

THE DEVELOPEMENT OF AN UNCONVENTIONAL VTOL VEHICLE

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Abstract

The inicial proposal for a vehicle was for a basically discoid form, the first prototype being octagonal with eight equal wings of variable angle of attack.

The basic concept used in all three prototypes to date includes a ducted propeller mounted on the vertical axis as the only means of propulsion, the airflow from the propeller being conducted downward and radially outward to flow over the aerofoils mounted along the periphery of the vehicle. Lift is generated using the Coanda principal over the aerofoils or wings.

The second prototype used the original duct system, slightly modified to give an upward flow exit direction and wings with a pronounced camber, generating approximately 25% more lift than the original machine.

A seperate single segment was then built with the possibility of adjustments to the main duct and exit geometry as well as a thin variable camber aerofoil. The result of experimental work using this apparatus was, within the possibilities of the adjustments mentioned above, the attainment of maximum static lift and the respective combination of duct and aerofoil geometry.

The third prototype was then built as an entirely new vehicle, using information from the above apparatus, combined with the lightest possible airframe, but with the aerofoils fixed and linked as a single almost circular structure of sixteen segments and seperate control surfaces. This version has attained VTOL capability.