



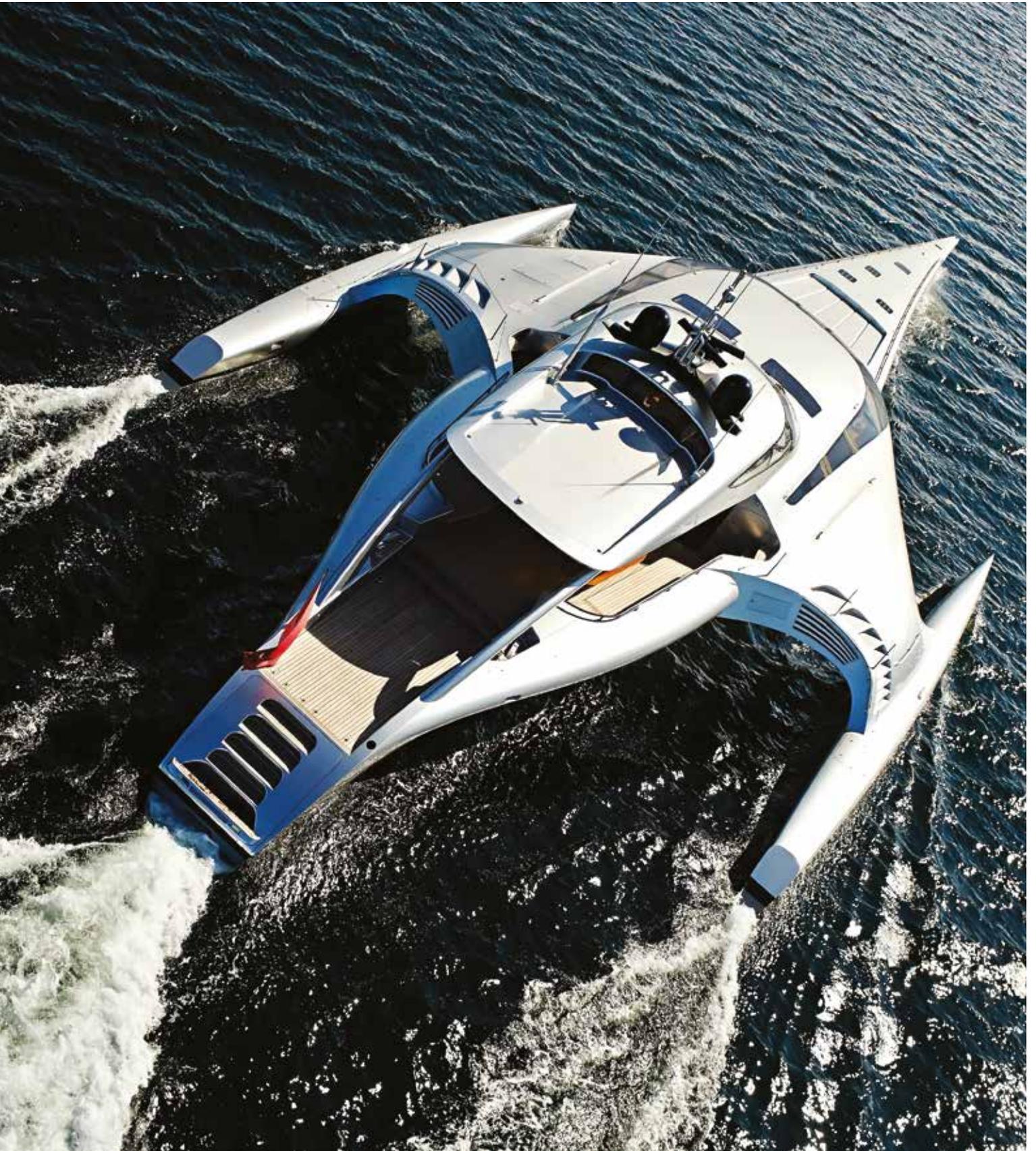
A multihull case
study on *Adastra*

One hull is good, three is better

BY JUSTIN RATCLIFFE

*Following the launch of the power trimaran *Adastra* (right) by McConaghy Boats in 2012, the yachting media rushed to publish articles with evocative titles such as ‘The Future Of Superyachts Is Here’ and ‘The Trimarans Are Coming’. The reality is that the trimaran configuration has remained an exciting, but elusive, concept. Five years after her launch, *Adastra*’s designer, captain and owner discuss whether trimaran superyachts can ever become mainstream.*







Any multihull enthusiast will tell you that a well-designed power trimaran not only looks incredibly cool, but is also faster, more fuel-efficient and more stable, both underway and at anchor, than a conventional monohull. John Shuttleworth, the designer of *Adastra*, has spent a lifetime developing these properties. With a background in sailing catamarans and trimarans, his innovative approach and interest in hydrodynamic efficiency has pushed the boundaries of multihull design.

“I come from an age when a lot of multihull designers were inventing it all from scratch through trial and error,” says the Sussex-based designer, whose first major success was Chay Blyth’s *Brittany Ferries GB* that set an East-West transatlantic record in 1981. “I’ve always been fascinated by combining design elements in the most efficient way possible and to look forward into different possibilities.”

Among other considerations such as weight – hence *Adastra*’s advanced composite construction – Shuttleworth identifies length-to-beam ratio as a critical factor in reducing the fuel consumption and maintaining the sea-kindliness of a trimaran in comparison with an equivalent monohull. Because friction dominates the resistance of a hull at low speed, it is well known that a long, slender hull is more efficient at the cruising speed of most displacement monohulls. But the length-to-beam ratio of a monohull is limited to about 7:1. Anything above this figure and the boat will start to roll uncomfortably, and the Vertical Centre of Gravity (VCG) will have to be kept low to meet the safety requirements for static stability, which limits the available accommodation space. In a trimaran, on the other hand, the outriggers provide all the stability, and *Adastra* has an optimal length-to-beam ratio of 17:1, which has been shown to significantly increase fuel efficiency and comfort.

“When we put *Adastra* in the water, I wouldn’t have believed the resistance curve if you had told me,” says John Shuttleworth, who trained as an electronics engineer. “The most efficient 40m displacement monohull consumes around 120 litres of fuel an hour at 12 knots. During her sea trials, *Adastra* [powered by her CAT C18 1000hp main engine] consumed just 17 litres per hour.”

“The consumption all depends on fuel weight, the weather and how we trim the vessel with the diesel,” says her captain, Jaryd Paarman. “We like to trim the nose down a bit and get fuel out of the stern as soon as we can, and then she just takes off, punching through the water and surfing the waves.”

Crossing non-stop from Tahiti to Panama, for example, a voyage of 18 days and more than 4,500 nautical miles, the yacht burnt an average of 85 litres of diesel an hour (including generators). After transiting the Panama Canal, they ran into 40-

knot headwinds and a nasty cross-sea heading for Grenada, but still made a steady 10 knots. Heading back across the Atlantic to Gibraltar, and despite heavy weather off Portugal, the wave-piercing trimaran averaged 13 knots (touching 16 knots when surfing the waves) and burnt less than 60 litres of fuel per hour.

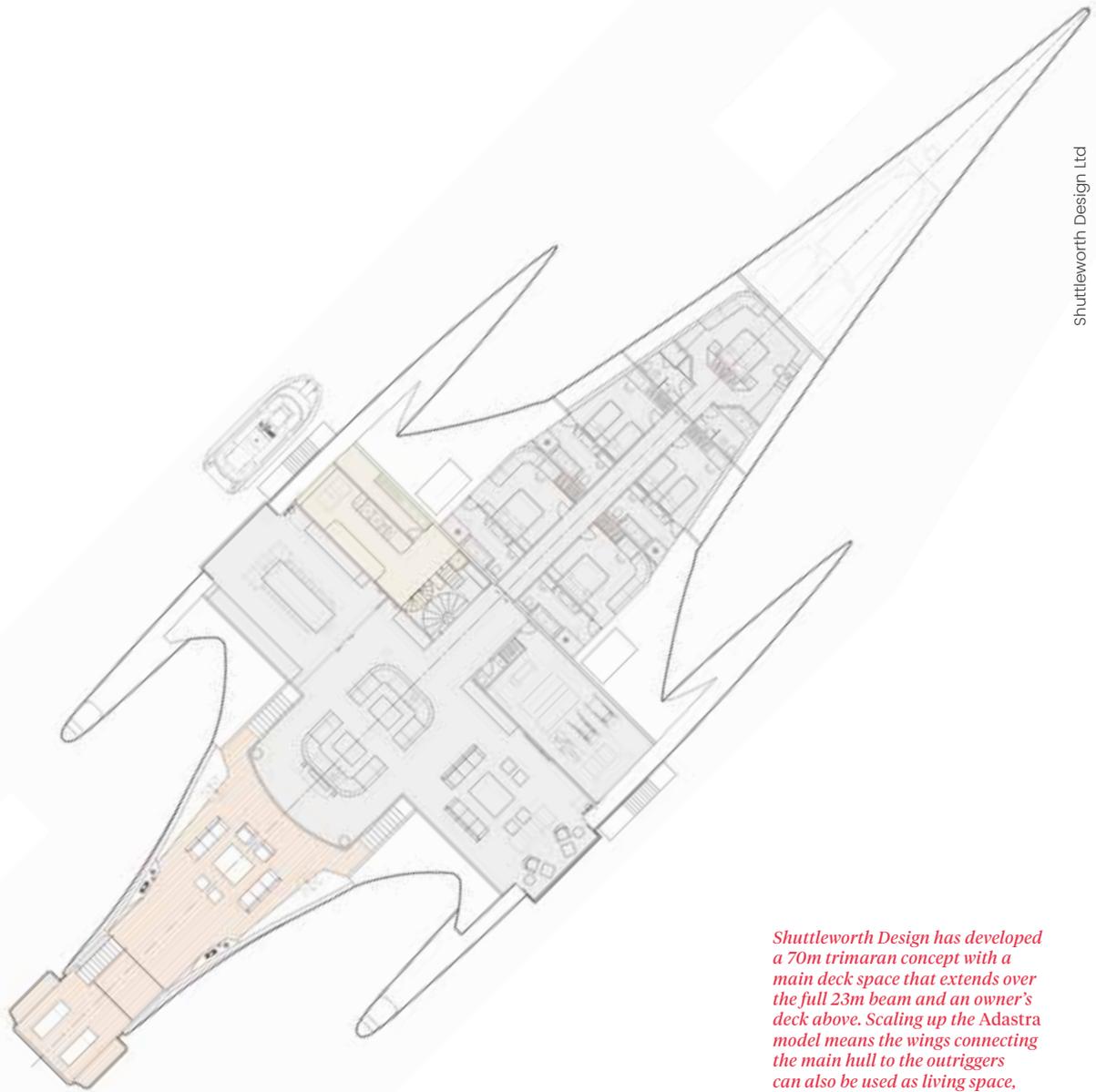
In-built stability, both underway and at anchor, is another advantage of the trimaran configuration. In the case of *Adastra*, Shuttleworth Design built a radio-controlled model with outriggers that could move up and down to test her roll and pitch in different sea states.

“We put the model through waves and filmed the results with the outriggers at different heights,” explains Shuttleworth. “We found there was a huge change between when the outriggers were skimming the water and when they were partially submerged. The boat became much more stable when the outriggers were piercing the waves because they don’t pick up any roll momentum.”

While the outriggers are what provide a trimaran with its inherent stability, they also mean a wider beam. Combined with the longer main hull to maintain that magic 17:1 ratio, this means that berthing a trimaran superyacht in a marina can be very expensive. This is arguably one of the main reasons why there are so few of them on the water. *Adastra*, for example, has a beam of 16m and spends most of her time at anchor. On the few occasions she is moored in a marina, the port authorities have been known to try to charge her captain for all three hulls.

There are other drawbacks. Due to the narrow forebody of the main hull and low-rise superstructure, trimarans are very different from vertically stacked monohull motoryachts in terms of available living space and interior layout. *Adastra*’s profile is low to reduce the VCG and her overall shape is streamlined to optimise aerodynamics and hydrodynamics above the waterline. The yacht still provides comfortable lower-deck accommodation for nine guests and six crew, but the concept might appear foreign to owners accustomed to panoramic cabin windows and separate crew circulation.

Scaling up the *Adastra* model means the wings connecting the main hull to the outriggers can also be used as living space, providing more interior volume than an equivalent monohull. Shuttleworth Design has developed a 70m trimaran concept with a main deck space that extends over the full 23m beam and an owner’s deck above. The project was developed for an experienced monohull owner who was looking for a 60m boat, but the designers still had to explain that to maintain performance and have the interior space he wanted on a trimaran, the length of the main hull had to be extended by 20 per cent.



Shuttleworth Design Ltd

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*Below: the main deck space aboard **Adastra** is surprisingly spacious and airy.
Bottom: John Shuttleworth and his son Orion, the yacht's designers.
Opposite: the **Origin575** trimaran concept by Nigel Irens.*

Will we see more power trimaran superyachts in the future? Despite an array of concept proposals, only three have been delivered since *Adastra*. These include 48m *Khalilah* by Palmer Johnson, and two 53m sisterships launched last year by Latitude Yachts in Latvia. In build at Echo Yachts in Western Australia is *White Rabbit Echo*, an 84m trimaran with hull design by fast-ferry specialists One2three Naval Architects. Upon delivery next year she will be the largest aluminium yacht in the world, but in a conservative industry it seems that trimarans are likely to remain a niche solution for a very specific market.

“It’s all about acceptance levels when you’re working on a really cutting-edge project that’s never been done before,” says Orion Shuttleworth. “It’s not uncommon for innovative products to take more than 10 years before they’re accepted by the mainstream. But after *Adastra*, these trimaran projects have stepped out of that realm and we’re now developing proven concepts.”



King Fung



Justin Ratcliffe

An Ocean Greyhound

Anto Marden, the British owner of *Adastra*, runs a shipping business out of Hong Kong. Already the owner of *Mazinga*, a 45ft sailing trimaran also designed by John Shuttleworth, his original brief for a power trimaran to bomb around the South China Sea developed into a superyacht to sail the world.

WHY DO WE SEE SO FEW TRIMARAN SUPERYACHTS?

People buy a yacht for different reasons, but most of them don't buy one to cross the Pacific Ocean, or any ocean for that matter. They buy it to look good in the marina, to impress their friends or to go out for lunch and then come back. Only very occasionally will they use it for crossing oceans. These people are more concerned about having a lot of accommodation and social spaces than with fuel economy or shallow draft for poking around atolls and that sort of stuff – all the things a power trimaran can do. *Adastra* ticks a lot of boxes for me, but those boxes are not important for the majority of people who can afford a superyacht.

WHAT ARE THE DRAWBACKS OF THE TRIMARAN CONFIGURATION?

There's the beam issue when you're in a marina, but we usually prefer to anchor offshore anyway. That's especially true in south-east Asia, which is very different from the Med, where you can visit historical sites and eat in excellent restaurants. Over here, you go ashore less because there's nowhere to go. And if you are going ashore a lot you probably want a big tender. We have a 4.7m RIB that fits on the aft deck, but that's a bit small if you're wearing smart clothes in a seaway.

WITH THE BENEFIT OF HINDSIGHT, IS THERE ANYTHING IN THE DESIGN OF ADASTRA YOU WOULD HAVE DONE DIFFERENTLY?

If I had to choose, I would have positioned the owner's cabin amidships instead of aft to avoid the rumble of the drive shaft, but I know John is already addressing that for future designs. Otherwise, she does exactly what I hoped she would do as a world cruiser: she's extremely seaworthy and if we want to cross the Atlantic to Cartagena and we've got the juice, we just cast off and go. A big fat white boat can't do that, and probably wouldn't want to. She's a real ocean greyhound, a super head-turner, and the family loves her.

Go Explore

Nigel Irens is another UK-based designer with a background in ocean-racing multihulls and record-breaking power trimarans, such as *iLAN Voyager* and *Cable & Wireless Adventurer*. He also has a connection with the owner of *Adastra*, having designed his 'other' motoryacht, a 41m steel monohull called *Hang Tuah*.

Irens' power trimaran concept derived from his proven platform developed for fast offshore patrol boats. Focusing on comfort, speed and ocean-crossing capability, his Xplore70 (70m) and Origin 575 (57.5m) concepts are designed as long-range explorers or fast shadow vessels. They feature a distinctive cutaway in the bow that serves both as a styling feature and to reduce forward buoyancy so it pierces the waves.

"You need a very specific operating profile for a superyacht trimaran to make sense, and the reality is there are only a handful of owners out there who would want one," says Irens. "When our power trimarans started breaking records, we thought they were how we were going to make our living, but that never happened. Most owners don't know what the options are and only understand what they can see, so it's hard to push forward new ideas. Another issue is that people are used to referring to the LOA to describe the 'size' of a boat, which is always wrong but especially unhelpful with a trimaran." JR

