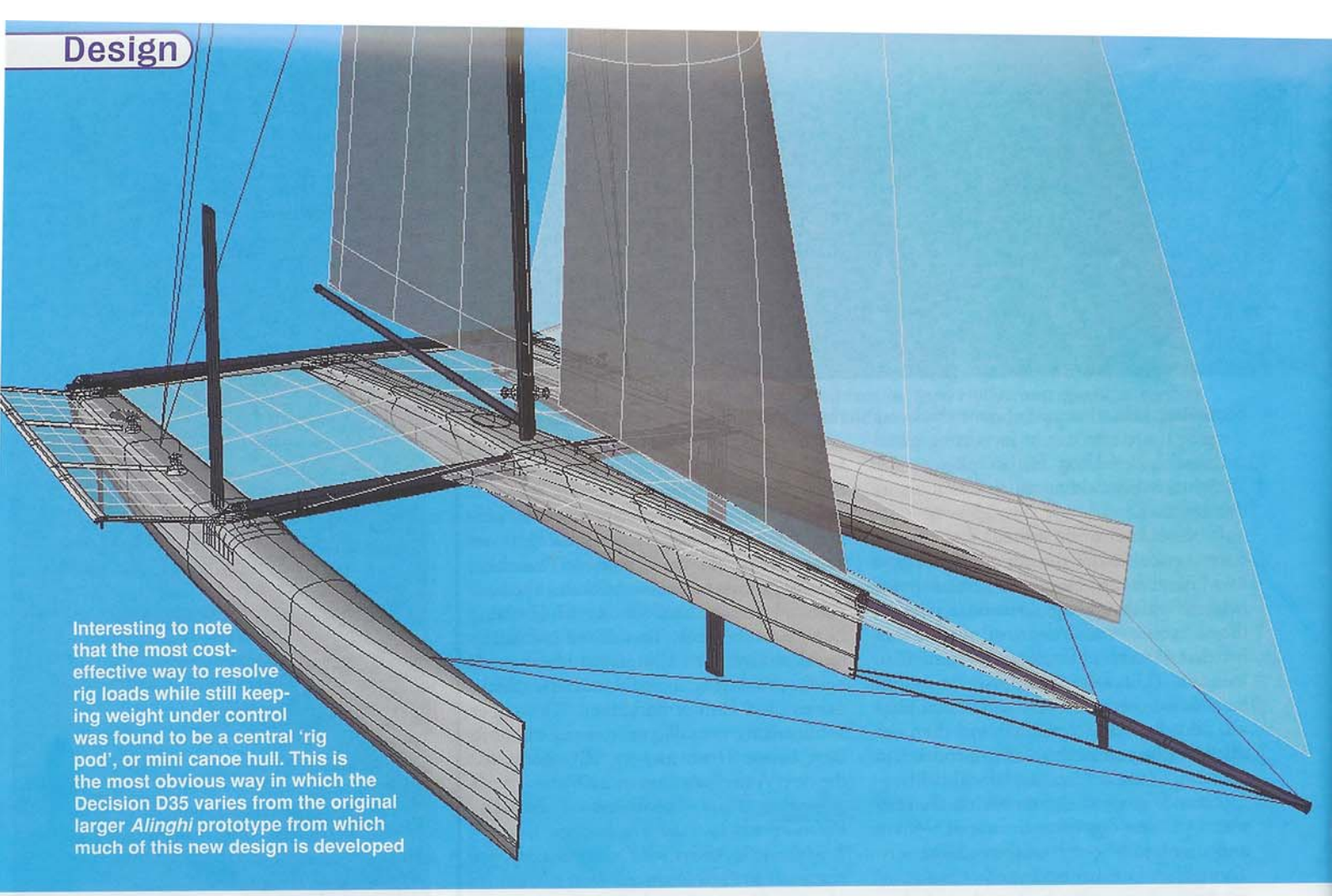

Interesting to note that the most cost-effective way to resolve rig loads while still keeping weight under control was found to be a central 'rig pod', or mini canoe hull. This is the most obvious way in which the Decision D35 varies from the original larger *Alinghi* prototype from which much of this new design is developed

Production madness!

Sébastien Schmidt describes his latest project, to create a fleet of eight large superlight lake-racing cats… in time for this summer's circuit

Decision 35 catamaran

Eight boats! Eight high-tech mad cats with prepreg carbon skins less than 1mm thick built all in a row! In the four years of racing on the lakes that have been dominated by *Alinghi* [co-designed by the author] not a single new prototype has been built; so the main players on Lake Leman have now combined forces to kick-start a new one-design project.

But such co-operation was not an easy concept to grasp in an arena that has been a positive playground, or laboratory, for extreme boats over the last 50 years, reaching an apogee between 1989 and 1995. During this period the late Formula 40 Class prompted some wild platforms from architects like Gino Morelli, Van Peteghem & Lauriot-Prévost, Jo Richards, Duncan Maclane and so on.

But last year's 'Leman gale' (30kt in a thunderstorm) – when several boats were destroyed leaving just two survivors in the 'monster' category – has rather hastened things along the evolutionary trail.

After this excitement we spent a great deal of time looking at the options for the future. When I say 'we', I refer to a healthy group of people who are more normally to be found fighting against each other in different clans around the lake. But once the rival yards, sailmakers, crews and clients had all gathered together around a single table this led to some unforgettable 'discussions': seven simultaneous, competing clients (one has ordered two units) is not a trivial situation for any design team!

Actually I was afraid that we might suffer from an overly democratic process, common in Switzerland where many people are frequently too quick to offer their opinion. As a result, our projects often end up with the bland and insipid scent of flat potpourri. However, quite the opposite transpired in this case, with a very positive dynamic soon defining the clear and convergent task at hand.

At the top of the list of requirements was the budget, which was targeted as close as possible to 230,000 euros per boat. This is to cover the initial build cost, but equal importance was given to constraining the running costs for each season. We estimated that our goal should be annual costs of around 30-40,000 euros, which we believe is the maximum amount that is saleable to a typical sponsor.

First off, we considered creating direct – simplified – sisterships to the original *Alinghi*, as the moulds were generously being offered to us by Ernesto Bertarelli. However, the sheer scale of this superb boat was still too high for our budget, even after cutting costs by simplifying the fit-out, reducing the modulus of the carbon fibre and so on.

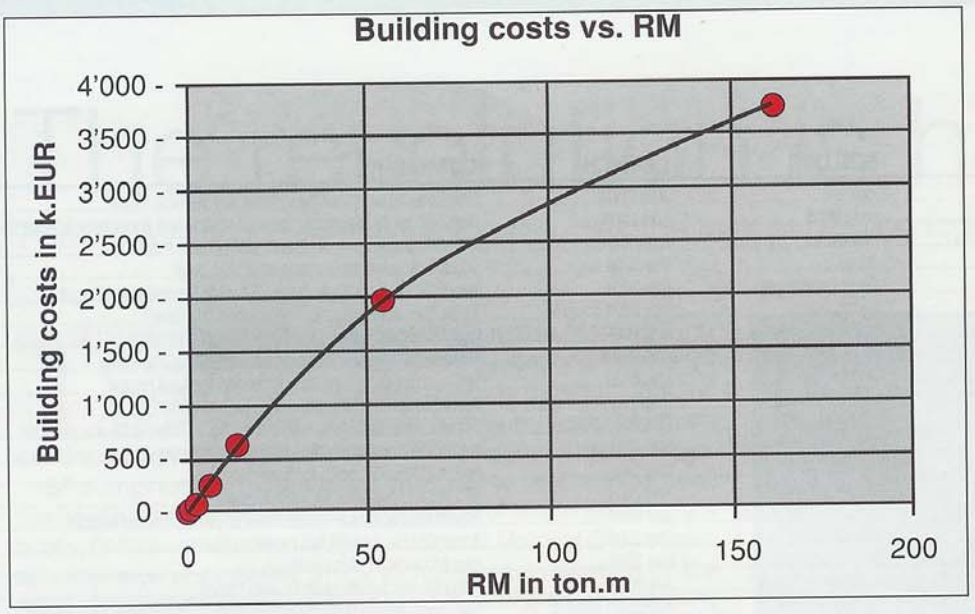

FIG 1
Carbon catamarans: righting moment vs build cost

In spite of the budget constraints there are few compromises in final construction with prepreg carbon being used throughout – the Decision shipyard couldn't build you a heavy boat even if you asked for one!

So we decided to start a brand-new project, with the next question being how to size it? Normally, to create an actual boat you first need a detailed specification with scantlings and construction details and so on? In fact, we started from the other end... with the price.

Interestingly, if you plot on a graph *(see Figure 1, above)* the existing references you have in carbon cat construction, the Formulas 20 and 28, the Ventilo 27, *Alinghi* and the ORMA 60s, right up to the 105ft *Club Med*, you obtain a very smooth curve... if you consider the price versus not the overall length, but the righting moment. So by then inputting the defined budget, we obtain a RM value of about seven ton-metres. Hence our new project hinged entirely around this fixed parameter, plus the fact that it was decided to reduce the crew number (from six to four/five) to simplify the organisation of the racing teams still further.

To be honest, our budget target was very ambitious indeed: there was never any question of making a polyester dog with aluminium spars just because all the boats would be the same. We were all determined to preserve the refinement that we had achieved on our previous designs: thin and light carbon-fibre structures, far from unbreakable, and with extreme sailplans and high-tech appendages for full-on high-emotion sailing. Indeed 160m^2 upwind on a 35ft cat targeted at about 1,200kg is not what we could ever call a demoiselle!

The commitment in terms of personal 'industry' was totally underestimated. We spent thousands of hours, yes, I said thousands of hours optimising the building to fit within the budget without sacrificing quality. The configuration, dimensions and hull shapes were quickly defined based upon our common experience, but the building optimisation, what a challenge this proved to be!

We followed the precept used in aircraft construction: to be at the same time lighter, more reliable and cheaper. This meant that there was one fundamental principle to which all involved must adhere: minimising the number of pieces. For instance the complex net of PBO cables used under the mast of *Alinghi* has been replaced by one larger composite element, like on Kelsall's *VSD* 20 years ago! Thus we ended up with this strange Virgin Cola bottle shape, which is not a hull, not a spar, but something like both together...

A big transition was also required by Bertrand Cardis and his team at the Decision shipyard, where up until now only one-off boats had been produced. A new production sequence was created, starting from the big oven, where all the moulds for one boat could be put in at the same time, allowing us to cook one whole boat every 10 days. The still hot shells are then moved to the assembly shed, where they are joined on a steel jig to the beams – which are manufactured separately at Ventilo some 20km away.

The paint on the first boat is still fresh as I'm writing these lines. In just a few days all the pieces will be mounted in the forecourt for a general check-over. Then the first mast should arrive from Lorima. Once this is stepped we will then doubtless watch the sailmakers swarm over the new boat like bees as they check all their details, cutbacks and so on...

The first launch should be early in May, and will be covered fully in a subsequent issue of *Seahorse*.

Sébastien Schmidt – for the design team

DECISION 35

Hull length	**10.81m**
Length overall	**14.09m**
Beam over hulls	**6.89m**
Beam overall (inc. racks)	**8.74m**
Mast height above WL	**21m**
Targeted displacement	**1,200kg**
Mainsail	**81.6m^2**
Solent	**40.7m^2**
Genoa	**70.8m^2**
Reacher	**131.1m^2**

Crew Minimum of 5 people, max 437.5kg
Project managers Nicolas Grange and Philippe Cardis
Design team Damien Cardenoso, Bertrand Cardis, Christian Favre, Jean-Marie Fragnière, Gérard Gautier, Rémi Laval-Jeantet, Sébastien Schmidt and Steve Wasem
Structural engineering Luke McEwen and Jennifer Forrester, SP Technologies. Franck de Rivoyre for the mast engineering
Builders Decision SA, Ventilo, Lorima and Compotech

Engineering

The engineering of the Decision 35 one-design has been an interesting follow-up to the successful Lake Leman racer *Alinghi*. Despite both boats being constructed in carbon prepreg by the same builder with the same designer, they are considerably different in their arrangement.

The D35 catamarans had to be simpler for an initial production run of eight boats. Where *Alinghi* used a complex truss arrangement to take the torsion loading, the D35 catamarans do not incorporate such a structure. They needed to be built with the minimum number of parts for a tight limit on construction costs.

An interesting aspect to the solution was the use of a central 'structural hull' to take the majority of the fore aft bending loads, which allowed a valuable reduction in the laminates of the 'sailing hulls'. Platform torsion is resolved in a conventional manner.

The requirements for weight and stiffness were stringent to live up to the performance of the boats' famous predecessor. This made for a challenging engineering project as minimum cost, minimum weight and maximum stiffness are conflicting demands and require some cunning compromise.

This has been an exciting project, particularly in view of the cost constraints, and we look forward to the launch of the first eight boats in the months ahead.

Jennifer Forrester, SP Technologies ❐