

# Grapevine

## The Magazine of Liverpool Yacht Club

Spring 2012



## Sailing Again

# Yachting in the North West

The surveyor in me got to thinking when I needed to write my editorial.

Practical Boat Owner published a guide to marinas in their April addition. Using that and based upon our sailing area ranging from Anglesey and the Straits, Isle of Mann and Cumbria then there are about 2,800 marina berths. Taking account of yacht clubs Blackpool and Fleetwood and Bludellsands and taking account of harbour berths such as Beaumaris and Menai then perhaps we have upwards of 3,500 potential berths available. Of course not all will be occupied so applying a 20% void rate then there are probably 2,800 yachts in or about the North West.

Say each owner spends about £3,000 per annum on berthing and running costs then that is an overall spend of about £8,400,000.

Above is just what owners might be spending on running their boats and ignores the actual capital cost and insurance etc. Taking a wild guess at that and assuming say 10 new boats are built in the region each year at an average cost of £100,000 each then there is another £1 million to be added

In addition crews spend money and say 4 crew per boat each spending £100 per annum on incidental sailing items then that is another £1.12 million.

Overall then the yachting pound in North West might be around the £11 million per annum. The value to the economy is multiplied when jobs are taken into account. A threefold figure does not seem unreasonable to me so we have a value to the regional economy of some £33 million. No quite that of football but nevertheless a valuable contribution.

In terms of where LYC sits I see it as becoming the premier racing club and cruising club in the region. It has the advantage of being in the heart of the region's maritime centre. The future for the Club should be good and growing.

Stephen Williams

Editor

## From The Commodore

It has been a year that has moved past at light speed and there has not been much time to catch breath. Consequently this has been my first Grapevine article. Stephen (our editor) has waited patiently for me to complete one on time. This article is by no means on time, I have just pleaded with Steve to stop the press. Apologies Steve, proportionally though it's not as long as I usually wait for Steve to down track the mainsail. Once again: apologies Steve.

As we draw to the end of a LYC/TSC year, I would like to thank all committee members for their invaluable effort over the year. I will mention no names for fear of being accused of beefing up the word count.

The activities in the Club have been astounding over the last twelve months culminating in a tremendous Annual Dinner held at the Marina. I hope that those who were able to attend had as good a time as I did and that not too many words were slurred during the speeches. It was great to see members from the Dinghy section and the Venture Fleet take part and be recognised at a dinner. Even the Ship's Cat was happy.....I think.

This brings me on nicely to the Venture Fleet. It has been two years since Andy Farrell and I set up the initiative and it is extremely gratifying to see other people carrying on and improving the fleet's activity. The rate at which the Venture Class is improving is phenomenal. They are now forming a valuable part of some of the Sunday racing. What would be great to see now, is Venture teams taking the next step and managing their own race officer duties. I'm sure Race Control would be glad to hand over the reins and there are courses available to show how it is done.

Personally I always enjoy doing an OD duty and like to take the start-line spotting responsibility as it makes my heart pound as much as if I were sailing up to the line, or over it, as the case may be. Being Officer of the Day is not always easy and as with everything on the Mersey, sometimes special innovations are required. The more all crews and skippers are involved with the process the better our race management will become. To that end, I have asked Race Control to set up some more Race Officer courses this year which I will present. These are not for newcomers to OD duty, although all are welcome, they are particularly for all racing skippers and crews as some of the rules have changed and some of the procedures have been improved. As well as easing the burden on Race Control, I think it is important that we all keep up with the practical implications of any changes, so hopefully, I will see you there.

Speaking of rules, I must admit that I have been caught out by a situation recently and was not able to call up the answer without particular research. Even then, I'm still not sure that I have found the correct decision. Looking forward, I think it

would be beneficial, if not only for myself, to have some more activities where the rules are discussed, in order that those of us who are a bit rusty may sharpen up. I have also heard some rumours that there are to be some sessions on racing boat/boat handling skills. Keep a look out on the new look web-site for details.

Did I mention the web-site? So I did. Doesn't it look fabulous? The information is new and up to date and I hope this will be the first port of call for members to find out what's going on. Well done the Web Team.

If you look on the web-site now, you will see the Holyhead Regatta advertised. Liverpool has taken over the running of this event and I hope to see as many boats as possible there competing. It is a hugely enjoyable regatta. It was actually my first. We came a fantastic 18<sup>th</sup> out of 19 boats in our fleet. Not bad eh? It was however, the making of us as racing yacht people. The nature of the racing and the competition means that competitors of all levels improve themselves over the weekend and come away with new thoughts and ideas to make the boat go faster, point higher, make the spinnaker fill quicker or win tacking duels. There is a white sail fleet for any cruising boats who wish to participate and join in the fun. If you can, please make the effort to get there.

2012 certainly looks busy, with lots to look forward to. By time of writing, an eventful cruise to Hilbre has already been organised kicking off the Cruising season. New and exciting racing has been advertised, taking the fleet to Fleetwood to kick off the Long Series, the Dinghies are back on the water and set for another great year. If you need to make any repairs or alterations, the workshop at Tranmere yard is now available. Details are, of course, on the web-site. Speaking with the Rear Commodore, the social scene looks ready to thrive once more with some new ideas afoot, however I will leave it to the Cat to tell you about that. Keep your eyes on the web site for latest news and details.

One last word for the members of the team who keep the club operating so well: Thank you for your continued efforts. Special mention, this month, goes to the Honorary Secretary. Thank you Janice.

I look forward to seeing you on the water.

Fairwinds and good company.

Andrew Napper

Commodore.

# Racing Report

As I write we are into the 2012 calendar and what a competitive series & fleet we look to be developing. A much sought after tonic as the last part of 2011 was an anti-climax due to the lock repairs. As ever this didn't quash the LYC spirit or activity, it actually snowballed into lots of positives thanks to the efforts of LYC members.

Firstly the dinghy section - what a transformation. I only managed one topper racing day but do you know what? One of the best days sailing I've had in years. Yes the boats aren't exactly taxing and they have definitely gotten smaller since I sailed one in 1988, but my heart still pounded on the start line!

I think it's unfortunate that we (and I) didn't turn out for more - but there's an obvious problem. To be part of a yacht racing team or squad (that's exactly what you are if your regular crew) is very time consuming. To many it was like a "closed season" when the lock gates were shut, I think the forced break has possibly refreshed people, recharged the batteries, let them visit old Aunty Nora etc. and now they are ready for some serious racing again. Perhaps it's something we should look at planning in again in the future?

The other positives to emerge over the last few months - Laser Bahia - fantastic work again by the dinghy section, another successful LYC operation for the P1 Powerboats and yachts progressing up from cruising class to IRC Racing. This was always the ambitious aim in the early days of the venture series - it's now reality.

We have a beautiful new Corby 29 - Easy Tiger - welcome back Adam, John and Mark etc. already in the chocolates! We are back to 3 prima 38's with the addition of Diva and more new IRC boats due in shortly. So numbers are looking good, competition rife and our heroes at Race Control are steady as ever - Thanks Guys.

Looking forward to 2012 series, I really hope that the different structure to the summer will prove to be the best LYC has had. Many of our boats go to Cork, Dun Laoghrie, Cowes, Fastnet, keelboat Week, Round Ireland etc. All fantastic prestigious events. However the trend this year is much different. Very few boats are leaving us; instead the trend seems to be to stay within the "LYC circuit". This involves a race to Fleetwood over the long weekend and of course the LYC organised event at Holyhead, followed by the summer of off-shores and round the cans. Looks like we will have far more attendees for these events this year than in recent times. Please give Holyhead a serious thought; it will be the pinnacle the season for us on Bada Bing as I guess it will be for many other boats. True windward leeward and no tidal window! Remember this event is led by LYC so please come along! Details are all posted up on our fabulous new look website. It's worth mentioning that this and the LYC Facebook and Twitter pages are becoming really useful and can reduce number of emails sent out if used properly!

See you at the start line.

Andy Farrell

Racing Captain.

## FLASH 2 THE END OF AN ERA

Myself and Jon Oliver bought Flash 2 from Mike Bryers in Lytham St Annes back in 1999. We had spent many years sailing on Neil Thomas's Sigma 33 Paranoah and had really enjoyed it but we felt it was time for a yacht of our own. There was a really good fleet of Sigma 33 at the club and another would have been great but unfortunately they were out of our price range.

We raced the boat successfully locally and at regattas further afield for a period of 12 years. We had had some time off the water over this period but mainly due to needing a new mast in 2007, so we were extremely disappointed to discover that in the autumn of 2010 we would be out of action again as we needed another new mast (Not again !!!). We used this time to refurbish the boat with the new one arriving in May. A few weeks later we were ready to go but unfortunately would have to miss the IOM midnight race. Everything was finished but we weren't prepared having only set up the mast and new rigging hours before. We went out for a sail however and watched the start whilst seeing how the new mast performed.

The following week we raced in class 2 and with the new mast she was performing really well. Next weekend was the Holyhead regatta and with work commitments we were unable to take time off to deliver her there.

We were entered in the Lyver Trophy and the Dun Laoghaire regatta and used this weekend as a delivery to Holyhead. I, Jon, Corky and Steve left Liverpool on the evening tide and had a F5 on the beam with clear skies and I remember stupidly saying "this is one of the nicest delivery trips we have ever had". Then the wind dropped and for about 5 minutes we were barely making 3 knots and thinking about the engine. Then suddenly out of nowhere the wind changed direction to the SW and increased to F6 started raining and visibility reduced substantially. With full main and No 1 we were now totally overpowered. Jon was on the helm Corky and Steve were briefly asleep. We dropped the genoa and I attempted to change to the No3. I say attempt but I don't think it was even that good. Just getting the Genoa off and down below was bad enough and after finally hoisting the No3 and untangling the sheets which had knotted and wrapped around everything I

was beginning to realize and also remember what it was like to be a bowman, enough said. "Good job we hadn't been racing with you on the bow" I heard Jon say as I eventually got back to the cockpit soaked and saw him laughing on the helm with a newly lit ciggy (rubbing it in just a bit). With Corky and Steve now on deck again we reefed the main as the wind increased further and the driving rain got heavier. It now resembled a normal delivery trip. F6-7 on the nose, tide against us, poor visibility, GPS nightmarishly adding hours to the ETA and still 10 miles to Lynas. A few hours later we had rounded the loom of Lynas and dove into Amlwch for a few hours rest and a wait for the tide to turn. As we approached Corky said "It's amazing in here the wind will completely go" He was dead right but unfortunately Amlwch didn't have the same effect on the rain which was still like Welsh monsoon. The day before Jon had bought a new cooker for the Lyver trophy which we hadn't had time to fit. Once moored up Jon and Steve assembled the cooker connected it up and bingo we had a heater, no mean feat at 4am in the morning, soaking wet with no sleep. It didn't completely dry us out but it helped. We left at 7am for the relatively short beat to Holyhead with positive tide. Fortunately the wind although still strong was enough in the south to lay Carmel Head in almost one tack and it had stopped raining things were definitely looking up. We arrived in Holyhead bay in time to see Gullmaren motoring out as start vessel for the Holyhead regatta. We were berthed up and all secure at about 10am all knackered after only a couple of hours sleep. Once again Flash had proved to be a remarkably seaworthy little boat and even the outboard was working well. With a new mast and new sails we were really looking forward to some serious racing.

After a quick tidy up someone suggested a couple of hours kip which was quickly dismissed as a bad idea as the Yacht club had just opened and a few beers were much more appealing.

Later on we met up with everyone and had a good night in the Yacht club and later into Holyhead town for a few beers before finishing off back at the Yacht club.

Mark very kindly drove down on the Sunday morning to give us a lift back. We briefly toyed with the idea of going racing but in the end decided against it.

The following Saturday Corky picked us up in his Toyota Camper van which was to be our crew bus to Holyhead for the Lyver Trophy. We had six of us for the race but Mark had texted the previous night to say that he was stuck

in Sardinia on business and may miss the race. Not because he had to work the weekend but because of a bush fire at the end of the runway all flights had been cancelled and would therefore have to make his own way to Holyhead but eventually with time against him he unfortunately could not make it. We would now sail with 5 Adam, Jon, Corky, Steve regulars with the addition of our special star guest our commodore Andy Napper. With Bad a Bing undergoing repairs I am sure our commodore could have got a berth on something more luxurious but no he was adamant he wanted to come with us and it was great to have him on board. Once in Holyhead we prepared everything for the scrutineering and once passed got some provisions. This time we checked what was going onboard as on the previous Lyver trophy Jon somehow managed to leave a lovely pan of stew in the boot of his car when it was most needed by a hungry crew in the middle of the Irish sea. Something's are never forgotten.

With the very light wind forecast a course from Holyhead leaving a virtual mark to port and Howth finish was decided upon. Initially there was a light breeze from the West and we decided rather than going hard on the wind to try and get as much North in as possible but the wind didn't stay long and proved to be a mistake as running the distance down to the mark would have been better. By dawn a light southerly breeze sprung up allowing us and the rest of the fleet to run slowly to the mark. Visibility was good and we could see the lead boats make their turns to the west as the mark was rounded. We were excited by this as if we could still see them we were in with a shout. Of course we knew that they had done the hard work and were now close reaching directly for Howth. The thought of their sudden increase in boat speed with the new apparent wind and asymmetric made the last hour of the run appear desperately slow.

We watched Ragtime round and 30 minutes later it was our turn. We overshot by at least 100 metres as Napper said we were there and then we weren't quite and then the handheld kicked in again displaying a reciprocal course to the virtual mark and a low battery warning, (those extra 2 mins could prove crucial) . We were chasing Ragtime down now they had us on time and we knew it was a drag race. The wind slowly built and backed enough to allow the asymmetric which although tight added another 0.5 knot or so and we could just about lay Howth. Ragtime chose a more southerly track and it crossed our minds several times that if the wind headed near the Irish coast as it so often does we would be screwed but we were committed. Fortunately it didn't and we just got our time on them. How we had done against the others remained to be seen.



The corrected times were very close with the first 5 yachts separated by only 10 minutes. The J109 from Pwlllehi won with A J111 second. We were 4<sup>th</sup> but won our class which was good. We all felt a bit disappointed as the times were so close and we knew where the lost time had gone but no one ever sails a perfect race and every boat loses time somewhere and the truth was we hadn't been quick enough.

We had a great afternoon and night in the Yacht club catching up with everyone and the next day my head certainly felt like I'd had a few. We were going to have almost the same crew for Dun Laoghaire regatta minus Corky, but his son Sam was replacing him. Sam and his friend Owen were sailing a wayfarer around Ireland and had already sailed from New Brighton to Holyhead and now Howth as we watched the two nutters sail into the harbour. We were only jealous that they had enough time to embark on such an adventure and what a great thing to do.

The following week we were in Dun Laoghire waiting for the first race to start and we went out early for some practice that we had been unable to do in the weeks preceding the event due to Flash being out of action. There was a good 10 knot breeze from the south allowing us to set a practice windward leeward course and all manoeuvres went well. By this time all the usual culprits that we had raced against here for years were approaching the line. The local Corby 25's & 26 & the half tonners all quick boats. Our start was the 3<sup>rd</sup> fleet off after the Beneteau 31.7's and the Sigma 33's. The wind was building and which gave us a dilemma about which headsail to use. Eventually Mark Shouted we need to make a decision and he was right as time was running out and we went for the No 2. By the time of the start the wind was at least 15 knots and building so the correct choice had been made. We had a relatively poor start being the slowest in the fleet we wanted clear air but got anything but as bigger boats powered over the top of us. The half tonner Dick Dastardly and the Corby 26 were making a definite move offshore. We knew how good they were and decided to follow them. One tack out and hit the lay line was normally a risk but as we approached the windward mark it looked really good apart from a procession of starboard tackers which if we had to go behind would have been a disaster. We left our tack as late as possible and tacked just below a DB1. Initially it looked bad but eventually we just scraped around the mark. Spinnaker up and we were off. Counting the boats ahead of us we were 4<sup>th</sup> on the water behind the Corby 26, Dick Dastardly and King One things were going well. The half tonner King one gybed ahead of us and broached our gybe

fortunately went better and when they recovered we were on their hip both surfing down the waves in excess of 10 knots great fun.

After another lap we were holding our position well and were probably 5<sup>th</sup> or 6<sup>th</sup> on the water. One beat a run and a short beat to the finish and the leaders weren't that far ahead and we felt we were definitely looking at a podium result if we could keep going with no mistakes which was getting harder as the wind was building, at least 20knots by now. Upwind we were well overpowered with the No 2 and full main but to change headsails or reef would take too long and put us out of contention, we had to keep going. About three quarters of the way up the beat we were starting to catch the tail enders of the Sigma 33 fleet. We tacked on a shift and on the lift were slightly below the mark. The Corby 26 had already rounded and we could see their spinnaker on the downwind leg, so had Dick Dastardly but they were the only two. Under the boom were two starboard tackers a fair way off and when they got closer Jon went to the bow to hail them. The first one a Corby 25 tacked immediately the second a Sigma 33 kept going and I remember thinking he'll tack soon. At the last minute he tried to duck behind but he had an awful lot more of our boat to go as he hit us just in front of the primary winches. Being well heeled over the sigma rode right up over the coach roof snapping the boom and bringing the mast down. We were all in shock at what had just happened but fortunately there were no injuries. The boat was a mess and on closer inspection the coach roof and the ribs supporting the deck were crushed. We called the race committee to let them know of our predicament but they were busy dealing with the many other incidents that day. Even the outboard packed up in sympathy and we were towed in by Polished Manx who had hit us. Myself and Napper went to the protest room whilst the others sorted the mess out. The result of the protest was totally in our favour and the other party was extremely apologetic and admitted full responsibility which was going to make the insurance claim an awful lot easier to deal with.

The crew filtered off onto other boats for the week whilst I and Jon dealt with surveyors and organizing storage of Flash at the National Yacht Club. We were both absolutely gutted at our misfortune especially with the new mast and rigging UNBELIEVABLE. We had owned Flash for 12 years and in that time covered many sea miles and been successful in a number of races the most notable being the overall winner of the Lyver trophy from Liverpool to Pwllheli in 2001. We had delivered her by sea to Cork on 3 occasions and to the Scottish series twice. We had had so much fun on that little boat and now a surveyor was saying "With the low value of your boat I'd say it's certainly a

write off". The words took a while to sink in and myself and Jon had a photo taken with the wreckage as a reminder and probably the last time we would be seen together. I remember Sam saying "it's like losing the family dog" but it felt much worse than that.

After a few months the insurance paid out the full value and the wreck was bought by Noonan Boats in Wicklow who are keen to repair the damage and get her back on the water.

Myself, Jon and Mark Connolly are now joint owners of a Corby 29 Easy Tiger, a lot more modern, comfortable, spacious and had something very important we weren't used to. An inboard engine. but we will always have fond memories of Flash and we still have an old outboard in the shed at a VERY reasonable price. An Evenrude 4hp, it's very reliable.

Adam Kyffin

Flash Bang No more (Steady Tiger)

## Queens Channel/Liverpool Bay Tactics

When the editor first asked me to write a few words on Queens Channel and Liverpool Bay tidal tactics as a follow up to Neil's excellent piece on the upper river, my initial reaction was that from a racing point of view, the tactics are relatively straightforward owing to the very tight, narrow confines of the Crosby and Queens Channels.

He did also mention it might be useful for visitors and newcomers and this led me to think of the particular nature of the channels and so first, by way of background, a little history...

By the late 1800's, Liverpool's port trade was booming but maintaining the approach channels by dredging was becoming increasingly ineffective and more costly due to the complex natures of the tidal scour and accretion. The main channel was effectively moving northwards and there was a danger of a north channel opening up through Taylors Bank to the detriment of the main channel. To counter this, Mersey Docks & Harbour Board engineers came up with plans to build a training wall on the inshore, outer bend of the main channel which both eliminated the threat of a new channel opening up to the north and

enhanced the ebb tide scour on the bend in the channel. The work began in 1909 and such was its success in preserving the channels and reducing the dredging (drastically), further training walls were built along both sides of the Crosby Channel from current buoy positions near C16 and C23 and extending along both sides of the Queens Channel westwards to Q4 and Q5. To say it was a long term project is to put it mildly with work only finally being completed in about 1960. Construction of the walls is primarily of limestone blocks dumped into position along the edges of the natural sandbanks and at the top, the walls range in width from 5 to 10 metres. The walls cover at around half tide but at the time we are generally racing in the area, say on a one day Bay race at a couple of hours after HW and the same before HW on the next flood, there is not enough water to cross over them (quite aside from the fact that on Channel courses, race rules dictate that all channel buoys must be passed to the correct side). The distances between the walls and the buoyed channels vary but to re-emphasise, excursions beyond the buoyed channels have little future during the times we are predominantly racing in the area. (*Skukusa* has in fact taken a close but fortunately very brief inspection of the blockwork on the west side of the Crosby Channel on a slightly ambitious tack...).

All this is to stress that despite all the appearance of open water, the reality is very far from it and the constriction on racing is considerably greater than that of the higher reaches of the estuary. The width of the buoyed channels varies from around a mere 400m to a maximum of only 900m and it is in this respect that the 'tactics' for the channels are important, not so much for racing but overwhelmingly for dealing with commercial traffic.

The tight confines of the channels are such that virtually all commercial traffic is restricted in its ability to manoeuvre and has right of way at all times over us 'pleasure craft' (how Mersey Radio frequently and concisely refer to us).

In an ideal world, we would transit the channels outward on a nice SSW F4

making an easy run/reach down the Crosby Channel and come up onto a close reach on the bend for the Queens Channel and all the time keeping close to the red cans as possible. Similarly, on heading back inward we would have a decent northerly breeze bringing us neatly up the greens through the full length of the channels.

The reality is usually very different of course and the tactics of dealing with the shipping must take overriding precedence over racing especially when the wind direction is calling for tacks or gybes in the channels. It goes without saying that close lookouts ahead and astern are vital and all manoeuvres should be planned and executed early in order to keep well clear of any ships. (It's tempting to think that sheer self preservation would make this kind of advice superfluous but cases of yachts tacking across a ship's close path are not entirely unknown). In very light wind and with a view to avoiding any close quarters situations, it's prudent to have the engine running in neutral and ready for immediate use if necessary. (Race rules do permit engine use for hazard avoidance and a simple notification to the Race Officer as to why, when, where and for how long the engine was in use will receive a fair

hearing without necessarily prejudicing any result so there's no reason to drift into a potentially dangerous situation).

An essential aid in channel planning is VHF 12 where vessels entering/leaving the channels make themselves known to Mersey Radio. Never is this more relevant than for the Isle of Man Seacat which by way of its speed is in the mid channels area within a very few minutes of reporting at the Bar or leaving the landing stage.

Putting aside the other factors above, the tidal aspect of the channels is quite straightforward and of far less of a consideration in comparison with the upper estuary. Generally speaking, on the outward leg on the ebb, a westerly set runs across the Crosby Channel and is weaker on the inshore side and especially so in the inshore corner where the Crosby Channel meets the Queens Channel. Care needs to be taken to avoid being pushed across to the wrong side of the channel especially towards the inner part of the bend where the flow tends to increase. Once around the bend, the flow runs westward pretty much in line with the Queens Channel, the relative shallowness of which always seems to mean there is some form of chop except in the lightest of wind conditions.

Once clear of Q2 and Q1 (or Q5 & Q4 if the Race Instructions dictate), things get easier and a weakish (up to 1kt) westerly set of the remaining ebb, slack and subsequent easterly flood have to be kept in mind for laying customary Bay marks such as Spoil, Bar and Jordan's Spit etc - the maximum tidal flow at the Bar on springs being 1.9kts on the flood and 1.7kts on the ebb. For buoys slightly further afield towards the Dee such as HE1 and North Hoyle, tidal planning should also take into account the enhanced flow out of the Dee which at times can add a little more onto the ebb.

Returning to the channels on a one day Bay race sees an easterly flood set (unless you are a red hot Class One boat having blasted around the Bay course and returned to the Queens Channel on the ebb). The tactic here is to maintain a course close in to the Greens for which there will be a natural tendency anyway given that this is the shortest distance on the inside on the bend. Tidal consideration will be to avoid a drift over to the wrong side of the Crosby Channel once the corner has been turned.

A final word on VHF use. On a one day Bay race, Race Control will have informed Mersey Radio of the race taking place so individual contact from each boat is unnecessary. On returning to the river after a longer offshore race or cruise however, a call to Mersey Radio at Q1 or Q2 is strongly advisable even if not mandatory – the Port's VTS radar is unable to pick up small targets at the lower end of the Queens Channel so it's very helpful for them to know we are there and equally helpful for us to know that they and the commercial vessels know we are there.

Keep safe and fair winds for the 2012 offshore season.

# Galvanic Corrosion

Over the last five years or so at LYC the term Galvanic corrosion has cropped up at the bar and led to some very interesting debates as boat owners do their best to try and understand how best to protect their craft. With a few weekends free due to early tides, in conversation with our editor Steve (Williams), he suggested I scribble some words to try and make sense of this interesting subject.

Most boat owners know galvanic corrosion but we should also consider Stray current corrosion. In basic terms, when two dissimilar metals are in contact, or in close proximity with a conducting fluid (salt water) an electrochemical cell can be formed that leads to the more reactive metal becoming an anode and the less reactive metal a cathode. The term is galvanic corrosion.

Galvanic corrosion can occur on any boat manufactured in any material, GRP, timber, aluminium etc, and really doesn't matter if you have shore power or not.

One of the earliest recorded examples of galvanic corrosion occurred in the eighteenth century. The wooden hull of a Royal Navy frigate HMS Alarm had been covered by copper sheathing, which was attached to the hull by iron nails. The Navy thought this might be the answer to their fighting ships being plagued by marine growth.



**HMS Alarm**

The purpose of the copper sheath was to limit marine fouling, which is known to plague many materials that are immersed in seawater. The growth of molluscs such as barnacles on the hulls of ships, which could then trap trailing seaweed, resulted in

reduced speed and manoeuvrability. The Copper sheath limits fouling by inhibiting the attachment of molluscs. The hull of HMS Alarm was covered in 1761, and the copper sheath detached two years later, during which time HMS Alarm had visited the Caribbean and elsewhere. The iron nails were found mostly to have corroded. Some nails however remained intact. Upon close inspection where the nails brown paper wrapping had remained in place between the copper and the iron, the fastening remained intact. Where the iron nail had perforated the paper had suffered rapid galvanic corrosion. A fortuitous event that prevented total detachment of the copper sheath.

In this case, small anode (iron nails) to cathode (copper sheet) area ratio favoured the loss of the iron, as the rate of corrosion is directly proportional to the current density (a measure of electron flow). In a sense, the nails acted as local electron concentrators, so attack was rapid. Where it was present, the brown paper insulated the nails and so there was insufficient electron flow to cause corrosion.

So, we agree that galvanic corrosion can occur when dissimilar metals meet in water, particularly salt water which is the perfect electrolyte. Here's why. Iron atoms want to return to their normal state as iron ore, iron oxide, or rust. Which are all the same. That's the state in which iron is most comfortable and most stable. Left alone, it won't turn into anything else. As most metals used in manufactured products marine and otherwise, they want to do the same—return to their natural state. The corrosion table shows Magnesium as the best material for protecting your boat.

Metals vary in their reaction to being part of this natural battery. Metals that are more active are less noble or anodic (creating a more negative voltage). In a galvanic cell a less noble metal like alloy, zinc or aluminum, will dissolve sooner than a more noble metal like brass or stainless steel.

Corrosion Table	
Gold	Least Active ↑ ↓ Most Active
Stainless Steel	
Bronze	
Copper	
Brass	
Steel	
Iron	
Aluminum	
Zinc	
Magnesium	

The table would also show that if you had an aluminum boat, applying a copper sheath or copper based anti-foul, it might not be a good idea since aluminum is considerably more active than copper.

### Stray Current Corrosion

We've discussed what galvanic corrosion can do, using just the electrical potential in metals. Imagine what happens if you add more electricity. That's exactly the basis for stray current corrosion. Stray

current corrosion occurs when metal with an electrical current flowing into it is immersed in water that is grounded (such as in a marina). The current can leave the metal and flow through the water to ground. This will cause rapid corrosion of the metal at the point where the current leaves. Stray direct current (or battery current)

is particularly destructive. Stray current corrosion can cause rapid deterioration of the metal. If the metal in question happens to be an aluminium part like a drive unit, it can be destroyed in a matter of days.

In stray current corrosion, electricity from an outside source flows into your boat's metal components and out through the water looking for a ground and again, Electrons flow from one dissimilar metal (the anode) to another dissimilar metal (the cathode).

For example, your boat may be berthed next to a nice new yacht leaking DC current. The best ground for that current, rather than the DC current moving through the water to mains ground i.e. the pontoon, could be your boat providing the lower path resistance. The DC current could enter a through hull fitting, travel through the bonding system, and leave via your drive to the ground. Please remember, that corrosion occurs at the locations where DC current leaves metal and enters water.

Stray current can come from an outside source either internal or external to your boat. Internal sources involve a short in your boat's wiring system, such as a poorly insulated wire in the bilge, an electrical accessory that may be improperly wired, or a wire with a weak or broken insulation that is intermittently wet.

External sources are always related to shore power connections. A boat with internal stray current problems can cause accelerated corrosion to other boats plugged into the same shore power line if they provide better ground. The stray current would be transmitted to other boats through the common ground wire, but can and should be blocked by installing a galvanic isolator.

This unfortunate scenario can also be prevented by the installation of a galvanic isolator. There is greater danger for boats that connect to AC shore power: destructive, low-voltage galvanic currents (DC) passing through the shore power ground wire. Normally, AC is not a corrosion problem, but because the boat, pier, and wire are all connected, or due to a leakage, there can be direct current (DC) also present. This is potentially very damaging and requires additional protection.

UK Safety regulations require a three-wire cable for carrying shore power aboard any boat, and that one of these leads grounds all electrical and propulsion equipment to shore. This safety procedure reduces the danger of shock, but also connects the underwater metal components on your boat with metal on neighbouring boats using shore power, steel piers, and metal objects on shore that extend into the water. This interconnecting of dissimilar metals allows destructive galvanic currents to flow between them. If these currents are allowed to continue, your drive or prop shaft unit will experience severe corrosion damage in a very short time—as little as a few days.

There is a common misconception that you can overprotect your drive by using too many zinc or sacrificial aluminium anodes. This is not true. The corrosion potential of any metal is a voltage that can be measured by a reference electrode. Such measurements in water commonly are made with a silver/silver chloride reference electrode. The corrosion potential of a sacrificial anode is a characteristic value for that metal, and it does matter if you have



one piece of the metal or 100 pieces. The corrosion potential stays the same. Of course, 100 anodes would be expensive, heavy, and a considerable drag under water. Only by increasing the corrosion potential by using a different anode material (such as magnesium in seawater) can you overprotect your boat.

Dave Butterfield

(Thanks to Wikipedia for the bit on HMS Alarm)

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