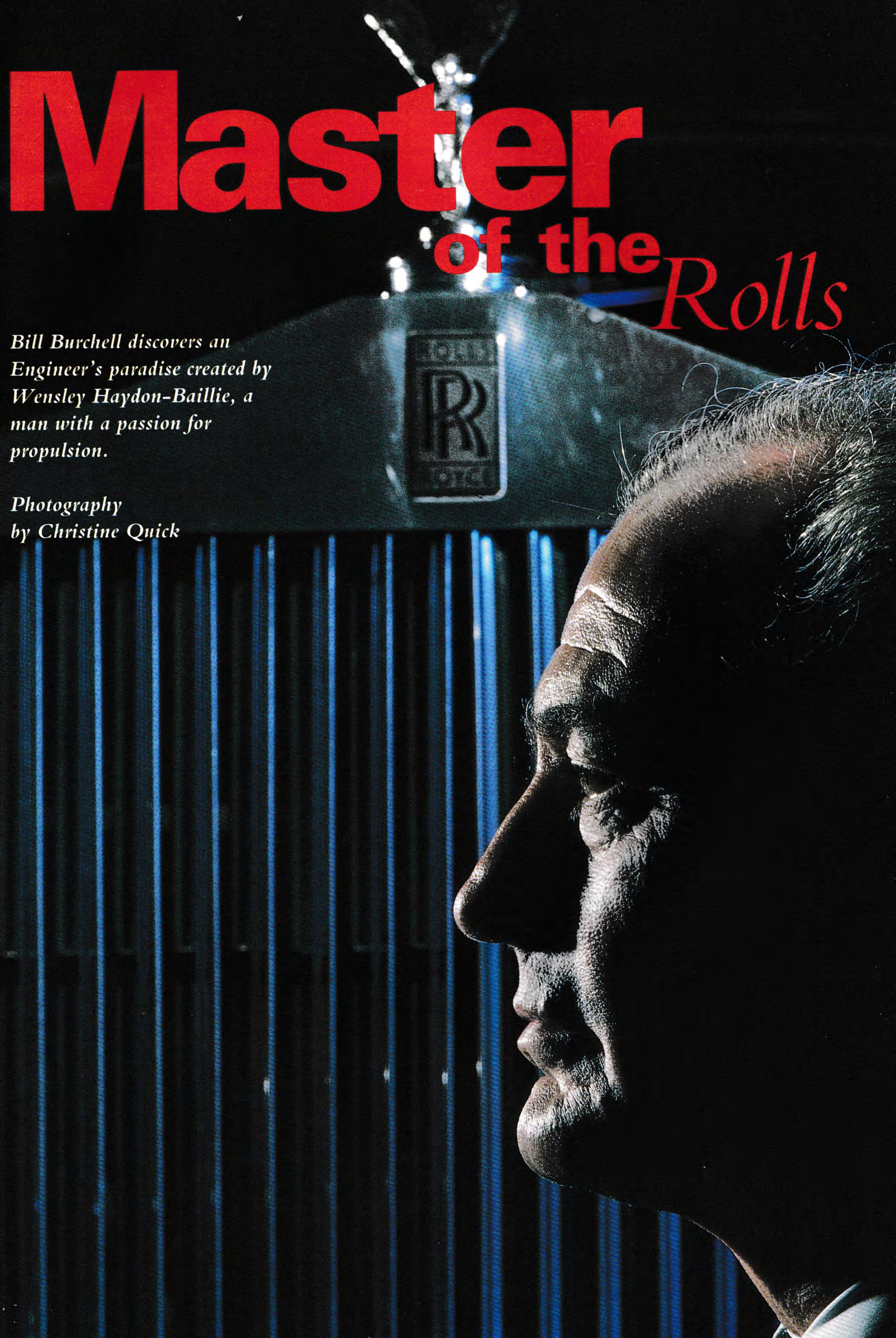


Master of the *Rolls*

*Bill Burchell discovers an
Engineer's paradise created by
Wensley Haydon-Baillie, a
man with a passion for
propulsion.*

*Photography
by Christine Quick*



From the bridge there is little sensation as the throttle levers are pushed firmly forward. A rapid but distant ‘ding-ding’ confirms the Captain’s command for full power, then the full force of 13,500 horsepower arrives like an express train.

Thrust by three Roll-Royce Proteus gas turbines driving small diameter super-cavitating propellers, the 106-ton Brave Challenger – the world’s fastest ship – accelerates from 0-60 knots in less than 60 seconds (it can decelerate even faster from top speed to 5 knots astern).

Seeing it sprint from a standing start is a bit like watching a slow motion film of a panther pouncing on its prey: bunched haunches suddenly released in one long muscular thrust... inexorable, unstoppable, but awesome in its purpose.

It is precisely this passion for propulsion which has made an English aristocrat its biggest fan, inspiring him to build a unique collection that celebrates engineering perfection. Wensley Haydon-Baillie founded the Haydon-Baillie Aircraft and Naval Museum with his brother, Ormond, almost 30 years ago, assembling a collection of 25 piston-engined and jet aircraft by 1977. But following Ormond’s tragic death in a flying accident that year, Wensley determined to expand the museum to encompass other pinnacles in 20th century technology.

“If you analyse the development of technology on land, sea and air in the 20th century, there is one common factor – the foundation of them all – and that is propulsion,” says Wensley Haydon-Baillie. “Only Rolls-Royce represents the quintessence of development of propulsion



technology throughout this century. Others have excelled in specific fields, building exceptional ships, motor vehicles and aircraft, but throughout this period only Rolls-Royce can rightfully claim to have sustained its place on the engineering pinnacle on land, sea and in the air.”

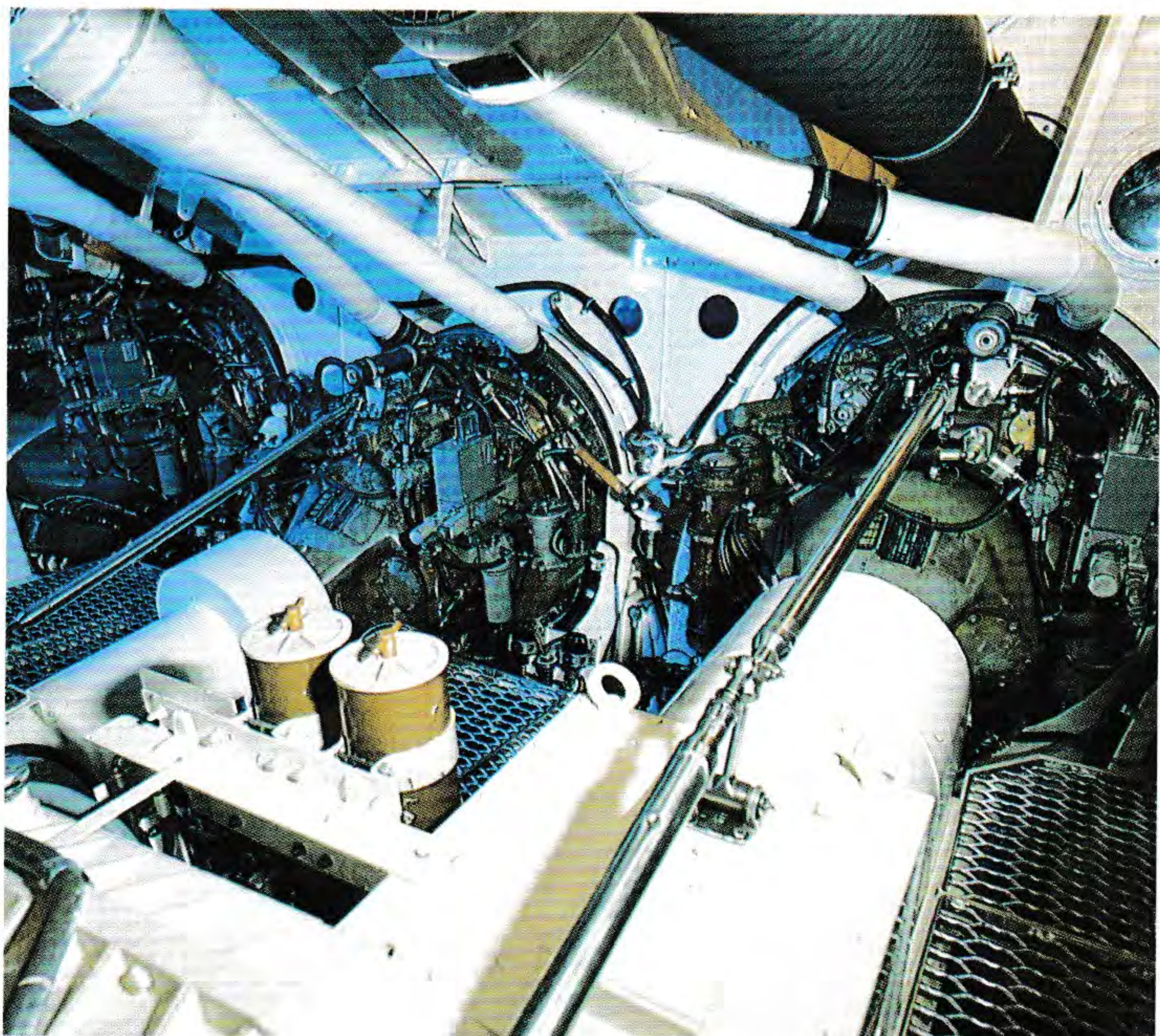
His conclusion is supported by historical fact. Right from its beginning in 1906, the name of Rolls-Royce has been synonymous with engineering excellence, powering record-breaking vehicles on land, sea and air, in a continuous sequence which spans the entire century.

Today, Rolls-Royce still lays claim to three world ‘firsts’: a Rolls-Royce Avon jet engine powered Thrust 2 to the current world land-speed record of 633.47 mph; Rolls-Royce Proteus gas turbines drove the world’s fastest ship, Brave Challenger, to 60.28 knots (Rolls-Royce marine gas turbines also power all the Royal Navy’s fast ships); and Rolls-Royce Olympus engines power the world’s first successful supersonic airliner, available to all in scheduled airline service, at Mach 2.02 1,350 mph.

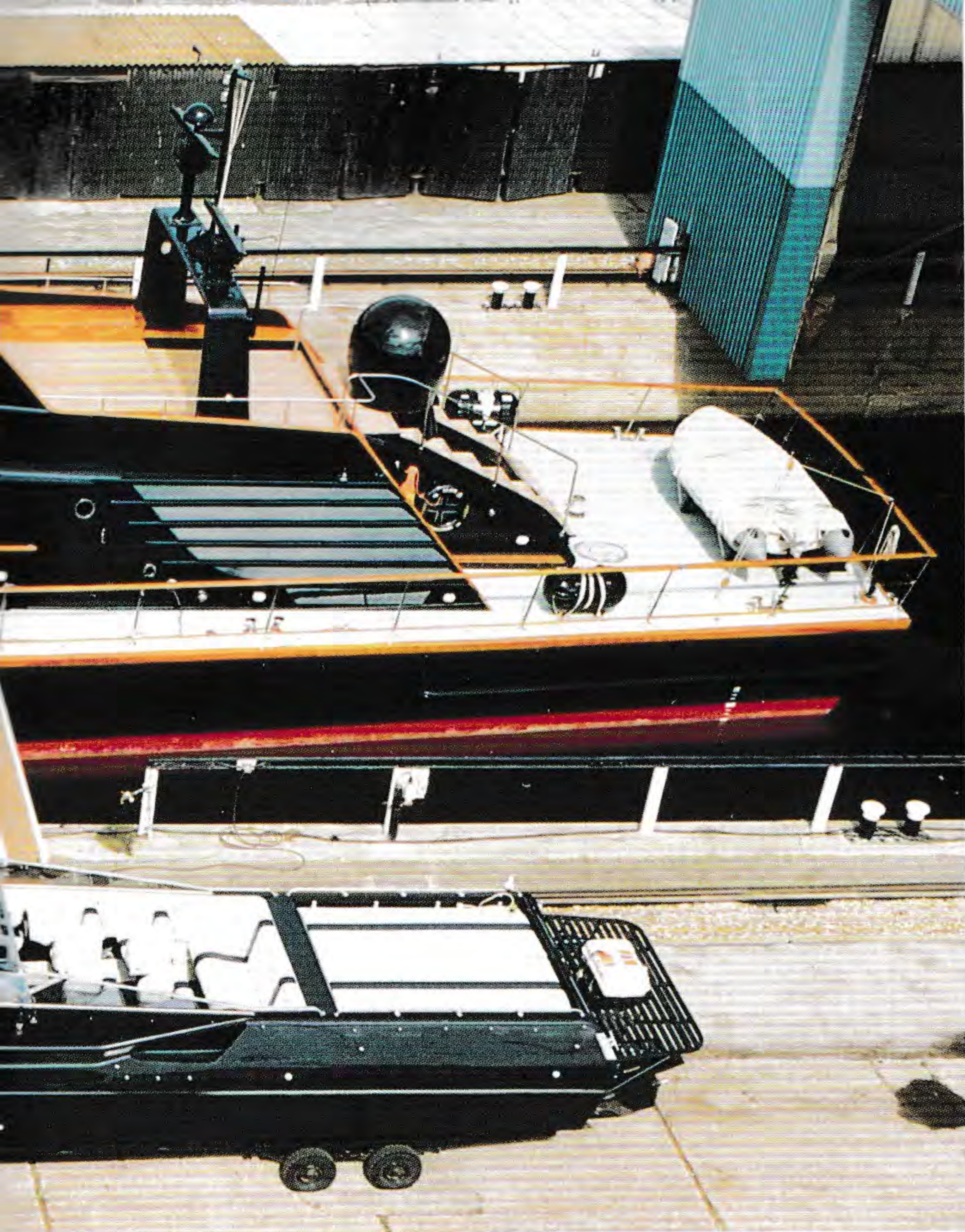
“When it was built,” says Mr Haydon-Baillie, “Concorde needed every aspect of aviation and propulsion technology then available. Yet still, no other aircraft looks like it or comes close to what it can do – carry 100 passengers in comfort and safety across the Atlantic in three hours. The Greek philosophers once described beauty as ‘fitness for function’. Concorde exemplifies that description, and there will never be another like it before the millenium – it’s one of the great masterpieces of the 20th century.”

His love of the aircraft has since spawned a comprehensive collection of material on the history of supersonic flight, including the development of Concorde. To ensure the widest research and authority in the project, Brian Trubshaw – the aircraft’s first British test pilot – joined Wensley Haydon-Baillie to establish and develop the Museum’s Concorde collection.

As a direct result, many of the artefacts



The power house that gives Brave Challenger its world-beating speed: three Rolls-Royce Proteus gas turbines, each providing 4,500 hp, drive small diameter, super-cavitating propellers through epicyclical reverse reduction Vee-drive gearboxes.



Brave Challenger, the world's fastest ship – 103 feet long and capable of more than 60 knots – at the Haydon-Baillie Aircraft and Naval Museum at Ocean Key, Southampton. The building behind it is mounted on rails and can be rolled forward to provide all-weather protection and offer covered wet and dry dock facilities. One of the collection's two Cougar pursuit boats rests on a cradle in the foreground.

specially developed to power the ill-fated TSR2 attack aircraft of the 1960s. These are displayed with the Olympus powerplants for the Vulcan and the Olympus Concorde engines, in a triple arrangement covering three decades of development in jet propulsion.

No Rolls-Royce collection would be complete, however, without the legendary cars. Here the collection has been surprisingly selective, predominantly choosing to concentrate on classics from the 1960s – 25 cars in all. More than half are Flying Spurs (13 of the 19 built belong to the Museum), and there are six examples of the Phantom V – the largest Rolls-Royce to date. The oldest is a 1949 Silver Wraith Shooting Brake. True to the Museum's philosophy, every single one is maintained in full working order.

The naval collection consists of Brave Challenger and three other Brave Class, fast patrol craft. Brave Class ships, designed for the Royal Navy in the early 1960s at Vosper's by Commander Peter Du Cane, were the first operational application of gas turbines at sea.

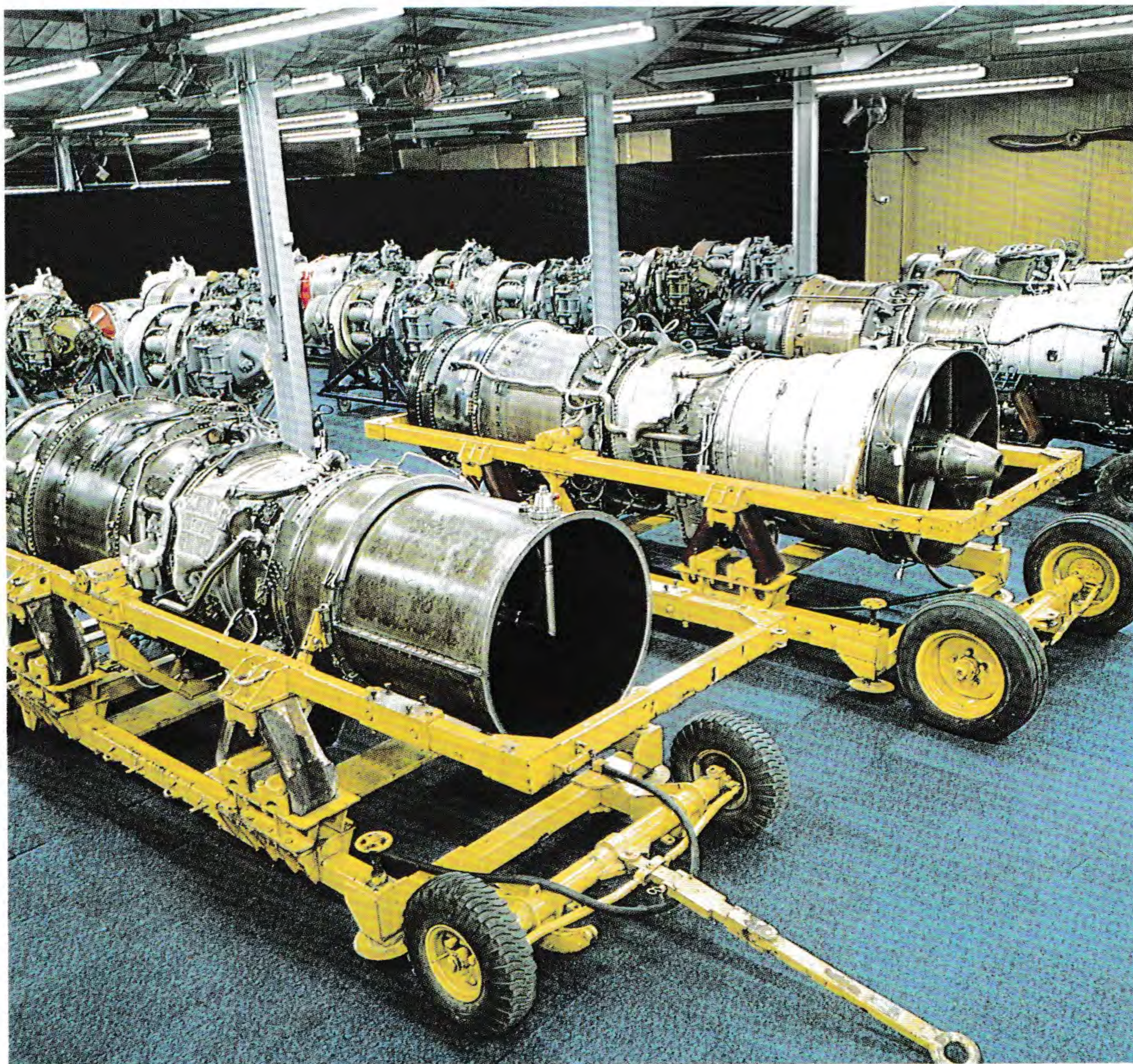
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surrounding its design and development have been preserved, including all 77,000 original design and engineering drawings (the last set of any great note to be drawn by hand, a function subsequently superseded by computer-aided design); the test pilot's helmets and flying suits; flight instruments from the prototype; check lists and procedure manuals; a nose section from a test aircraft with fully working heat shield; original wind tunnel models, and six fully serviceable Rolls-Royce Olympus 593-610 engines, which form part of the Museum's collection of 250 Rolls-Royce jet engines.

"We prefer to call this our collection," says Mr Haydon-Baillie. "The word 'museum' implies static exhibits that have no life. This is a functional and working collection." Supporting the collection is an amazing inventory of spare parts that will allow any exhibit to be used for many years to come – such as two complete reheat nozzles for Concorde engines, and hardware from the first Concorde simulator.

BAe Lightnings, the first British aircraft to exceed Mach 2 and enter RAF service, occupy a prominent place in the collection. There are 17 in total, 15 of which have been professionally dismantled and stored in de-humidified containers, ready for reassembly; another guards the gate at RAF Coltishall; and the last, the original P1B prototype, is on floodlit display at the Museum.

Even rarer are ten Olympus 320 engines,



The Museum's 'engine room'. Nearest the camera sits one of the original Olympus 593s used to finalise engine installation on the Concorde prototype. Three fully-working Olympus engines sit alongside. Behind is a row of marinised Rolls-Royce Proteus gas turbines, all in full working order.



The bridge of Brave Challenger, added to the ship during her restoration, was completed to aircraft standard. To the right, the navigator's position features a large screen ARPA anti-collision radar and a state-of-the-art satellite navigation system. The central teak pedestal houses the ship's traditional gyro-compass.

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While three await restoration, the fourth, Brave Challenger (built in 1961), is the centrepiece of the Haydon-Baillie Aircraft and Naval Museum.

"I was 18 when I first dreamt of the Brave Class ships," recalls Mr Haydon-Baillie. His dream became reality in 1979, when he acquired Brave Challenger for the collection. But owning her has been so much more than a labour of love. Nine years were spent on a complete rebuild and restoration, some under Peter Du Cane's personal supervision, bringing her to a state of stunning magnificence and operational ability, with perfection set as the minimum standard.

During the refit, the hull, built of welded aluminium frames and covered with double diagonal mahogany sheets coated with epoxy resin, was completely rebuilt and on each side of the hull, 64,000 fastenings were thoroughly inspected and tested. More than 65 miles of wiring were renewed and all the systems and instrumentation completely overhauled.

A new bridge, originally conceived by Commander Peter Du Cane and featuring aircraft-standard instrumentation, was built above the main-deck saloon; state-of-the-art

radar displays and satellite navigation and communication systems were also added to improve ocean-going capability.

Below decks a new combined diesel or gas turbine (CODOG) arrangement was designed for low speed, long distance economy cruising and harbour manoeuvring. Great attention has also been paid to the insulation of accommodation from noise and vibration. The gas turbines themselves create no vibration at high speed and 2.5 tons of batteries were installed to provide 24-hour silent running of ship systems, as required.



The team that keeps the collection 'functional and working': (left to right) Nick Gill (Electrical Systems Engineer), Ian McDougall (Chief Engineer), Wensley Haydon-Baillie and Richard Evans, Brave Challenger's Captain and the collection's helicopter pilot.

The fit and finish of the accommodation, as well as all the complex systems, are a tribute to the 65 craftsmen who completed the refit.



Below:
Wensley Haydon-Baillie (left) and former Concorde test pilot Brian Trubshaw – joint organisers of the Museum’s Concorde collection – with one of the original hand-drawn design drawings for Concorde. In the background on stepped platforms are a Rolls-Royce Olympus 593 jet engine, the fully working nose from a Concorde prototype, a Rolls-Royce Silver Cloud III and a Phantom V limousine.

The English Electric P1B prototype (the first aircraft to exceed Mach 2 in level flight, and forerunner of the Lightning fighter), its wings beside it, next to a complete scale model. Behind is a Lockheed T33 Silver Star, once flown by Museum founders Wensley and Ormond Haydon-Baillie; to the right are two Rolls-Royce Avon 302 engines, the same type used to power Thrust 2 to the current land-speed record of 633.47 mph.

The bridge and forward accommodation are panelled in golden teak, while the saloon walls, stairwells and main cabin areas feature polished Honduras mahogany, with navy blue Connolly-leather seating – following the Brave Class Naval tradition. At night, its lights ablaze, Brave Challenger becomes a living presence, its form transcending its function to become an icon of its ilk.

“A ship like this creates its own life,”

enthuses Mr Haydon-Baillie. “Its high-speed capability combined with modern systems make it uniquely qualified for worldwide oceanographic expeditions.” In his dual role of Brave Challenger’s owner and Patron of a worldwide Oceanographic Expedition, he will soon be putting this to the test, for his ship will be used as the flagship of what is planned to be the largest scientific expedition ever mounted. Scheduled to begin in late

1994 and last for several years, the expedition will involve sampling and mapping the chemical composition of all the world’s oceans. “Brave Challenger,” he adds, “was designed at the forefront of knowledge in its era, so the expedition is the rightful place for it to prove its unique functional abilities.”



Meanwhile, the collection intends to deepen and broaden its scope, preserving technology that man continues to discard. “That which is made today is history tomorrow,” concludes Mr Haydon-Baillie. Although Rolls-Royce will remain its core interest, it will not restrict its search for other forms of technical excellence. The only criteria is the Museum’s motto – “perfection is the minimum standard”.

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16 of the Museum’s 25 Rolls-Royce cars, photographed at the Haydon-Baillie ancestral home at Wentworth Woodhouse, Yorkshire. The car collection includes 13 of the 19 Flying Spur models made by Rolls-Royce – four of which feature in the foreground.