

COOL YOUR JETS

Imagine an airliner so fast it can fly from London to Sydney and back again the same day. A British SME is developing the engines to make it possible. **Paul Sillers** reports

When air travel switched from propeller-driven planes to jetliners in the 1950s (BA's predecessor, BOAC, was the first airline to do so), it opened up a new dimension in aviation, bringing faster, smoother and more efficient journeys high above the weather system. Nearly seven decades on, another similarly dramatic step-change is in its early stages of evolution, with the prospect of hypersonic passenger flight (flying five times the speed of sound). When it becomes an actuality, the possibilities for intercontinental commerce will be irrefutable – it will be viable to get anywhere on Earth (with a suitable runway, of course) and back within 24 hours, enabling businesses to extend their geographic footprint whilst saving time.

But here's the thing: to fly at Mach 5 over long-haul distances would normally require two types of propulsion – jet engines to start your journey from the airport and take you to the edge of space, then rockets with plenty of oomph to complete the lengthier and much faster segment of the flight. What if there could be a new category of engine that could do both jobs, as well as cope with the sizzling temperatures generated by high friction as it zooms through the atmosphere?

UK-based Reaction Engines is developing such a solution with its SABRE (Synergetic Air Breathing Rocket Engine). "SABRE is unique in delivering the fuel efficiency of a jet engine with the power and high-speed ability of a rocket, enabling air-breathing flight from standstill to more than five times the speed of sound, before transitioning into rocket mode, allowing orbital access," says Mark Thomas, the firm's chief executive.

What's unique about the SABRE design is that

it's equipped with ultra-lightweight heat exchangers (aka a pre-cooler), which stop engine components overheating at hypersonic speeds. The company says these are capable of cooling airstreams from over 1,000°C to -150°C in less than 1/20th of a second.

Cool stuff, but – as we like to ask at *Business Life* – where next?

"We've raised over £100m in the last three years from public and private sources and have secured significant investment from a range of industry and financial investors, including BAE Systems, Rolls-Royce and Boeing's venture capital arm," says Thomas. "Reaction Engines is currently in the middle of a very busy development phase for SABRE and we'll see a number of significant programme milestones in the next two to three years."

The chief executive adds: "SABRE-powered vehicles will be capable of cutting the London to Australia flight time to four and a half hours." But before you can hop on one of those flights there are still some hoops to jump through: "The adoption path of the SABRE engine will probably be similar to the jet engine, where we saw specialised and military uses of the technology before it matured sufficiently to be used in passenger transport," says Thomas. "So it's likely we'll see SABRE-powered vehicles being employed by air forces and being used for satellite launching before we see passenger-carrying hypersonic aircraft developed." ■

"These could cut the flight time from London to Australia to under five hours"

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Less heat, more speed
SABRE could deliver reusable
hypersonic planes by 2025

REACTION ENGINES