

MISCELLANEOUS INFORMATION - MI 50

Yacht Design Notes

brief details of designs

by Graham Bantock

introduction

Over the years we have been responsible for many designs in all the international and UK national classes. Not surprisingly there is at times confusion about which designs are currently available and in what format (lines plans, hull moulding, kit, completed boat etc.). Additionally some of our designs are available from other sources.

Please see the separate list 'Other Builders' to see which SAILSetc designs are available from which builders.

Brief details of the various designs and the relationships between them are given here. To help dispel false rumours about our future intentions, information concerning forthcoming designs and intentions is also given where it is realistic to do so.

Work that is subject to confidentiality agreement is not listed here.

See the SAILSetc website for addresses of builders.

CAD lines drawing

From mid 1996 onwards a very user friendly CAD system, Maxsurf, for yachts has enabled the efficient production of new lines plans. The first use of the system was to model the existing 1991 design **PARADOX**. From this file we developed the Marblehead CUMULUS and the Ten Raters **PUZZLE** and STRATUS. All other designs have since been developed directly from the same starting point or from other base designs.

VPP

Added to the CAD tools used here in 1998 was a velocity prediction program (VPP) suitably modified for model yachts. Some time was spent looking at existing One Metre designs of known good, and not so good, performance so that a feel for this new tool could be gained. It was used to help refine the lines of **IKON**.

The second use of the VPP was to evaluate the Marblehead RAD before going to the 1998 world championship. The boat compared well in real life too, further encouraging our use of this tool. The third use was to develop **STRAD** which has also proved a very fast hull.

The fourth major task for the VPP was to help develop the lines of the 1999 Ten Rater **PRIZM** which was optimised for the expected stronger conditions at the Singapore world championship of that year. Again the boats proved fast in real life.

As the process of using the VPP appears to have given a good degree of success since we started to use it, our confidence in this approach has been boosted. We are aware that use of a the VPP has its limitations but we expect to use it to continue to aid the production of better optimised lines in the future.

custom lines drawing

A set of lines to your specific requirements can always be drawn. The CAD system permits a fair set of lines to be produced quite economically. How costly this process will be will depend on how much the design varies from other designs already on file and how difficult it is to meet any given target requirements.

Comparing the performance of the new design with that of other existing designs can be carried out using the VPP. The performance of the boat, in a range of wind speeds, for specific courses or

for a typical rc course, is evaluated and then compared with others. If a spectrum of likely wind speeds is available it is possible to build on this simple comparison by allowing for the probability of different wind speeds. Knowledge of the way that relative performance has been changed as a result of making changes to the hull design can then inform the design process.

This process can be relatively short or extended for as long as you wish. Going on with the design process as a result of the predicted relative performance to refine the design can be very time consuming and thus costly. But this may be a very worthwhile investment for a production boat and where top level performance is sought.

design formats and availability

To aid clarity, different styles of text have been used throughout this document to help identify the availability of the various designs.

We do not release the lines of designs that we are moulding or have moulded. Except where the lines are first released as a plan this is also true of designs moulded under license.

availability	hulls, kits or completed boats only from SAILSetc except where noted	lines plans, moulded under license	unreleased designs, one offs
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style of text	BOLD CAPITALS	CAPITALS	
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6M	RENAISSANCE RAVENNA § OCTAVIA §	REVIVAL ROCOCO ROMANZA	SOPORIFIC SOPRIFIC 2 POLARIS BLUE SKY SIGMA 6 ROMANZA 2
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A	SWORD §	BATTLESHIP FRIGATE DESTROYER PRIVATEER SHIELD GUNBOAT LANCE SPEAR	POTSHOT
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10R	PUZZLE PRIZM § DIAMOND § KOKILLO 2 10R §	SPLASH! SHIFT SHIFT 2 STRATUS IOTA § IONA GRAFFITO LENTE (SATORI) § CONCORDE DIADEM	
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KOKILLO 2

M	OVERTURE SYMPHONY FOREIGN AFFAIR * NO SECRET * HUSH HUSH * ENIGMA * WHISPER 1 PARADOX § STRAD * ROK PRIME NUMBER § QUARK § VB01 § PENCIL § KOKILLO 2 §	HEART BEAT CLOUDBURST HAVOC WAFER CUMULUS RAD ASTRA MONARCH PARADIGM	ANAGRAM OUTLINE INSECT/KEBAB
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1M	RHYTHM * JAZZ * RED WINE * SINGLE MALT * TINTO § IKON § IMAGE § ITALIKO § TOPIKO § PIKANTO § FRAKTAL FRAKTAL 2 AKZIOM	BIKINI STOMP RAGTIME SCREAM STANLEY BEAR MISTRA LION NIMBUS MIKON KITE BOXKITE NIMBUS II TRINITY VEKTOR ZIG ZAG VIVID MERLO3 BLACKBIRD UN-NAMED 2018	VINHO VERDE
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36R	SPAR SPARTAN SPARKLE
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		SPARKLET TINTO (SHIRAZ)
	BLACKWATER	
36/600 (Japan)		3rd DEGREE
US 1M		1st IMPRESSION § (aka Valkyrie, Sabre)
2M		Un-named
RG65	ARGON	ROGUE UN-NAMED 2018
S-CLASS		UN-NAMED 2018

§ not available from SAILSetc but moulded under license

§§ available from SAILSetc and moulded under license

* no longer in production

Note `1 moulded by Robert Brown

The lines of SAILSetc production hulls are not available

It is our policy NOT to make available the lines of hulls which are in production. Sorry.

6 Metre

SOPORIFIC (No 1)
SOPORIFIC2 (No 2)
POLARIS (No 3)
BLUE SKY (No 4)
SIGMA 6 (No 5)

The above designs were made during the late 70s/early 80s and were for Free Sailing competition. No 2 and 4 were not built but 1, 3 and 5 each won the free sailing national championship. The prototype No 5, fitted with a non-bulb keel, was converted to RC and also won the 1997 national championship in that format (Martin Roberts). All these designs exploited weaknesses in the class rules of the time and could not now be rated as 6 Metres. The existing certificated boats remain grandfathered and able to continue to compete.

In 2019 one of the POLARIS hulls was revised underwater in order to increase displacement and sail area so that it would be viable for rc.

RENAISSANCE (No 6) - 1987

This design has performed well since it first appeared with the prototype winning the UK champs in 1992, 1993, 1994, 1995, 1996, 1998, 2002, 2003 and 2005. After an absence from the competition from 2006 to 2014 it returned in 2015 to give a win for Colin Goodman, and again for the designer in 2019. Its direct predecessor, Northern Lights (No 5 design, no longer permitted by class rules although the boat itself is grandfathered) won in 1997 thanks to its soft profile/non bulb keel which did not foul on the weed prevalent at that event. The only other boat to come close to beating **RENAISSANCE** at championship level until 1999 (an **OCTAVIA** won) was a sistership in 1995. After stopping boat production at SAILSetc the moulds have been sold to Ian Cooke who has placed them with Ray Baker of Gosport. The prototype has been modified by the addition of a new fin keel, with a section similar to that used on our Marbleheads and One Metres, a new rudder from the same mould as our Marblehead and One Metre rudder, and two different ballast designs in turn. The first of these ballasts is the same design as first used on the A Class **SWORD** in 2005. This longer and slimmer ballast lowers the centre of gravity and has worked well. In 2020 the boat has been fitted with a wider delta ballast shape, again as used on the A Class **SWORD** for a number of years. The prototype and two other **RENAISSANCE** have been modified at the bow to regain (and increase) the sail area lost due to the drop in displacement due to the lighter and thinner more modern foils.

REVIVAL (No 7) - 1988

A design which has been around for almost as long as **RENAISSANCE**. The underwater lines are very similar but the overhangs are reduced so that the boat has more sail area. A very competitive

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boat with the edge in light airs up to the point where **RENAISSANCE** takes over. There are apparently sources of hull mouldings the quality with which we are totally un-responsible for!

OCTAVIA (No. 8) - 1995

A design produced in 1995 exclusively for Nigel Fordyce and based on **RENAISSANCE**. It is in fact a narrower version with more sail area and perhaps even prettier for being narrower. Planked in balsa and covered with glass it raced at the 1997 National Championship and was sold to Richard Rowan. Richard won the 1999, 2000 and 2001 national championships with this design.

ROCOCO (No 9) - 1997

An up to date variation of the earlier designs aimed at home construction using planking as the method. In fact this design checks out on the VPP at the top of the heap of the most competitive designs. Observed performance tends to support this as these boats give good performance across a wide range of conditions.

RAVENNA (No 10) - 1997

This design relates to *ROCOCO* as **RENAISSANCE** does to *REVIVAL*. The mould was made by Barry Chisam with the option of the SAILSetc design fin box moulding supplied or fitted. Mike Barr of Paisley Club drove this project which contributed to club funds as well as placing a new design on the market. Mike's own boat won a well contested open event in the hands of Paul Jones in 1999 and since then other owners have fared very well with their new boats.

ONE-OFF for Porter Loring (No 11) - 2002

The opportunity to build a one-off to the designs currently being worked on as the possible next production boat came up in 2002 when Porter Loring wanted a 6 Metre to add to his growing collection of boats, SAILSetc and other. The hull was planked by William Mazzotti of Ravenna and completed by SAILSetc. After Porter passed away the boat has been sold on in the USA.

ROMANZA (No 12) - 2009

Lines of this boat were finalised in August 2009 after being developed using the VPP to optimise performance to give it the best chance of success across a wide range of conditions against the other designs listed above. Progress has been slow on this project, unusually so as optimising a design using the VPP as a comparative tool for the various candidate designs can provide a very focussed path towards a 'better' design. The task seems more complex in the 6 Metre class partly because of the nature of the rating formula and, in this specific case, because the ROCOCO design is rated by the VPP as an extremely strong one across the range of conditions. This was both pleasing, because ROCOCO was drawn without the ability to use the VPP at the time, and annoying because it proved a difficult target to 'beat'.

However the new design appears to represent an improvement right across the wind speed range and offers the prospect of being well balanced otherwise. Available as a plan for home construction and with the possibility of hull mouldings becoming available at some stage if we can tempt a builder to take the plunge.

The design has, necessarily, been drawn close to the limits of the class rules and will require careful building if it is to gain the advantages it should have. For example it will be necessary to check the building shadows before adding planks to ensure there are no 'illegal' hollows above the waterline. Likewise the displacement is close to the minimum and care will be required to ensure no displacement is lost during the fairing process. For these reasons ROMANZA should be seen as an alternative design to ROCOCO rather than as a replacement.

A plug and mould were under construction in 2013 (not at SAILSetc). This mould was completed in 2019 after a series of delays. One hull was completed for Malcolm Button who had started the project. The moulds have been much revised and production of hulls started in autumn 2020.

A number of boats to this design took part in the 2019 championship and, although not being very consistent in their performance, showed encouraging signs.

ROMANZA 2 (No 13) – 2020

A revised version of the original with the bow chin taken to the forward waterline ending. This will allow the builder to make a comparison with the standard design.

One Metre

RHYTHM - 1987

A hard chine design which was kitted by Carbon Craft (Carbon Craft was taken over by SAILSetc 1989). The hull form was copied into round bilge format to make **JAZZ**. Otherwise the two are identical. In the hands of Phillip Playle the prototype won the first UK national championship held in 1990.

JAZZ - 1988

The most successful early One Metre in the UK taking the 1991-93 national championships. In fact this design was nothing more than a round bilge version of RHYTHM retaining the emerging lower chines at the stern. It has enjoyed a good degree of success at the highest level later on (4th 1995 UK Champs and 4th 1994 World Champs).

BIKINI - 1989/90

is a beamier and shallower version of **JAZZ**. A 1989/90 plan with a good deal of construction detail but now removed from our list of recommended designs.

RAGTIME - 1991

is a design completely unrelated to all our other designs and originally produced for *Marine Modelling*. Now withdrawn from their range and replaced by NIMBUS and subsequently NIMBUS II and NIMBUS III.

MIMIC – 1991

An early narrow design in the class built as a one off.

STOMP - 1993

is a narrow version of **JAZZ** and the lines plan is available only from SAILSetc. No construction details are given on the plan.

RED WINE - 1994

was designed to maximise performance in the expected light airs conditions at the 1994 World Champs which the prototype won. The hull lines are very close to those used for the successful Marblehead **PARADOX**. The boat was no slouch in heavy weather either compared with contemporary designs, achieving 2nd in the windy 1994 UK Champs and 4th and 5th in similar

conditions at the 1996 Euro Champs. During 2009 the design was brought up to date at the request of Bob Provoost and led directly to MERLO3.

VINHO VERDE - 1994

A version of RED WINE produced for production in Portugal, hence the name. This project may not have got off the ground.

TINTO - 1994

has the same underwater lines as **RED WINE** but was designed for less expensive home completion by using timber components for the deck structure. At the time it had the same sparkling performance as **RED WINE** in light airs and, as anticipated, was an excellent all rounder. The prototype placed a very close 2nd at the 1996 UK Champs after little previous time on the water.

SAILSetc sold moulds for **TINTO** to builders who produced their own hulls under licence.

A version of **TINTO** with a moulded deck with lowered rear 'cockpit' was marketed by Richard Moroney under the name **SHIRAZ**.

SINGLE MALT - 1994

has the same underwater lines as RED WINE but has a conventional hollow sheerline and flat deck. This design was moulded and marketed by Robert Brown of Edinburgh.

NIMBUS - 1996

is a design with a narrow waterline beam and deep hull suited to first time builders. The plan printed by *Marine Modelling* gives a lot of construction detail although the planking process is not described. Now replaced by NIMBUS II & NIMBUS III

SCREAM - 1996

is the name of the design and boat used by Robert Brown at the 1996 UK Champs. It has underwater lines based on **PARADOX** and above water lines in the style usually associated with Roger Stollery. Robert Brown made the plug and mould and moulded a strictly limited number of hulls. Keith Skipper and Graham Bantock used this design in the Malta Open National Championships in December 1996 gaining 6th and 1st place respectively. The design seemed to have promise and Graham gained 9th place in the Feb. 1997 World Championship in Wellington. The design is judged not to be among the best and the plan was not made available.

STANLEY - 1996

is the name of the design which is basically a One Metre version of the Skalpel Marblehead design of Janusc Walicki. Plan not available.

MISTRA - 1997

is the design produced for Keith Skipper and Albert Micallef in Malta. It is the first set of lines developed from Martin Firebrace's 2 DOGS design. Plan not available.

BEAR - 1997

is the second set of lines developed from 2 DOGS and was drawn for Nigel Fordyce, Drew Taylor and Rupert Jeffries. Plan not available.

LION - 1997

is a third set of lines in the MISTRA/BEAR line of development. It was done for several potential builders who wanted one like BEAR. The list grew and this plan was listed in the 1998 catalogue. The plan shows a raised foredeck/cockpit layout which should be formed from 0.8 mm plywood. Fittings layout is shown as well as reduced sections for shadows. Boats to this design have performed well in a wide range of conditions. David Bridge tells us that he is still using a LION very successfully in 2008 and says

".... it has one less plank (the upper plank which includes the inwhale was omitted).The result is a really good looking boat which shows surprisingly little tendency to dive or become over powered in puffs."

IKON - 1998

It is the first design in any class to have been finalised here after using a VPP to help optimise the hull lines. Prior work involved making a comparison of other designs of known good, and not so good, performance. The boat is not such an extreme design as the TS2 which dominated the results of the 1997 world championship and we have aimed at good all round performance rather than a boost in one wind speed only.

IKONs won the 1998 European and 1999 World Championships as well as numerous national championships. An IKON gained 3rd place at the 2005 European championship and remained in production until 2005.

Circa 100 + have been moulded (Jan 2003).

The IKON mould has been sold and hulls/boats may be available again.

IMAGE - 1998

has identical underwater lines to **IKON**. The moulds of this design are available from SAILSetc to builders who want to step into production of a boat with the performance of the **IKON** without the problems of making the plug and mould and sorting out the details.

The hull is moulded as a deck and shell with the join around the deck edge using an outward flange. The deck moulding has a similar appearance to **IKON** and makes installation of the RC equipment and other components very simple. Reinforcements and fin box/mast tube are fitted to the underside of the deck before it is bonded to the shell.

ITALIKO - 2000

This design was developed to be at its best in winds in which the No 1 rig would be used. It is not the fastest design possible for very low wind speeds as this approach would produce a boat which is poor at larger heel angles. **ITALIKO** offers a small advantage over **IKON** up to more moderate wind speeds and won its debut race, the Italian National Championship, against top quality opposition in light winds in May 2000. It also won the 2000 UK national championship and placed 3rd in the breezy European championship. The 2001 season saw **ITALIKO** winning impressively in a light airs and two heavy airs UK Ranking Races. Peter Spence used a borrowed **ITALIKO** for the 2002 European Championship and placed a creditable 5th. Had he not picked up a plastic bag while leading A fleet in the earlier stages he would almost certainly have been 2nd. The revised fin design used in 2003 for the first time brought **ITALIKO** back into winning form – as well as the 2003 Iberian championship and the 2004 Adriatic and USA championship, the designer's boat won the 2003 and 2004 national championship having placed 2nd in 2001 and 2002.

Circa 110 have been moulded – August 2004.

The **ITALIKO** mould has been sold and hulls/boats may be available again.

MIKON – 2001

During 2001 several variations of **IKON** were produced for Mario Jorini to test. They were the same hull form as **IKON** but had different beam/depth ratios and Mario chose the middle one. And so it became known as **MIKON**. He used it at the 2001 European championship where it showed amazing offwind performance in a squall quite different to that of the parent design.

Several **MIKON**s have been moulded in Italy.

KITE - 2001

is a design completely unrelated to all our other One Metre designs and based on our successful Ten Rater **PRIZM** but rated very well by our VPP. The plan shows full size sections and building shadows suitable for 3 mm finished thickness planks. The position of foils, ballast and rig are

shown but this is not a construction plan. The deck moulding for IMAGE could be used to finish a KITE.

BOXKITE - 2002

is a multichine version of KITE released as a Marine Modelling plan in 2002. Shows more construction detail than normal including panel shapes full size thus making this an ideal and competitive introduction to the class.

NIMBUS II - 2003

is a revised version of NIMBUS. The plan remains essentially the same as released earlier by Marine Modelling but the hull lines have been adjusted.

NIMBUS III - 2004

is a revised version of NIMBUS II. The plan remains essentially the same as released earlier by Marine Modelling but the hull lines have been refined using the VPP to maximise performance.

TOPIKO - 2004

The design is very similar to ITALIKO and the above waterline lines, wetted surface area, stability and general dimensions are nearly the same.

The differences are small changes to the section shape, rocker line, longitudinal centre of buoyancy and detail cosmetic treatment of the transom and bow.

The decision to build the new plug was based on favourable reports of the performance of a number of close sisters to ITALIKO that have been built and trialled. In particular they are reported to have excellent speed downwind in a breeze and the ability to sprint away in a gust. Time will tell if this difference represents a genuine overall increase in performance of what is already known to be a superb design or whether it is a change of emphasis.

The prototype TOPIKO won the 2004 European championship held on a large water at Arcos de la Frontera, Spain, just 10 weeks after we started construction work. The event was over 17 races with all but 3 being in a range of No 1 rig conditions. The only other TOPIKO at the event placed 7th and had the best scores by far over the last 9 races. An IKON was 3rd. TOPIKO placed 2nd at the 2005 and 2007 world championships. In 2007 the top boat from six countries was a TOPIKO, thirteen of the twenty five races were won by TOPIKOs and six of the top eleven boats were TOPIKOs.

TRINITY – 2004

A design related to ITALIKO and TOPIKO and under construction by Mike Hughes for production in limited numbers in the USA.

UN-NAMED design – 2005

A double ender drawn to see what happens with a really narrow stern. A British built version has given some good performances.

VEKTOR – 2006

A round bilge hull of moderate beam for planked construction. The lines have been tuned to give best performance on courses where there is a lot of reaching and/or straight line sailing.

A lot of club races have courses that are predominantly reaches because the race committee does not take care to adjust the start line, first mark, or overall course to give the type of course that is normally strived for at a major event. Some manoeuvrability has been sacrificed but this should be less important as there will be less tacking involved. The boat has performed well for many owners.

During the time Denis Astbury worked with SAILSetc we moulded some VEKTOR hulls and offered hulls and hull kits. The moulds have been sold to Spain.

ZIG ZAG - 2006

A round bilge hull of narrower beam for planked construction. The lines have been tuned to give best performance on windward/leeward courses and where manoeuvrability is at a premium.

Some major events have used windward/leeward courses as there are advantages from a race committee point of view. The racing is also more tactical for the competitors with no reaches that tend to be processions with gaps opening up rather than with positions swapping. In these conditions fast tacking is useful and it has been possible to choose a hull form that gives this as well as other features that help when there is no reaching. Again, the boat has performed well for many owners.

TEJAS – 2006

A design developed to achieve best performance in the upper range of No 1 suit conditions and upwards. This design was drawn for Mike Hughes and some light airs potential is sacrificed to give a boat that would be best in the conditions where TRINITY would be less competitive. A British built prototype began sailing in 2007 and, perversely, seems to go well in light airs as well as in a breeze.

PIKANTO – 2008

After four seasons use of TOPIKO and the opportunity to hear from other users and builders about the boat it seemed possible that some small changes to the hull would be useful and without any serious detrimental side effects.

The bow was made slightly higher and wider at deck level thus introducing more flare forward. Emerging chines have been added over the last 200 mm or so of the hull's length. I have not used these on an IOM hull since RED WINE although they have featured on some of my more recent Marbleheads. Both features should help in high speed sailing, especially downwind where more confidence that the boat will not nose dive in gusts would be useful. TOPIKO has been excellent in light airs and it is unlikely the extra drag from the chines and slightly immersed transom at low speeds and heel angles will change that significantly.

With no other changes the boat was finished with the foils and ballast in the same place as for TOPIKO and performance was much the same. It was tempting to leave the name of the boat as TOPIKO but we realised that may create problems for customers when ordering replacement bumpers.

The builder of our IOMs, Al McMeekin was instrumental in developing some details of construction and we took the opportunity to revise the foredeck centreline girder/joiner so that boats come out of the mould with the tube for the No 1 headsail swivel in place as well as the recess for the underdeck attachments for the No 2 and No 3 headsail boom swivels.

A borrowed PIKANTO in the hands of Guillermo Beltri won the 2008 European championship. In fact 9 of the top 12 boats were TOPIKOs or PIKANTOs built by SAILSetc or Robert Grubisa. This was followed by an excellent showing in the 2009 Barbados world championship where the design was used by Zvonko Jelacic to win the event. Six of the top 9 boats were TOPIKOs or PIKANTOs built by SAILSetc or the other builders.

VIVID – 2009

A narrower hull form drawn for Alistair Law. He has named it NIP & TUCK. It was revised in 2014 to VIVID 2

MERLO3 – 2009

A revision of the 1994 RED WINE design. With the benefit of hindsight the original lines were modified for Bob Provoost to create MERLO. When checked out with the VPP it appeared the design had a lot of potential and some more versions were drawn and checked. MERLO3 was the best of the bunch. Martin Houlton made a mould and one for himself with which he is pleased. Denis Astbury made a beautifully planked version and placed 5th in the 2010 South American championship, 2nd in the 2011 Brazilian championship and 1st in the 2011. He planned to make a mould for a production version. The lines of the production version were amended a little to give more bow flare.

BLACKBIRD – 2011

A development of MERLO3 for Pierluigi Puthod/Luca Geri/Riccardo Arnone. Pierluigi asked about a design I had done named BLACKBIRD. I did not know anything about such a design but I asked if he wanted one. So that it would be different to the one Denis planned to make in Brazil I amended the lines to give this version better potential on reaching and off wind legs but a little loss to windward. In the hands of a helmsman at his best for starting and windward legs this may be a sound approach. We named it BLACKBIRD.

FRAKTAL - 2012

The IOM world championship put a question mark against the performance of previously successful designs including TOPIKO and PIKANTO and no doubt time will tell if there is a real performance gain to be had by moving to narrower hull forms. PIKANTO has provided strong performances and it remains an excellent design choice. In fact it has been hard to identify any ways to significantly improve the over-all performance of this design without risking its excellent performance in one or more wind speeds.

Going back to the drawing board and checking out narrower hull forms confirms that the VPP does not rate them as well as boats of more moderate proportions. This has led in turn to a closer look at the way the VPP handles the added drag of a hull passing through surface waves, a possible explanation of why less stable but narrow hull forms sometimes seem to out-perform more stable but wider designs. While everything seems in order it is hard to see what might, or should, be done next. After much checking and re-checking we have committed to building a new design of somewhat narrower beam than PIKANTO and the first boat is expected to be sailing early in 2012. The hull form of this design represents a departure from the previous line of development through IKON/ITALIKO/TOPIKO/PIKANTO. In fact the hull form is a direct descendent of our RG65 design ARGON.

For the 2014 season the hull has been modified slightly. The lower tip of the bow has been raised a little and re-faired into the hull over a length of less than 100 mm. Some cosmetic changes have been made to the bow higher up. To avoid confusion we have named this development FRAKTAL 2.

FRAKTAL 2 – 2014

See above.

AKZIOM - 2015

A new design for Tim Brown for production in Australia. This is a much revised and developed version of PIKANTO incorporating feedback from Ante Kovacevic in light of his continued experiments with that design which have changed the hull overall beam considerably. Ante firmly believes the narrower hull forms are not capable of surfing downwind in heavy conditions as well as the earlier more moderate beamed boats are. And Tim has found a strong preference for the PIKANTO design amongst sailors local to him who are used to sailing in stronger winds.

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The plug has been CNC cut and production will start some time in 2016. The designer's first use of this design was at the 2016 European championship – after some teething problems at the beginning of the event, including losing the ballast in one race, the boat stayed in A heat for the 2nd half of the event.

AKA – 2016

After Tim had a problem with the master of AKZIOM from which he was moulding male hull mouldings he re-faired it a little and re-named the design taken from the same master AKA in order to differentiate them from the original AKZIOM.

UN-NAMED-2018

Designed for production in USA using pre-preg glass.

KOKILLO-IOM-2020

Derived from the hull form of the KOKILLO Marblehead developed by Roberto Zanasi with some input from Bantock. The Marblehead has shown promising performance especially off wind in a breeze and it is hoped this aspect of its performance will be evident on the IOM version. Moulds are being made in Italy and Britain.

The same basic design is being prepared for moulding in GBR by Martin Dovey. As there are some differences in the above water treatment of the design it will be marketed under the name FORKILO to avoid confusion with KOKILLO.

Marblehead

OVERTURE - 1971

SYMPHONY – 197?

The first two of these were designed when the designer was at university getting to grips with naval architecture. They were moulded in limited numbers (probably no more than 6 apiece) during vacation time. SYMPHONY placed 4th in a GBR free sailing championship and featured a three part skeg/rudder system as well as a home made metal mast with a luff groove.

HEARTBEAT – 198?

Designed for release as a plan by Model Yachting News and moulded by Ken Jones for a while. The prototype could be used with free sailing or rc. The designer used it to win the Marblehead 50 year jubilee free sailing event held at Fleetwood and went on to use it to take a low place in the 1983 European championship.

CLOUDBURST – 198?

A variation of HEARTBEAT drawn for Harvey Hansen of Denmark for production in that country.

FOREIGN AFFAIR - 1983

Developed from a design by Katou (known in the UK as NET SUKI), bought by John Cleave after the 1978 Ottawa world championship.

The original NET SUKI was rather heavily built in balsa wood with a glass covering and SAILSetc made some moulded versions of the same design for John Cleave and Norman Hatfield. John Cleave placed a creditable 5th in the 1982 world championship with this boat – probably the first SAILSetc boat built for a customer. The weight saved in the construction meant this design was overly stable if ballasted to the design waterline or short on waterline length if used with the same ballast (which it was). The decision was taken to cut a section out of the centre of the hull and join the two halves back again to form a narrower and lighter design. This was FOREIGN AFFAIR of which several were made including one for Bantock. This design featured a fully moulded deck with built in stiffening and access to the rc.

NO SECRET – 1984

The designer's first set of lines drawn strictly for rc. Inevitably influenced by experience with FOREIGN AFFAIR but with a more rounded hull form. However the hull had emerging chines for the aft 300 mm or so which were to feature on later SAILSetc production designs up to as far as RAD. The original boats were moulded in glass by Ray Baker and one of these gave Bantock 15th

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and then 4th place at the GBR championships. Ian Cole bought one and was encouraged to mould the boat using epoxy/carbon. This further reduced the structural weight to the extent another 300 grams of ballast could be used. In fact ballast weight was kept at 3.6 kgs and the boat had a reduced waterline length in common with its predecessors. The carbon/epoxy prototype placed 2nd in the 1986 GBR championship and 3rd in the 1986 world championship held at Fleetwood, England. In fact the light winds at the start of the event combined with the advantage in those conditions of swing rigs gave the designer an early lead which could not be maintained when the breeze strengthened at the end of the week. Ian Cole started the business CARBON CRAFT shortly afterwards and made many boats to this design before joining SAILSetc.

HUSH HUSH – 1987

A development of NO SECRET designed to deal with the perceived balance issues found when using swing rigs on that design. Probably the perceived problems were more to do with the swing rigs than the hull design and it was about this time that the designer started to use un-stayed conventional rigs (termed shroudless rigs elsewhere in SAILSetc literature) which seemed to almost eliminate the handling problems in a breeze. Used by the designer to place 2nd in the 1988 world championship in Berlin, Germany. Made in kit and completed form by CARBON CRAFT.

ENIGMA - 1989

The 1990 world championship was planned for the Canary Islands noted for the strength of the wind. The decision was taken to increase the beam of the previous design (literally by bonding in a tapered section of timber between the two halves, and re-fairing the hull). Whereas HUSH HUSH had a full length waterline this increase in beam restored some modest bow and stern overhang. The boat was incredibly easy to tack and accelerate in comparison to its predecessor and immediately became a popular replacement winning many national championships up to 1993. When CARBON CRAFT was incorporated into SAILSetc in 1989 this design was already in production. Numerous modifications were made to the production process (moulded fin box and mast tubes, moulded fin, moulded rudder) by SAILSetc before it went out of production.

HAVOC - 1988

is a design with lines close to **NO SECRET** and **HUSH HUSH**.

PARADOX - 1991

is the design which enjoyed continuous success for many years from 1992, winning three world championship and one european championship in that time. It is in fact a 70% wide version of ENIGMA scaled deeper to retain the same design displacement. Many skippers have achieved success with the design, conspicuously Gordon Maguire placing 3rd in the 1996 world championship and winning the 1996 UK national championship. The 1997 UK national championship was a close fought battle between Martin Roberts and Paul Jones, both sailing **PARADOXs**, with Martin taking 1st place by a narrow margin. Paul led the 1997 european

championship until the last day when he was overtaken but **PARADOXs** placed 2nd, 3rd and 5th. However Paul won the 1998 UK national championship becoming the fourth different skipper to do so in four years with a **PARADOX**. In 1999 Mike Hounsell won the UK Vets national championship with his **PARADOX** and Mark Dennis placed third in the Ten Rater world championship with his. More recently Paul Jones and Brad Gibson have used this design very effectively in AUS.

Currently available from Mike Clifton.

WAFER - 1992

a lines plan close to **PARADOX**. Approximately 75% as wide as **ENIGMA** (compared to 70% for **PARADOX**) and appropriately deeper.

WHISPER - 1992

Very similar lines to WAFER. A version of WAFER made by Robert Brown under license for a short time. The change of name and slight change of design was deliberate to avoid confusion between the two.

CUMULUS - 1997

is a lines plan produced for *Marine Modelling* and developed from **PARADOX**. The boat has a little more displacement to accommodate the extra hull weight of a planked boat. No construction detail for the hull is given but brief details are given of how to make carbon covered foils and there is some simplified rigging information. Intended as an ideal follow on project for anyone completing NIMBUS. Plan also available from SAILSetc.

RAD - 1998

The boat used to win the 1998 world championship in wide ranging wind conditions in Viry-Chatillon, France. It was a standard **PARADOX** hull which had material removed along the centreline reducing the beam by 20 mm at the stern and progressively less towards the bow. The fore deck was raised somewhat similar to the MARGO design by Paul Lucas and the deck level of the shroudless rigs was dropped using the same deck mould as for **IKON**. A new ballast shape with a length/diameter ratio of 9.5 was used for the event and this is now the standard ballast supplied/fitted. Several modifications to the standard **PARADOX** had been tried over the years but this was the first which impressed. Although it would have been possible to build other 'one-offs' like it, that would have been a rather expensive route to take. Thus the boat form the basis for development of the new design **STRAD** for production in spring 1999.

STRAD - 1999

17 boats were moulded up to May 2000. The prototype won its first race, a 1999 UK ranking race as well as the UK national championship that year. A STRAD sent to Italy placed 2nd by 2 points in a ranking race which was also its first race. The prototype was top placed at the Italian national championship that year. The basic layout is much like *RAD* and many of the component parts are common with **IKON** and **PARADOX**.

The slightly deep rocker line between the between the fin and bow meant the fin had to be placed further aft to keep the balance the same. This led to some difficulties with placement of the ballast on the fin and eventually we revised the hull lines to produce ROK. It was the first SAILSetc production Marblehead to drop emerging chines at the stern.

No longer in production. Moulds sold.

ASTRA - 1999

Designed for Mario Jorini of Italy in late 1999. This is similar to **STRAD** but with a shorter waterline to test how this feature affects all round performance. Two versions are shown on the plan, one is 180 mm beam and the other is 200 mm beam. Depths vary proportionately to give the same displacement which is targeted at 4.9 kgs. This design has performed very well and a timber version placed an amazing 4th in the 2000 world championship. A moulded ASTRA placed 2nd in the 2009 German national championship.

ROK - 2000

After some handling and balance problems were identified with **STRAD** (but not experienced by all owners) work started on a revised set of lines which would permit better placement of the ballast on the fin and give a more manoeuvrable hull. The result was very similar to **STRAD** and ASTRA in overall proportions but with a rather different rocker line. The VPP indicates speed is slightly lower than **STRAD** by a few seconds per mile but trials indicate high manoeuvrability of the kind required from a top level design. The designer's own boat made its debut by taking the 2000 UK national championship by a 28 pt margin in a range of C2 to A rig conditions.

This boat went on to take an early 20 pt lead in the 2000 World Championship which it held up to the later stages when the wind moderated. Although placing 2nd may be viewed as a failure by our own high standards we were encouraged by the boat's tremendous performance in a breeze and looked at redressing the slight speed deficit in lighter conditions. Tests with a shroudless conventional A rig instead of a swing rig resulted in winning the Italian open championship in 2000 and the Brass Monkey 2000 at Guildford.

The 2001 nationals was taken by this design with a pleasingly large margin with impressive results in light airs with the conventional A rig confirming that this is a safe choice for the boat. This marked the first time a boat without swing rigs had won the UK nationals since 1986.

One of the last ROK hulls moulded was loaned to Ante Kovacevic for the 2006 Marblehead world championship. This was the first time Ante had raced a Marblehead for many years but he placed an impressive 2nd. The same boat won the 2007 and 2009 NED Open Championship.

PRIME NUMBER - 2002

Experience with ROK showed us that we had gone slightly too far away from STRAD with hull form and we had a similar problem with placement of the ballast on the fin (but this time the other way round). Consequently work started on a design which is virtually mid-way between the two. It gave excellent results from the outset and was 2nd in the 2002 world championship after a series of races held mostly in A rig conditions. This time the margin of error behind the winner was reduced to four points. The boat retains ROK's marvellous heavy airs performance. Fitted with the first fin out of the new mould in 2003 the boat won the 2003 national championship against tough competition at Birkenhead. Since then the boat has shown excellent speed in a range of conditions against the best competition in the UK.

In 2006 new moulds were made for this boat in preparation for production of hulls using pre-preg carbon. The moulds produce a hull and deck joined around the line of maximum beam rather than along the centreline as is our usual format. This change enables the one piece hull to be moulded with the entire deck structure in place. The fin box and mast tube are incorporated into the primary hull moulding thus ensuring consistency between hulls. We also took the opportunity to incorporate some cosmetic and detail design changes that will assist with production, improve the function and keep weight down.

One of the first pre-preg PRIME NUMBERS was used by Zvonko Jelacic to place 3rd in the 2006 Marblehead world championship. What made this remarkable is that it was the first time he had raced a Marblehead ever. He was beaten narrowly by Ante Kovacevic sailing a ROK and Martin Roberts.

Original mould sold to Steve Walters in New Zealand who is making hulls/boats under license. SAILSetc production continues using pre-preg hulls from a revised mould. Several hulls have been completed by Heinz Bohn in Germany starting from kits.

In late 2009 we started to produce an alternative flat deck for PRIME NUMBER that is ideal for boats to be used with a swing rig. The mast tube for conventional rig is retained and this will allow the customer to choose the combination of rigs he wishes to use.

After a break in the Marblehead class at national championship level Graham Bantock took a PRIME NUMBER to the UK national championship and placed a creditable 2nd behind Brad Gibson's new boat after a weekend of strong and testing conditions. Brad's pocket luff sails were made under license by BG Design to the tried and tested SAILSetc design. Later in the year the top 2 places at the world championship held in Ploermel, France, were the same although this time in mostly A rig conditions and with fading winds towards the end of the championship. After a

decade of excellent world championship results for PRIME NUMBER (2nd for Bantock in 2002, 2nd equal for Jelacic in 2006) it has been time to look again at this class.

MONARCH - 2003

The lines of this boat are similar to PRIME NUMBER but are modified to allow for building using timber. The plan is a Marine Modelling issue and contains a good deal of construction detail as well as plans for the rigs.

Mario Jorini used a wooden MONARCH to win the 2003 Italian national championship beating the best of the Italian fleet of Skalpels to do so. He won the 2004 Italian national championship with a close sister to Monarch, also built in wood.

QUARK - 2013

Design work for the replacement for PRIME NUMBER started in mid 2012 and continued until the end of the year. Several starting points were used to create candidate designs that were carefully compared using the VPP. Construction weights were carefully considered again with a view to reducing them. The wish to produce a design that would easily accept a swing rig and/or a conventional rig (as well as a Walicki rig) led us towards a flat deck through the boat from bow to stern.

In fact the primary hull moulding of QUARK is flash with no added features apart from mast tubes for swing and conventional rigs as well as the fin box. The bow and the stern are moulded open to enable the vacuum bags to be more easily introduced and removed. The other features that may be required (recess for rc pot, recess midships for lowered mast, recess in foredeck for headsail boom attachments) are moulded separately and are added as and if required. The stern moulding is added at a later stage as is the closure at the bow. Making the hull in modular form like this helps reduce the weight and complexity of the primary hull moulding and, if the builder wants a super simple swing rigged boat, he can have it. Likewise if the owner wants the other features that were standard on PRIME NUMBER added then we can do that too.

The design has emerging chines at the stern, a feature used on SAILSetc production designs from NO SECRET through to RAD, and a mild knuckle at the bow that will help deflect water that would otherwise flow over the bow and onto the topsides.

Displacement has been reduced a little but the design ballast weight remains at 3.6 kgs as has been the case with our Marbleheads since **NO SECRET** (1986).

Trials of the prototype took place early April 2013. Early results suggested the boat was very strong in higher wind speeds to the extent that a slightly lighter ballast was then tested. Use of a swing rig for light airs has further enhanced light airs and downwind speed. The early boats have been retro fitted with the lighter ballast.

VB01 – 2013

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A design for a customer in Germany who wants to produce top quality Marblehead class yachts to suit the local market. The design has been developed to suit local conditions and to readily accept Walicki rigs which are so popular there. The option to use SAILSetc style shroudless rigs will probably be offered too.

PENCIL – 2015

A design for MX Components for production in Thailand. The design has been developed to suit the conditions expected at the 2016 world championship in Lake Garda.

KOKILLO 2 – 2018

A variation of Roberto Zanasi's original KOKILLO design. Moulded and built by Roberto for himself and impressively fast downwind at the 2018 Greschun Trophy event in St Moritz, Switzerland. Used as the basis for the KOKILLO-IOM design.

RAD2020 - 2020

A revised version of RAD, the 1998 world championship winning variation of PARADOX. Designed with 3D printing the hull in mind as a test to see if a reasonably competitive boat can be created in this class by printing. To be built by Selwyn Holland.

Ten Rater

SPLASH – 1987

Designed for Model Yachting News to publish. Withdrawn from use after an interpretation of the rules made it clear that a bustle at the stern in this class is not permitted (even though many designs from the early history of the class exist with such a hull form).

SHIFT - 1989

is a design based on the **ENIGMA** hull form and superseded by SHIFT 2.

PARADOX - 1991

This design has performed well with a larger rig and no other modifications, winning the 1994 and 1995 UK national championship and 1995 Australian national championship. Encouragingly the performance in the heavier conditions on the second day of the 1994 event was better than anticipated probably due to the very light hull construction and better fin design compared with the other boats. Although you would probably not choose **PARADOX** as a purpose built Ten Rater, if you already have it as a Marblehead, the addition of one rig makes it a very viable route into the class.

SHIFT 2 - 1992

a design based on the lines of **PARADOX**. No construction detail on plan.

AIRSHAFT - 1993

Not a Bantock or SAILSetc design. Designed by Geoff Draper and moulded by SAILSetc for a brief time.

STRATUS - 1997

is a design for *Marine Modelling*. It is also intended as a follow on project for people who have built NIMBUS and CUMULUS. Lighter and narrower than most current designs in this class, it has a hull form based on **PUZZLE** suitably modified for home construction.

Work during the development of PRIZM indicated this was a particularly good design for home building.

PUZZLE - 1997

This design is very similar to **PARADOX** but with short overhangs added. The intention was to produce a hull which would enable anyone with a **PARADOX** to use the same foils, RC and rigs and be extremely well prepared for competition in this class in a wide range of wind/wave conditions. Mike Hounsell made the plug; SAILSetc made the mould and produced the mouldings. A general arrangement drawing at small scale is available.

The top two British yachts at the 1997 UK national championship were the **PUZZLEs** of the designer and Mike Hounsell. The prototype narrowly missed 1st place in 1998 after the first day of light airs put the short boats at the top of the list. Several modifications had been made to the prototype which had the effect of dropping speed in light airs to help heavy air performance. Failure to change a well used battery resulting in a DNF did not help the overall result. Nevertheless it was clear the design was a good one with two more placing in the top six as well as winning the Marine Modelling series trophy for 1998.

The prototype, restored to full competitiveness, won the 1999 national championship against the prototype PRIZM, remains on loan from SAILSetc and is currently for sale.

Mould available for sale.

PRIZM - 1999

A new design in late 1999 fine tuned using the VPP to maximise its performance at the World Championship in November/December 1999. The prototype was 2nd in the 1999 NC (first time on the water) and 2nd in an open race at Poole. A sister ship won this race (its first race). These two placed 1st and 2nd at the World Championship.

Since then the design has won the Swiss Open Championship in 2000, placed 2nd and 3rd in the light airs dominated UK 2000 national championship (won only narrowly by a 'Marblehead' with a swing rig), won the Brittany Cup in 2001 and 2004, many of the 2000 and 2001 UK Traveller Series events as well as the 2001 national championship. Phillip Playle placed 2nd in the 2002 national championship but easily won the traveller series that year. The designer won the 2003 championship with a PRIZM and Ken Binks sailed Phillip's PRIZM into 2nd place. More recently Patrice Montero won the 2010 GBR championship and placed 2nd in 2011 with a PRIZM built by Marc Pomarede.

The boat was moulded in limited quantities in France for a while. Whereabouts of mould currently uncertain.

IOTA - 2001

a design based on the lines of **PRIZM** but expressly optimised to give better performance around the course in all wind speeds than the Marblehead **PARADOX** rigged as a Ten Rater. Excellent for light airs performance. Short waterline and 1500 mm loa. No construction detail on plan.

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Marc Pomarede, France, has moulds and has made a limited number of hulls/boats.

IONA - 2003

a design based on the lines of IOTA but with narrower overall beam. Also optimised to give better performance around the course in all wind speeds than the Marblehead PARADOX rigged as a Ten Rater. Excellent for light airs performance. The plan was a free issue in the winter 2003 AMYA quarterly newsletter and is available from the AMYA as a free download – take a disk to a local copy shop and get the plan printed full size. Short waterline and circa 1500 mm loa. No construction detail on plan.

Check the spacing of the horizontal and vertical grid on the section plan is 10 mm before building.

IONA may be built free of royalty by individuals for themselves but SAILSetc reserves the right to receive a royalty from commercial builders. Please contact SAILSetc directly for details.

UNDER DEVELOPMENT – 2003 onwards

A design expressly optimised for best performance in strong winds. This would be the third boat in a series of optimum designs starting with IONA for light airs, PRIZM/DIAMOND for across the range speed, and the third design specifically for strong winds. Progressing as time and demand permit. It will be a lines plan only. Sidelined in favour of GRAFFITO – see below.

DIAMOND – 2007

Having learnt much from the revision to the way in which PRIME NUMBER is made from pre-preg carbon we decided to make new moulds for a Ten Rater so that we could obtain the same benefits in this class too. We were happy that the PRIZM design was an excellent all round boat and we would probably find it hard to improve on that design but we could reduce the construction weight. But in fact careful development of the hull form indicated we could also improve both light airs and heavy airs performance by shortening the waterline marginally to raise sail area and narrowing the beam the keep the hull deep in the water and thus maintain a long sailing length. The rocker line and underwater hull form remains much the same so the manoeuvrability remains good.

A batch of boats was built in early 2007 and the prototype won both the well attended Brittany Cup and the GBR national championship that year. Both events had a range of conditions requiring the top three rigs to be used.

Performance of the design continues to reward the effort put into the design and build process. In fact the plug/mould tooling for this boat was made in a thoroughly professional way with the plug being CNC machined in high density epoxy block and the mould being made from pre-preg carbon with an emphasis on top quality surface finish. Total cost including our workshop time was in

excess of £6K so this is a project we are not likely to repeat in the near future unless we can identify a much better hull form across the wind speed range and, given the time we spent developing this one, that seems unlikely. In short, DIAMOND will remain a viable Ten Rater for some time to come.

In 2009 some minor changes were made to the moulds adding 15 mm freeboard at the bow and re-siting the rc pot and rc access hatch. The rc tray moulding has been simplified and lightened a little.

The design has won the 2008 and 2009 UK national championship as well as the 2009 Brittany Cup. Gary Cotterell and Andrew Reid have both had success in the Australian championships with this design.

RUBIS – 2009

A design drawn for Edouard Pinta for production in France to help swell the already growing fleet of Ten Raters there. It is based on DIAMOND but with minor hull form and cosmetic changes.

GRAFFITO – 2010

Another variation of DIAMOND but with the emphasis on best performance in stronger winds.

Available as a plan for home building.

The following url will take you to some interesting photos showing the way Olli Jovero has built his GRAFFITO.

<http://www.rc-purjehdus.net/2011/03/10r-graffito-projekti/>

Urs Blum of Switzerland also has a mould from which he has made some excellent hulls.

LENTE (also known as SATORI) – 2010

A design for a customer in Germany and which is to be optimised for light airs. This boat is made by Ralph Tacke. This design is a departure from the PRIZM/DIAMOND development route – the result is a very different style of boat perhaps more in keeping with other boats made in Germany over the years.

ANOTHER – 2010 ongoing

A design for a customer in Australia optimised for their conditions and which should also be available locally.

CONCORDE – 2015

A design to the NAVIGA Ten Rater class rule for a customer in China.

The NAVIGA version of the class rule is adjusted so that boats that are competitive in the IRSA class are not fully competitive in the NAVIGA class. And boats that are competitive in the NAVIGA class are not fully competitive in the IRSA class.

However this has provided an opportunity to evolve a design that is more competitive in the NAVIGA class than existing boats. Hopefully it will be built to a high standard to maximise its potential to excel in China.

DIADEM – 2016

A variation of DIAMOND drawn for Richard Uttley in late 2016 in light of observations at the 2016 world championship. This boat is a little shorter than DIAMOND. The plan is to use a swing rig for the No 1 rig and conventional rigs for the lower rigs. Richard may be able to supply a limited number of hulls.

KOKILLO 2 10R – 2019

Based on the KOKILLO 2 Marblehead design for Roberto Zanasi which he intends to build for himself.

A Class

SCHERZO - 1976

SCHERZOPHRENIC (also known as MENE TEKEL PERES) - 1978

MIDNIGHT OIL - 1981?

NIGHT SKY - 1984?

None of these is currently in production and none would be legal under the 1994 class rules.

POTSHOT - 1989

This design requires only minor modification to make it legal under the 1994 class rules and is a large boat at its best in stronger winds. Built at closer section spacing to give appropriately more sail area and lower displacement may well have given sparkling performance as a radio yacht at the time.

BATTLESHIP - 1997

The boat is heavier and with more sail area than originally anticipated at 21.25 kgs and 1.1 m². This should have given the boat excellent all round performance on waters away from the coast and where lower wind speeds are normally encountered.

The plan shows profile and plan views at quarter size. Sections are full size and reduced sections for shadows are given. A full size set of lines for an elliptical section ballast (based on our One Metre/Marblehead ballast) is shown for those who wish to make a pattern and arrange their own casting. However, better performance should be found with our own ballast design.

Work on the new design (see below) confirmed that BATTLESHIP was a competitive design across a wide range of wind speeds. However it will lose out at higher wind speeds to the newly developed designs.

FRIGATE - 2002

The project to develop a new set of lines for an A for planked construction was completed in early 2002. The background work for the new design involved a comparison of existing successful designs using the VPP and revealed that BATTLESHIP could be expected to be a competitive boat. The new lines were related to BATTLESHIP and were arrived at after more development using the VPP. The boat has a shorter overall length and narrower beam making planked boats easier to keep down to weight. The design total displacement is just under 21 kgs.

The design uses the existing SAILSetc fin box, keel fin and rudder mouldings and ballast casting.

The prototype, sailed by Vernon Appleton, placed in the middle of the fleet on its first outing at the 2002 national championship and showed good speed at the national championship in 2002 and 2003. The designer used the boat at the breezy 2004 championship and enjoyed excellent results until rig failure (not made by us) started. Poor down wind speed relative to the lighter designs present could often be offset by better windward speed and more reliable tacking. Since then Vernon has chalked up wins with FRIGATE in light airs and a breeze.

DESTROYER - 2004

This continues development of the FRIGATE design. Many generations of designs were compared using the VPP and we have identified this design as an excellent choice for home construction. Just under 20 kgs displacement and with a generous sail area. The prototype has performed well and, built with care, this design will provide a very stable and fast boat for large courses. Again, though, this design will lose out in higher wind speeds compared with the newer designs due to the higher displacement.

SWORD - 2005

The design process for DESTROYER yielded this design as an excellent choice for carbon construction. Plug construction started in late 2004 and the first boat sailed in March 2005.

There were four examples of **SWORD** at the world championship and two took the top places. One of these was raced for the first time at the event by newcomer to the class, Ken Binks. The other also won the UK veterans' championship in the hands of Roy Pearson (who won the IOM and Marblehead veterans' events in 2005 too). The effort put into the development of the overall design and attention to detail seems to have been justified and we are confident that **SWORD**, and the other equipment used in the project, will be competitive for years to come.

The hull was finished using a new deck unit 311m and fin box/mast tube 350g. The ballast is similar to the one tested on FRIGATE in 2004. A revised fin is used, item 350h.

After the first half dozen hulls were made we extended the hull mould to allow the centre deck, foredeck, fin box and mast tube to be incorporated into the primary hull moulding. This ensures consistency of overall shape, saves even more weight and reduces our own construction time.

As with DIAMOND and PRIME NUMBER performance of the design continues to reward the effort put into the design and build process. The plug/mould tooling for this boat represents a sum in excess of £6K so this is a project we are not likely to repeat in the near future unless we can identify a much better hull form across the wind speed range and, given the time we spent developing this one, that seems unlikely. In short, **SWORD** will remain our production A Class for some time to come.

To put this in context it is worth noting that the 1987 6 Metre design RENAISSANCE has remained a top performing boat in its class across the wind speed range for 25 years. Built in carbon and

rigged with the original carbon spars the prototype remains in much the same condition as originally built but with the benefit of updated foils. In fact the prototype RENAISSANCE won the 2015 national championship in the hands of Colin Goodman. On this basis we may reasonably expect well maintained SWORDS to be giving top level performance in 2025.

PRIVATEER - 2006

Experience with DESTROYER and SWORD during 2005 suggests the better manoeuvrability of the lighter SWORD is needed for top level results. The PRIVATEER design has characteristics close to SWORD but is tuned to enable the home builder to construct a boat with a better ballast ratio than is possible with a large hull.

A mould has been made by Trevor Jenkins who is offering the hulls commercially.

One hull has been built by John Gale with length stretched and sail area reduced to make it more suitable for free-sailing. Results in 2007 were encouraging, winning the Yachting Monthly Cup, fourth place (apparently correct addition of scores would have given it 3rd) in the class championship across a wide range of conditions and the Metropolitan & Southern District championship. This design was then used as a bench mark for further development for Free-Sailing A Class designs. It continues to perform well for Graeme Wyeth in 2009.

SHIELD – 2007

A free sailing design developed for Anthony Warren during a thorough comparison of as many of the existing and past successful designs in the class's recent history as we could find reliable information for. John Gale's original freehand experiment with the lines of PRIVATEER provided a fortuitous starting point for this design and a good number of candidate designs evolved from that starting point. One of these designs was made ready for the 2010 season and, in spite of suffering from lack of preparation, showed good speed at times during the championship. Some asymmetry was corrected before sailing again in 2011 and the boat showed excellent speed gaining 6th place in the championship.

Finding SHIELD unable to compete well in light winds against the lighter boats that have emerged since the design was drawn Anthony commissioned the LANCE design as a replacement in 2016.

SHIELD was sold to Graham Butler for the 2018 season. Graham spent most of the Gosport championship that year in 2nd place but dropped to 3rd after the wind reduced towards the end of the event. Nevertheless an excellent result for a boat now at the heavier end of the spectrum. Graham won the 2019 championship at Fleetwood where the boat gave him a big advantage in the stronger winds at the beginning of the event. Nevertheless he had to survive lightening winds at the end of the event, this time successfully.

GUNBOAT - 2009

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This class appeals to many older people who are able to enjoy the more social side of racing that it offers at Poole and Gosport MYCs in particular where the provision of a waterside clubhouse enables use of the boats without so much carrying. There still remains the problem of getting the boats into and out of the water. Even 15/16 kg boats present a problem for some and the prospect of a lighter design that can be competitive is attractive.

Original thoughts were that 12 kgs would be too low to give a boat able to compete with the best above 6 knots but it seems this may be unduly pessimistic. The new design has a hull form closely related to the successful SWORD but has dimensions optimised to provide the best boat speed below 4 knots and to be as good as possible above that. Regardless of building weight the boat will be good below 4 knots true wind speed providing the foils, ballast and rig are also top quality. Building the boat as light as possible will enable good performance to be extended up the wind speed range where ballast ratio inevitably becomes an important factor.

Brian Dill of Australia reports excellent performance in light airs and is pleasantly surprised by its performance at higher wind speeds.

The design has, necessarily, been drawn close to the limits of the class rules and will require careful building if it is to gain the advantages it should have. For example it will be necessary to check the building shadows before adding planks to ensure there are no 'illegal' hollows above the waterline. For these reasons GUNBOAT should be seen as an alternative design to PRIVATEER rather than as a replacement.

Available as a plan and Ray Baker of the Gosport club has stated to produce good quality hulls.

LANCE – 2016

A lighter displacement design for free sailing commissioned by the owner of SHIELD who wanted something easier to handle and more competitive on off wind courses. Construction was not completed in time for the 2016 national championship but it sailed in the 2017 event with no time for practicing before the event.

Better tuned for the 2018 event where it gave excellent performance to windward and downwind subject to the abilities of the aging crew.

LANCE was sold to Shaun Wyeth for the 2019 season and placed 2nd at the Fleetwood 2019 championship by the narrowest margin after surviving the heavier winds of the earlier part of the week and catching fast in the lighter winds at the end of the week.

The mould for LANCE is now with Martin Dovey who will be able to produce the boat if required.

The first hull out of the mould was completed at a much lower beam than designed - the deck edge was not held out to the correct beam before adding the deck. Construction was abandoned

in 2016 when that was discovered and the hull was eventually sold to John Taylor who intends to correct the error and complete the boat for rc.

SPEAR – 2019

This design is similar in concept to LANCE but is re-configured to suit rc sailing. The prototype has been built by Selwyn Holland in Australia using 3D printing to test the ability of a boat this size to perform when built using a low tech and easily accessible method.

Like LANCE the design is capable of being rated favourably at across a range of displacements, 1 kg lighter for lighter winds and 1 kg heavier for stronger winds.

Thanks to Selwyn Holland the print files are being made available to others who want to build the boat. Access to this is via purchase of a SPEAR royalty fee using the SAILSetc website. Two such boats are being built in 2020, one in AUS, one in GBR.

36" Restricted

SPAR - 1998

A set of lines which exploits the 'skiff' concept and which seems to be worth exploring in this class where lack of stability is the main problem. No construction detail on plan.

SPARTAN - 1999

A variation of SPAR designed in light of experience with the SPAR. The prototype placed 2nd on its first outing at the 2000 UK national championship and is reported to be a fast hull. This was confirmed by Vernon Appleton using it to win the 2001 national championship and place 3rd in 2002. No construction detail on plan.

SPARKLE – 2003

This development of SPARTAN was built in time for the 2003 national championship where Vernon placed 2nd.

SPARKLET – 2004

This development of SPARKLE was in use for the 2004 UK nationals. It had an elliptical section ballast which was possibly the reason that the boat suffered rather more than usual from nose diving. This has since been replaced with the more normal round section bulb. Plan available.

UN-NAMED – 2004

A development of the Tansley design Skylark has been drawn for Richard Wells. He hopes to go into moulded production after planking a prototype. Aimed more for 'vintage' and free sailing competition than for serious rc racing.

TINTO (also known as SHIRAZ) – 1994

Richard Moroney made a 36"R boat by moulding a TINTO IOM and removing the excess length at the stern. Freeboard was reduced marginally too. The boat performed well and the same has been done with good results in the USA as recently as 2016.

BLACKWATER – 2010

A traditional 'vintage' style hull for recreational sailing. The prototype has been built but remains un-sailed. The hull is a one piece moulding, complete out of the mould. Moulds exist for the

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internal structure and rc support. The mast is a shroudless, tapered, carbon spar and all spars and fittings are simple and modern for the sake of ease of use and longevity.

Moulds available for anyone seriously interested in taking this project forward.

36/600 (Japan) (& US 36/600?)

3rd DEGREE - 1999

We have only sketchy information about other yachts in this class so these lines are very much a first shot based on **1st IMPRESSION**. No construction detail. The total displacement is 2.72 kgs (6 lbs). Overall beam is 173 mm. The fin, rudder and fin box are standard SAILSetc mouldings.

US One Metre Class

1st IMPRESSION

marketed as VALKYRIE 1998 – 2001 and as SABRE from 2002

This design was drawn for Chip Bullen who has built a prototype and found its performance very good. The hull form is a development of PARADOX. Was made by Mike Hughes.

F100 – Open One Metre

Design for Doug Lord - MicroSail

The Open One Metre class has fewer restrictions than the International One Metre class. It represents a big challenge for designers and builders who are effectively having to start with a clean sheet of paper. Doug wanted to build a design that exploits the opportunity that exists within this class to use moving ballast. In fact the design developed has a canting ballast and twin rudders (CBTF) a concept for which a patent exists and which Doug has permission to use on model yachts.

If the construction and use of the canting ballast concept can be mastered there is no doubt that the design will outperform, by a large margin and in all conditions, traditional fixed ballast designs.

In the course of the design process we did find that **ITALIKO** is a near optimum hull for the F100 class if one is going to use a fixed ballast. We'd build the boat in all carbon rather than the glass we use for International One Metres. Contact us for details.

Two Metre

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2005 - Design for Patrizio Rocosegiani – Ancona

Boats in a two metre class are raced in small numbers in Italy. Racing can be in the open sea with the sailors following in chase boats.

The class rules permit ketch and schooner rigs but traditional single masted sloop rigs seem to be the preferred solution. Displacement is restricted to the 9 to 13 kg range.

The design for Patrizio was towards the top end of this range and had a hull form typical of my Ten Raters up to that time (PRIZM, IONA, IOTA).

ACC/12 – America's Cup Class *1/12th*

Design for Brian Brozek, USA

The AMYA recognises a 1/12th version of the original ACC rule. The boats are therefore restricted in ways that do not apply to the current version of the ACC and 'scale' versions of the current and recent breed of ACC are, sadly, not possible. This design was developed in a fairly extensive VPP based study and is at the mould making stage in late 2005. The SAILSetc fin mould, for item 350h, can be adapted to provide an ideal fin for this class. The fittings developed recently for the A Class SWORD will be suitable for this class too.

Before that hull could be finished the class rules were changed to a degree that no existing boats would be competitive against hulls developed to take advantage of the changes – in fact a new class was created. After Brian recovered from the news and regained the enthusiasm for going through the whole process again, another design was worked up to take full advantage of the class rule changes. Some hulls to this design were finished and sailed at about the time of the 2007 AC. Shortly after that Team Alinghi announced plans to use multihulls for the 33rd AC. Plus a change....

Footy

Un-named design

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Work began for a design in this class during early 2008 as background for the 'FOOTY Symposium' planned to coincide with the open race scheduled for the summer. Both were cancelled and the design work was halted.

During the design work it was found that an 'optimum' design in this class is totally dependent on the quality of building that can be achieved. In this context read stiffness/weight ratio for quality. To enlarge on this statement.....

- The boats have to be heavy for their length in order that a significant amount of ballast can be achieved.
- The high displacement/length ratio increases wave making drag and form drag to very high levels and this has a negative impact on potential speed.
- The high permitted draught encourages a deep fin in order to gain stability and keep displacement as low as possible.
- Unless the fin can be made very stiff it will bend and therefore lower the real stability of the boat.
- A stiff fin can be made by making it thick and of the highest possible modulus material.
- A thick fin, whether of small or large chord width, will have a high drag.
- Knowledge of the stiffness of the fin material and the build weight of the hull and rig can be built into the modelling program in the initial stages and allows optimisation of the yacht design although homing in on the target can be extremely tedious.
- Small changes in anticipated fin stiffness and build weights have a big impact on the resultant 'optimum' design.

It is difficult to envisage releasing a design for general use as an average builder would find his boat lacked stability and competitive ability whereas a truly expert builder would be building a boat hampered by being too heavy and of non-optimum proportions.

Early use the WinDesign VPP for modelling FOOTY designs resulted in the program crashing. Clay Oliver responded promptly by fixing the bugs which only came into play for small absolute hull sizes.

From late 2009 onwards we are able to supply a fin optimised for the RG65/65 class and also suitable for the FOOTY class. Now that we know the dimensions of the fin available and, more importantly, its real stiffness and weight, we can in principle design an optimum boat to match the available fin.

65 & the RG65 class

ROGUE

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Several people requested a design for this class during 2008 and Denis Astbury arranged for a hull built to a Pedro Stier design to be sent to SAILSetc for checking out. The design was modelled in the VPP along with several others from other designers. Comparisons between those designs was followed by development of the stronger designs to produce a design named ROGUE that will give the best chance of success.

All the European designs I looked at were lighter than Pedro's and, of course, will be faster in light winds. I took the view that this design has to be a general purpose design (it is my first in the class) and it is likely to be built by people of varying skill levels. Construction weight will probably be higher than for the expertly built ones (like Pedro's) and it would be useful if beginners found their boats were not too unstable. That is the rationale for the design displacement for ROGUE.

The class rules produce boats that are really half size Marbleheads. This suggests the key to performance will be the build (stiffness to weight ratio) quality of the fin. Although not so critical an issue as in the FOOTY class (see above) it will be key to getting the best out any boat in the class.

David Hollom has identified several good fin sections that will work at the Reynold's numbers appropriate for this class and these were ready for sale from late 2009. A method of manufacture that gives very high stiffness without undue weight has been developed. No shaping of the fin section is required but abrading and spraying the surface is recommended.

In an age where travelling with large boat and rig boxes is beginning to be a problem, the small size of these boats and their good sailing ability would seem to indicate the class has a great future ahead of it.

ARGON

When Agustin Moreno joined us in late 2011 he brought with him a keen interest in the RG65 class. He had been moulding and selling his own design in Argentina which he made using pre-preg carbon in an oven in his basement. We responded to his interest in the class by going through the full design process thoroughly so that we would have the confidence to follow up with investment in top quality moulds. The hull form was developed from the IOM BLACKBIRD but went through many revisions in the process. The production version was first sailed in the summer of 2011 and led the early stages of the race in Switzerland before chaotic conditions set in. Since then Diego Louyer has won the Argentinian championship with the design.

The existence of the inert gas Argon was first postulated by Baron Rayleigh who lived a few miles from Kelvedon and, all in all, this seemed a good choice for the design name. Although Rayleigh noted the presence of Argon it was Sir William Ramsay who identified and isolated the gas.

UN-NAMED – RAD-65

Designed for Vernon Appleton in light of experience with ARGON and other boats in the class. Based on the RAD Marblehead design of 1998.

S class

UN-NAMED - 2018

Being designed for Bai Xin, China, to build for his daughter.

designs for Bob Provoost

Since the 1970s Bob Provoost has been a regular customer for designs to suit his specific requirements. Designs commissioned by him remain restricted to him alone. He has also had other designs that are variations of other openly available designs. Again these remain restricted to him. No attempt has been made to describe those designs here.

Non Class Yachts

TACTIC - early 1990s

is a 600 mm long yacht which was available in kit form from SAILSetc in the 90's and suitable for first time builders young and old.

HORNPIPE - 1996

A 700 mm long yacht available as a hull moulding, kit or completed yacht from David Cousins. Intended for free sailing competition at Southwold, this yacht is also ideal for entry into RC sailing at non competition level.

MINIMUMM - 1997

A 750 mm long yacht designed for *Marine Modelling* magazine and available as a plan from them.

WEE NIP - 2001

A 700 mm long yacht designed for *Marine Modelling* magazine to the Strathclyde 70 class rules. These class rules are intended to provide a framework in which younger people might make their first tentative steps in design and construction of model yachts.

WEE NIP is an ultra simple design using a minimum of easy to use materials with a una rig. It is intended to provide a very simple construction project but one which will sail well. It can then provide a basis against which more sophisticated designs can be compared. Or it can be developed using better construction materials or a more complex rig.

A video describing construction and sailing is available from Marine Modelling. Download the plan from their website.

DeAgostini project – 2002/3

A design for a 700 mm radio controlled semi scale Open 60 was developed specially as the subject of a partwork (parts are supplied week by week as part of a magazine). The prototype was sailed and test marketing of the partwork package was carried out in 2003.

end