

NEW ZEALAND

Another 'giant' success

The design process for *Mari Cha IV*, the new Atlantic monohull record holder, began four years ago and continued for 18 months with no guarantee that the groundbreaking yacht would ever be built.

'It is a real credit to the owner [Bob Miller] that he took the leap of faith to go ahead,' says New Zealand-based Greg Elliott, who, with Clay Oliver and Philippe Briand, was one of the principal designers.

Elliott says the project began when he was asked to submit a concept design to fulfil a one-sentence brief: 'create the fastest monohull in the world'. Elliott is into unbridled speed in a big way.

He has made a name for himself with a series of out-and-out speed machines. Something of a maverick, he also has little patience with rating rules, most of which, he says, stifle speed. His yachts typically feature maximum waterline length for a given size, very light displacement, a hint of reverse sheer, deep, powerful appendages and plenty of sail.

The *Mari Cha IV* project was governed by the fact that ocean record attempts have to be conducted on manually operated yachts. All the sail trimming and handling functions, apart from the vang and rig tensioning, must be driven by human power. 'That was the overall controlling factor,' says Elliott. 'Everything had to be kept within the bounds of realistic deck hardware and, for example, the size of rope that a crew can get hold of and put around a winch.'

Almost from the start this limitation ruled out a sloop rig. Elliott had developed considerable experience with his previous very fast 50ft equal-masted schooner and it is no real surprise to see a similar configuration on this yacht. 'But,' he says, 'the decision was made easier by the fact that all the wind tunnel testing we did showed that the good schooner rig is faster than a sloop on any given day – and on all points of sail.'

Elliott's 50ft schooner sports rotating wingmasts, which must surely have tempted the designers of this project as well. 'We looked at all kinds of configurations,' says Elliott, 'including sloops, ketches and schooners. We considered rotating wingmasts as well. There is no doubt it could be done, but the owner took the decision to go with what is tried and proven.'

'Let's face it, the boat is already "out there" compared with any other 140-footer. I think the feeling was "let's not be too far out there!" We still have the option to retrofit the boat to a faster rig if we want to...'

The trimming crew split into two, the main section operating the forward mast, which carries the mainsail and headsails, with a smaller group handling the mizzen, which carries an equal-sized mainsail, plus staysails when the sailing angles are broad enough.

The twin-wheel steering positions are well forward, with the mainsheet and headsail trimmers in front of the helmsman. Principal communication is with these trimmers, while the mizzen trimmers largely work intuitively to keep things in balance. With the typical high speeds the apparent wind is usually well forward, so that the mizzen sail is more often than not sheeted to the centreline or above.

In reaching mode the yacht almost always exceeds windspeed. 'In 12kt of wind, with a true wind angle of 135 degrees, the apparent wind angle will be 55 degrees and the boatspeed will be 20kt,' says Elliott, who joined the crew for the inaugural transatlantic passage from France to the US. 'Upwind, with the apparent wind at 20kt, you will be doing 12.5kt in a seaway.'

On that first transatlantic passage Elliott was particularly impressed with the way the boat maintained high speeds for long periods. 'It would just sit on 17kt,' he says. 'On lots of boats you see 17kt in bursts, but then it is back down to 12 or 13. This boat just sits there.'

Elliott says that for one 24-hour period they had winds of 16kt on a broad angle and clocked up 420 miles. The boat's predecessor, *Mari Cha III*, which set many records in its own right, including the transatlantic, never did a 24-hour run over 400 miles. The target for this boat is 500 miles.

But there are limits to the power the crew has to play with, even – or especially – at this size. 'There's plenty of stability using the



'80-days', no problem: Robert Miller (seated centre) relaxes in Falmouth with his predominantly French and New Zealand 23-man crew following *Mari-Cha IV*'s comprehensive demolition of Bernard Stamm's west-east transatlantic monohull record

combination of swing keel and water ballast,' says Elliott, 'but you can't have the keel fully canted plus full water ballast – it would be too much. The rigs would not take the loads. You either have the keel fully canted, with no water, or half water/half cant, or full water and no cant. You break those rules at your peril!'

In the absence of forward daggerboards, or canard rudders, the upwind configuration is to lock the keel in the vertical to maximise lift and use water ballast for added displacement and stability. Then, as the wind comes aft, you progressively get rid of water and increase the keel angle.

Elliott says the principal design team comprised himself, Oliver

and Briand, with Mike Sanderson directing the sails and deck layout and project manager and skipper Jef d'Etivaud presiding. 'It was very much a team effort,' says Elliott. 'Everybody had input into all aspects of the design. The design team would meet about every two months in New York for intensive three-day sessions. Out of those meetings we would assign areas for further investigation. Between meetings communication was by email.

'Jef [d'Etivaud] did a good job of keeping everything on track. It would have been very easy to wander off the straight and narrow and, once that had happened, very difficult to bring it all back again.'

No deadline was set. The initial task was to investigate the creation of the fastest monohull ever, but with no guarantees that the project would ever be more than a theoretical exercise. Finally, after 18 months of design and research, d'Etivaud judged the project ready to be presented to Bob Miller.

Having ventured before where nobody else had gone with his stunning Briand-designed carbon ketch *Mari Cha III*, Miller has already revealed the pioneer spirit. Whereas that project had a split personality, sometime racer, sometime elegant superyacht, this one is a further leap to the edge. It is a no-frills, no-compromise race machine.

Miller was ready to take that step and the result is the striking machine we see today. //