Hornet

January 2018

MAINSHEET

Colwyn Bay Report

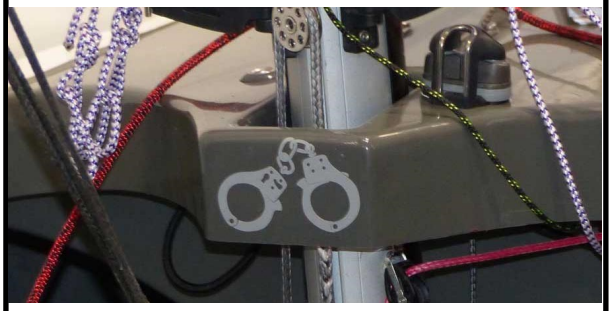
Birth of a Mucky Muff

Breathing life into an old gal

Treasurers grand scheme of things

Chairman's bit

I hope you have all enjoyed the festive season and are now looking forward to the New Year and the sailing season.
If you enjoy this magazine, you have got it because you are a paid up member of the association, feel free to pass it onto your crew and also if you are able also to any helm you know isn't an association member suggesting they might to join as well.
For me, this year was all a bit of a blur as much was going on in my personal life including a move back to my home in Anglesey - somewhat unsuccessful as I'm still waiting for the tenants to move out so I can live in that rather than camp out in a static caravan in the garden.
My move means that I no longer belong to Starcross, but hopefully I will be joining Port Dinorwic sailing club in the spring. The move means I need to find a new crew, so I'd like to thank Lucy Loughton for sailing with me for the past year and a half. I understand from Sam that Lucy is moving on to a younger better helm and may be restoring Sam's old boat to sail with him.
We can only show a single boat this year at the Dinghy Show and we've been allocated a spot in the West Hall, so we will make the best of that position. Sam will



be exhibiting "Shades of Grey" on that stand which will be ready to hit the sailing season for 2018. That choice has been made on the basis of needing to have a similar boat to that which can be bought new from Steve Parker boats. I understand from Steve that he is taking a commercial stand this year which will focus on the mainstay of his business which is the GP14, however, if there is space he will also be looking to show a Hornet as well.
I now have my garages back, but at the moment they are mainly full of my home possession until I move back into the house, but I have been able to recently get my boat back under cover. As soon as there is space, I'll arrange the Class owned Hornet to come back with a view to rubbing down and re-varnishing before the new season.
Thorpe Bay Championship organization is well under way, the NRO – Alan Willis a club member at Thorpe Bay has already been working on the Notice of Race and sailing instructions and there have been some interesting emails to a fro sorting out the differences. In the end the ▶

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www.hornet.org.uk

Hornet Sailing UK

Front Page

Our National Champions Dave Jones and Mark Hogan shovelling the Class Boat through the water very fast. Anglesey Offshore Race 2017. The boat is available for trial sails, open meetings etc.
©Paul Hargreaves Photography Reproduced with permission

For Sale

Hornet GBR2180, "Lilith" Bob Hoare full GRP in excellent condition. Milanes foils, Winder rudder stock/tiller, 2 suits identical North (dacron) sails, one very good and the other still good. End to end pole but single launcher and carbon pole available if you like. Set up for either full centremain or transom-to-centre system. Name easily removed if you wish. Quality combi trailer. Spare wheel. Undercover good. Top cover a bit tired. Spare boom. £2,200 May be seen at CH2 4PD. Alan.Butler76@gmail.com 077866 10224

▶Kestrels have upped the number of Championship races they normally do to the same as ours. That will make race organization easier.
The club has new and keen caterers (they are a franchise). Mark Dell is confident that we will all get a better deal from them. Remember also that this year both camping and parking will be free as part of the deal as well as food and entertainment, so at £150 for the event that rates as a cheap holiday. So rock up and encourage your friends and other sailors to go as well and enjoy the racing and the partying afterward – p.s if anyone hides my boat overnight this time there will be more than wheels missing from the culprits car the following night - Corin…..
TBYC used to be a hotbed of the Hornet Class, there is a lot of history and a good many people that will be helping to make this the best event of the century so far•

HORNET EUROPEAN CHAMPIONSHIPS 2018

Saturday 11th August – Tuesday 14th August

Friday 10th August
HW 12:20 BST
Registration and entry from 19:00
Club open for dinner and camping available.

Saturday 11th August
HW 13:13 BST
08:00 – 09:00 Breakfast served
08:00 Registration and entry
09:30 Competitor briefing
11:00 First start – 2 Races
BBQ and Live music

Sunday 12th August
HW 14:01 BST
08:00 – 09:00 Breakfast served
First start 11:30 – 3 races
Fish & Chip supper and AGM

Monday 13th August
HW 14:47 BST
08:00 – 09:00 Breakfast served
First start 12:15 – 3 races
Championship dinner and entertainment

Tuesday 14th August
HW 15:31 BST
08:00 – 09:00 Breakfast served
First start 13:00 – 2 races – no start after 15:00
Prize giving asap after racing
Club open for food

For Further Details, NOR and Entry:

www.hornet.org.uk

www.tbyc.org

Entries to Janet Wilsmer -secretary@tbyc.org

Club / event enquiries:

Mark Dell – sailmark@aol.com

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Breathing some life into H1798

Mark Smith

"The sea finds out everything you did wrong."
- Francis Stokes

Just over a year ago I felt I needed a project, perhaps my advancing years made me feel I needed something sporty, I believe it's a common problem amongst middle aged men. I have two late teenage sons and a very understanding wife and very, very bad boat habit. At the time we had just got rid of my younger son Matt's Feva and Tera both of which he had some real measures of success sailing. I had an RS200 which the boys and I were getting too big for but in which we could still sail well at club level and I held my own in the small esoteric RS Vareo class.

I had learned to sail in Brightlingsea ages ago and still had fond memories of its large Hornet and Toy fleets from the late seventies and early eighties, I even managed to crew on the Hornets a few times and for a teenager, rock album named boats: Hornet 'Darkside of the Moon', Tornado 'Bridge over Troubled Water' added an air of speed and glamour that my father's GP 14 'Bee' sadly failed to live up in name or performance. He spent many weekends crewing for Ian Johnson on his Hornet 'Blue Suede Shoes' then later 'Shadowfax' (Tolkien, another teenage passion of mine). I was bumbling around in an old Mirror bought from Chris and Andy Bines and later in a cheap but very heavy GP, I wanted a Hornet…

Fast forward 30 or so years and after many changes of hobby and lifestyle I am now in 2016 and have restarted sailing for about six years, I have some money in my pocket from the Feva and Tera sales and see what looks like a Revolution for sale relatively nearby in mid-Essex on Facebook. The boat had seemingly been in barn for some time and was dry throughout, I fancied a winter project and back in the day had looked after my Mirror and GP so a Hornet should be more of the same I thought. After measuring my garage to check a 16 foot dinghy would go in I paid less than 10% of what I had got for the Feva and dragged my Hornet home. It came with Needlespar spars and very complex twin-pole set up, two sets of white sails, the better set of which were fine and were measured in 1980! and a couple of truly dreadful kites.

Matt and I turned it over and took it back to the wood and pleasingly found it was sound apart from the very end of the keel at the stern which we cut back and filled with Epoxy to give us a hard bumper. Kilos of paint removed we started putting it back on again. Rolling and tipping was a new experience, I hadn't used the method before and we certainly have an OK finish but next time it will be better, the Hempel paint probably needed more thinning.

While we were putting the paint on, removing the ancient fittings and getting the decks down to the wood Peter told me my Hornet was originally 'Restive' from Stone, Eric ID'd it as probably a Revolution but it also first appeared in the class in 1973 (built 1972?) which is around the same time as the original Revolution. Nigel provided me with a lovely wooden rudder blade (for CVDRA and classic events) and Jo sourced a couple of decent kites to learn on. I also ordered a set of Sam's Exe sails and decent cover from Pinnell and Bax. The class is the friendliest, most helpful bunch I have yet met in sailing and it was nice to meet a lot of you at the Dinghy Show.

One long spring weekend saw Matt and I re-rigging the boat and then with my older son Dom and my 400 sailing pal Joe, started sailing the now racing green 'Vermiscious Knid' initially just to shake it down inland at Alton Water – the kite system was horrendous but the boat really flew. Matt and I got to sail it too and recorded 17 knots on a GPS in a mighty puff on the lake just before we put it in – that was the trip we also put a big longitudinal crack in the old gybing centreboard.

Thinking we could sail this thing (how wrong we were) Matt and I entered Pyefleet Week at Brightlingsea with him driving and me on the wire. Will and Issy (Matt's old Feva crew) were also racing their Hornet, Will has done a superb job of restoring his and Issy can really sail it, what is more their systems worked - unlike ours.

We had a smashing time at Pyefleet Week. We broke the kite system in different ways on both sides of the boom, found a lovely spreading 150mm crack coming up from the mast foot, pulled both our old main and new main out of the track on the boom, found our new Milanes centreboard wouldn't go into the boat as the slot wasn't true. Then the launch trolley fell to bits. At Pyefleet Malcolm Goodwin confirmed that our boat was one of his kits, perhaps built around an existing Hornet transom and centreboard case, our boat probably is all a bit Trigger's Broom. Eventually I sailed my Vareo on the last day of the regatta as I just wanted to sail something that didn't break. The experiences of the week proved our Hornet was quick upwind and pointed well. Sadly, with only two sails much of the time we were very slow off the wind.

Where are we now? After help from Toby (at the Maylandsea Open) and Will (who as well as owning a Hornet runs Fox's in Ipswich) I have new spars on order, Fox's will make the narrow Needlespar sized mast slot in the foredeck fit the wider Cumulus Selden mast section and true up the case so our new plate fits. We'll then touch up the varnish at home (too many trapeze hook dents) and seriously simplify the systems, I'm used to straightforward dinghies and we need to learn to sail the boat rather than worrying about bits coming off all of the time. We will get the work done over the winter and learn to sail the Hornet ready to see you at Thorpe Bay in the summer.

I still fancy having a go in a Toy sometime…•

Market Capitalisation of the Hornet

By our Treasurer

Have you ever wondered exactly how much the entire Hornet fleet is worth and perhaps where your boat fits in the grand scale of things? Well it may not be possible to determine where your boat fits into the grand scale of things (that is for you to do) but it is possible to estimate the value of the entire Hornet fleet.

Estimating the value of the entire Hornet fleet is just that, estimation! Any calculation would take into account a number of factors, which could lead to potential differences of opinion, dependent on who was carrying out the exercise.

Despite the limitations arising from the inherent estimates used the exercise could still prove useful for the class. First, an estimate of the market value of the class would be useful in marketing. To demonstrate to boat builders, suppliers as well as sailing clubs that the class is worth being involved with on a commercial basis. Secondly, to stimulate competition amongst suppliers (sail makers and chandlery) to the class as this will also assist class development. Third, to provide information to class members about the value of the class expressed in terms of boat numbers and average prices.

In this two-part article I will give my estimation. But before I do we have to make clear our overall parameters and this will the purpose of this first article.

Put in its simplest form the Market Capitalisation of the Hornet fleet would be the product of the average market value of a boat multiplied by the number of boats in existence. It does sound a simple exercise. But if you look a little deeper it is not quite that simple. To explain this we will look at each factor in turn.

Factor 1:- Average Market Value.

The market value of the fleet in general will be effected by two main factors, first whether there is a class builder an second whether there is an active class association. Their effect on boat value can be demonstrated by way of the example of what happened to the Laser 5000.

Laser Sailing were the exclusive builders of this boat with production commencing in 1992 and ending around 2001 when Laser 5000 sail number ESP5318 (Spain) was produced. Consequently a total of 318 boats were built.

By around 2005 the class was in full decline and the class association all but folded, events were few and poorly attended. For example the Eurocup was attended by 70 boats in 1997 from about 5 countries and by 2005 the number attending had reduced to 16, all British.

So what effect did the above have on the second hand market? The answer is quite simple the value of the individual Laser 5000 dropped like a stone. I purchased Laser 5000 sail number GBR5252 for £2,500 in 2001, the year production ceased, and sold it in 2004 for £1,700. But by 2006 it would sell for £1,000. So the effect on the class in losing its builder and active class association was to reduce the value by about 60%, which if applied to the entire fleet would be staggering even if applied to, say, the 270 remaining boats. This is assuming boats were lost/destroyed over the 14 years since production started!

The loss of fleet value, assuming that the boat, GBR5252 was an average boat, would be £405,000 quite alarming. The boat when I purchased it was an average example of the class, apart from the later addition of Intermediate Bars into the trapezing racks, so the estimation of the fall in value of the fleet could be reasonably accurate.

The problem with trying to establish the fleet value of the Hornet is, however, much more complex.

First, there are several different builders compared to the Laser 5000's single builder, albeit based in several countries across Europe, after all the pen-ultimate boat was GER5317 and the last British boat built is believed to be GBR5312. The Hornet having several builders will have several different cost profiles at initial build.

Second, the Hornet class has been in existence since 1952, that is 65 years, compared with the Laser 5000 being in existence 14 years at the time of the calculation referred to earlier in this article. This will make it difficult to estimate the number of boats in existence as well as the value of an average Hornet.

Third, the Hornet is a semi-restricted class with considerable leeway in terms of design and the layout of fittings. Remember the Laser 5000 is a strict one-design class, in fact the only difference I can remember is whether or not the boat carried "Intermediate Bars" on the wing configuration. My boat carried the Intermediate Bars as, being a light-weight crew the distance between the gunwale and the trapeze racks was too great for comfort. But this has only a minimal effect on the overall estimate calculated.

Finally, the value of our boats will be affected by the fact that we do have an active class association. Of course, we do have to support the Association by helping at exhibition stands, attending open meetings and sailing in handicap events to ensure that the profile of the class remains visible.

Factor 2:- Number of Boats in Existence

Determining the number of sail numbers issued is relatively simple it is 2192, but that number will be reduced by two factors. First, the number of boat numbers issued to boats that were never built and to boats built but subsequently destroyed. Examples of numbers issued to boats never built are, 1748, 1423, 1071 and perhaps the infamous gap of 1979 to 1999 (were they issued to Holland?). Boats later destroyed include 1626, a former world championship boat and 689 where all that now exists is a rather nice suit of sails, small rig format.

Unfortunately, my access to Hornet yearbooks stops at 1972/3 and I believe we do not have detailed records after that date. Even so, based on the information we have it should be possible to estimate the number of boats in existence based on; old yearbooks, modern records (however incomplete), recent build programmes and racing results.

Conclusion

Any estimation of Market Capitalisation of the Hornet Fleet will essentially be one persons opinion but we can be confident that factors such as current builders and a class association will play a major role in retaining value of the fleet as a whole.

We already have two builders being Tim Coombe and SP Boats so production of Hornets can continue, however, it is up to individual members to be as active in the class as possible. In addition, to support the Association. But I had better stop now, as I am beginning to sound like the class treasurer•

2018 FIXTURES

[More to be added]

3/4 March	Dinghy Show Alexandra Palace Don't burn it down
12/13 May	Port Dinorwic SC North Wales Language lessons at the Briefing PROVISIONAL DATE
23/24 June	Exe Regatta Down Devon way me boy
2/3 June	Sheppey Kent (with Ospreys) An Island by the sea PROVISIONAL
23/24 June	Stone SC Deepest Essex
11/14 Aug	**Championships Thorpe Bay** near the Kursaal Palace of Fun!
20/21 Oct	Rutland SC Beware mast climbing sheep

Colwyn Bay Nationals

Dougal Henshall

When the fleet arrived at Porth Eirias, the Watersports Centre on the Promenade at Colwyn Bay, they were greeted by large orange marks labelled USWIM (an open water swimming group who had loaned the event the marks).

In the end the name was somewhat prophetic, as at what was destined to be a windy Championships, many of the competitors would end up testing the water at some point in the full programme of racing afloat. Being Hornet sailors, this of course had to be balanced by a full programme of happy activities ashore!

Day 1 just happened to coincide with the 12th August but there was nothing glorious about getting afloat. First the competitors had to punch out through the curling shore dump, only to find more wind than expected and an ugly sea state that would quickly catching out the unwary helm. Dave Jones and Mark Hogan, having borrowed the Class Association boat, quickly stamped their authority on the fleet with a comfortable win. For the second race the wind had moderated slightly but the tide had turned making the sea state even worse. All the usual heavy weather suspects were up there but the competition was for the lower podium places as Jones and Hogan were again way out front, though Tim Coombe and James Beer worked hard at keeping them honest. With a forecast of zilch wind for the following day it had been hoped to squeeze in an extra race, but by now the depleted fleet were pretty exhausted. Out on the course the Race Team were now clinging on for dear life in their Committee Boat, so there was little dissent when the boats were sent back to the shore after Race 2. One who was very happy to be heading for the shore was Roger Kelleway, who had injured his leg during the 2016 Nationals at Herne Bay. Picking up another injury, after his second trip to A&E in two years, Thorpe Bay General Hospital are already booking him his slot for the 2018 event.

Top marks to the forecasters for a spot-on call for Day 2. They promised 3-5 kts and that it exactly what was happening out in the bay. The Race Team dispatched RIBs to see if things were better further out only to find that it was even worse there than inshore. There was a moment of excitement when 6 kts was seen at one point, but it could have been someone sneezing, for nothing else like it was seen and racing was reluctantly canned for the day. An early start for Day 3 was set with the intention of getting 4 – and maybe even 5 races in. Once again though the weather would have the last laugh. The fleet started in a good breeze and fairly romped around the first triangle and sausage but then the wind started to die – but only in patches. Jones and Hogan had their own supply of breeze, as did the evergreen partnership of Strangler and Pippa Rogers who rode a narrowband of private breeze into a deserved second place. The top place finishers were the only ones to enjoy the race as behind them the rest of the fleet were left drifting around in a faint and fickle breeze There was then an unfortunate and lengthy delay as the sun shone and the best breeze blew happily; unhappily two of the marks had gone for a Sunday stroll and in trying to get them back in place one of those simple but so easy to make mistakes happened. A misunderstanding with a GPS 'ping' saw the course doubled in

size rather than reduced, with the fleet being sent out on the dinghy equivalent of the Fastnet Race. With the wind relatively stable, boat speed was always going to be a premium on the long legs and so it was hardly a surprise that Dave Jones and Mark Hogan were again front running. Behind them, Dick Garry and Sam Woolner were holding second place, with this being the start of a long run of top results. After the earlier delays, getting the full four races in was going to be a big ask, but by now the mark layers were getting into their stride and despite the long day afloat, racing continued. For Race 5 it was business as usual out front, though this time the chasing hounds were Nigel Scudder/Keith Hills and Storky/Mark Taylor. Behind them the racing was close and

intense, at times too close, as several protests where to result from the race. The most notable of these would see Strangler and Pippa relegated to a DSQ score; the question was now if this would impact on the final places.

There was just time for a shortened final race but what was this? Instead of the lemon-yellow spinnaker of the Jones boat, the first kite to pop out at the windward mark was the blue of Toby Barsley-Dale/ Richard Nurse. Behind Toby came Nigel Scudder/ Keith Hills and then the rest of the pack; Jones and Hogan were some way back playing Wurzel. Yet their run of 5 straight wins had already put them out of reach of the rest for the Championship; the competition was now about who would be the 'best of the rest'. As if to heap yet more hardship onto the fleet, that night Colwyn Bay produced some near biblical rain that seemed to be falling mainly on the tent village that had been set up for the Hornet fleet in the grounds of the local rugby club. With the last night of the championships antics concluded (how did Barry Miller's back survive doing the Gay Gordons) some still managed to sleep all the way through.

The final day dawned to a near perfect day, with warm sunshine and a stiff westerly breeze. This was something of a relief for the Race Officer, who was not only a Horneteer from the past but who had a long and illustrious (is that the right word) history of officiating at Hornet Championships. The deal is simple; deliver sunshine and breeze or it is trousers off with them then being run up the flag pole. Luckily the weather helped him preserve his modesty, for it was a great day for Hornet sailing. Big seas, big winds and sunshine, with reaches that were just on the sailable side of tight. For once it was a day for the bigger crews to really stretch their legs, but Dave Jones and Mark Hogan wouldn't be amongst them as they were one of two boats called out UFD on a very competitive start line. The Race Team were dismayed to have to call the second boat, as Eric Styles was being crewed by Catherine Westbrook, yet a boat that is OCS must be called as such. Being in the front of a Hornet is a demanding task at the best of times, even for a fully equipped crew, yet Catherine is blind. Even in the confused seas on the Saturday, she was seen, spinnaker flying and hard out on the wire and Eric and Catherine would score their best result at the event in the second race of the day.

Steve's patent bottle opener

With the leading boat pulled out, Dick Garry and Sam Woolner changed up through the gears, storming around to take the win to close the gap on the absent leaders. Time was running out and there was just enough left on the clock for a final race blast around the bay which suited Toby Barsley-Dale and Richard Nurse just fine, as they sailed a classy race, leading from the off. The action though was going on behind them when, with the breeze building even further, the fleet decided to two sail it down the last reach to the finish line. Normally, this would be a sign that the reach had been set too tight but this was clearly not the case, as Garry/Woolner blasted down the leg, kite up and in a cloud of spray. Not only did they carry it but ended up having to bear off slightly to tear across the finish line in second place. Their 1,2 score on the day closed them within a point of the winners Jones and Hogan for one of the closest finishes in recent Hornet history.

The Mayor of Colwyn Bay was on hand to give out the silverware at the prize giving on the roof of the Centre, where Class Chairman Eric Marchbanks and Champion crew Mark Hogan all gave their thanks to the organisers of the event, the helpers from Porth Eirias and the race team afloat.

2018 will see the Hornet fleet heading back to more familiar waters with a Championships at Thorpe Bay and a more conventional event. The memories though will be not of the rain, nor the trek across the sand, but of those final day reaches. As one competitor said, "this is what we came for!"•

Birth of a Mucky Muff - Hornet 2191 Build

Martin Arnison & Dave Edge

Reason for Design and Build

There are often times when you ask yourself why are we doing this or, in our case, why are we doing this again? But then you must take a breath and, I my case, realize that it is a privilege to be given the opportunity to design and build a brand-new boat. On reflection, the last new boats were derived from previous hull shapes with some changes to the inner deck layout, but we wanted a completely new design from start to finish including foils to help the Hornet association move forwards.

I always remember being told that the build time for an RS800 is approximately 80 hours, so how does this become 18 months? All I can say is don't underestimate the time required for development and discussion. Towards the end, I have a well-used phrase 'don't give me any more options' but such is the joy and pain of an open class dinghy design. It is a clever man that knows all the answers from the start. From our years of sailing Hornets, we did have areas that were clearly marked for change.

Design Principals

Dirty Dog (2183) has proven to be a very sound and well laid out boat. What it may have lacked in straight line speed it more than made up for in ease of sailing. So where could we improve?

Hull Form – Particularly in waves, the current boat always gave the impression of pushing a lot of water rather than cutting through it. Having sailed International 14s for many years, we observed a significant step change between the Bieker 4 and 5 designs where the latter had a very fine bow. The ride was very different with the 5 punching through any rough water with minimal pitching and the 4 riding over the bumps which used energy and was slower. Dirty Dog was akin to the full Bieker 4 bow so we wanted to make a similar update to the new bow.

Panel Stiffness – the Hornet is notoriously flat panelled, especially on the bottom surfaces. The aim was to subdivide as much as possible in conjunction with using maximum allowable panel thicknesses.

Headsail Sheeting – particularly noticeable on the composite Hornets, the genoa clew position is very loosely controlled. There is no convenient fairlead position resulting in a clew to fairlead distance of up to 12". Knowing that the slot gap and twist of the headsail is dramatically influenced by even ¼" sheet tension adjustment on our old boat, we can only imagine the how the genoa shape changes when hit with variable wind speeds when you have such inbuilt looseness. We wanted to lock this down

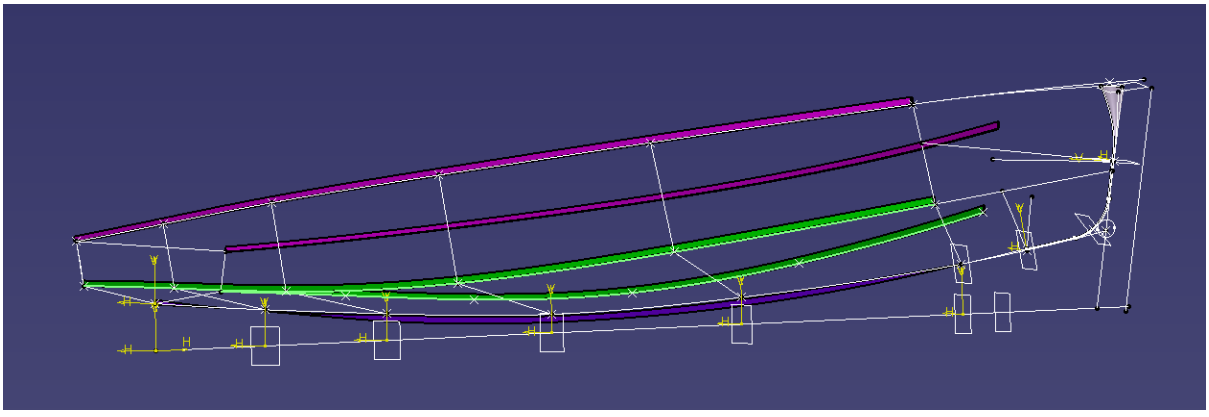
Weight – we wanted a boat that would require correctors but not at the expense of strength. The centre of gravity should also be centred and low with weight reduction at bow and stern. All this to produce a boat that has the highest righting moment and lowest pitching and inertia.

With grateful thanks to Roger Callaway we were able to scan both his and Dirty Dog hull which were used as a reference whilst developing our new design.

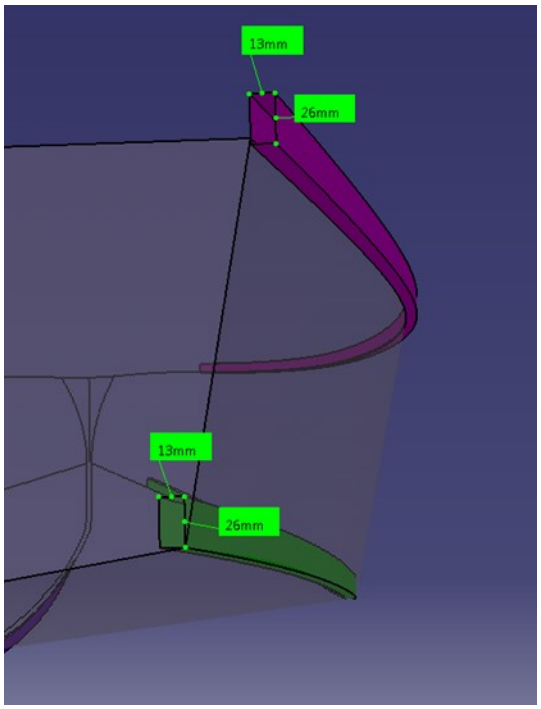
Hull

So, to roughing out the hull form. Reading and implementing the rules from top to bottom proved to be quite a journey of discovery. Far from being able to exploit gaps and loopholes, what initially appeared to be a vague and imprecise set of instructions very accurately controlled the resultant shape. Put in the numbers and you cannot help but produce a form that is indisputably a Hornet.

This being a modern world, we had up-to-date 3D parametric design software available to us. In this way, it was possible to build a 3D hull form on screen that was driven by numerical input. Each measurement point was controlled by a linked spreadsheet each line of which contained a new configuration limited by the maximum and minimum values allowed by the rules. The amount of flare, rocker, panel curvature, bow radius, mast position etc. could all be modified to produce a new Hornet with the ability to overlay and compare each iteration. If the programming was correct, every shape produced would be rule compliant.

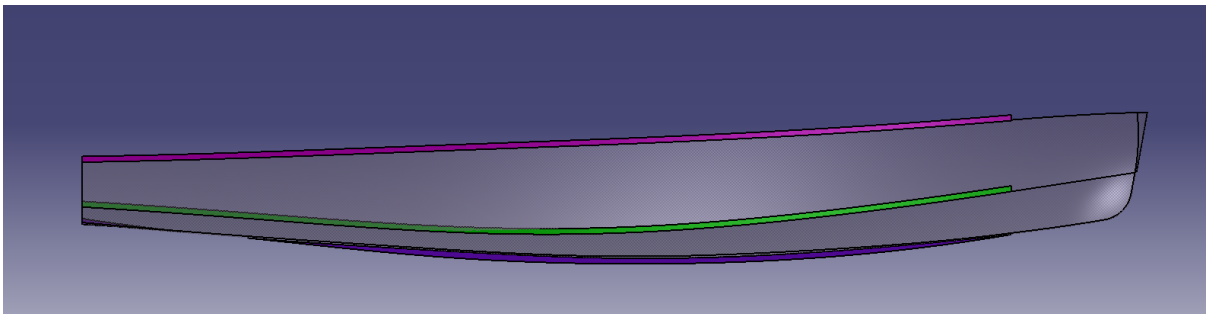


As an aid to visualise the allowable measurement point locii we draughted a boundary box for the keel, chine and sheer. Typical 'tweakage' was small at 13mm on half breadth and 26mm in height

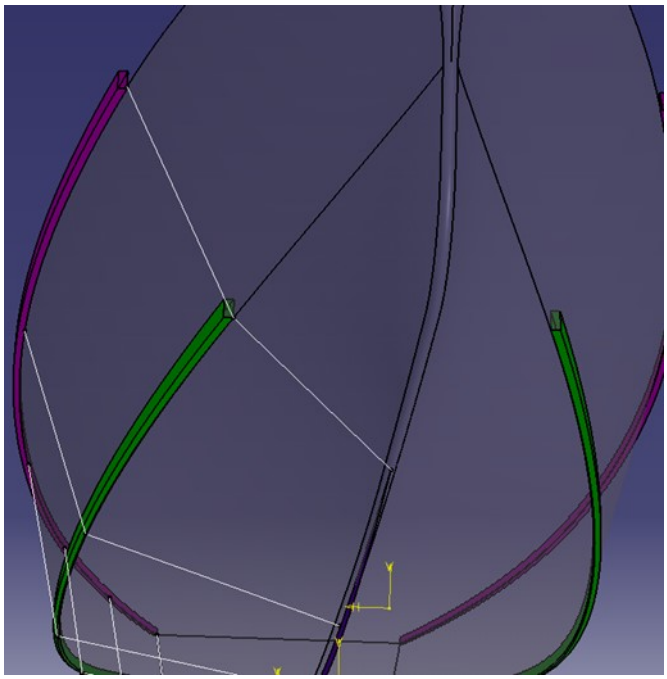


Shapes in between measurement points were uncontrolled which gave options for panel curvature. This is where design variability is most greatly seen across the fleet. Sticking to our principals we opted for the following: -

Keel/ Rocker – as flat as possible. Flat aft rocker ensures that the bow doesn't rise to early in displacement/ planning transition i.e. maintaining waterline length. Keeping the bow down may not help the boat ride over waves but therefore a fine bow was chosen

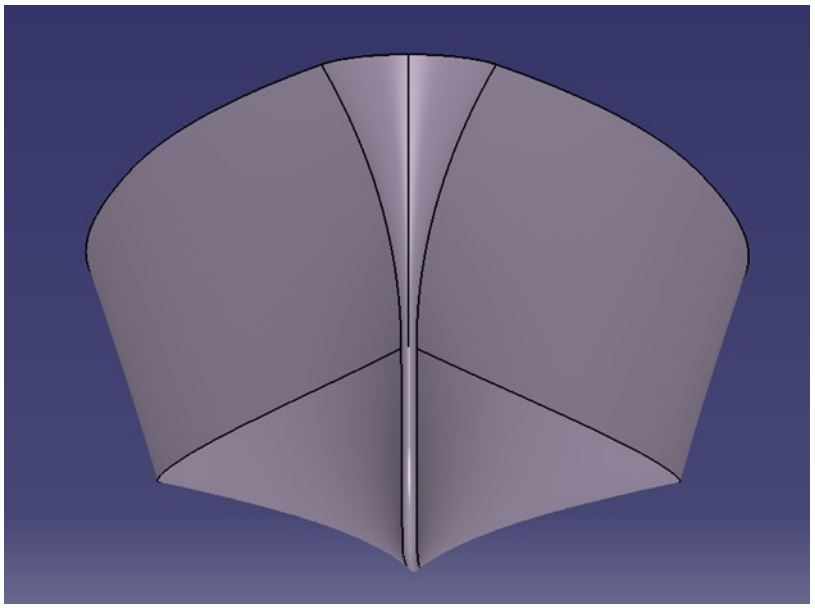


Section Geometry – a narrow, fine bow for punching through waves, minimum bow radius with straightest stem allowable for waterline length. Maximum flare my midships giving flattest/ widest sections aft for lift and straightest side panel run. Sheerline narrow forwards and wide aft for maximum righting moment. This boat could be wet!



Panel curvature – flat (straight line point to point) gave minimum wetted surface area and, as a by-product, was easier to build. An interesting visual effect was that the bow looks concave but was in fact flat. The result was pleasing and gave a very fine entry. It remained to be seen whether the boat would nose dive in waves!

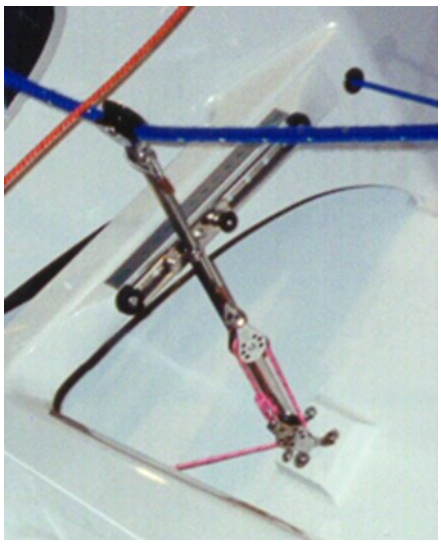
Sail Plan

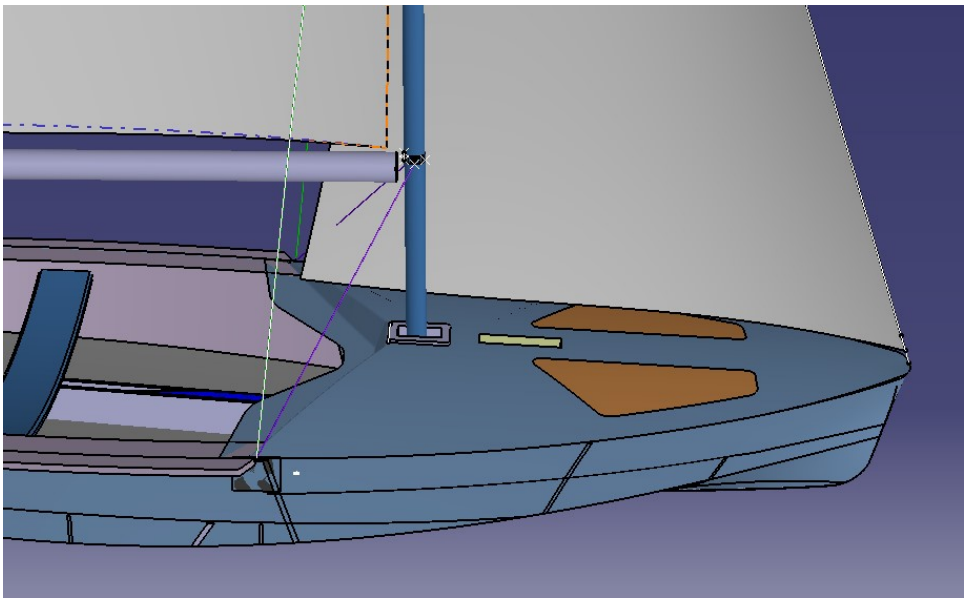


This was driven almost entirely by trying to lock down the genoa sheeting position. Often in no man's land the Hornet, Fireball, 505 all suffer with this problem and many intricate and expensive mechanisms have been tried.

We wanted a low maintenance solution and de-

cided to move the foresail as far forwards as possible to get the clew out of the crew area and near the foredeck. With forestay at the bow the spinnaker chute had to be to one side (port for left hand courses) which was a calculated risk. A 45° clew board helped to shorten the foot length further to achieve the desired result





Deck Plan

Dirty Dog was very well laid out and easy to sail. We wanted the same result for 2191. Careful thought was put into the mast heal area, the centreboard case and take-up systems. Quite heavy on fittings but the result was a tidy, out of the way set to rope runs with the thwart as the command centre. New additions were the ability to sheet the main to windward plus the twin pole spinnaker system influenced by current Merlin Rocket thinking.

Foil Design

We wanted carbon and, after research, we decided that it would cost about the same to manufacture our own foils as it would to buy them. This would also give us design control and repeatability.

Again, in line with current 505 thinking, we pushed foil aspect ratio as much as we could. The rudder was unrestricted in this case but the centreboard case size was a limiting factor. Many foil sections exist but none more tried and tested than the NACA 4 -digit series. With a very short chord length we opted for a 12% curve on the rudder with an 8% section for the wider centreboard. Foil area was taken from Dirty Dog and we went fixed rather than gybing centreboard for simplicity.

Pictures illustrate the moulds and finish;

Construction

Materials

Class rules put set out some boundaries but we took advantage of the allowable 'option materials' as often as possible. We also used the best materials available

Hull Laminate	300gsm E-glass, +-45°, stitched either side of 12mm M80 Corecell
Deck/ Bulkhead Laminate	300gsm Carbon +-45° woven either side of 8 & 10mm M80 Corecell
Secondary Bonding	100gsm E-glass tape

Resin	Sicomin 1280 Epoxy resin, fast & slow hardener
Additives	Microfibre, Silica, Micro balloons
Structural Adhesive	Spabond 345
Foils	2 x 300gsm Carbon laid 0/90/45, 1 x 400gsm Carbon Uni
	Sicomin PB 250/ DM03 expanding epoxy foam

Male Plug

After hours of design deliberation, it was time to start the build process of the male plug, the decision was made early that we would build the hull over a male plug using a "strong back" frame method. The section patterns where plotted straight from the 3D model with the appropriate offset allowances for the final hull thickness (the plug represents the inside shape of the hull). Paper 1:1 scale plots where glued to 18mm ply and cut to size. We worked to a tolerance of 2mm! Note the notches for strongback beams and longitudinal battens.

After cutting all the main frames we then fixed these to two beams that were bolted to the workshop floor (levelled and parallel) at the station points as dictated by the model & class rules. Make sure you know which side is the datum face!


The next step was to start inserting and fixing the battens that created the shape of the hornet. Each batten was installed as a pair either side of centreline to avoid too much pull to one side ensuring symmetry. We opted for 20 X 20mm Columbian pine battens with each batten was glued and screwed to the base frame. This was a hugely satisfying process – proper boatbuilding.


Once we had the basic shape of the Hornet with the "strongback" the next step was to build the bow. Using a sandwich construction of plywood sections and low density foam, the final shape was hand faired, sheathed in glass fibre, filled and painted.

Note the offset used when building the bow. Most the hull was to be laid up on the outside plug but to do the bow in this way would have been very difficult and accuracy would have been lost. Instead we had an inside to outside transition at the bow so that the foam core could be added to the inside of the bow after release from the mould.

The framework was then planned to its final shape ready to be covered using 4mm marine ply, glued and stapled to the battens. Final planning, sanding and filling to create the male plug. At this stage, further measurement checks were made as we still had an opportunity to fair out any inaccuracies.

The male plug was then given two coats of grey epoxy paint to give a hard surface and sealing the plug ready for the vacuum consolidated layup to come.

Hull Layup

The male plug was given several coats of release wax ready to start the layup process. We used 300gsm biaxial E-glass, Epoxy resin with slow hardener that created the first coat and skin. At each stage the wetted cloth was overlaid with peel ply and bleed/ breather cloth before enclosing in the vacuum bag and consolidated. The first layup was allowed to harden over a 24-hr period. Stage 2 was to add the

12mm M80 Corecell foam firstly to the side and then to the running surface. We did this in 2 hits as it would be too unwieldy to try it in one go. Before the outer skin was applied we inserted all the plywood pads (hard points) required for fitting out. This included compression pads for shrouds and rudder pintle. Finally, the outer layer of 300g E-glass finished the hull lay-up.

Note the direction of the E glass fibres, they have been laid 45° to centreline. This is 4 times stiffer in twist when compared to a 0/90° layup!

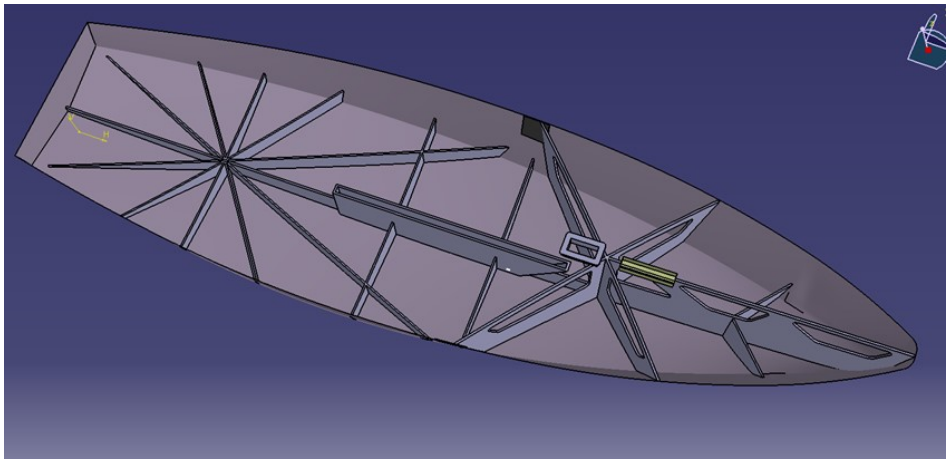
Inner Skin

Corecell

Outer skin

The final process was to allow the epoxy resin to harden and cure for a further 24 hr period with the workshop at a temperature of around 25 degree's. We then removed the vacuum bag and peel ply to uncover the finished layup of the hull.

Internal Bulkheads, Inc deck and floor



The importance was set for a stiff boat not a light boat (but within 126KG min limit) and a hull that would not flex when sailing. We took ideas from the International 14 with a main X frame intersecting at the mast heel and linking with the shroud positions and the main fore and aft centreline spine. Using the rule allowance for optional materials all structure from this point forwards was 300gsm Carbon biax skins over 8 or 10mm M80 foam core. Again, using the 3D model for the patterns, we paid up 8x4ft panels and nested the shapes paying attention to the fibre direction.

We didn't take any short cuts when dry fitting the panels. We wanted an accurate fit to reduce the amount of expensive (and heavy) Spabond 345 structural adhesive used. In addition, all joints where over taped with 25mm glass tape. Prior to the bulkheads being glued into position final checks of the measurement stations was carried out and locked into position.

The image shows the front bulkheads, lower foredeck and centre spine have been fitted. Note the amount of panel subdivision and distribution of load.

Below shows the same fitting and bonding processes for the rear of the hull, the centre board housing was constructed using melamine faced chip board to create a mould, we then shaped to the rules prior to 5 coats of mould release wax. The layup was the same construction as the bulkheads and vacuumed and heat cured for 24 hrs. The internal mould was then knocked out leaving us the shape and construction as seen below. The picture below clearly demonstrates the hull material being E-glass and the bulkheads being carbon.

After the bulkheads where complete and all secondary bonding was complete we painted the internal hull with Duropox (two pack epoxy paint) black paint to protect from any sea water exposure.

We then started the process of fitting the internal floor (the floor was scribed into the hull for fuller stiffness and reducing unsupported panels) and front tanks. Each piece was taken from the pattern and scribed in cleaned up and glued into place using Spabond. Prior to the deck being fitted the underside was cleaned filled, sanded and then painted using Duropox epoxy paint in light grey. The picture below shows this process including the detail of the rear tanks being fitted.

The picture over also illustrates that all the way through the build were possible the boat was rigged and checked so that all pads, tubes etc. could be fitted so that when it came to final fitting out after the paintwork we had the correct positions. The tubes detailed above where fitted for the windward sheeting and spinnaker sheets.

The picture next page shows the deck and thwart being fitted prior to the tops of the side tanks. We deliberately delayed fitting the tops of the side tanks to allow us to mock-up the control lines and fittings.

The foredeck used our thinnest foam core at 5mm with the intention of forming the camber over the shaped bulkheads as per a plywood construction. However, we underestimated the stiffness of the panel and had to kerf and repair the underside to get it to flex. In hindsight, we would have been better making a simple

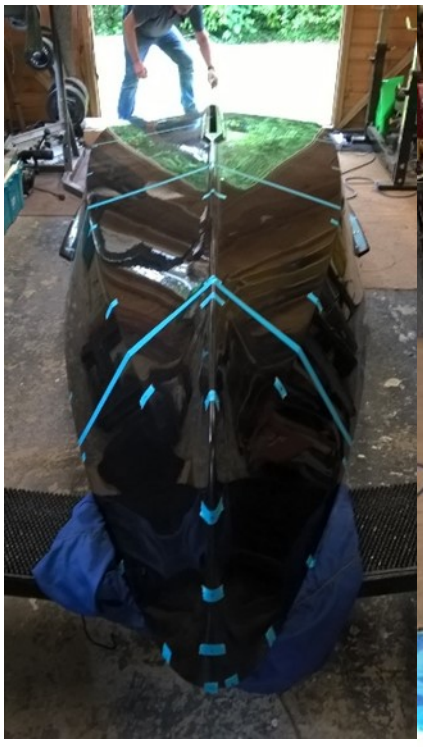
mould to perform the camber.

A high-density foam panel was added in way of the mast step area which locked into the x frame.

The thwart needed to be simple yet effective for the control lines and bracing the hull port and starboard.

The mould would be made from a strip of 4mm marine ply approximately 300mm wide and 1500mm long to create the curvature, we measured the offset from top of centre board box and the position of the letter box slots (considering for the 10mm carbon tube) cut in the side tanks port and starboard (that would house the finish thwart). We used 10mm foam and cut some wedges for the ply and created the curvature by using hot glue gun fixed to the bench. The ply was then coated 5 times with release wax, using a sheet of 10mm M80 Corecell foam and wrapped with Carbon fibre cloth, epoxy resin and vacuumed to the mould. This was left to cure for 24hrs and then removed from the mould. Once completed we then cut the thwart to the desired length and glued into position with Spabond (capturing the 3 no carbon tubes that would allow the control lines to run freely) Final measurements were taken again at the measurement stations to make sure that we retained the hull shape to the rules.

The hull build was then finalised and completely fitted out prior to painting. The fittings were stripped off and the boat was prepped ready for fairing using fairing compound (epoxy based). Using long boards for most of the fairing / sanding works including a lot of blood, sweat and tears the hull was ready to receive the first coat of epoxy high build paint. The hull was sanded and faired 3 more times until we got the results ready for the painter.



We followed the same process for the deck and inside of the hull, this was a lot harder due to all the shapes of the tanks, thwart etc.

On completion of the high build primer works ready for the painters we checked all the measurements again on all the station points.

Paint finish and fit out

The hull was delivered to Zest boat works

in December 2016 ready for a professional paint finish with some additional touches like the boat name, Picture and Number in the paint finish. In April 2017, we picked up the hull from Zest and bought it back to the workshop ready for fitting out. Before the boat was fitted out we took a scan of the hull with a pro-liner and focused on the measurement stations as the pictures show.

The fit out started and whilst we had previously dry fitted most of the fittings it still took around 2 months to complete to a satisfactory standard and making sure that all the control lines run properly and easily.

Reflections……. Did we get it, Right?

There wasn't much time between build completion and the championships. The first sail was the Exe Regatta which was a light wind event. The championship, by contrast, wasn't so much of the character of the boat didn't show itself until later.

Hull Form and Feel

Despite some concerns with the fine bow, she didn't nose dive. However, we did sit far further aft than we were used to but this felt natural. There was no slamming and she did cut through waves and was at the front of the fleet at the top mark when it blew up. Light wind performance was inconclusive. This is not our strongest sailing mode and will have far more to do with the rig than the hull shape

The boat was unbelievably stiff which, whilst theoretically fast, gave for a boat with very little compliance. Coming out of a roll tack there was no sense of soft acceleration, everything was very rigid. Adjustment of sheet tensions was necessary to get this feel back. Maybe locking the jib down so tight was a contributing factor. Again, I am sure we adjust our sailing style to compensate.

About the jib sheeting position, the jury is out now. It needs to be closely monitored and calls for an attentive crew. If practical, it needs to be finessed in line with the mainsheet and for this the fairleads and cleats need to be user friendly.

Foils

The foils came out beautifully and where extremely light and stiff. Initially the boat was not balanced and had excessive weather helm. This was unexpected as we had already effectively moved the centre of effort forwards with our forestay position. Lee helm should have been the result if anything. So, we moved the centreboard aft by 20mm which was an improvement but it could have taken more.

The super long rudder placed a huge load on the rudder stock which unfortunately failed in the fresh breeze. Way more laminate was need around the lower pintle. This was a simple oversight. The foil itself will never need to be fully deployed (as I had done before the failure) but the cassette system allows for this

Interior Fit out/ Practicalities of Sailing

The lack of practice let to a few issues whilst sailing but there were also some things that needed changing.

The cockpit sole had been made from a single panel offering great drainage and positioned at a height to allow for the extensive sub-sole hull stiffening. All good reasoning, however, for the helm, the boat is precarious to sail. There is no safety in waves with spinnaker hoists/ drops particularly hairy. There is a real risk of falling out of the boat. So, at the expense of stiffness, we will be lowering the aft sole as much as possible

Refine the take-up system on the control lines – whilst we were very happy with the solution there was a little bit of friction in the system that needs some finer changes.

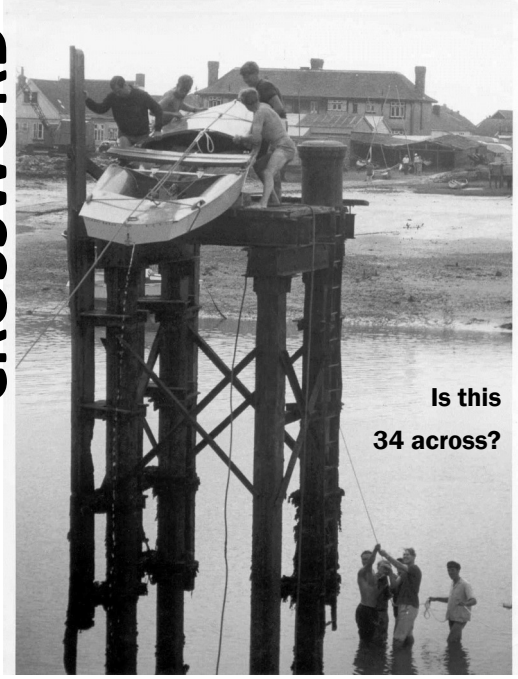
Centre board control – this needs changing as this was rigged on the shorelines at the championships.

Twin pole system – much of this was copied from the Merlin, but we found this very complicated to the point where it offered no competitive advantage on the race Course. Again, lack of practice was a factor but we need to rethink this and find a system that works for us•

Final comment from the editor:

Don't mix your f 'n t's.

CROSSWORD



ACROSS

1	A sort of grown up plank.
7	Ah! So those sail were made down-under before 1993.
8	Is Nicholas contained in his acting? Was his Face-Off, Gone in 60 seconds?
9	Sang "My Sharona" but only if you leave out the definate article.
12	Capable of being trained
14	We had them until 1970 then they became bigger for the crews.
15	Is this what Tantalum has come to symbolise?
16	When we called Fireballs, meatballs we do it just for fun.
17	American TV Series based in a Hospital, a very busy place.
20	This returning officer wonders if he needs Romanticism (chemical)
21	This Norse God has acquired an extra letter, unlike Hornet 1951.
23	A type of curtain
25	Egyptian God of the Sun. But definitely not of sailing.
26	Its STOP and __ __ with this game, alternatively you could get £200..
28	If we were an army it would be "Old Marchbanks" I think!
29	Has Mike-the-Lark been writing again, wanting to usurp Strang?
30	Have in the past tense.
31	Electron-Volt a shocking simple answer.
32	With a poor launching trolly this boat weights a ___ ____ ___.
34	A former world champion was a member of this regiment - Shoreham memories with 1049?
36	Now this is 'Alcohol' for the RYA National Hornet Class.
37	I will use this word to catch your attention.
38	"Wash you mouth out and remove your nappy!" said the old Hornet Crew.

DOWN

1	The trailing edge of the Sail.
2	We have the swivelling type, rather than taking the plunge, but both are useful in a capsize. But they get chipped and damaged , so a letter is missing from the answer. (A Question for the intellectual Horneteers - if we have any?)
3	Sailing on the chine I believe
4	A number of large colourful sails to push the fleet downhill.
5	3991 erofeb rednu-nwod edam erew lias esoht oS !hA
6	Time to change direction through the 35 down of the wind.
10	A young horse for the young guns.
11	Will keep the boom down so it can hit the helm's head as well as decapitate the crew.
12	This frightened person lost his ID - but his namesake builds great Hornets.
13	Where we all live and will probably never leave.
18	A number of insects and a rocky ridge in the Peek District.
19	THE Boat
22	These organisations both deal with different types of break-downs , to those they help they are essential.
24	Belonging to a dry white wine from veneto region in Italy.
27	Fireball sailors need this to turn them into Horneteers. (Initials only.)
33	Issued prior to the racce - but do you read it?
35	We had them in our sails, now it is in the wind I see. 6 Down helps us through it.