



## THE NEED FOR SPEED HASN'T CHANGED

Overture, Racer and Seaglider are taking over from the Concorde of yesteryear, showing the spread of technology that allows greater numbers of us to access it

BY ROHIT JAQOI

**S**peed sells. Especially in aviation. If you're offering a service predicated on being faster and more convenient than ground transport, it makes sense to keep turning up the dial on speed.

But in aircraft speed comes at a cost, too. Greater velocity means greater fuel use. Carrying more fuel means carrying more weight, which entails higher fuel use to stay aloft and go fast. Such are the endless trade-offs of aircraft designers and pilots.

For business jet buyers and flyers, however, the balance is tilted towards saving time. That is why veteran US aircraft makers Cessna and Gulfstream for many years slugged it out in a contest to have the accolade of producing the fastest non-military airplane.

A younger pretender has now, though, made a huge stride towards knocking these two heavyweights out of the ring. Boom Supersonic in August made its bid to take over from Concorde as the world's favourite supersonic passenger plane with the completion of first flights by its XB-1 test plane, a roughly two-thirds version of the planned production version.

With a projected cruise speed of

Mach 1.7, the 2019-long Overture will be a formidable 64-80-seat airliner or high-end business jet, with a range of 4,250 nautical miles or 7,867 km and the ability to reach New York from London in three and a half hours or Singapore to Dubai in four and a half hours – cutting conventional airliner trip times roughly in half. Entry into service could be by 2029.

The aircraft will bristle with cutting-edge technology, including specifically designed Symphony engines, rated at 35,000 pounds of thrust for takeoff and capable of running wholly on sustainable aviation fuel (SAF). While Concorde famously had a "droop-snoot" that allowed the pilots to see the runway as the aircraft approached to land, the Overture will use a combination of synthetic vision and augmented reality based on views fed in from cameras to avoid the complication of a moveable nose. Interestingly, the Overture's flight deck, a customised version of Honeywell's Anthem cockpit, moves most switch functions to the 17-inch touchscreens that dominate the cockpit, despite many cockpits coming to realise that physical buttons are often easier to use.

Crucially, Boom chief executive Blake Scholl says the Overture can drive down

costs so that supersonic travel will be available not just to the extremely wealthy, as was the case with Concorde.

Boom is not the only company operating in the space left vacant by Concorde's withdrawal from service in 2003. The US National Aerodynamics and Space Administration and Lockheed Martin are readying for flight the X-59, aimed at quieting the boom noise when an aircraft passes the sound barrier. Its success could lead to countries such as the US repealing laws banning supersonic flight over land.

That fear, cutting the advantage of supersonic speed except on over water routes, is one of the reasons it has been so difficult getting a Concorde replacement off the ground. Before the latest crop of planned supersonic planes.

Aerion, another US company, was pushing its budget plan for 17 years before it ran out of money in 2021. There are other ways of getting speedily around the planet, though. UK company Reaction Engines has rolled up successes with its Sabre air-breathing rocket engine that offers speeds of up to Mach 5 in air and up to Mach 25 in space. With the right airframe this could mean ballistic trajectories between points on opposite sides of the globe and a journey time of as little as four

hours to Sydney from London. However, in what for aviation is a familiar development, it has recently struggled with raising enough money to develop its ideas.

Meanwhile Australia's Hypersonic has set out plans for an aircraft that could fly at Mach 7 and cut the Sydney-London time to something like two hours. With defence funding for its Dart spacecraft and hypersonic missiles, though, the company may have a better chance of seeing its aircraft plans through to fruition.

The search for higher speed in non-spacecraft vertical takeoff and landing aircraft is on a more modest scale. But Airbus Helicopters is one of the manufacturers that has kept up the pressure and its Racer recently exceeded its target velocity by demonstrating a 227 knot (420kmph) cruise speed. The basic aerodynamics of retractable-blade stall limit most helicopters to 140 knots or 260 kmph.

The Racer, which looks like a conventional helicopter but with a pusher propeller at the end of a box wing on each side of the fuselage, also addresses the energy wastage in bigger helicopters that have two turbine engines running for safety. The Racer's hybrid electrical system allows for one engine to be put on standby in cruise flight, cutting emissions, noise and costs.

Higher speed is also desirable on the water but all that drag against a ship's hull is costly. However, lessons from aircraft are addressing that.

Soviet-era wave-skimming ekranoplans such as the giant military Caspian Sea Monster exploited ground-effect – a winged craft close to the ground or water rides on a low-drag cushion of air. The Caspian Sea Monster could cruise at 500 kmph.

The idea has been revived by US company Regent for its electric Seaglider, which is expected to cruise at 290kmph just above the waves. The low drag and lack of a need for aircraft levels of power reserves should give a remarkable range of 290km.

The Seaglider uses hydrofoils –

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effectively wings under the waterline – to raise the hull out of the water at just over 30 kmph, before its wing starts flying.

Swedish company Cessna also uses hydrofoils to squeeze more speed and range out of the electric powertrains in its boats and ferries. The underwater wings permit speeds and a range that would be impossible if the entire hull of the vessel had to be pushed through the water.

The need for speed, whether in the air or on the water, hasn't changed since Concorde's maiden flight in 1969. What has changed is the spread of the technology that allows greater numbers of us to access it.

The writer is a freelance journalist based in London and Berlin, and an airplane, helicopter and autogiro pilot

## The Dawn of Fractional Ownership for Aircraft in India?

If the challenges, including taxation, are overcome, we could see a defining reform that will change the face of non-scheduled aviation in India.

BY JAYANT NADKARNI

The most successful and proven aircraft operating model globally (non-scheduled) that allows the largest aircraft fleets is Fractional Aircraft Ownership. Globally, the industry leader is NetJets, which has over 750+ business jets, all in this model (while all of India has just 100+ jets). There are many other such foreign companies.

### MODEL WORKING

An aviation company wanting to conduct fractional ownership business invests in the aircraft, imports, operates and maintains it, and sells part shares in the aircraft asset to a few interested co-owners (1/8th, 1/4th, and so on). It's like joint or fractional ownership of the asset, where the co-owners may not be in aviation business, but get 'preferred right to use' the aircraft. All



along, the aircraft's possession and control remain with the aviation company, and if it is a NSOP, it can be chartered out to 3rd parties as well. The main advantage is that capital costs are spread across many owners. It allows the aviation company to grow to higher fleet sizes. This fractional model is well suited for capital constrained countries like India. It will attract huge investments into the sector. It will help bring India from our small fleet size (relative to advanced countries). It is good for safety and asset quality.

### CURRENT POSITION

The fractional model described above is not permitted in India. The Ministry of Civil Aviation (MoCA) is appraised of the matter and has studied it in depth for nearly two years with the DGCA and Industry experts. Draft policy guidelines are lying ready in

MoCA, but have not been released, due to specific challenges outlined below.

### HURDLES

(a) DGCA part-As or data, the DGCA does not register more than one owner for an aircraft in India, as no policy guideline allows for it. What's good is that draft policy guidelines have been drawn out to allow this, outlining how to de-risk the model into existing regulatory provisions, with no disruptions. To be clear, they haven't been released yet. But this is the lesser challenge.

(b) Taxation part – In the working of the model, when the fractional sale of aircraft occurs (from NSOP to fractional buyers), the present GST treatment is based on the status of the buyer upon sale. Since, the buyer does not hold an NSOP license (as it's not his business), taxation will be @25% IGST, that too, with no ITC and the model will not work. The likely solution is that the model

will work – provided GST treatment is based on aircraft End Use being NSOP as then taxation will be @ 5% IGST. The supporting logic is that the aircraft was imported under NSOP license and continues to remain in NSOP's possession and control regardless of fractional sales, and further, it is chartered out to 3rd parties also, and only preferential right of use is given to the co-owners.

So, will 2024 see any major announcements in this regard? If it does happen, it could be a defining aviation reform that will change the face of non-scheduled aviation in India. It has worked so well abroad. Why will it not in India? What we need is a guiding policy framework coming from the government. A framework that sets in motion operative and taxation changes. Let's see what the last few months of 2024 hold in store.

The writer MD, Flightshare Private Limited.