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BY TIM THOMAS
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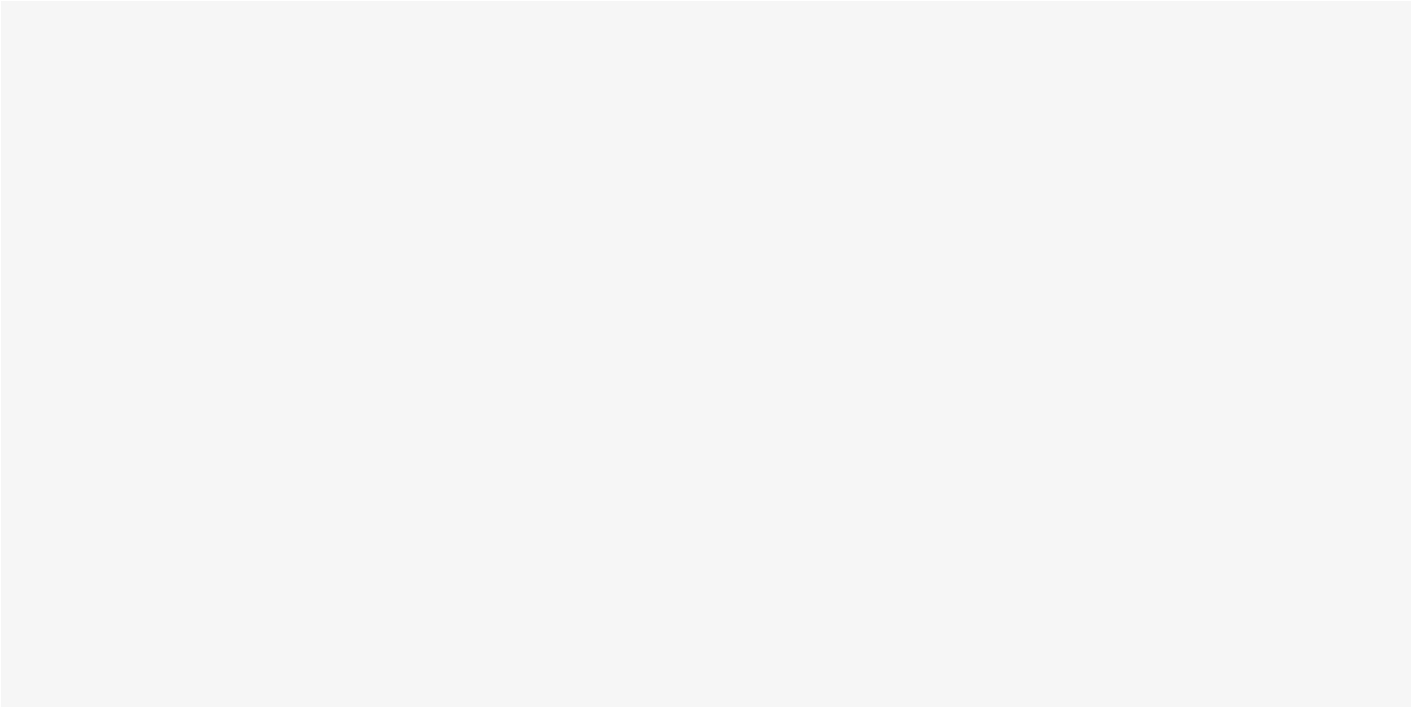
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It's not a bad way to kick off your Fort Lauderdale International Boat Show - scooping the Excellence in Innovation award at the International Superyacht Society's gala evening - but for metamaterials antenna company Kymeta and their exclusive superyacht distribution partner e3 Systems it comes as further proof that the mTenna flat panel solution is a winner. "It is a real honour to receive this award from the ISS and I'd like to thank everyone at e3, Kymeta and our partners for all their hard work," comments Roger Horner, group managing director of e3 Systems. "I'd also like to offer our gratitude to the owner and crew of *White Rose of Drachs* and *Maltese Falcon* for their part in the successful sea trials which have been fundamental in bringing this game-changing technology to market and ensuring that reliable, ubiquitous, mobile connectivity on the water is now a reality."

That the technology has proven successful in real-world conditions has been amply demonstrated after several months of trials aboard both the aforementioned *White Rose* and



Maltese Falcon. Of course, very few people get to enjoy time aboard the iconic superyacht *Maltese Falcon*, much less cruise or join her on passage. There are a couple of ways of getting there – you could charter the yacht, or join the crew or just perhaps, as in the case of Mikala Johnson, you could do your PhD in metamaterials technology. Admittedly, it's an extreme route to pursue for that one goal and for Johnson really it's a bonus that has come five years after completing her thesis – the first to tackle such subject matter. "I got involved before the technology left Intellectual Ventures," she explains as we stand on deck in front of *Maltese Falcon's* bridge. "They had already build a little one-dimensional scanning prototype and then I started doing numerical modelling of the antenna and how we were going to make it bigger, and how we were going to form the beam on these larger antennas. That was part of my thesis work, which also included adjacent satellite interference cancellation and essentially trying to get the best beams off the antenna."

The success of Johnson's work and contribution to the successful trialling of the antennas aboard both the *Falcon* and aboard motor yacht *White Rose of Drachs* is plain to see by the reactions of the captains of both yachts ([click here](#) for our exclusive report from the Monaco Yacht Show in September). So how did all that translate into joining *Maltese Falcon* for the passage from the Caribbean to Bermuda? "Once we got the beam forming done it was all about pointing and tracking, which we did around seven months ago," she smiles. "I wanted to take it out and see how it actually worked on a boat, because we always test a lot on land vehicles and boats behave differently." It proved key that Johnson was on board – getting reliable data on how boats move and how quickly, along with information on mast blockage and satellite acquisition times, has been critical in fine-tuning the antenna's performance and in solving some of the more complex problems such as handling the symbol rate of older satellites. "It was something we hadn't run into before because we hadn't put the antenna on a bunch of different carriers," she explains. "So fortunately we found this out then because now we need exactly that fix for the KALO service – the problem lay in the automatic signalling carriers (ASC) which are very low symbol rate. But we were able to solve that problem – it was a good thing to find!"

The KALO service – which is powered by Intelsat's FLEX network – is an integral part of the Kymeta flat panel solution. It is a foundation satellite service that comes with the panel, offering a complementary 12 months of connection with a 4mb/s down and 1mb/s up speed, and 40gb of data per month included. It means that a Kymeta panel – which also comes with all necessary

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hardware including an X7 modem – can be taken out of the box, quickly wired in, switched on and be delivering satellite comms in under 10 minutes. It's an impressive proposition, and what's more e3 Systems have deliberately refused to tie the Kymeta panels to a particular service provider.

The result of this could prove of considerable interest to the wider superyacht fleet, not just in the flexibility to select the package that best suits each yacht's profile, but also because it could be the spark that ignites something of a package war between the different providers. "I absolutely insisted in making sure the panel is open for all service providers who can deliver Ku-band HTS or broadbeam solutions," says Horner. "It means we can create a much bigger marketplace and we have different options and types of services on offer. The service providers will compete against each other, so it's in the consumers' interests to have these options. There isn't a single service provider that meets everything that every yacht does, and what might be good for the Med might not be good for, say, the Indian Ocean so you need to be able to switch service providers to suit."

With the KALO service coming with 12 months of airtime included, is there really a need to look at other service providers? The answer, generally, is maybe, because flexibility is the key. "The panel comes with the X7 modem and 12 months of bandwidth, but we can then put in a second modem with a dedicated service from one of our service providers," Horner suggests. "The intention then is to be able to provide a bandwidth-on-demand switch between the two, on a touch panel, to be able to switch into a dedicated high-bandwidth service when there are owners, family and guests on board, where the KALO service can be complemented by third party providers when higher bandwidth CIR services are required."

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The flat panel solution should be ready for delivery to the wider yacht market from January 2018 in a single-panel solution at around \$62,000, which the trials have shown can be a good solution for smaller vessels or those mainly based in the traditional Med and Caribbean cruising grounds. For yachts who want more throughput or who are travelling to higher latitudes, a multi-panel solution – which will likely be in the region of just under \$200,000 all in for a four-panel system – is recommended, and the availability of this is predicted to be around April 2018 when the combiner technology that has been trialled this year should have been finalised and entered production phase. It's all part of the crawl-walk-run approach that Kymeta is taking to the development of the panels and the market, and the nature of the core technology of the panels – which shares the same tech used in modern flatscreen televisions – means mass production is feasible as demand increases. This also means, of course, that the prices of future panels should tumble as economies of scale take effect.

“The crawl phase,” explains Håkan Olsson, vice president maritime at Kymeta, “is more as it relates to the size of the market – superyachts are a good example. The walk phase is when we take it to the next level with slightly larger markets where we will also have a more economical terminal solution which is a little more integrated as well. The run phase is personal vehicles like cars, as well as pleasure boats down to 9m or so, where you're talking about tens of millions of units per year. That's where Kymeta's tech is really differentiated from other flat panels because both the cost drop and the manufacturing scale are achievable. It's the only flat panel tech that I'm aware of where you can automate manufacturing and utilise the \$500 billion that's been invested by the TV industry to get high volume, highly reliable production of televisions.”

The proof, of course, is in the pudding. If you missed the chance to see the panels on board *Maltese Falcon* or *White Rose* during this year's Monaco show, there is a second chance to see the panels installed and in operation during the Fort Lauderdale International Boat Show from 1 to 5 November. At FLIBS, Kymeta and e3 are offering VIP tours to see the panels on board the 47m motor yacht *Usher* (ex-*Mr Terrible*) and a 16m Shredder motor yacht. [Click here for more information and to register your interest.](#)

We take a detailed look at the Kymeta trialling process aboard both Maltese Falcon and White Rose of Drachs in issue 183 of The Superyacht Report. Have you subscribed to The ‘new’ Superyacht Report? If you are a captain, owner, yacht manager, chief engineer, first officer, broker, designer, senior shipyard management, an owner’s representative, investor, or a family office, you are eligible for a complimentary annual subscription to the only superyacht industry publication worth reading. To apply for your VIP subscription, click here.

Technology will also be a key focus in this year’s The Superyacht Forum, taking place 13-16 November at Amsterdam RAI, and both Kymeta and e3 will be actively involved in panels and workshops during the event. Following a theme of A 10-year Blueprint for the Superyacht Market, the forum is set to be the networking highlight of the superyacht calendar, with 800 delegates and key decision makers from the technology, operations, owner and family office, project management, yard and construction sectors brought together to discuss the key factors affecting and influencing our industry. To book your place and for further information, click here.

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