



THE END OF ROCK N' ROLL

Perhaps not on a par with Columbus' discovery of the new world or Harrison's chronometer, but for superyacht owners, whose search for perfection has been stymied by the uncomfortable rolling of their floating palaces at anchor, zero speed fin stabilisation is a breakthrough.

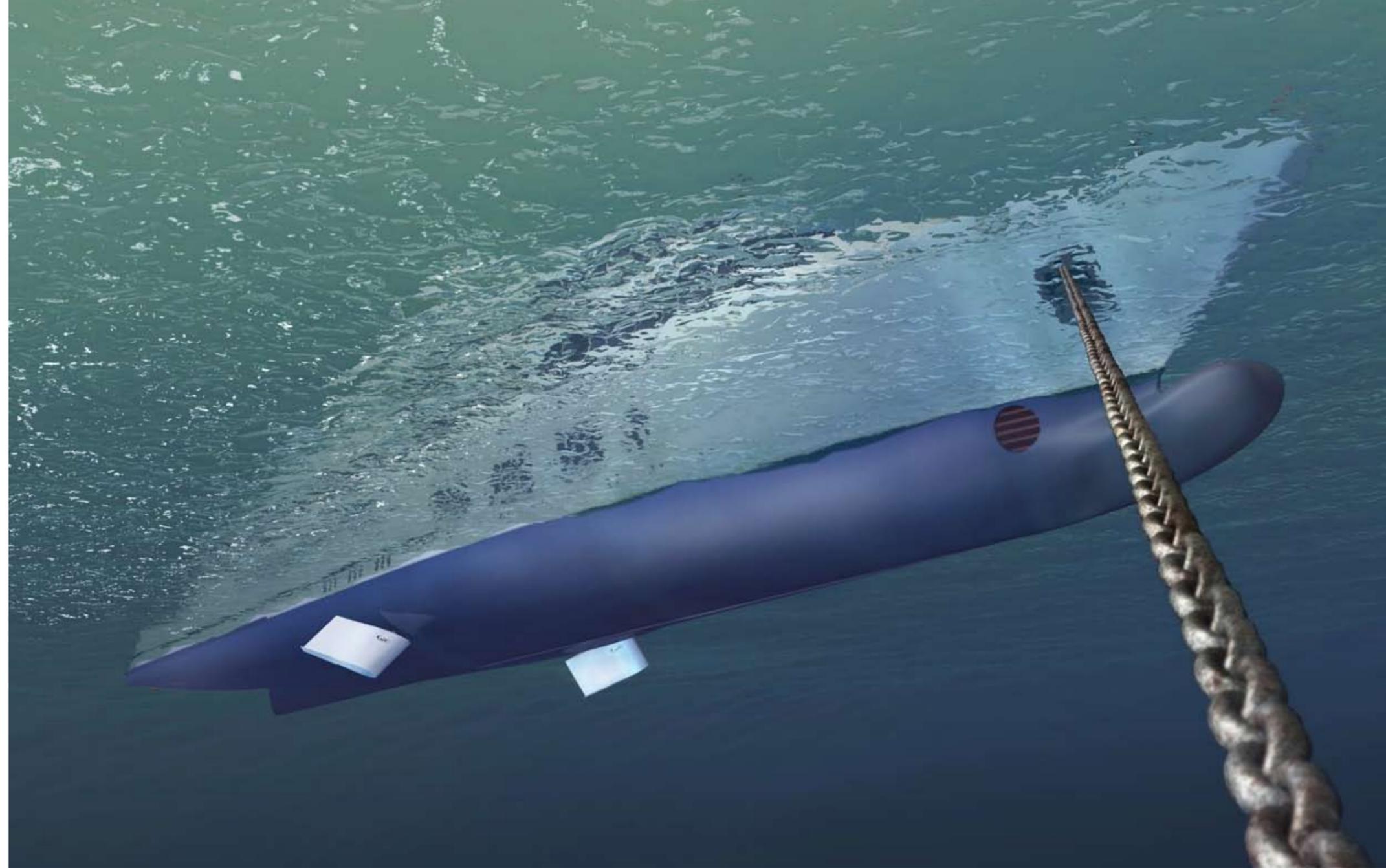
First installed in 1998 aboard the motor yacht 'Boadicea', perfect luxury now is just being able to anchor in some picturesque bay, beam on to a ground swell, without tall crystal flutes of vintage champagne crashing to the deck, along with the guests. In fact, because they can eliminate up to ninety percent of a yacht's roll and cost less than two week's charter, it is surprising that many builders still build superyachts without zero speed stabilisation.

Increasingly charterers in-the-know are telling brokers, "Nice yacht, too bad no zero speed stabilisers, what else do you have?"

It's easy to see why. Superyachts are gregarious vessels, tending to anchor in the same picturesque bays. Question: If you have five superyachts anchored in a bay which one doesn't have zero speed stabilisation? Clue: it's the one that's rolling; whose upper-works are slicing wild arcs in the otherwise tranquil evening air.

The largest and most successful manufacturer of the zero speed technology is Quantum Marine Engineering of Florida, Inc. with 160+ systems in service and another 248 on order.

"Since the word about Zero Speed™ stabilisers has spread throughout the yachting community, it's difficult to find a yacht owner or prospective owner that does not insist



on having the maximum in comfort," says Mike Perkins of Quantum.

You only have to take off your shoes and have a look inside a superyacht equipped with zero speed stabilizers, to see that a superyacht is different. Absent are all those classical nautical oddities such as hand-rails in the passageways or halls, lights on gimbals mounted on the bulkheads, and fiddles – those clever little pieces of wood along the top edge of the table that stop dinner from sliding off in a heavy sea.

The problem is that ever since man has been going to sea for pleasure, ironically he has expended tremendous effort trying to make it seem like he was still on shore. Superyachts take it to a whole new level. Decorations and paintings befitting a stately home gracing the bulkheads, furniture and even fireplaces all enhance the illusion of being securely on terra firma – at least in port.

But once clear of the harbour, the sea's natural wave action takes over making a nonsense of all that. Unless all those reminders of things terrestrial are solidly welded/bolted/tied down, when the vessel begins to roll, they



Above & Far Left: Zero Speed™ fin units at anchor.

Left: The size of the stabiliser fins can be easily seen.



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tend to join unfortunate passengers heaped in the corner. In fact, it has been estimated that before the widespread adoption of fin roll stabilizers in commercial passenger ships just after the Second World War (the first passenger ship credited with having a stabiliser system was the Italian liner 'Conte di Savoia' in 1932), as many as twenty percent of passengers were seasick, many never leaving their cabins whilst thinking there are worse things than hitting an iceberg. Needless to say, today there is hardly a single passenger ship in the world without some version of fin stabilisers.

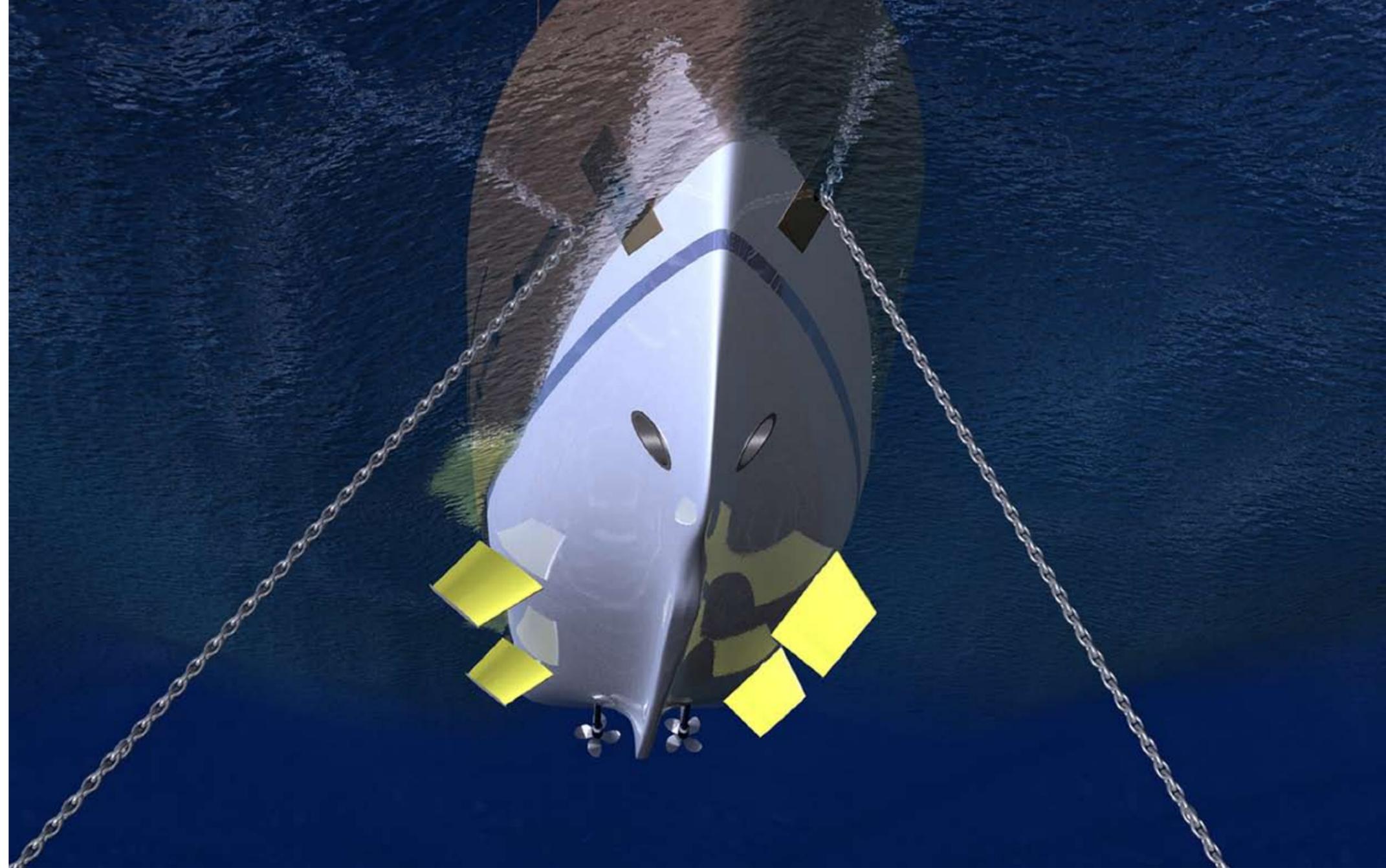
However, zero speed fin stabilisation should not be confused with ordinary fin stabilisation which is effective only when the vessel is moving. Once anchored or drifting, say to watch a whale, a vessel with regular fins begins to roll, sometimes quite violently, spilling that champagne and much more besides.

This is not a problem for commercial ships. "Ships don't make any money in port," is an old axiom of the industry. So, unlike their superyacht cousins, commercial passenger vessels are kept moving constantly on very profitable schedules, thank you very much. They are also generally far larger and hence more able to resist the force of the sea's motion.

Conversely, superyachts spend weeks in port or hours stopped in mid ocean admiring a pod of orcas and if there's a ground swell, you can almost hear the crystal crashing, the chef cursing and the guests...

Until a decade ago there were few practical ways for a superyacht owner to deal with the problem.

The first was to check in to the nearest five star hotel. Of those who stubbornly insisted on staying on board their expensive boats, some resorted to using technology



borrowed from icebreakers anti-roll tanks. By moving large volumes of water from side to side, these could dampen much of a vessel's roll. But the associated tanks and piping took up vast amounts of space in a yacht, often amounting to five percent of the vessel's displacement, which in turn increased the yacht's draft and slowed her down. Also, tanks are almost impossible to retrofit.

Recently there was a brief flurry of excitement in the industry when Mitsubishi teamed up with an Italian yacht builder to install what amounted to quite massive spinning flywheels. The idea hasn't exactly taken off.

Enter Zero Speed™ fins.

Somewhat larger in surface area but similar in appearance to regular fins, Zero Speed™ fins usually occupy the same "footprint" within the vessel. Underway both types function in much the same way.

The big difference is when the vessel stops, at anchor or drifting. When regular fins stop working, the Zero Speed™ come into their own, by moving independently in opposition.

The principle is like a canoe paddle held flat, with



Above:
Zero Speed™ fin units at anchor.

Far Left:
Great care must be taken when taking a yacht with stabiliser fins out of the water.

Left:
The difference fin stabilisation makes to guest comfort is huge.



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its blade a foot or so underwater and the shaft balanced on the gunwale. If you're sitting in the canoe, a sharp push down on the handle of the paddle causes the blade to rise, thus heeling the canoe (or capsizing it, if you're having a particularly bad day).

On a much grander scale, flipping a Zero Speed™ fin up on one side of a yacht has the same effect. And if you flip the fin on the other side down at the precise same moment, you double the effect. That's why Zero Speed™ fins are larger than regular fins.

Simple, right? Well it turns out, like everything these days, the secret is in the software and timing is everything. The software is adaptive logic based and the system is designed to constantly monitor and adjust the fin response to meet the ambient conditions.

"To be really effective the fins have to accelerate at the precise moment, that's the really hard bit, it's not good enough to be reactive," cautions Perkins: "The latest generation of software and control algorithms are fully proportional and the fins respond to the sensor input to deliver the precise fin deflections to correct the roll motion."

The hydraulics associated with the flipping motion is managed by an electronic controller which is receiving input from a roll sensor, which in turn, monitors the roll continuously. The fins "wait" at an angle approximately thirty degrees from the horizontal – one up, one down. On cue from the controller, the fins begin to rotate in complimentary but opposite directions, accelerating to the required speed then slowing to stop after approximately sixty degrees travel to wait to move back to oppose the next roll.

But a potential problem is that classically, hydraulic systems are noisy – a very taboo subject for superyachts – and at anchor with the main engines silent, other noises become much more noticeable. Noise could originate from the hydraulic power-pack, hydraulic lines and servos and even water noise as the fins cycle outside the hull. Situating Zero Speed™ fin units in machinery spaces, away from

accommodation and insulation eliminates this.

Zero speed fin stabilisation is even being credited with offering the solution to what many think is one of the greatest challenges facing the growth of the superyacht industry. As vessels pass 500 feet in length and marinas give way to high rise condos, there's just no place to tie them up. US superyacht builder Trinity Yachts, puts Quantum Zero speed stabilizers on virtually all of its new-builds. Billy Smith from Trinity Yachts once commented, "With dynamic positioning and zero speed, berthing is no problem."

Demand is high for new installations and retrofits. Quantum has completed 63 retro-fits over the past 5 years and has another 17 contracts for the rest of 2007. The lead time for Quantum to produce the equipment is between 5 and 9 months.

The cost for a retrofit can vary greatly depending on the size of the yacht, the amount of structural modifications (if any) required and the labour costs by the shipyard where the work is done.

Sadly, like all good things in life, not all yachts are candidates for retro-fits. "The limiting factor is the boat's roll period," says Perkins. In the end, perhaps Captain Carl Sputh, master of the yacht 'Starfire', says it best:

"Ok how about this: First day of the charter, we are underway from Falmouth, Antigua to Green Island; time 1330; seas, one to three feet; the galley is in full swing; interior staff setting up for lunch...you know the game! Two whales off the starboard bow, three hundred metres out. We slid right up on them, popped on the Zero Speed™ and watched the whales for about an hour. Not once did I think about lunch setup and not a glass broke, nor was there a whimper from the galley!"

That just about says it all. Perfect luxury.

For further information on Zero Speed™ fin units, please contact Mike Perkins, Quantum Marine Engineering of Florida: E: mperkins@quantumhydraulic.com T: +1 954 587 4205, Web: www.quantumhydraulic.com

Opposite:
Launching a new superyacht fitted with Zero Speed™ fin units at Trinity Yachts.

Below Left:
The finished product. Trinity Yachts motor yacht 'Mia Elise' is one of many yachts now fitted with Zero Speed™ stabilisers.

Below Right:
A Zero Speed™ fin unit with extendable fin retracted (top) and extended (bottom).

