

SUPERBOAT SPECIAL REPORT

The good ship BMW prepares for action

Among the glittering yachts at the London Boat Show one stands out. Emma Smith reports on the car company taking to the oceans in search of glory in the America's Cup

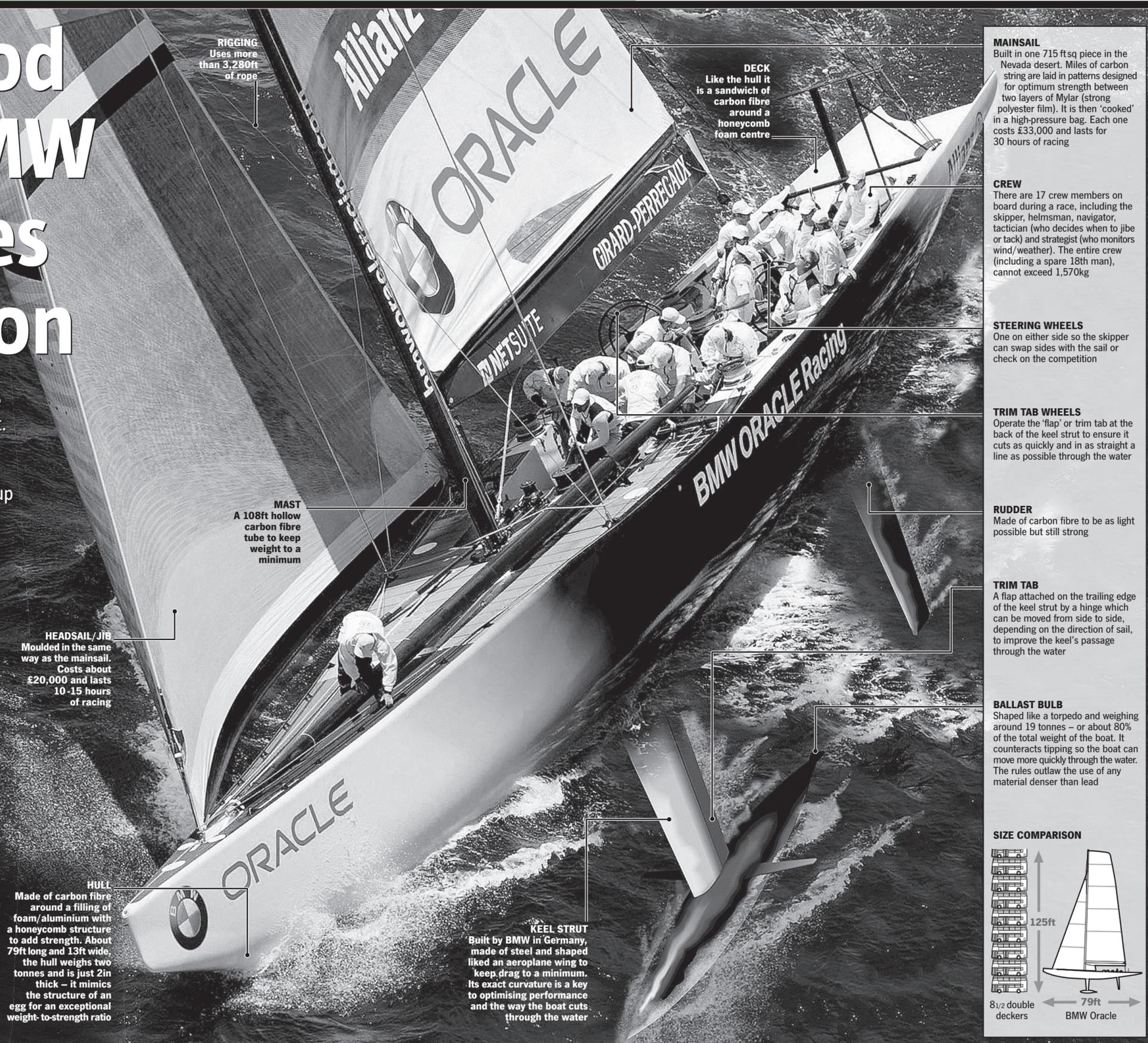
At 125ft it stands higher than a stack of eight double-decker buses and its mast, at full stretch, would pierce the roof of London's cavernous ExCeL exhibition centre. Its hull is made from the same lightweight carbon fibre used in Formula One cars and each sail is moulded in one giant piece in the Nevada desert using miles of intricately laid carbon thread. Its keel mirrors the shape and curvature of an aeroplane wing and it took thousands of hours to develop, almost 30,000 man hours to build and is part of a four-year campaign that will cost BMW Oracle Racing more than £60m.

This is the first time anyone has squeezed an America's Cup sailing boat into the London Boat Show. The BMW Oracle USA-61 juts out emphatically from the tightly packed displays of plush yachts and pleasure cruisers. It is a triumph of engineering, combining the very best of materials science with the latest in naval architecture, fluid dynamics and centuries of accumulated sailing know-how.

The America's Cup has become the Formula One of sailing and BMW is now harnessing all its expertise with the Sauber-BMW F1 team to help build what will be a top contender in the 32nd running of the race, in Valencia, Spain, this April.

Every bit of the boat must be as light as possible, apart from the torpedo-shaped lead bulb at the bottom of the keel that keeps the vessel upright when the wind blows against the sails. "A heavier bulb means more horsepower," says Tom Ehman of BMW Oracle Racing, who claims the team's latest hull is the lightest of any America's Cup craft to date. The boat at the ExCeL arena is a previous model and the USA-87, pictured, will be replaced by the USA-98 for the race.

The cup boats don't actually go that fast — rarely more than 18mph — but that's missing the point, says Ehman. "Windsurfers are faster in a straight line, but in all conditions, upwind and downwind, these boats are enormously powerful, nimble and very, very quick for a craft driven by nothing but mother nature."



RIGGING
Uses more than 3,280ft of rope

DECK
Like the hull it is a sandwich of carbon fibre around a honeycomb foam centre

MAST
A 108ft hollow carbon fibre tube to keep weight to a minimum

HEADSAIL/JIB
Moulded in the same way as the mainsail. Costs about £20,000 and lasts 10-15 hours of racing

HULL
Made of carbon fibre around a filling of foam/aluminium with a honeycomb structure to add strength. About 79ft long and 13ft wide, the hull weighs two tonnes and is just 2in thick — it mimics the structure of an egg for an exceptional weight-to-strength ratio

KEEL STRUT
Built by BMW in Germany, made of steel and shaped like an aeroplane wing to keep drag to a minimum. Its exact curvature is a key to optimising performance and the way the boat cuts through the water

MAINSAIL

Built in one 715 ftsq piece in the Nevada desert. Miles of carbon string are laid in patterns designed for optimum strength between two layers of Mylar (strong polyester film). It is then 'cooked' in a high-pressure bag. Each one costs £33,000 and lasts for 30 hours of racing

CREW

There are 17 crew members on board during a race, including the skipper, helmsman, navigator, tactician (who decides when to jibe or tack) and strategist (who monitors wind/weather). The entire crew (including a spare 18th man), cannot exceed 1,570kg

STEERING WHEELS

One on either side so the skipper can swap sides with the sail or check on the competition

TRIM TAB WHEELS

Operate the 'flap' or trim tab at the back of the keel strut to ensure it cuts as quickly and in as straight a line as possible through the water

RUDDER

Made of carbon fibre to be as light possible but still strong

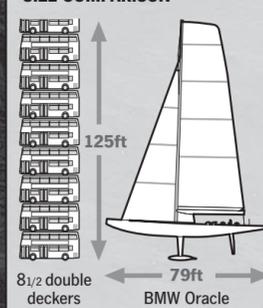
TRIM TAB

A flap attached on the trailing edge of the keel strut by a hinge which can be moved from side to side, depending on the direction of sail, to improve the keel's passage through the water

BALLAST BULB

Shaped like a torpedo and weighing around 19 tonnes — or about 80% of the total weight of the boat. It counteracts tipping so the boat can move more quickly through the water. The rules outlaw the use of any material denser than lead

SIZE COMPARISON



What the well-equipped sailor needs

Musto HPX Ocean Jacket £499.95, www.musto.com

The latest version of Musto's ocean-going jacket has a higher thread count and a tighter weave to encourage the water to bead on the surface (rather than soaking in). The improved cut of the hood and collar also creates a head-hugging barrier against wind and rain. Even the front zip is completely submerged.



Hammerhead Extreme Tablet PC £3,113.75, www.marinevision.co.uk

These days onboard navigation is a computerised business. So it's reassuring to know there are PCs that can withstand rough treatment. The Extreme is designed to run all the most popular navigation software, and features a milled aluminium case that the makers claim can withstand a drop of more than 3ft onto concrete and 30 minutes underwater (at a depth of 1ft). A Wi-Fi connection completes the package, allowing you to look at your navigational information, including radar, anywhere on the boat.



Euronav AI3000 Automatic Identification System (AIS) £351.33, www.euronav.co.uk

Dodging traffic is a nerve racking business when you're in a boat, particularly when you're crossing busy shipping lanes in thick Channel fog. And that is why an AIS is the latest must-have accessory for the sailor, as it allows users to receive information about every large commercial vessel in the area, including its name, its dimensions, its course and speed. It doesn't see everything that's out there, however. Unnoticed items will include ships belonging to the Royal Navy, small private boats and — of course — great big lumps of coastline. For this reason the Euronav AI3000 is best combined with a conventional radar system.



Steiner 7x30 Skipper binoculars £250, www.steiner-binoculars.co.uk

The German optics company Steiner has been supplying binoculars to the US navy for many years, and this is the latest addition to its leisure boating range. Weighing just 570g, these binoculars have a built-in compass, allowing users to narrow down their search for buoys, harbour entrances and other fixed points by looking along a bearing. The extended depth of field keeps everything between 65ft and infinity in sharp focus, too, which means no fiddling with the focus wheel while you're scanning the horizon.



Suunto M3 watch £140, www.suunto.com

Waterproof to depths of 100ft, this digital-display watch is designed for competitive sailors who need to time their starts as precisely as possible. Its most important feature is the countdown function. Hit it when the five-minute warning is sounded before a race and you'll get both a visual and audible countdown to the start.



Gerber Multi Tool Diesel S/S £67.99, www.greatkit.com

Every boater needs a knife — one that has a serrated edge to cut rope quickly in times of emergency. Every boater needs a toolkit, too, so why not combine the two in a single, all-conquering tool. As well as two serrated knives the Diesel includes scissors, pliers that can be opened one handed with a flick of the wrist, four screwdrivers, wirecutters, a file and the all-important bottle opener.

