



Diligent... and dominant

The ORC B class has seen very close racing in the past few years, much of it dominated by the designs of Maurizio Cossutti. Here Cossutti gives the chronology of his success

The last time that I wrote an article for *Seahorse* the subject was an ultra-light open 65-footer with wing mast and canting keel. A lot of (salt) water has since passed beneath the bridge, and this time I'd like to describe the birth and evolution of two very different kinds of sailing beasts, smaller and made for the strict ORC rule requirements. Both, however, have been highly successful, having won four ORC world titles in the past four editions in the B class, plus many other prizes.

The story starts in the first years of this millennium when we enjoyed a lot of success in modifying and optimising various series and one-off designs for IMS, including in the B class the ubiquitous Bénéteau 36.7 that dominated the racing scene for a couple of seasons.

After that we moved our attention to the Vrolijk 37, an evolution of the successful Rodman 42, a boat closely tailored around the rule. Never mind the fox, in terms of results the effect was akin to putting a lion into the chicken coop...

Another couple of years and Italian boatyard Cantiere del Pardo, which in the meantime with Botín & Carkeek had developed the famous Grand Soleil 42 Race series, launched a smaller 37ft baby, along the same 'boxy' hull family lines.

Despite being less sophisticated than the Vrolijk 37, and sensibly heavier, it was nevertheless immediately evident that the rating/performance ratio of this boat was the new winning combination.

In 2005 I was also partner in a small boatyard, 2M Marine in the northeast of Italy. And as a first boat we decided to create a new B class racer-cruiser for 2006, the M37. My idea was simple: the boat should be light and as fast as a Vrolijk 37, but with a rating similar to the GS37 – clearly an ambitious target. Also, the interior volume must be suitable for cruising but the construction, rig and appendage design would all be driven by race performance. We were fortunate too to have the opportunity of undertaking rating work on some of the boats designed by our main rivals, which was a great help...

For our new boat I began a parametric study of weight/length/sail area parameters, with a view to having the lightest boat possible compatible with IMS requirements – our design background sits firmly in the area where light, over-canvassed and fast and fun open class boats are the norm for racing. Working with the best commercially available VPP of that time, and with the ORC programme, I tested four families of hulls, crossing performance and rating data to determine the best corrected time winner especially on windward-leeward courses. We also accepted a penalty in the GPH figure, for scoring offshore races, being convinced that a lighter boat would overcome this handicap.

Of course during this process I was also drafting my ideas on hull form, with a pronounced knuckle bow and raised stern, for minimising IMS length, but with distinctive voluminous bow sections for high prismatic coefficient in the heeled

condition, and for better control in power-reaching conditions. The M37 was probably also the first high-stability design, launched when the IMS rule was still promoting low RMs, and the results in terms of boatspeed were evident.

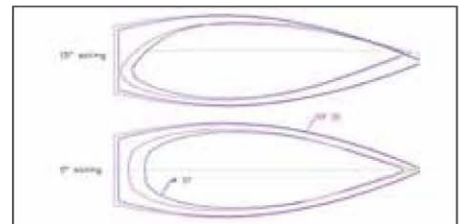
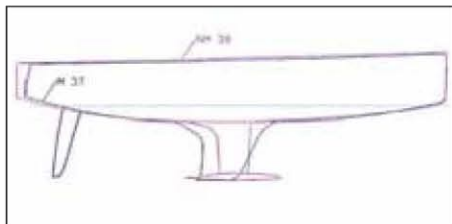
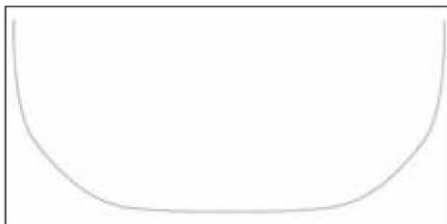
In plan view the M37 showed the characteristic full bow, a regular sheer, with a rapid closure towards a stern counter that was rewarded under the old IMS system.

But one of the most interesting features was the midship section with vertical sides near the sheerline, a steady slope with a first 'soft chine' towards the waterline, to reduce beam waterline, and a 'beefed-up' hull bottom to maximise the BTR measurement: the resulting shape in some ways resembled the old IOR sections, but it proved very effective both in rating and performance.

Construction was in epoxy and glass sandwich over a foam core, vacuum bagged and post cured, together with internal reinforcement in glass and carbon with a steel structure for the keel, mast step and shrouds making for a construction far more sophisticated than series-built competitors, stiffer and with better weight distribution.

The keel was also a very different beast: shallow draft at 1.95m, trapezoidal, with a lot of area and volume (with four big empty holes inside) and refined laminar sections. The trailing edge also sported a big triangular 'skeg' that we used to put in our keels to get a bonus for added volume and wetted area; but since this skeg was in the wake of the keel itself, in this disturbed flow the effective added resistance was less than the calculation from the IMS algorithm. This loophole has now been cancelled!

So we arrived in Cagliari with our new M37 after only three hours of practice, but went on to score five wins in the first five races in winds of 25-35kt. We clearly had ▶



Top: Cossutti's all-conquering M37 displays a distinctive bow knuckle to reduce measured waterline. The same boat's trademark keel (right) showing the aft flange that until 2013 offered a beneficial rating gain. The midship sections (left) are not unlike an '80s IOR boat. The subsequent NM 38 is compared with its M37 predecessor (centre/right). This boat was targeted as a faster, higher rating evolution

the fastest boat in the fleet, and also a very good rating. We ended with seven 1st places, one 2nd and one 3rd – a big result and, to be honest, a big surprise for us too.

Ottavo Peccato, this was the boat name, has continued its winning career with several Italian titles, and is still racing in its original shape.

2M Marine decided, after a couple of cruising M37s, to put into production an evolution of the boat, even more race oriented: the *Corsa*. Three *Corsas* were built, the most famous being *Low Noise*. The modifications comprised a simplified interior, and a more refined construction with composite bulkheads and furniture, and therefore better weight distribution – plus the possibility of having different weight-trim combinations by playing around with the internal ballast. *Low Noise* won its first IMS world title in Brindisi in 2009, confirming the validity of the design.

In the meantime 2M Marine suffered some economical difficulties, and I left the company to start my own independent design operation. One of our first clients was Pino Stillitano, owner of Nautilus Marina in Fiumicino (Rome), for whom I modified and updated a 36.7 and then *QQ7*, a nice *Vismara 41*. With Pino, for his new NM range, I first designed a 'borderline' carbon-built 43-footer with very light displacement and planing hull; this boat showed promising flashes of speed, but also proved difficult to drive at 100 per cent when racing against more traditional designs like the *Comet 45* and *GS 42 Race*.

After that NM Yachts decided to enter the Class B competition, with a new design to fight with the M37 and other newcomers like the *Comet 38 S* – not an easy task. The target was the 2011 season with the world championship in Cres, Croatia and the Italian championship in Trieste, all in the Adriatic.

The idea behind the new NM38 was to sacrifice something in rating to create a

faster boat. Also keeping in mind the lessons learnt with the NM43, we decided to make a longer boat, just under 11.40m (the limit for the B class in Italy), with cleaner lines, softer sections, shorter overhangs and of course updated appendages.

We also decided to maintain more or less the same sailplan proportions that had so far worked well, albeit slightly squeezing up the aspect ratio.

So we began drafting the first new set of lines whereupon the speed potential of the new hull soon became evident. But it was also clear that the sail area/displacement and wetted surface ratios were critical in low wind speeds (5-7kt TWS); however, we were confident that with proper tuning with the sailmaker any perceived disadvantage could be overcome.

Having defined the hull, and of course the deck styling, we moved onto the structure. It was soon decided to abandon the central steel structure of the M37, which weighed around 300kg, replacing it with a carbon grid. To maximise CNC work and reduce manual operations we developed a narrow spaced series of longitudinals and girders that could be cut with a CNC machine and assembled like Lego before being installed in the boat. The system proved very effective, saving more than 200kg that could be put partly in the keel and partly in the bilge.

The small R&D budget we obtained from our first customer was not sufficient for a complete CFD programme, so it was decided to rely upon VPP comparisons for hull definitions, and use what money we had to study new T-keels and bulbs and compare them to the existing M37 keel, and also compare different bulbs from slimmer to fatter.

The keel also sported our 'trademark' trailing edge skeg that at the time was not yet penalised by the rule. The keel was a lead casting with final CNC-machining.

NM Yachts built two sisterships,

Scugnizza and *Rewind* (now *Sugar 2*), with the same hull and appendages, but with two different rig options. The principal measurements were the same, but for *Scugnizza* we chose a John Mast aluminium profile that had proved to be sufficiently stiff on the M37, was cheaper than carbon and had a better mast weight and centre of gravity for ORC measurement. This was completed with carbon boomerang spreaders, composite PBO rigging from Armare, and a nice and very light trellis-style RIBA carbon boom.

Meanwhile, the *Rewind* team opted for a King carbon mast and boom with traditional rod rigging. When it came to sails the choices were different too: on *Scugnizza* match racer Paolo Cian wanted a square-top mainsail with twin backstays and extra winches which forced us to modify the hardware layout. They also soon switched from fractional to big masthead kites, while Paolo Montefusco decided on a more traditional inventory for *Rewind*, with the addition of a jib top for offshore races.

Finally, it was time to put the boats into the water and sail: the impression for both teams was that the boat itself was fast and with great potential but not easy to drive, especially upwind and in lighter conditions.

In the same period the original M37 *Low Noise* was being modified and updated by Matteo Polli with a new T keel – Polli had worked with me during the original boat design. The old lady proved to be very fast and competitive, so competitive that she won the ORC worlds in Cres.

One month later *Rewind* and *Scugnizza* finished 1st and 3rd at the Italian championship in Trieste, giving us cause for cautious optimism for 2012.

In fact, during the winter of 2011-2012 *Rewind* was sold to a new Estonian owner, while *Scugnizza* was slightly modified in her keel profile to make her easier to drive for an owner-driver. We also modified the sailplan to keep a moderate square-top



Top left: the original NM 38 keel still featured the 'rating' flange which has since been dispensed with. *Scugnizza* (above left and page 45) features a big square-top main and masthead chutes while *Rewind* (right) has a more conventional sailplan. The hull bottom (top right) of *Scugnizza* was filled out following the rule change in the winter of 2012/13

main, but now with a single backstay attached to an extra-long new topmast.

The 2012 worlds were hosted by the very nice city of Helsinki in summer, but with winter temperatures. The end result after a hard battle was *Scugnizza* 1st and *Sugar* 4th.

But the bad news was coming. ORC was working towards a complete revision of its VPP, and the end result was that all my designs were heavily penalised, with the most extreme like *Scugnizza* and *Sugar* losing more seconds/mile than a TP52...

To be honest, the ORC technical committee did a great job updating the rule and 2013 delivered much tighter differences in corrected times among different boats, and therefore very good racing. This is a tribute to their hard work; but when last November I saw the new rating list the word 'disappointed' didn't fully reflect my feelings.

But we have really great owners, very competitive and passionate. And for *Scugnizza*, *Sugar* and *Low Noise* the teams and designers have done a clever job in overcoming the huge penalty that was handed down, without slowing the boats too much. It was always clear that the weight/sail area ratio was the main point to work on, so adding weight was now the way to go, together with playing with trim and spinnaker halyard position.

The *Sugar* team also decided, as they do many offshore races, to add a little more comfort to their rather minimal interior, plus some refinements on the deck hardware; the rest of the weight needed to

reach the desired target was added in the bilge with lead pigs.

For *Scugnizza* the team wished to maintain the same sail area and waterline flotation, so it was decided to modify the hull bottom to add the same volume as the added weight. Also, all three boats now removed the keel skeg that no longer provided any rating benefit, thus slightly reducing appendage resistance.

So how did the changes this year work out... Well, *Scugnizza* won the ORC Worlds, *Sugar 2* won the Europeans and *Low Noise* are the Italian National Champions: in football terms we got the triple!

So what about the future? Owners are now interested in faster and more entertaining boats, and having sailed on TP52s and 72ft Mini Maxis it's difficult to say that they are wrong. But such a radical approach is still best reserved for the A class, while in the B class the rating parameters are relatively more strict, delivering tight competition with small time differences.

This also complicates the general trend towards highly canvassed and light boats: it's a situation very similar to the glorious times of the IOR Level classes, where you had to play constantly with three variables – length, weight and sail area – to stay inside the rating band.

But challenge is what drives us, so we are working to offer owners new design avenues while hoping to continue our current winning streak. See you on the *Seahorse* pages... □