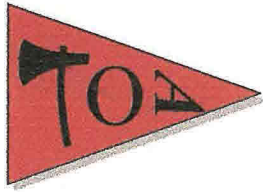


DMC

# Tomahawk Owners Association



October 2001

## Editorial Column

*Michael Juer  
Warpath*

Well even for the bravest of us the season is drawing to a close. I am hoping for one more weekend and just a few I know are leaving boats in over Xmas and will take a sail if the weather permits. For me it has been a frustrating season having fallen off a ladder in the boat yard in April breaking my right heel. Effectively this meant I was not able to start my season proper until end of July hence my frustration. Nevertheless I had some good weekends and 2 weeks with family at the end of August taking in the America Cup Jubilee. What a great sight that was and we will probably never see anything like it again during our lifetime. Some people have argued that it was "elitist" but even if it was what a privilege to see these beautiful boats and enjoy this spectacle of the sea. Whilst on the subject of the summer holiday we had a COB in the second week. Child Over Board that is. Luckily it was what I can only describe as a "controllable" version in that Amy (4 years old), fell of the rubber duck whilst in Bembridge harbor coming onto the pontoon. She was life jacketed and we had her out seconds after the lifejacket inflated. This season we had decided, following a review of various lifejackets in PBO, to buy the gas operated self-inflating type for them both (rather than the "buoyancy aid" type). It worked very well and we already knew that the less bulky style helped both of them get around the boat more easily. Her 5-year-old brother witnessed the whole thing and it

provided a good opportunity for all to discuss what happened and to learn from the experience. We have been waiting for this moment from when the children were just months old - thank goodness it turned out as it did.

I was glad to include in this Bulletin a story from a "landlubbing partner" - to use her expression I assure you. Please let's have more contributions from partners where we get alternative views to those expressed by obsessive, sailing boring, Tomahawk lovers like myself.

Congratulations to the crew of Crystal for winning the Tomahawk Round the Island Race Trophy in its first year 2001. To those that don't know we had 4 or 5 entrants for the Round the Island Race this year and a trophy to race for. It turned out to be a very windy day with a steady 20 knots and big gusts and all the records, literally, were broken for both mono hulls and multi hulls. To my knowledge only Crystal completed the course but please correct me if I am wrong. I did not start as with one leg in plaster anything over a F5 was out of the question. I spoke to one other owner who had an injured crew taken off by lifeboat (all was well in the end I believe). Read Crystals story in this bulletin.

Thank you to all our contributors including Kemp Sails & Sailing in Depth & finally I wish you all a productive maintenance season and have a Happy Xmas and New Year.

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## Round the Island Race 2001

My Dad Bill Garrod and my brother Simon have competed in the annual Round the Island Race for a number of years, along with their friends Nick and Barry. This year was to be the usual "male bonding fest" but unfortunately Nick was unable to crew due to work commitments abroad, and then with just three days notice, Barry was forced to pull out because of work commitments abroad!!! This left them with the option of finding another crew members rather quickly, or withdrawing from the race altogether, and with the TOA Challenge Trophy to be won, withdrawing was not an option.

Hence they turned to me! Now my experience of sailing is limited to a little dinghy racing in my teens, and jaunts over to the Isle of Wight with Dad and my children. In fact Simon and I had not sailed together for about 16 years. However, family loyalty came to the fore and I was recruited to the crew of *Crystal* for the race (although press-ganged would probably be a better word to use).

The day of the race dawned grey and miserable, the weather forecast was for force 5 winds and a lot of rain, and I was more than a little apprehensive. However, the buzz of the crews preparing and the sight of the massed yachts soon had my pulses racing, and of course the sun had come out with helped considerably. We made good time to start with, heading towards the Needles at a fair pace, but as we approached them I began to get an idea of what was in store. Several boats were turning back, one without its mast, another with damaged rigging, and once again the clouds rolled in and it began to rain.

As we round the Needles into the sea we really hit the bad weather as the clouds lowered and made visibility almost impossible. At times the coastline of the island disappeared into the fog and along with the wind gusting to force 6 and the four meter high waves, I knew I had made a mistake!! All I wanted to do was to get off!! Simon and Dad however, sat eating chocolate and discussing tactics. I just gripped the GPS and watched the miles tick

off, as they'd promised me it would get better once we rounded St. Catherine's. It did of course get better, the sun came out, the wind dropped a little and I started to enjoy myself. I even managed to put down the GPS and started looking around at the other boats. It was brilliant getting into our own little race with two or three other boats that we kept up with all the way round.

From Bembridge back to Cowes the race became quite boring, we had to beat against wind and tide and it took hours, but the sun was out and I warmed up a little. Nothing however could compare to the feeling of elation when we finished. I still can't believe I actually managed it, and I get a huge buzz whenever I think about it, especially as I now know we were the only Tomahawk to finish. I have kept the Tankard that you get for finishing, and it has pride of place in my sitting room. So, am I glad I competed? Absolutely. Would I do it again? Not likely, I will leave that to Barry and Nick!!

Joanne Garrod

*Crystal*

## Irish Sea Owners Rally

5 boats made the passage from their homeports to Caernarfon on Saturday 14<sup>th</sup> July in light Northwesterly winds and pleasant sunny conditions. Those attending were: -

IOLA – Geoff Hilditch accompanied by our Secretary David Collinson and his wife Alison.

CHIMO – Paul Mounford accompanied by his wife Jen and partner Barry with his wife Jonquil.

WINDLASS – Paul Jones ( joined later by road by his wife Karen and their 2 young daughters).

MACAW Mike and Fran Warr

(congratulations on their recent marriage!).

MALIBU – Dave Meacher ( joined later by road by his wife Françoise ).

Visitors space is limited in the small marina in Victoria Dock and the 5 Tomahawks made a fine sight rafted on the outside of 3 rows of boats on the visitor's pontoon flying their TOA burgees. It also gave us the first

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opportunity to fly our area's large, banner size, TOA flag to advertise our presence! We adjourned to the "Black Buoy" for drinks and a meal and finished the evening in the Royal Welsh Yacht Club where we were given a warm welcome.

An early start was necessary on the Sunday morning in order to leave the marina before the cill gate was raised at 0815. Paul Jones decided to take advantage of Karen and the children's absence, have a lie in and await the afternoon's tide (maybe due to that "one for the road" back on board Windlass after leaving the RWYC which turned into a bottle!). The rest of us left bright and early, Chimo elected to head back North to pass through the Swellies at low water slack, Macaw made the short passage to the anchorage at Abermenai and Malibu and Iola sailed over the Caernarfon Bar bound for the picturesque Mermaid Cove at Llanddwyn Island.

As usual there was a lumpy sea running over the 3 miles across the bar with the Westerly 3-4 over the strong ebb but we had an enjoyable beat under full sail down the twisting channel and were soon anchored in the calm water and tranquility of Mermaid Cove. Malibu rafted alongside Iola for an hour or so before setting off on her return passage to Cemaes on the North coast of Anglesey.

It was a marvelously clear day with the whole of the Snowdonia range and the mountains of the Lleyn peninsular stretching towards Bardsey Island to the South standing clearly in the bright sunshine.

We left Llanddwyn after lunch and enjoyed a gentle sail back up the Menai Straits to pass through the Swellies before high water slack and carry the flood back up to Beaumaris followed by Windlass and Macaw to end what had been a most pleasant and enjoyable weekend.

Thanks to the skippers and crews of all the boats who attended the rally and here's to the next one!

Geoff Hilditch  
IOLA

## The Secretary Scribbles

We are now nearing the end of the second Season since the Association was formed and many members have taken part in the Rallies organised by the various Regions. Speaking for Alison and myself they have been very enjoyable occasions. We have only managed to be present at three of them, Irish Sea Rally to Conway in July 2000, Island Harbour I.o.W. in September 2000, and the Irish Sea Rally to Caernarfon last July.

Much work is involved contacting members and organising these events, and we should be grateful to those members who spend time and telephone calls to make it all happen. I know that members who have joined in the Rallies have found them fun, and interesting, if you have not taken part yet, then I hope we will see you soon, and we look forward to welcoming you, and your Tomahawk.

Our web site is now on line [www.tomahawk-owners.co.uk](http://www.tomahawk-owners.co.uk) thanks to Simon Trigwell. No doubt as time permits more information will be recorded, it is good to have this ready means of communication available.

I receive many enquiries for Tomahawks "For Sale", I do my best to put prospective owners in touch with members who have yachts for sale, but it is first necessary for owners to advise me if they want to sell. So do let me know should you decide to sell. I also get many enquiries from people who want details of Tomahawks and to know more about them, sometimes these are very interesting; the last one was from Germany!

**This is your Association, if there is anything you would like the Association to do that it is not doing for you, then please let one of the Officers know about it. We would welcome ideas.**

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## Bits & Pieces

**Quick formula** for converting knots to Beaufort & v.v.:  $\text{Knots}/5+1=\text{Beaufort}$ ,  $\text{Beaufort}-1 \times 5 + \text{knots}$ . Works on centre range up to F8

**Rudder** failed on 24ft Trident, when 200nm north of C.Verde. 60-year old single-handed yachtsman used his 121mhz PLB. When battery ran down he used VHF Ch. 16 Cypriot bulk carrier "Baynes" heard after 3 days. PLB's and VHF are local, an EPIRB is instantaneous worldwide. How is your rudder?

**Criminal Yacht Skipper.** Yachtsman fined £2,500. Seen on radar when sailing in Dover Strait. Sailing North East on French side and straying into South West lane during the hours of darkness. He passed 17 big ships all at close quarters.

**GPS Reliability.** Latest statistics show half of current GPS satellites operate with no remaining back-up systems, i.e. are running on third & last clock or last balance wheel (so using up limited fuel to operate thrusters) or have solar-panel steering failure needing ground crew steering. When did you last use your sextant?

**High Speed Ferry Death.** Case concluded without going to court. Seems Stena Line paid sum to Sibley family in settlement return for confidentiality clauses.

**Seasick.** If crewman or crewperson is about to be sick over the side, make them take their teeth out first!

**Changing Britain.** Excessive rainfall soaking chalk caused Devil's Chimney landmark at Beachy Head to collapse into sea and rockfalls into Brighton Marina. Little danger to boats on water but keep well away on foot. Not all problem sites yet known.

**Main injuries** from sailing said to be: boom hitting head, falling down hatch, fingers in winches. Main injuries on motor cruisers said to be sunburn and hangovers!

**Suggestion.** Vallance Pro-Build Moss & Mould Killer, available at good builders merchants, is said to be excellent at ridding boats of mildew, etc. Much cheaper than marine products. If you try it let us know the results. Ordinary Gloss paint on boot-topping proved remarkably good after one year. Got a bit dirty but cleaned off easily.

**Correspondence** in PBO says that babies in nappies float upside down

David Collinson  
*Keewaydin*

## Warsash. The Journey Home.

After a wonderful weekend with friends and fellow Tomahawk owners at a Rally @ Warsash Salining Club (courtesy Peter Lewellyn), it was time to head back to Mill Rythe in Chichester Harbour

The forecast was NW 3-4, but at Warsash it was blowing considerably more. So some of us tied a reef before leaving.

Four boats headed out into the Solent escorted by *Inca Moon* As soon we cleared the Hamble the wind died right down so on *Red Warrior* we shook out the reef and set main and genoa. We were the last to leave but soon caught up with *Inca Moon* and *Sea Belle* and after brief photo session *Inca Moon* turned for the Hamble and we sailed on beside *Sea Belle* hugging the shore.

*Crystal* & *Warpath* had left earlier and gone further out into the Solent & it wasn't long before our paths converged & we caught and passed *Crystal* who were flying only a No2 genoa. All the time the wind was increasing but being abaft the beam we did not realise how strong it had got. It had been quite strong and fluky with gusts and lulls and veering at times. We were handling it well and making ground on *Warpath* who had an injured skipper and was towing a dinghy as well. We were surfing off Lee on Solent when a very strong gust caught us slewing the stern around. Before we knew it the main had depowered as the wind came forward of the beam and all the power went into the genoa. We had broached, the genoa was holding us down in the water up to the starboard windows, Pauline was pinned against the cockpit combings her hair almost in the water. Our only movement was sideways. Letting the genoa right out and sheeting the main in got us back up and on course after what seemed an awful long time. Fortunately apart from some bruising to Pauline no one was hurt, the cabin was a bit of a mess but that was soon cleared up. In radio traffic just after the coastguard onfirmed winds of force 6 @ Lee on Solent,

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so I guess it was gusting 7 or more. Obviously we were over canvassed for the conditions. The lessons of wind apparent and wind true came to mind.

*Crystal* who was inshore of us & carrying less sail also got caught by the gust but got away with some quick sail trimming and heading up.

Les single handed on *Sea Belle* with one reef in the main and the genoa goose winged, luffed slightly to attempt sheeting the genoa to leeward for furling. The sheet removed some skin from a finger & produced several choice words. Genoa & sheet wrapped around the around the foresat effectively reducing sail. Heaving to seemed the logical solution to restore order & permitted a leisurely stroll to the foredeck, unravel the tangle, furl half the genoa and resume course.

Thankfully we all got home safe and sound although now I have some sewing to do. Our genoa got off light with a 12 inch tear. A small price to pay.

Mike Cox  
*Red Warrior*

With thanks to Les/*Sea Belle* & Bill/*Crystal* for contributions

(*Ed* - I can vouch for this gust too. We had just rounded Gillkicker point when it caught us. One minute all was calm with 2 children under 5 sitting on their mother laps on the leeward side and a one legged skipper on the helm then hey presto over on our ears with water very close. It was then I realised the limitations of sailing with a leg in plaster. An angle of heel that extreme means you have to hold on with one hand (one leg is not enough) & this makes it difficult to take any action. However I eventually got to the main sheet and depowered the main and we were ok. We swiftly reduced sail!)

## Letter

Dear Bulletin Editor

Thanks for your letter regarding the forthcoming Rallys which I am unfortunately unable to attend.

However you will be interested to know that we had a mini rally at the Folly Inn on 27<sup>th</sup> May.

*Red Warrior*, *Sanites*, *Moccasin* all enjoyed the impromptu meeting.

I was very interested in *Sanites* new forehatch (see photo) & would be pleased to learn who could do this if I decide to make this important investment.

Douglas Allum  
*Hoka Hey*  
(Contact Editor if you can help Douglas)

## Bembridge Rally September 8/9 2001

Well, it all started well, for a seasoned sailor and a landloving, landlubbing wife. A trip to Bembridge from Portsmouth harbour?

"Nothing so easy," says he, as they set off on Saturday in a force something or other, spray hurtling past her delicate face as the boat dipped and troughed with alarming regularity. "All we have to do is go round the fort and we're there."

"Which bloody fort?" I yell as seasickness starts to churn its well-worn path in my stomach. "There are bloody three!" "Sit back and enjoy" says he, steering a course for, "er...somewhere over there". Enjoy? Enjoy? If you can't put a saddle on it and gallop off into the distance, what's to enjoy? Coastguard helicopters here, coastguard helicopters there, flying a bit too low, if you ask me. "Think yourself lucky they're there," says former coastguard he. Never a truer word...

Got round the fort, eventually, heading for Bembridge - still "somewhere over there" but looked a bit nearer - well land did, anyway.

But there are always times when we landlubbers can come to the fore. Map-reading? No problem. Guiding through the narrow channel to get into Bembridge harbour? A piece of cake. Arrived in a haven to find two other Tomahawk owners waiting for us at a pontoon. Lashed ourselves next to them and discovered the

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yacht club had conveniently forgotten about our booking at the marina. Bit of a bad taste, that, but the cheerful harbourmaster made up for that bit of news. Nothing like a bit of banter to set the tone for a good excursion.

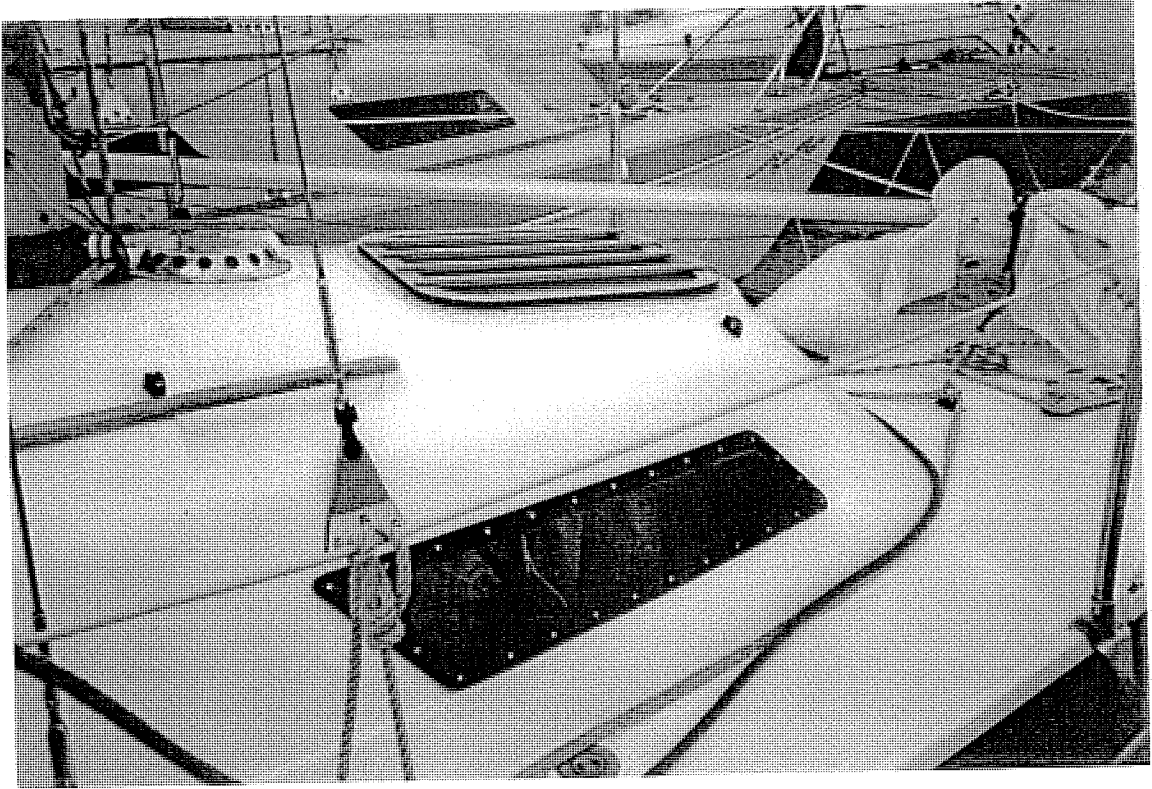
Even the fact that the club had also forgotten our evening meal booking, even though it had been confirmed didn't dampen our spirits and we were given a table to ourselves in the club where we enjoyed an excellent three-course meal.

Woke on Sunday to the sound of a couple of fishing boats going out for an (very) early morning catch. As soon as we had breakfast the seven of us went off for a leisurely walk along the edge of the sea to have morning coffee at a distant cafe as we watched the tide creeping in. Despite the indifference of the yacht club, the Bembridge harbour area is a magical place, like most of the Isle of Wight, full of interesting birdlife and places to visit and see. It is no wonder that so many weekend sailors anchor there time after time.

Dark, dire warnings followed about the crossing back to Portsmouth harbour, the words "force seven in the Solent" started to conjure up misgivings and "let's get the ferry back" mutterings from mutinous and, let's face it, terrified landlubbers. But the sooner braved, the sooner home and we set off first.

Negotiating the channel out was another adventure, actually quite heart-stopping and seemed to take an eternity. Once out of it, we were really out in it. Not quite a force seven but not an easy passage either. Still, if you've done it once...And there's always that coastguard helicopter..

Ailsa Mackenzie  
*Soilbheas*

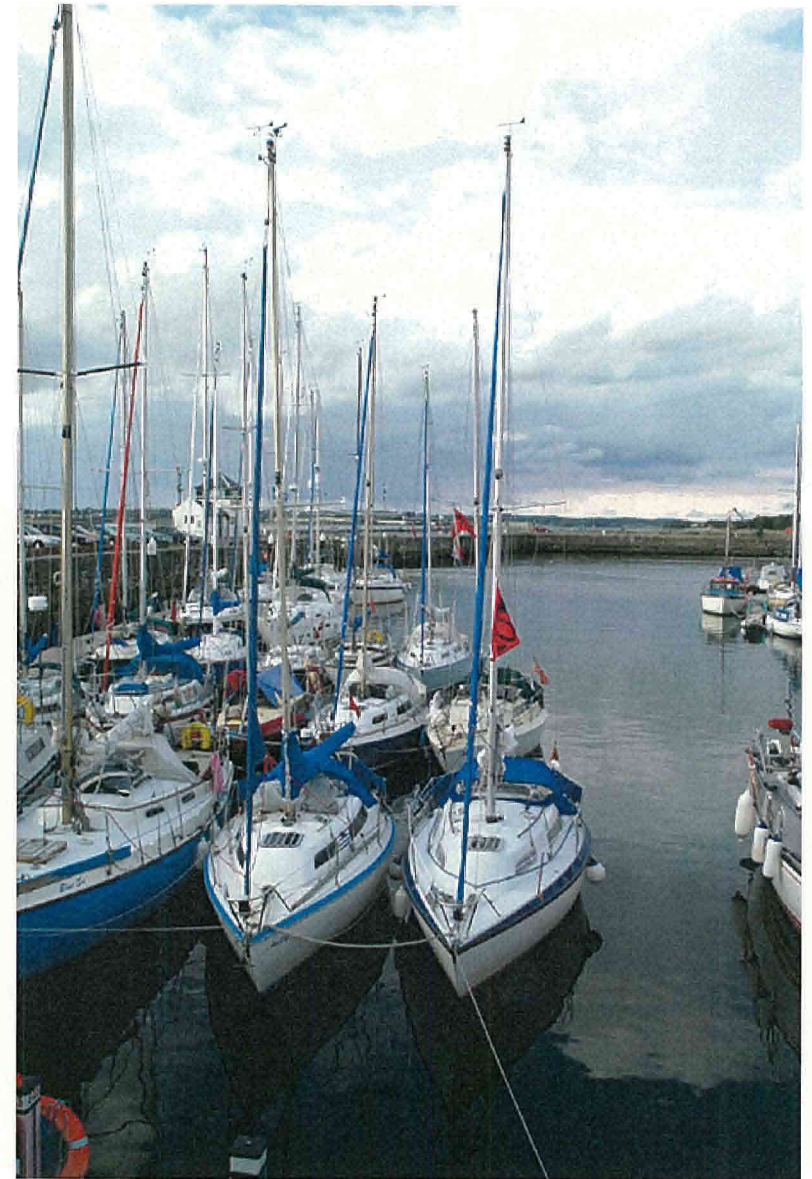


**Irish Sea Owners Rally - Photographs**





Iola beating towards Caernarfon  
Note the beautifully set biradial genoa  
By "Kemp" (our main bulletin Sponsors!)



5 Tomahawks in Caernarfon Marina

## TERRESTRIAL MAGNETISM

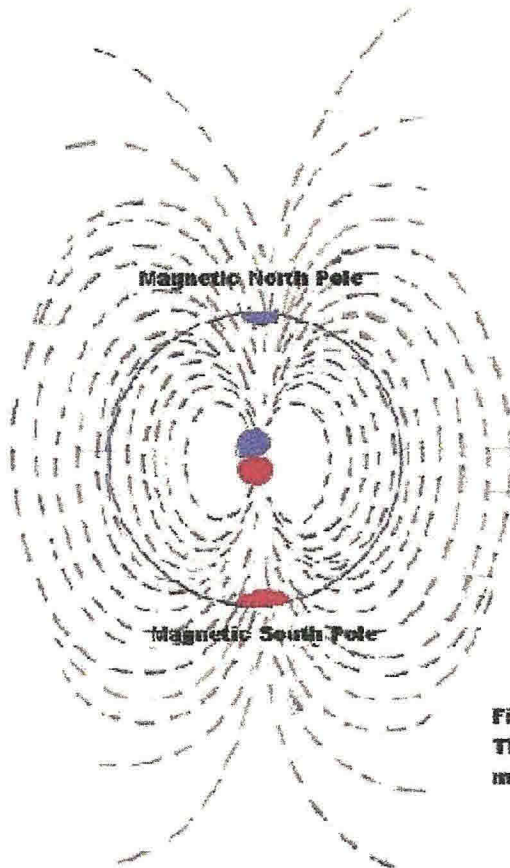
*Terrestrial magnetism* is one of those natural phenomena that we can recognise by its effects but of its origins we know practically nothing. We can make measurements of the Earth's magnetic field and the changes that have occurred in it since records began. We can make use of the field to indicate direction on the surface of the Earth but what actually causes the field and why it changes with time is still something of a mystery.

### The Earth as a Magnet

The Earth's magnetic field gives the appearance of being generated by a very powerful dipole magnet situated at its centre. A dipole magnet is a purely hypothetical concept and is conceived to be a magnet having no length, just a red pole and a blue pole. Since, however, the iron at the Earth's core is in a molten state this poses another problem as molten iron is non-magnetic!

The lines of force generated by this imaginary magnet are assumed by convention to radiate from the dipole magnet's red pole and exit the Earth's surface vertically upwards at the magnetic S pole (MSP). They then converge towards the magnetic N pole (MNP) where they enter the Earth's surface vertically downwards towards the magnet's blue pole.

See figure 1, The Earth's Magnetic Field



**Fig 1**  
**The Earth's**  
**magnetic field**

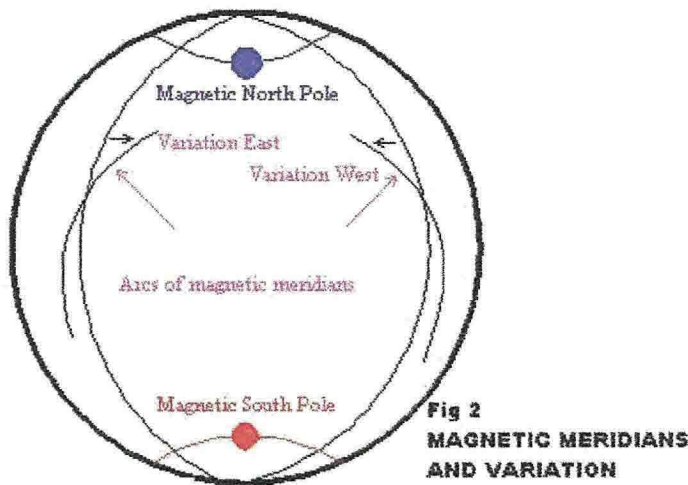
For convenience it is useful to imagine that the area covered by the magnetic N pole is coloured blue and that of the magnetic S pole coloured red. The magnetic poles cover a relatively large area of radius 25 miles or so. They are not absolutely diametrically opposed and for reasons as yet unknown appear to circle the true poles, travelling in a westerly direction, in a period of several hundred years. The magnetic N pole is situated in the

northern part of Canada in the vicinity of Bathurst Island, the magnetic S pole in the vicinity of King George V Land in Antarctica. Geological studies appear to indicate that there have been complete reversals of the Earth's magnetic field in times past.

#### *The Earth's Magnetic Field*

A magnetic needle freely suspended at any position on the surface of the Earth will align itself with the total line of force. The vertical plane through this total line of force represents the magnetic meridian at that position and is the direction in which a compass needle, free from any local deviating effect, would lie. The magnetic meridian, however, does not follow a perfect great circle path and although a compass needle will align itself with the magnetic meridian, its red, or N seeking, end does not necessarily point directly towards the magnetic N pole. The angle contained between the true meridian and the magnetic meridian is known by navigators as variation, and in geomagnetics as declination. It is named East when the N end of the needle is deflected to the right of the true meridian and West when deflected to the left.

See figure 2, *Magnetic Meridians and Variation*.



British Admiralty chart 5374 shows magnetic variation for the World in the form of isogonic lines or isogonals joining places having the same variation together with isallogonic lines joining places having the same rate of change of variation. The agonic line joins places having zero variation. This chart is updated with a new edition every five years from information supplied by the Geomagnetism Unit of British Geological Survey, based in Edinburgh, and the United States Naval Oceanographic Office. The first chart showing world wide variation was produced in 1701 by Edmond Halley and it is interesting to note that these early charts were actually used to find longitude from variation.

The angle at which the total line of force cuts the horizontal plane at the Earth's surface is known by navigators as dip, and in geomagnetics as inclination. Dip by convention is positive if the red end of a freely suspended magnetic needle points downwards and negative if it points up. It was not until the middle of the 16th century that dip was recognised. William Gilbert produced what is considered to be the first scientific attempt to study the Earth's magnetic field in a treatise entitled *De Magnete* in 1600 and it was he who first discovered that the red end of a freely suspended magnetic needle would tilt downwards in England at an angle of about 70°.

#### *The Magnetic Equator or Aclinic Line*

This is a more or less sinusoidal line joining all places where the total line of force is horizontal and where dip is zero. It approximates to the geographic Equator which it crosses twice, once in the Pacific in about longitude 168°W and again in the Atlantic in about longitude 41°W. It reaches a maximum latitude in S America of about 13°S in longitude 74°W and about 11°N in Africa more or less in longitude 0°.

Lines joining places of equal dip are called isoclinic lines; they run roughly parallel to the magnetic Equator and are shown on British Admiralty chart 5383. Isalloclinic lines joining

places having the same rate of change of dip are also shown on the same chart. The chart itself is updated as a new edition every ten years. The above values have been taken from the 1995 edition.

Magnetic latitude may be defined as the angular distance of a position N or S of the magnetic Equator, positive dip being synonymous with N magnetic latitude, negative dip with S magnetic latitude. At the magnetic N pole dip will be  $+90^\circ$  and at the magnetic S pole  $-90^\circ$ .

$$\tan \text{dip} = 2 \times \tan \text{mag. lat}$$

#### Example

To find the dip at London:

The magnetic equator in the longitude of London lies approximately  $11^\circ$  N of the geographic Equator. Therefore, the magnetic latitude of London is approximately  $51\frac{1}{2}^\circ - 11^\circ = 40\frac{1}{2}^\circ$  N

$$\tan \text{dip} = 2 \times \tan 40\frac{1}{2}^\circ \quad \text{dip} = \tan^{-1} 17082 \quad \text{dip} = 59\frac{1}{2}^\circ (-)$$

This is a little less than the actual value of about  $-66\frac{1}{2}^\circ$ . When you consider that the value of dip off the northern tip of Scotland increases to  $-72^\circ$ , well within navigable latitudes, it will be appreciated how important it is to have a suspension system that will keep the compass card as level as possible and resist the tendency of the needles or ring magnet to tilt due to these large angles of dip.

#### *Horizontal and Vertical Components of the Earth's Field*

The Earth's magnetic field can be defined by the three elements, namely total magnetic force, dip and, of course, variation. It is, however, best studied by resolving the total field (T) into a horizontal component (H) and a vertical component (Z). The S.I. unit of field strength normally quoted by the British Geological Survey (BGS) is the nano tesla, (BA charts used the micro tesla); they will, however, provide the same information in CGS units, namely oersteds, or gauss. In practical compass correction little use is made of absolute values of field strength. It is however important to appreciate the way in which the relative values change as a vessel changes her magnetic latitude, as this will affect the induced magnetism in the vessel and the directive force at the compass position.

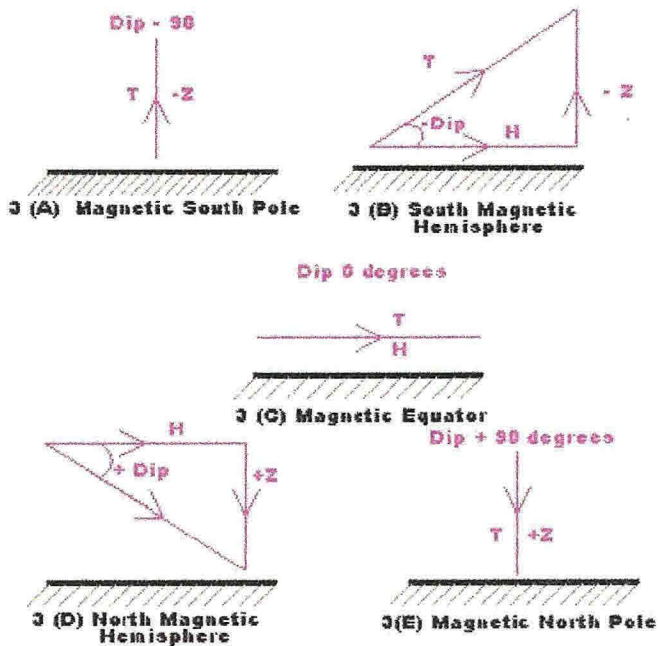
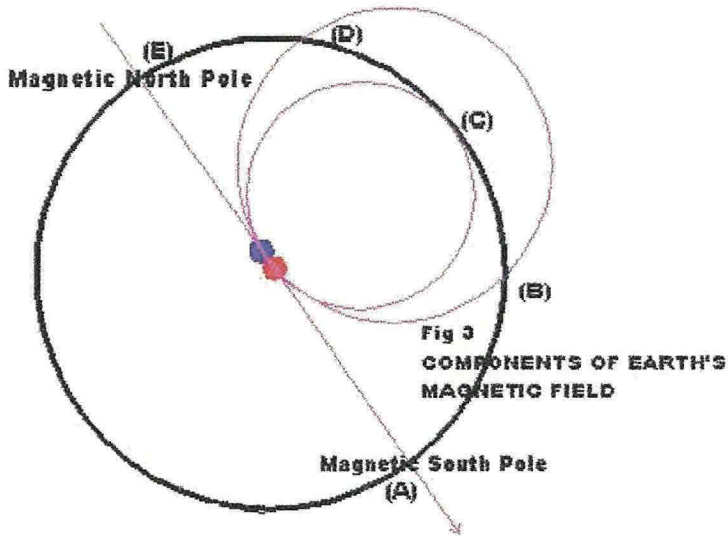
T is greatest near the magnetic poles with a value of about 0.66 oersteds and least near the magnetic equator at 0.24 oersteds. Notice that these values exist near but not at their respective positions. The areas where T is strongest are known as magnetic foci.

Since it is H which directs the compass needle, the greater the value of H, the more stable will be the compass. H will obviously be zero at the magnetic poles and for this reason the compass will then have no directional quality. The greatest directive force will be found at the magnetic equator when H is at its maximum. It is of interest, in passing, to note that a gyro compass suffers in much the same way but this time as it approaches the geographic poles.

Z plays no part in directing the compass, however, it does have some unfortunate effects on it. It has already been mentioned that the card must be mounted so that its centre of gravity is below the point of suspension to resist the tilting effect of Z. On a steel built vessel Z induces vertical hard and soft iron magnetism in the hull and rigging and with change of magnetic latitude the soft iron component will change in sympathy with the changing value of Z. Try holding a hand bearing compass near the top of a steel pile in a marina and see what happens!

The relationship between T, H, Z and dip may be expressed in terms of trigonometric ratios.

Figure 3 a, b, c, d and e illustrate these relationships by means of vector triangles. Notice that at the magnetic poles and the magnetic equator the triangles reduce to straight lines.



Lines joining places of equal values of T, H and Z are known as isodynamic lines. Isalodynamic lines join places having the same rate of change of magnetic intensity. The British Admiralty no longer publishes charts of magnetic intensity, however, the BGS will on request provide the information in whatever units are preferred. The Earth's magnetic field is in a constant state of change. To date, however, there is insufficient evidence to enable long range predictions to be made. Observations appear to indicate that the strength of the field has been decreasing over the past hundred years or so. Could this indicate the advent of another field reversal?

From the vector triangles it can be seen that:

- $\text{Cos dip} = H/T$
- $\text{Sin dip} = Z/T$
- $\text{Tan dip} = H/Z$

#### *Changes in the Earth's Magnetism*

The navigator, whilst possibly being aware of the changing values of H, Z and dip, is more concerned with the actual variation as it affects his course and bearings. On small scale charts variation for a stated year, together with the annual rate of change in minutes of angle, is indicated by means of isogonic lines. On large scale British Admiralty charts variation is expressed to the nearest 5' and dates from the 1st January for the stated year, the variation and the rate of change is given under the title or included in the compass rose. See also Symbols and Abbreviations used on Admiralty Charts, 5011, page 8, IB.

#### Ø *Secular Change in Variation*

This is a slow but persistent change in variation and accounts for the values mentioned above, together with the changes associated with H, Z and dip. Observations dating back to 1540 would appear to indicate a periodic cycle of about 500 years at London. At other places periods of up to approximately 1000 years have been suggested. This cannot be explained by the assumed rotation of the hypothetical dipole magnet at the Earth's centre.

#### Ø *Diurnal Solar Change*

This represents a small change in the values of variation, H, Z and dip and appears to be associated with the apparent daily movement of the Sun around the Earth. The changes, which are opposite in the N and S hemispheres, are greatest in the daytime and in Summer. They are fairly consistent but undergo an eleven year cycle associated with sunspot activity.

#### Ø *Semidiurnal Lunar Change*

This very small change appears to be caused by a lunar tidal current in the ionosphere.

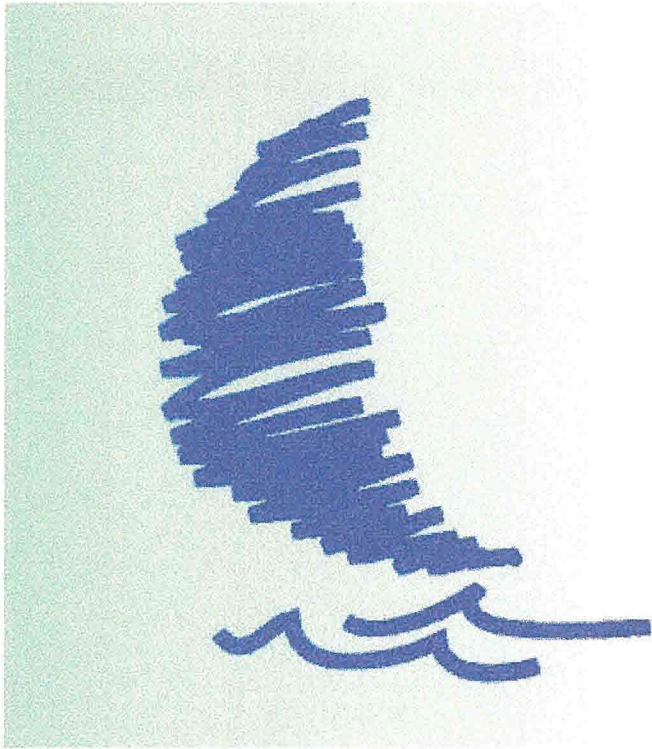
#### Ø *Changes Due to Magnetic Storms*

Magnetic storms appear to be caused by particle emission from the Sun. They have a disturbing effect not only on the Earth's magnetic field but also, perhaps not surprisingly, on radio waves. The aurora which are concentrated in the ionosphere above the magnetic poles are also associated with this phenomenon. The frequency of these storms bears a direct relationship to the period of rotation of the Sun with respect to the Earth, about twenty seven days, and the period of maximum sunspot activity, eleven years. Except in very high latitudes the very small changes in variation due to magnetic storms do not pose a problem in practical navigation.

#### Ø *Local Magnetic Anomalies*

Localised areas sometimes exist in shallow waters where the variation does not conform to the normal pattern of isogonic lines. Abnormal variation can be expected in such areas and a warning is included in the relevant Sailing Directions and on charts affected. Mariners are warned to check the compass error frequently as the variation is not only abnormal but is liable to change erratically. It is thought that the effect is caused by deposits of magnetic ore in the sea bed.

# SAILING



# in depth

The Terrestrial Magnetism article originally appeared on the [www.sailingindepth.com](http://www.sailingindepth.com) website and we are indebted to Sailing in Depth for their permission to reproduce it here. Take a look at their site - although it has not yet been formally launched you will find a wealth of information.

# Kemp Sails

## Getting the best out of your sails

Making your sails last is important - but so too is using them efficiently. Hundreds of books and magazine articles have been written on the subject, but below we've listed a few of the basics.

### Genoas

- **Make sure the sheet leads are in the right position on the track.** As a rule of thumb, the sheet's angle should bisect the clew. With the lead too far aft, the leech will be slack when the foot's tight; too far forward, and the leech will be hard against the spreaders while the foot is still some way off the bottom of the shrouds.
- **Use the telltales.** They will indicate whether the lead is correct. If the top windward telltale breaks first, the lead is too far aft. If the bottom one goes first, move the lead forward. Ideally, the windward telltales all the way down the luff should break (stop streaming) simultaneously when you luff gently into the wind with the sheet in tight.
- **Move the sheet lead forward when you reef the sail.** As you reef a roller genoa, the clew moves up and forward - so you'll need to move the lead forward to maintain the correct sheeting angle. If you've rolled the telltales up in the sail, you can add extra sets at known reef positions. Otherwise, watch the sail - the lead needs to be moved forward if you lose drive at the top of the luff before the bottom.
- **Don't forget forestay tension.** If your backstay is too slack (or the cap shrouds on a fractional rig) your genoa will be too full - the main symptoms are excessive heel and loss of pointing ability. Try tightening the rigging. Watch the halyard tension too, in light winds you shouldn't have any vertical creases, but as the wind builds you'll need a tighter luff. When you've established the right tension for average conditions, mark across the headfoil and luff tape a few feet above the tack, that way, when the marks come into line, you're at the right point to start adjusting for more or less wind if necessary.

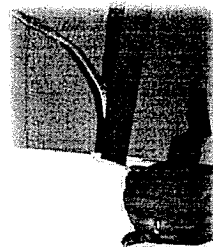
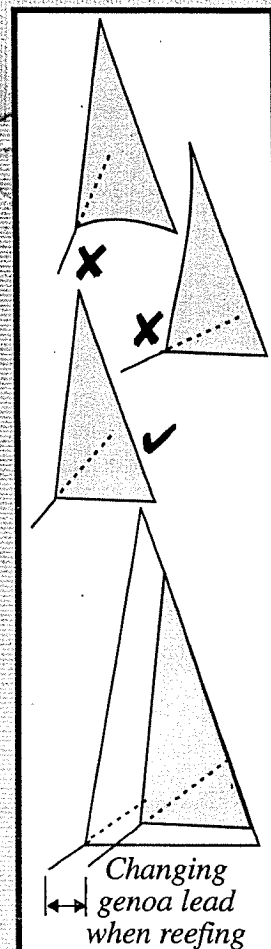
### Mainsails

- **Keep the top telltale streaming.** If it isn't, your leech is too tight - ease the mainsheet and/or kicking strap.
- **When sailing to windward, keep the boom central until weather helm builds up.** The mainsail's leech is primarily responsible for making the boat point upwind - so keep it working. As a general rule, this means keeping the boom fairly central until the boat starts protesting through the helm, heeling too much, or losing speed. Then you'll need to start easing the traveller - or, if you don't have a traveller, ease the sheet but make sure the kicking strap is reasonably tight.
- **Don't over-sheet.** This applies to both genoas and mainsails. If the genoa's too tight, it will back-wind the main and you'll pull the main in to compensate, resulting in too much weather helm, heel and loss of speed. Use the **cunningham**. It'll help flatten the sail, move the draft forward and open the leech in stronger winds.

### General Tips

- With tapered battens, make sure you insert the thin end first.
- For easier mainsail reefing, mark the halyard at the point where you can hook the reef spectacle over the tack horn. This saves extra trips along the deck.

If you're experiencing problems with sail trim, please call us. Quite apart from wanting happy customers, we'd like boats with Kemp sails to be seen sailing well. So it's in our interest to help you!



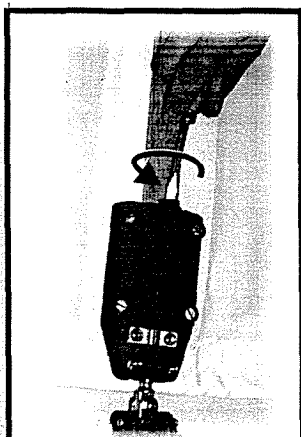
Fitting batten with velcro closure - stage one



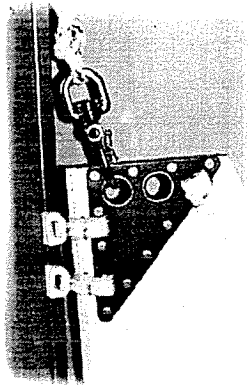
Stage two, inserting velcro strip



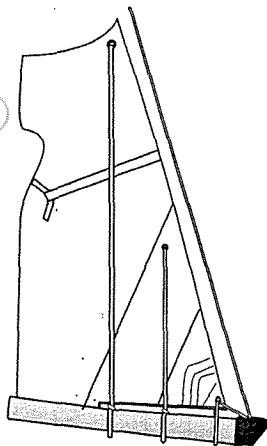
# Looking after your sails



Turn adjuster clockwise on the Sailman batten box to tension batten



The halyard is attached to the forward eye in the head plate of the main



Loose foot at the clew of the mainsail leaves space for reefing lines

We want your new sails to give many years' service. That's one of the reasons why we invite all our UK customers to return them for an annual inspection. At our loft, we can rectify some of the effects of wear-and-tear - and, if necessary, take steps to minimise future damage. But how long your sails last ultimately depends on the way they're treated. So, on this sheet, we've covered some of the most important aspects of sail-care. If you have questions about any aspect of care or maintenance we haven't covered here, please ask - we're always happy to help.

- **Don't let them flog!** Letting your sails flap in the wind is one of the quickest ways of ruining their shape.
- **Wash the salt out.** Salt is abrasive and will wear away at both the fabric and stitching. It also attracts moisture, which can quickly lead to the growth of mould and mildew.
- **Don't put them away wet for long periods.** It's impossible to leave a boat with the sails dry every time - but don't leave them wet in their bags or covers for too long. When storing damp sails down below, spread them out as much as you can.
- **Remove the battens for prolonged storage.** This saves the elastic at the inboard end of the pockets.
- **Don't serunch them up!** Hard Dacrons and laminates in particular don't like being creased any more than necessary. Flake, fold loosely or, if possible, roll them up and store straight and flat.
- **Keep them clean.** Most dirt marks and stains are purely cosmetic - but we'd all rather have nice clean sails. Water, mild soap and a sponge is usually the best way to start. In any case, the sooner you get marks off the better, because they'll become more difficult to remove with time. More stubborn patches can be tackled with a detergent powder called Bio-Tex, sold in supermarkets. Avoid acids, strong chemicals and over-zealous scrubbing, all of which can damage the fibres. With blood, spit on it as quickly as possible - saliva is the best way to get it off.
- **Protect them from the sun.** Don't leave roller genoas on the headfoil if you're not using the boat for a while - take them down and stow them below. Even if the sail has a UV protective strip, it'll last longer this way. And you'll reduce the chance of rain water running down inside the sail and staining the leech.
- **Roll the headsail up tightly.** When leaving the boat for short periods, make sure the genoa is rolled up tightly so the wind can't catch it. Carry on rolling until the sheets are wrapped round a couple of times, then cleat them off securely.
- **Protect laminates from chafe.** Laminated fabrics without a taffeta backing are vulnerable to damage from chafing, especially around the guardrails and spreaders. We'll give you anti-chafe patches with the sails which you need to put on in the right places.
- **Beware split pins!** Tape over split pins and sharp edges around shroud bases, spreader ends, pulpits and anywhere else your spinnaker or cruising chute can rub when being hoisted and lowered. One sharp pin could do a lot of damage.
- **Don't leave your sails under tension.** Slacken the halyard on roller reefing genoas when leaving the boat, and ease the mainsail's clew outhaul.



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web address: [http://www.scoot.co.uk/kemp\\_sails](http://www.scoot.co.uk/kemp_sails)

# KEMP SAILS PRICE LIST

Imperial (ft)

Metric (m)

**TOMAHAWK 25**

I: 30.37	J: 10.23
P: 25.48	E: 8.98

I: 9.26	J: 3.12
P: 7.77	E: 2.74

LOA:

Beam:

Prices in Bold-Italic include VAT @ 17.5%

Mainsail	Area (sq.ft)	Area (sq.m)	Coastal (Bermuda)	PC (Bermuda)	PCP (Bermuda)	PCR (Radial Weave)
Mainsail	114.41	10.64	418.72 <b>492.00</b>	507.96 <b>596.85</b>	589.19 <b>692.29</b>	699.02 <b>821.34</b>

Headsails	Area (sq.ft)	Area (sq.m)	Coastal / Xcut / Bermuda	PC / Xcut / Bermuda	PCP / Xcut / Premium	PCR / Radial Cut / Radial Weave
150% No.1	233.01	21.67	466.03 <b>547.58</b>	549.91 <b>646.15</b>	633.80 <b>744.71</b>	659.43 <b>774.83</b>
145% No.H1	225.25	20.95	457.25 <b>537.27</b>	545.10 <b>640.49</b>	612.67 <b>719.89</b>	648.71 <b>762.23</b>
135% No.2	209.71	19.50	425.72 <b>500.22</b>	507.50 <b>596.32</b>	570.42 <b>670.24</b>	603.97 <b>709.67</b>
95% No.3	147.58	13.72	348.28 <b>409.23</b>	379.27 <b>445.64</b>	425.02 <b>499.40</b>	439.77 <b>516.74</b>
80% WJ	124.27	11.56	280.86 <b>330.01</b>	311.93 <b>366.52</b>	345.48 <b>405.94</b>	364.12 <b>427.84</b>

Downwind Sails	Area (sq.ft)	Area (sq.m)	Coastal / Radial Head	PC / Tri Radial	PC+ / Full Radial
Spinnaker AP	559.23	52.01		592.79 <b>696.52</b>	777.33 <b>913.37</b>
Spinnaker 80%	447.39	41.61		514.49 <b>604.53</b>	621.87 <b>730.69</b>
Aysmetric	397.68	36.98		489.14 <b>574.74</b>	552.77 <b>649.51</b>
Cruising Chute	397.68	36.98	401.65 <b>471.94</b>	489.14 <b>574.74</b>	552.77 <b>649.51</b>

## Other Products

Packaway Inc LJ	206.54 <b>242.68</b>
Packaway Ex LJ	179.60 <b>211.03</b>
Boom Cover	85.31 <b>100.24</b>
Sunsleeve	191.33 <b>224.81</b>

## Other Products 2

Extra Reefs	35.92 <b>42.21</b>
UV Strips	45.56 <b>53.53</b>
Foam Luffs	60.74 <b>71.37</b>

NB. Prices in bold include VAT @ 17 1/2 %.

Snuffers	Size 1	Luff to 36	£143	<b>£168</b>
	Size 2	Luff to 45	£162	<b>£190</b>
	Size 3	Luff to 60	£187	<b>£220</b>

Fabric	DIAX P + 5%	CL + 12%
Upgrades	DIAX PP + 7%	KEVLAR POA
	LSP + 10%	

# SAVE UP TO 30% ON PLEASURE CRAFT INSURANCE

## MASSIVE SAVINGS

GJW Direct can deduct up to pleasure craft insurance and drive direct with you the boatowner. We pay no commission as pleasure brokers and can pass big savings of up to 30% or more straight back to you. Easy payment terms, also available.

**CHECK How much broker commissions is included in your premium?**

## WIDER COVER

GJW Direct offers a comprehensive package, including fire, physical, accident cover, theft, medical expenses, storm, flood, legal protection cover and the protection of your boat's security. Accidents always in experienced hands. R.V.A. respondents and yacht boat owners including SVOL, former crew, boatowner and yacht owners. Easy to understand, pass on, compare, policy recommendations which meet the needs of all boatowners.

**CHECK Are these benefits included in your policy type of choice?**

## SUPERIOR SERVICE

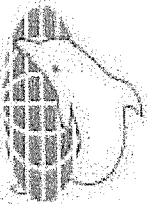
GJW Direct are committed to a Priority Personal Service policy direct access to our specialist underwriting and claims teams. Our 24 hour retrieval claim helpline is open 365 days a year, which provides a friendly, efficient settlement of any claim. 100% coverage is insured in the holiday.

**CHECK Are your current insurers always there when you need them?**

## COMPLETE SECURITY

GJW Direct have a reputation of being the world's largest boatowner group with total above 500,000 policyholders. GJW Direct are insured with the Watford Insurance Co. 100% security managed by the best in the industry, the Lloyd's of London.

**CHECK Does your existing policy offer such excellent financial security?**



**GJW DIRECT 0500 141 141**

**Pleasure Craft Insurance**

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www.gjwdirect.com