



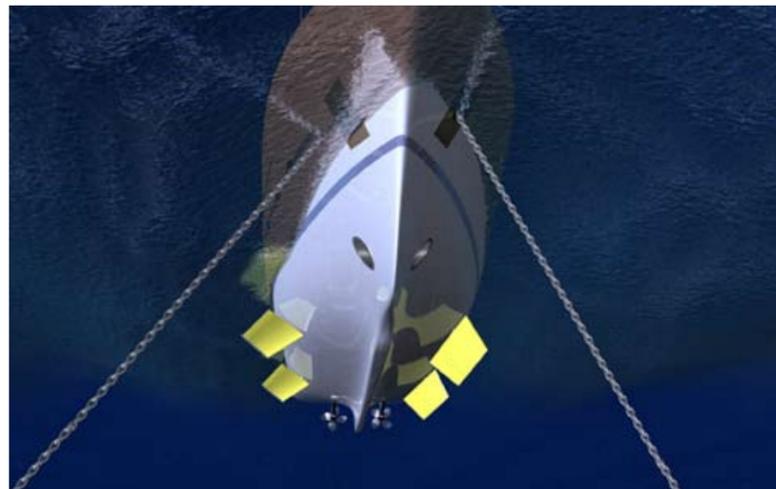
# ZERO SPEED™ AND BEYOND



**B**ack in 1999 and 2000 a small but enterprising company based in Florida, Quantum Marine Engineering, implemented the first successful application of a stabilization system that could not only stabilize the vessel when the ship was sailing, but also when the yacht was at anchor. This innovation would prove to have some far reaching impacts on the global market for owning and chartering mega yachts. It is well known that the majority of time spent aboard these yachts is with the yacht either in a port or when the yacht is at anchor.

In the past, owners, their guests and charter parties accepted the fact that the yachts would roll when they were at anchor and sometimes in port as well. The fact that the yachts would roll when anchored did serve to restrict the market somewhat, due to the fact that many people are very sensitive to such motions. After all, who in their right mind would spend hundreds of thousands of dollars per week to expose themselves to the discomfort and inconvenience of living aboard a constantly rolling platform?

Given that challenge, the group of technicians at Quantum brought to bear all of their experience, knowledge and most of their resources to explore this opportunity. The company had a significant amount of experience in improving conventional stabilizer performance by upgrading the control systems. Over the relatively short period of three years, Quantum supplied its control technology to over 350 yachts with remarkable success and the company gained a reputation as somewhat of a miracle worker for yachts fitted with older and outdated



systems. Quantum's control designer, a Dutchman, had developed what was, at that time, the most sophisticated control technology that was commercially available for the private sector. He had also been involved in a previous but unsuccessful attempt to provide stabilization with a vessel at anchor and he therefore understood the challenges. The first application did not go without its ups and downs and, after several false starts, the system was eventually tested and proven in the year 2000 - to the great relief and satisfaction of both the customer and the Quantum team. Word of this first application spread rapidly and, within a very short time, Quantum had orders from other owners who wished to have this unique enhancement installed on their yachts.

The term, "Zero-Speed™" was added to the nautical dictionary and it helped define a new chapter to nautical knowledge, called roll stabilization. Since its introduction in 1999, Quantum's Zero-Speed™ stabilization has added immeasurably to luxury yachting and expanded cruising options, particularly when encountering exposed anchorages. Currently, there are over 300 yachts enjoying



**Above:**  
The 49.1m (161') Trinity yacht 'Fox Harb'r Too' is equipped with Quantum Zero Speed™ Stabilizers.

**Far Left:**  
An artist's drawing showing Quantum Zero Speed™ Stabilizers in action with the yacht at anchor.

**Left:**  
A Quantum Zero Speed™ Stabilizer in its extended position.



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the system, varying in size from 29 m (96 ft) to 150 m (500 ft). From a performance standpoint, no other stabilizer company comes close to delivering the roll reduction performance; hence approximately 80% of the world's superyachts have Quantum's Zero Speed™ systems on board!

During the past few years, the engineers at Quantum have not been idle. They continue to innovate with new technology and have broadened the range of yachts that can benefit from Zero-Speed™ Stabilizers.

Quantum recently developed a new patented expandable fin system called the "XT™ fin". This system has been designed to overcome a number of challenges when fitting these dual-purpose systems to larger vessels. The modern yacht designs are calling for higher volume hull forms that are not always conducive to fitting the stabilizer fin area required for stabilizing ships at rest (zero speed). Additionally, most of these vessels have designed speeds in excess of 20 knots, dictating that appendage drag be minimized.

The XT™ fins are designed to reduce the fin footprint by having extendable foils that are only deployed for stabilizing the vessel at anchor. When the yacht is underway the foils are retracted, thus reducing drag. When deployed, the XT™ fins have a vastly more efficient geometry due to the fact that the area of the foil is aft of the shaft and in the best position to deliver the force required for roll damping at anchor. An additional benefit of these XT™ fins is the ability, in some cases, to fit two fins instead of four based on the total area requirements.

During the planning stages for the yacht 'Mary P', Quantum met with the yacht owners and builder to plan and design a custom solution for this unique sport fisher. At 122' and built with an aluminium hull, 'Mary P' was designed for serious sport fishing with the ability to go anywhere in the world so the owners could pursue their passion for the sport. The owners also wished to be able to enjoy their time onboard in ultimate comfort. This created a challenge for Quantum to develop a system that could



**Above:**  
The 37.2m (122') Trinity sportfisher 'Mary P' is a high performance sports fishing yacht.

**Far Left:**  
The 49.9m (169') Trinity motor yacht 'Norwegian Queen' is fitted with Zero Speed™ Stabilizers.

**Left:**  
An XT™ fin unit with extendable fin retracted (top) and extended (below).



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deliver excellent motion control at the vessel's high end operating speed in the mid 20 knot range, while offering the same control while the yacht was trawling at low speeds in the 4 – 7 knot range. In addition to the high speed and low speed motion control requirements, was the owner's desire to have the same Zero Speed™ performance that earned Quantum its excellent reputation for the mega yacht market.

Quantum's latest innovation is the MagLift series of rotary stabilizers perfectly suited to high-speed yachts, large sports fishers and several other applications including the military.

Based upon the "Magnus Effect" discovered in the 19th century, which basically states, "the Magnus effect is the phenomenon whereby a spinning object moving in a fluid creates a whirlpool of fluid around itself, and experiences a force perpendicular to the line of motion and away from the direction of spin." In essence, the Magnus effect can be observed when a golfer hooks or slices a shot.

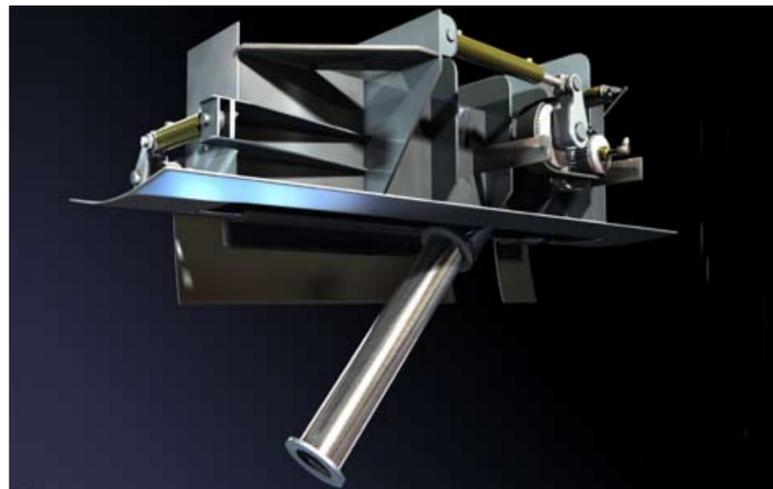
Using this principal, Quantum has invented and patented a completely new cylinder stabilizer that delivers full functionality both underway and at anchor. The MagLift systems offer the option of retracting the rotors into the hull for high speed, no drag travel. When deployed, they deliver a level of low-drag performance at slow speeds (3 - 16 knots) not achievable using conventional fins.

Stabilizer fins require a lot of power delivered quickly, which is why stabilizers use hydraulic power. Quantum began building its own high-capacity power packs several years ago. With the smallest footprint available, greatest flexibility of operation and highest level of redundancy, Quantum's Integrated Hydraulic Systems have earned a reputation for superior quality and reliability.

With bespoke electronic controllers and hydraulic power packs perfectly matched to the demands of its own fins or MagLift cylinders, Quantum confidently proclaims, "No one does it better."



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**Above:**  
The 122' Trinity sportfisher 'Mary P' at her launch.

**Far Left:**  
Quantum's MagLift™ Stabilizer.

**Centre:**  
Quantum's Archer™, active trim tab ride control fin can be seen to the right of the yacht's propeller.

**Left:**  
A Quantum MagLift™ Stabilizer on 'Mary P'.