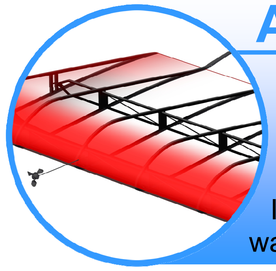
THE UNIVERSITY OF ADELAIDE AUSTRALIA

THE ULTIMATE SAILING CRAFT

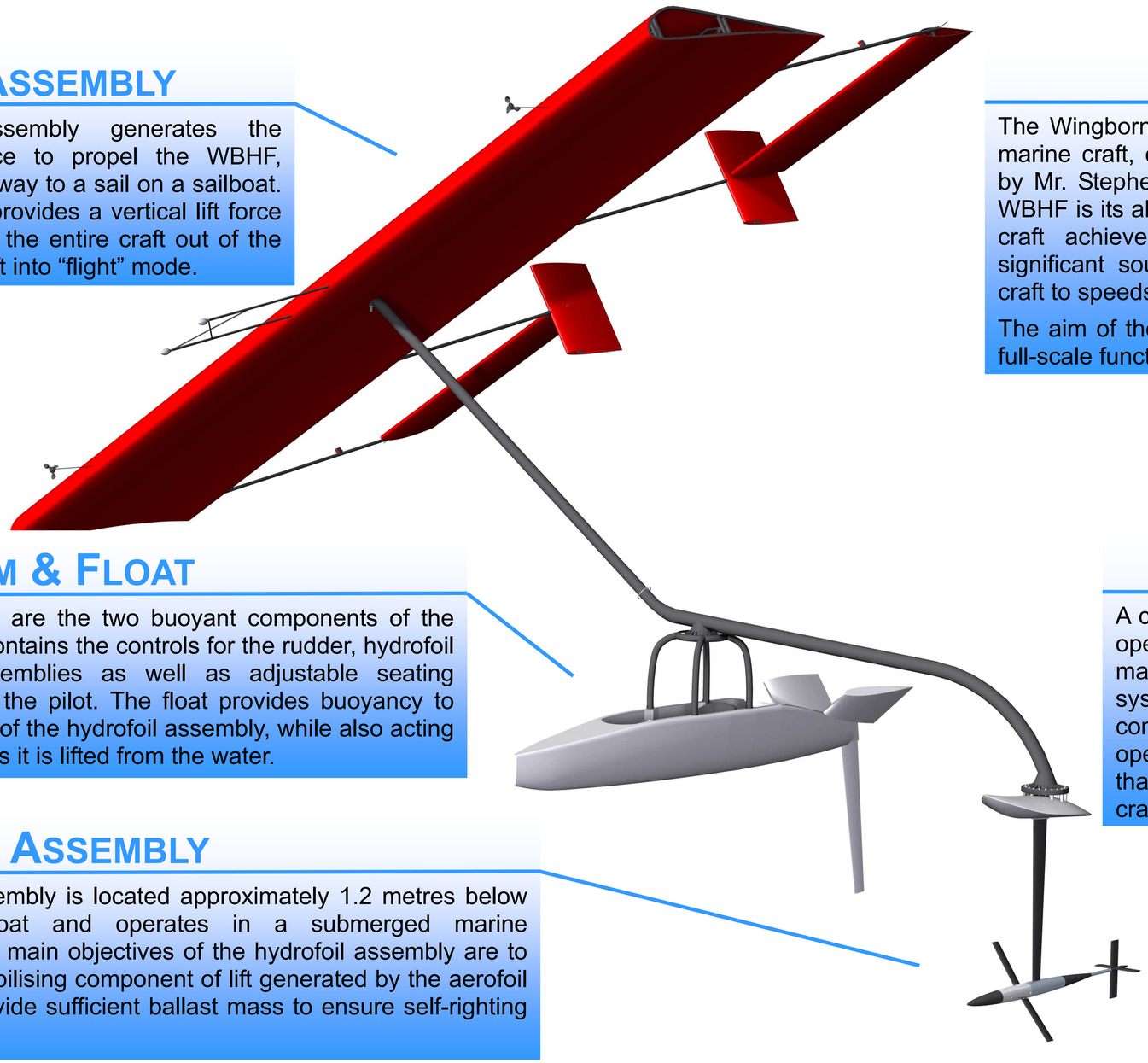
WINGBORNEHYDROFOIL

A WINGBORNE HYDROFOIL



AEROFOIL ASSEMBLY

The aerofoil assembly generates the horizontal lift force to propel the WBHF, acting in a similar way to a sail on a sailboat. The aerofoil also provides a vertical lift force large enough to lift the entire craft out of the water, putting the craft into “flight” mode.



OVERVIEW

The Wingborne hydrofoil (WBHF) is a high performance marine craft, conceptualised and developed theoretically by Mr. Stephen Bourn. The distinguishing feature of the WBHF is its ability to lift the hull out of the water when the craft achieves sufficient velocity, thus eliminating a significant source of drag, and hence accelerating the craft to speeds in excess of 40 knots.

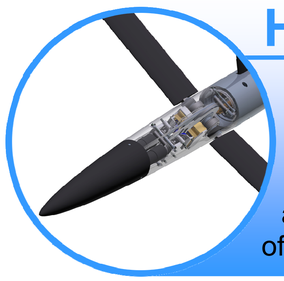
The aim of the project was to design and manufacture a full-scale functional prototype of the craft.

HULL, BEAM & FLOAT

The hull and float are the two buoyant components of the WBHF. The hull contains the controls for the rudder, hydrofoil and aerofoil assemblies as well as adjustable seating configurations for the pilot. The float provides buoyancy to counter the weight of the hydrofoil assembly, while also acting as a planning body as it is lifted from the water.

CONTROL SYSTEM

A control system enables the pilot to intuitively operate the craft at high speeds, while maintaining dynamic craft stability. The control system algorithms interpret the pilot’s commands, and based on the craft’s current operating conditions, create control signals that will operate the actuators to affect the craft’s motion as desired.



HYDROFOIL ASSEMBLY

The hydrofoil assembly is located approximately 1.2 metres below the outrigger float and operates in a submerged marine environment. The main objectives of the hydrofoil assembly are to counter the destabilising component of lift generated by the aerofoil assembly and provide sufficient ballast mass to ensure self-righting of the craft.

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