircraft designs.

It also should be noted that aircraft developers normally don't develop propellers or power and auto-control systems for their designs, but do work cooperatively with suppliers for them.

LTA Solutions has numerous designs incorporating them, beginning with LTA drones – as shown right. These thus offer a way for businesses to get underway where, with an order for say 100 LTA drones using quad CP sets, would be a production line situation for the propeller supplier with a potential order of say 500 (including spares) worth considering.

Please contact LTA Solutions if you can provide them.

