

## Offshore



Photo: Gilles Martin-Raget/www.martin-raget.com

## Carnage preventer



Roger Ganovelli talks to editor James Boyd about his new anti-capsize equipment for multihulls

After the carnage of the 2002 race, this year's Route du Rhum was lining up to have a perfect safety record for the trimarans taking part. That was until Steve Ravussin managed to flip *Orange Project*, and was then followed in rapid succession by Ross Hobson's 40 footer *Ideal Stelrad* and Pascal Quintin's trimaran *Jean Stalaven*. All the trimarans capsized as they were tackling the front to the northwest of the Azores. This front had remained virtually static for almost a week and the sea state on its west side was steep and confused, drummed up by persistent northeasterly winds at times reaching gale force strength.

Capsize, it seems, is an unavoidable ingredient of solo long distance multihull racing. However an individual in France is trying to reverse this state of affairs.

Roger Ganovelli is a second generation multihull sailor. His father Marc, a dentist, is an Olympic Tornado sailor of a similar vintage to Reg White and Roger's background is scarily reminiscent of our own, his father still owns one of White's 1970s-built Iroquois 30ft catamarans. The Ganovellis have lived and breathed multihulls for almost 40 years.

During the last disastrous Route du Rhum in 2002 Ganovelli junior was at college where he witnessed the mid-Atlantic destruction that resulted in just three of the 60ft trimaran starters making to Guadeloupe as once out into the Atlantic they

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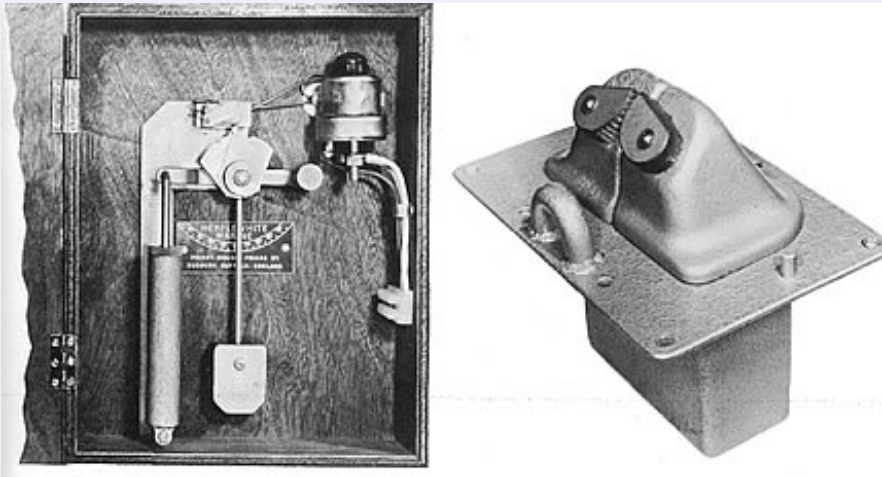
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## technique

were nailed by hurricane strength winds.

Studying as a mechanical engineer at the time the cogs began turning in Ganovelli's head over the possibility of some kind of sheet release device to help prevent capsizing or pitchpoling. His ideas were galvanised when the ORMA 60ft trimaran class made it mandatory for some kind of sheet release mechanism to be fitted to the boats for the Route du Rhum.

Sheet release systems are not a new idea. In fact going back through my own father's magnum opus *Catamarans In Close-Up* from the early 1970s there is a picture of a then state-of-the-art device developed by Hepplewhite Marine, comprising a pendulum arrangement hooked up electronically to a jammer. The boat heels, the pendulum swings, the jammer releases.



More recently several other trimaran teams have attempted to create their own systems. On board *Fujifilm* for example Loick Peyron used to have a sensor at the end of his boat's centreboard - when the centreboard left the water an alarm sounded. This system did not release the sheets and only worked for heeling, points out Ganovelli. Ellen MacArthur's team were also developing a system for use on her *B&Q Castorama* trimaran.

Following the last Route du Rhum Ganovelli and his father set about working out how to conceive a state of the art sheet release system that would release the sheet not only at extreme angles of heel but also prior to pitchpoling. Initially they worked with Lalou Roucayrol, at the time skipper of the *Banque Populaire* trimaran, and their first working equipment was installed on Franck Cammas' *Groupama II* in June last year.

Their new gizmo is designed principally for the ORMA 60s and comes in several different forms able to release not only headsails but also a hydraulically operated main sheet, as all the tris use for solo racing. It comprises two parts - one electronic, the other mechanical.

The former comprises a black box and sensors. The systems are patented and Ganovelli won't say how the sensors work, but it is not a pendulum system. "The problem with a pendulum is its inertia and how to treat the signal after it. It is impossible to treat this information very well." It is also not based on an airbag-style of accelerometer, again because of the inertia but also because of the difference in the magnetic field around the world. It is not computer or performance instrument-based because he maintains these are reliable enough to sound an alarm but not to release a sheet.

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All Ganovelli will say about his sensor is that it measures angle, be it heel or pitching. "When you pitchpole the first parameter that changes is the angle, only after that do you have acceleration. If you detect acceleration you lose one or 1.5 seconds of reaction time to release a sheet or set off an alarm." He adds that the sensors can be fitted anywhere on the boat and it doesn't matter whether this is at one of the extremities or on a rotational axis.

The sensors in his system are able to detect both pitching and heel angles while electronics in the black box make it possible to set the parameters enabling the system to differentiate between the normal expected movement of the boat in a variety of different sea states and any abnormal movements such as the boat going down the mine or catching a gust and heeling in an extreme manner. However the motion, or how an ORMA 60 travels through the water, can be extremely unusual. For example they are fitted with curved lifting foils in their floats and obviously these are located forward of the centre of pitching of the boat. As a result when the foil begins to work the boats develop a bow-up tendency. These nuances can be taken into account with Ganovelli's system for example if the boat nose-dives by 10degrees the sheets can be set to release but if the boat is launched off the back of a wave and inclines aft by this same amount, they won't release. "It can differentiate between the natural movement of the boat and a movement that is too much," explains Ganovelli. "After that you can set the angle of pitchpoling forwards, the angle of heeling and their resultant, diagonally. So all the angles between heeling and pitchpoling are covered."



Photo: James Boyd/www.thedailysail.com



The black box part of the device comes with rotary switches where the limit of the angle of heel (gite) and pitching (enfournement) can be set along with a sensitivity control, much like the setting on an autopilot.

In practise a skipper 'zeroes' the system for the sea state they're in - six sensitivity settings are available - and then adjusts the settings up a bit, the degree of which depends upon how brave they're feeling and also according to the direction and stability of the wind/sea conditions - ie if the wind is gusty and on the beam then they pay careful attention to the heel threshold, whereas reaching downwind under genniker they concentrate on the pitch pole moment. "You can set the pitchpoling to zero if you have a rhythm of waves that is very long, because the boats can descend down waves over two or three minutes without it being dangerous. So you can switch that off and when it is off a red light comes on warning you that it is off," continues Ganovelli.

Ganovelli provides a set of standard settings but says it is ultimately up to the skipper to get to know the system and its limits and use it according to their style of sailing. "People like Franck Cammas has a table of settings and from this they know in certain wind and wave conditions, they set the dial to '2' for the heeling and '3' for the pitching, etc."

The threshold to prevent pitchpoling generally is 2-4° says Ganovelli, although there are 11 different settings, the maximum being 25°. In practise anything beyond 10° means the rudders are out of the water. As heeling tends to be less sudden the threshold can be larger, typically seven to 14°. "With heeling it is slow to go and they usually have time to react. So rather than having a system that releases all the time they like a system where it can withstand a momentary gust, that is why it is quite adaptable."



In addition to the automatic sensors manual overrides, are also fitted, resembling the automatic fuel cut-off switches you find on RIBs. When we had a look around Yvon Bourgnon's *Brossard* for example these were on the black box, mounted just inside the doghouse, in the cockpit and by Bourgnon's bunk. There is also a wrist mounted wireless release - this could be useful to blow the sheets in the event of a skipper falling overboard.

While the electronics are standard several options are available controlling the mechanical side. The main sheet hydraulics can be released through a simple 50g valve, plumbed into the hydraulic feed to the main sheet ram. This comes with a fuse to protect the system. For boats with a conventional rope sheet system rather than a hydraulic one, Ganovelli offers a Spinlock X6 jammer modified with an electronic piston that opens the jammer lever releasing the sheet.

For the headsails, Ganovelli has come up with another release system where the sheet is held in place by a Harken cam cleat. This is mounted on hinged a plate and when the headsail is released this plate simply angles up to the extent that the pressure on the sheet will pull it out of the cleat (see photos and video below). On *Brossard* for example this plate is mounted on the vertical bulkhead at the back end of the doghouse area.

Obviously with the cleat release systems the amount of load on the sheet must be enough so that the sheet will fly off the winch. Ganovelli recommends that the number of turns put around a winch be enough so that the crew can comfortably hold it but not so much that the sheet doesn't move, although the system works with 20kg load or 500kg.





Once the sheet has been released the cam cleat system must be manually reset, while the hydraulic system and the X6 jammer re-engage once the boat has returned to a 'safe' angle.

The sheet release system has been developed initially for racing multihulls, however Ganovelli is now looking at a simpler model for cruising multihulls, where the designer can decide upon the maximum angle of pitching or heel and this is then set up permanently.

We understand that *Orange Project* was not fitted with Ganovelli's system and one suspects that a system such as this will never be 100% reliable. However even if it prevents one capsizing then the hard work put in by this father and son team will have paid off.

Most of the trimaran skippers are sold on it - as Franck Cammas puts it: "If I had had this equipment in 2002 I would probably not have capsized." And so we are guaranteed light weather flat sea races for the 60ft trimarans in the foreseeable future....

**To see some video in French of Yvan Bourgnon demonstrating this system - [click here](#).**





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