

# Seahorse

## International Sailing

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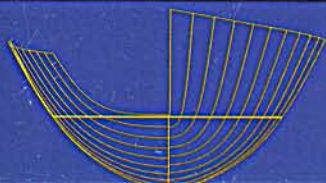
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# Here we go again...

– Rigs, keels and reputations tumble on the Hauraki Gulf



**THE MAGIC OF SCALE**  
**– HOW MODEL YACHT**  
**DESIGN GOT THERE FIRST**

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It all comes good in the end for the Cometa team as their Open Class 65-footer leads 1,968 rivals away from the start of the 2001 Barcolana Regatta. Cometa went on to set a new course record

# DESIGN Time bandit

Maurizio Cossutti describes his Open Class design *Cometa*, winner of Barcolana 2001, pinnacle event of the Adriatic season that this year drew a record entry of nearly 2,000 boats

## Background

The original commission for *Cometa* came from Pfizer Pharmaceuticals, to take advantage of the great visibility offered by Barcolana's unique show, held the second Sunday of October every year. The dream was to realise an innovative boat able to carry Pfizer's commitment to research all over the Mediterranean, racing not only the Barcolana, but also the Giraglia, Roma per Tutti and Middle Sea events.

## The hull

The guidelines were defined in December 1999, centred around a length of 65ft, with the possibility of reducing it to 60ft by trimming the stern scoop. The last parameter was included in anticipation of a new Open 60 Class in the Med, which has in fact yet to materialise.

Cossutti Yacht Design's usual Open class philosophy is to design light, heavily canvassed boats with high form stability. At the same time bow and stern lines are drawn in quite harshly, producing a narrow bow entry and a stern that can be

lifted out of the water relatively easily with forward trim in light air.

However, for the first phase of this project we chose to pursue two designs: a 'narrow boat' (with slim and slab-sided canoe body and wings to improve crew righting moment) and a 'wide boat', with the features more typical of our previous projects. In both cases we kept a canting keel, plus double asymmetrical canards forward, and a single rudder.

After two months of detailed VPP comparisons, it became clear that the advantage of the first type when sailing close hauled and in generally lighter conditions was more than balanced by the sheer power of the second in all other conditions. Finally, we expected to use the canting keel to heel the boat to leeward in light air in order to reduce the weak points.

Thus we finally opted for the most extreme of the 'wide' hulls, 19.8m long, with 5.4m maximum beam and displacement at around 8,000kg.

## The rig

From the beginning we were convinced of the superiority of the rotating wingmast over a conventional spar. Theoretical data validated by racing our 6.6m monotype Zero, and also our Open 35 in the 2000 Europe 1 Star, reinforced our choice. A mast of chord of 500mm and a width/length ratio of 48% gave the best lift-to-drag results for our purposes.

The original rig layout was free of any spreaders: a single pair of shrouds supported the mast athwartships, with a single pair of runners positioned halfway between the forestay attachment and the masthead. We relied on the stiffness of the section to keep the luff of the Code Zero

tight, without adding another masthead backstay. All rigging was in EPI Kevlar apart from the forestay, which was in stainless rod; everything was linked to the mast by Vectran lashings.

The mast was built in M40 carbon prepreg in a female mould, in two elliptical halves. A non-structural tail fairing completed the aerodynamic elliptical section.

An innovative telescopic bowsprit system was fitted to the boat. The Code Zero was set with the tack 2m forward of the bow on a large carbon section, while a smaller carbon section could then be extended another 2m forward for the asymmetric genakers.

## Sailplan and appendages

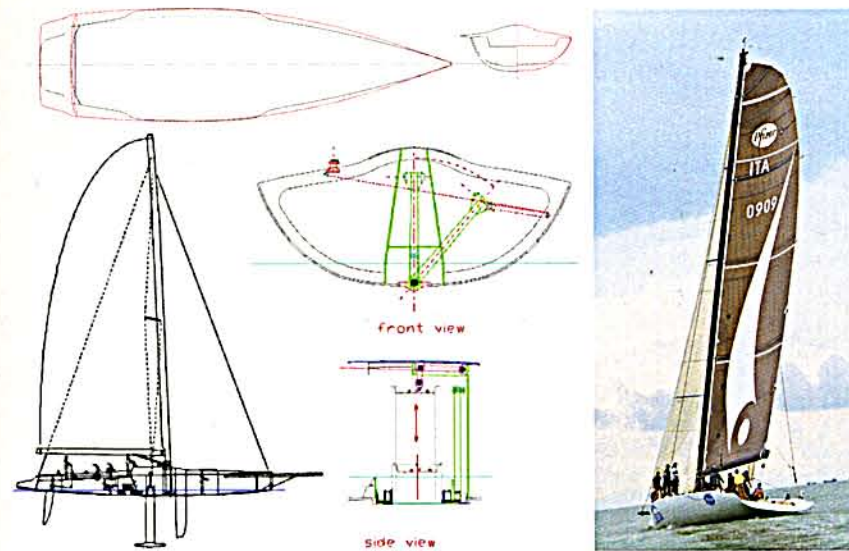
One of the central parameters of the project was to make the most of the stability of the boat, maximising sail area for optimum performances in the lighter winds characteristic of the Mediterranean. As a result the sailplan has a very big main of 170sqm (similar to a 60ft multihull), and a genoa of 110sqm. The masthead Code Zero is some 150sqm and the asymmetrical maxi spi 450sqm.

We made extensive use of CFD to balance the boat in several configurations:
 

- light-air close-hauled, with all the lift on the main keel (vertical), without canard
- close hauled with stronger breezes, with keel canted (and therefore losing its side force), and leeward canard increasingly lowered to a maximum of 2.5m below the hull, with the hydrodynamic balance point moving more and more forward

- in all the conditions the rudder angle should be below 6°

Quantum Sails Italy were appointed to



Top: comparison of twin hull studies for slim and wide designs. Left to right: Cometa GA; the original lifting and canting-keel mechanism; first spreaderless rig configuration

develop the whole sail programme, using both Q-Sail software, developed by Cimne (University of Barcelona), and Quantum Europe's own proprietary tools. This was especially critical when such a big, high-roach mainsail was combined on a large-section wing mast.

Meanwhile, CFD studies of the appendages were being carried out by MC Yacht Design, together with Alberto Porto, a fluid dynamics engineer from Argentina. Following this project, Porto went on to study Mani Frers' VOR 60 *Amer Sport One*, and he is currently working with the Swedish America's Cup team.

## Structure

Marco Angeloni engineered both the spars and the primary structure. The hull and deck are in unidirectional carbon fibre, laid over a PVC core of varying density. The hull was laminated on a male mould while we chose to use a female mould for the deck.

Timing was tight. The hull lines were released in February 2000 and the launch planned for 15 August. With only six months remaining, we decided to run two parallel production lines, at FK Boats and Cantiere Crosato.

A serious challenge was the canting keel, which also needed to be lifted to reduce draft from 4.4 to 3m to enter port. To reduce cost and weight we had also decided to avoid hydraulic systems, so both the canting of the keel during sailing and the lifting of the keel itself were carried out by purchase systems driven by the primary winches.

## Trials...

Launch was on schedule and first trials took place in September 2000, only a

month before the Coppa d'Autunno. Bad weather and some problems with the complex systems of the keel and mast allowed only a few days of training, albeit with a strong crew including guest star Luca Devoti, fresh back from winning an Olympic bronze in Sydney.

Unfortunately, on the day of Barcolana 2000, a strong Bora was blowing at around 50 knots - and *Cometa* broke her rudder stock just before the start. Though very disappointed, the Pfizer board decided to carry on with the project while reinforcing the technical management.

During the winter of 2000-2001, under project manager Vittorio Volonté, and with the support of Giovanni Belgrano and Franck de Rivoyre for the mast, *Cometa* was refined. One pair of rotating spreaders was added to the mast to support the high loads of the Code Zero better. Also, the keel-lift system was abandoned as it was deemed superfluous.

## 2001 - a happier New Year

So *Cometa* had her 'new' debut at the Giraglia Rolex Cup in St Tropez, finishing fourth after some halyard problems.

At last it was back to the Barcolana, albeit a year later than planned. At the helm was Flavio Favini, fresh from winning the IMS 50 worlds on *Brava*. On a gloriously sunny day, with winds between 15 and 25 knots, *Cometa* revealed her potential, taking line honours in the biggest regatta of the Mediterranean, destroying the race record and showing plenty of promise of even better performances to come. Thankfully! □



Subtle stern treatment - not very. Cometa is wide and powerful and relies on a huge rig and a leeward-canted keel in light air

Maurizio Cossutti,  
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