Introduction to Cherubs

Australian Cherub Fact Sheet No 1

November 2010

Australian Cherub Fact Sheets

Stepping into a new class or even upgrading your existing equipment can be a daunting experience if you do not have good information to help you with decisions on the design and sourcing of gear. This fact sheet is part of a series of documents that have been has been developed by the Cherub National Council of Australia to assist new Cherub sailors to make decisions about their boats and equipment.

The series includes:

No 1	Introduction to Cherubs
No 2	Hull Design
No 3	Deck Layouts
No 4	Construction Methods
No 5	Sails
No 6	Rig Tuning

The full series is available free of charge from the Cherub web site Cherub Central. If further topics are required the series may be expanded and updated.

If you need further technical information about your Cherub you can contact one of the people listed at the bottom of this page.

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What makes a Cherub

The Cherub is a 'restricted' class as distinct from a 'one design' class. The measurement rules for the class set maximum and minimum limits on most of the key dimensions of the boat. This feature of the class allows amateur designers and builders flexibility to develop deigns that allow the boat to be tailored to the needs a wide range of crew sizes and sailing conditions. Being a 'restricted' class also allows Cherub owners to choose their own gear from a wide range of suppliers of spars, sails, foils and fittings and to individually tailor they way that they set out their control systems.

Measurement Rules and Restrictions

Cherub measurement rules are set out in the Cherub National Council of Australia's *Rules and Restrictions 2006*. A copy of this document can be found at Cherub Central. The rules change from time to time but usually only in minor ways.

When the rules do happen to change boats built to the older rule usually continue to be recognised with any features non compliant with the new rule "grandfathered". This slow pace of change means that Cherub hulls can retain their value over a long period of time.

The rule changes that introduced asymmetric kites and self draining hulls were introduced in 1997. These changes effectively created the boats that we now recognise as Cherubs.

UK Cherubs

The Cherub class as sailed in Australia is now a very different boat to the UK Cherub. While the class once conducted regular World Championships involving boats from Australia, New Zealand and the UK, the situation is now quite different. The UK class decided to go down a different development path in the late 1980s. The results is that today their boats are narrower, have larger sail plans and carry twin trapezes and lifting foils. While the two streams of Cherubs now differ considerable, Cherub sailors in the two countries still keep in touch and share ideas and experiences.

Cherub basics

Cherubs have been built and sailed in Australia since the early 1960s. At present there are several hundred Cherubs actively sailing at venues across Australia. Each of the boats currently sailing can be grouped into one of three categories.

Modern Cherubs

Cherubs designed and built following the rules changes of 1997 that introduced asymmetric kites and self draining hulls. Boats in this group will have sail numbers above 3055. The boats that have filled the top 25 places in each of the last 5 National Championships have come from this group of boats.

Pre 1997 Cherubs

Boats designed and built for the old rules but converted to asymmetric kites. Converted older boats can still be effective boats for local club racing and are often the entry point to the class.

Classic Cherubs

Old schools Cherubs with pole kites, often timber. Some of these boats as still sailing , a number of timber examples have been lovingly restored and represent an important part of the heritage of the class. They are rarely raced.

New Cherubs

New Cherub hulls are available for Complete Composites in any form from a bare shell through to a finished hull. Complete Composites' price list is available at Cherub Central. Their phone number is 0422 304 307.

Second hand Cherubs

Most Cherub sailors start by purchasing a second hand boat and sailing in the class for a period of time before upgrading their boat of building a new one. The Cherub Class Association operates an active second hand Cherub list at Cherub Central.

To list your Cherub on the web site contact info@cherub.org.au at Cherub Central.

The restricted design nature of the class and the high proportion of home building means that there is quite a deal of variation in the quality of second hand Cherubs as they hit the market. It also means that the prices at which Cherubs trade in each of the categories above vary significantly.

Boats in the Modern Cherub category can trade for up to $17,000 for an example that is virtually "as new" with good quality gear and essentially ready to race at the very top level of the Nationals fleet. Other boats in this group will very across a wide band depending on design, age, condition and the type and quality of the foils, sails and spars..

Pre 1997 boat that have been converted often trade for $1,500 to $2,500 with the best examples, that may have carbon spars, slightly higher.

Sail numbers

Cherub sail numbers, which are the boat's registration number, are part of an international numbering system that is shared across Australia, the UK, New Zealand, France and even Italy. The system covers both International Cherubs as raced in Australia and the UK Cherubs. Under the international system each country is assigned a block of numbers and issues individual numbers sequentially when each new boat is built, measured and registered.

The sequential numbering means that within any one country the sail number is a good indicator of the age of the boat. It also means that boats of similar age in two different countries will have very different sail numbers.

Some time in the early 1980s Australia was assigned the block of numbers from 2800 to 3000. Italy was then given the numbers 3001 to 3050. In 1995 Australia moved on to the block from 3051 to 3200 and it is this block that is used for new boats in Australia today.

While UK Cherubs are now very different boats to Australian and New Zealand Cherubs, they still share the same numbering system . For some time the UK has been using the block from 2601 to 2700. They also share this block with the small number of UK Cherubs recently built in France. With a spate of new boat building in the UK ,and their most recent boat numbered 2996 the Poms have been coming to the end of their block and they have now been assigned the new block 3201 to 3300.

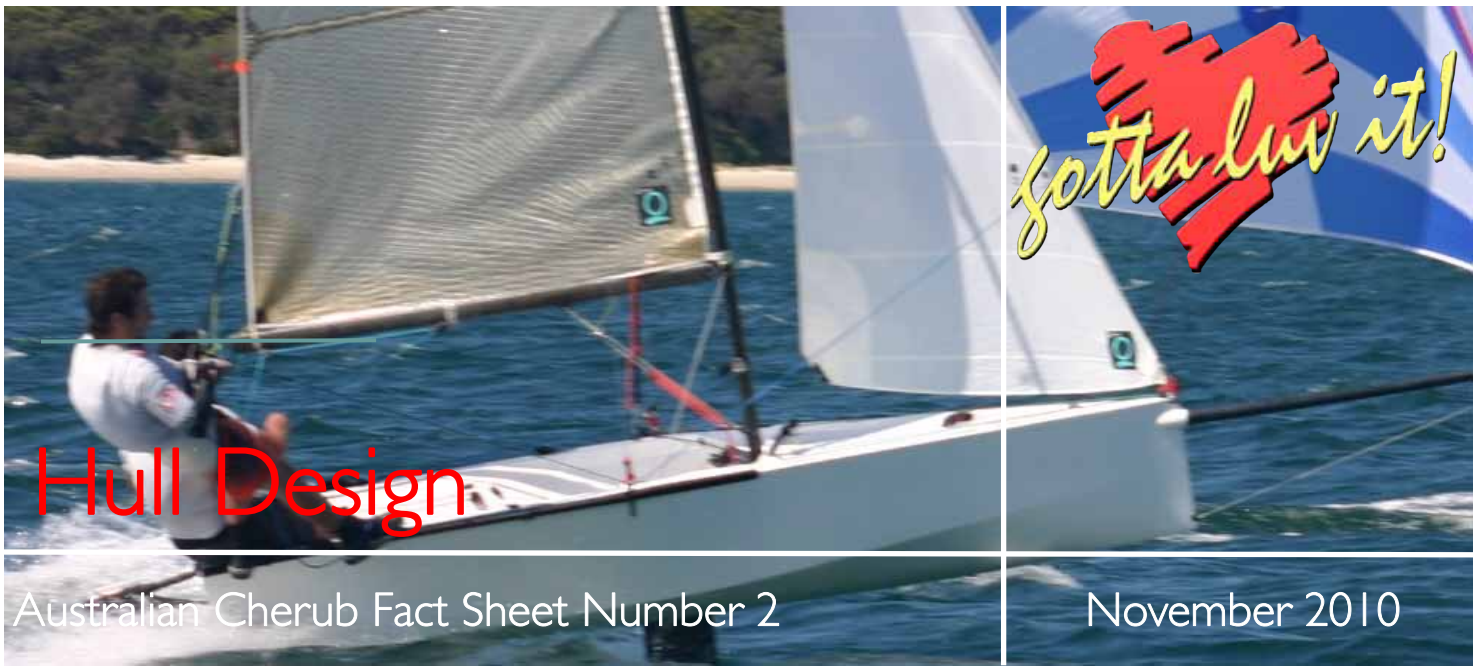
The number sequence started when the first Cherubs were built in New Zealand in the early 1950s.

This number allocation history means that there are no Cherubs in Australia with numbers between 3001 and 3050. It also means that Cherubs numbered 2999, 3000 and 3151 were all built and registered in the same season 1995.

Above: A top line modern Cherub will typically be equipped with all carbon spars, a self tacker for the jib, a carbon or stainless steel tube rudder gantry and foils with a very high quality finish.

Supplier Directory

Business	Contact Details	Products
Complete Composites Ben Lawrie (m) 0422 304 307 (Freight can be organised easily to anywhere in Australia)	Unit 19/4 Roper St O'Connor WA 6163 benlawrie1@gmail.com	Carbon Cherub Hulls Carbon Booms Carbon Bow Poles Carbon Hull Shells Carbon Decks Carbon Foils Carbon Rudder Gantries
Windrush Yachts Brett Burvill Ph: (08) 9314 1317 M: 0407 944 060	1 Stockdale Rd O'Connor WA 6163 www.windrushyachts.com.au brett@windrushyachts.com.au	Carbon Mast Carbon Boom Carbon Bow Poles
CST Composites Chris Dixon Ph: (02) 9668 8488	78 -80 Tasman St Kurnell NSW 2231 sales@cstcomposites.com www.cstcomposites.com	Carbon Masts Carbon Booms Carbon Bow poles
Fasta Craft John Ilett M: 0419 907 923	43 Magnolia Gardens Yangebup WA 6164 john@fastacraft.com	Foils
Dixon Foils Ian Dixon Ph: 02 9525 0821 M: 0409 911 905	dixonboats.com	Foils
For Sailmakers see Fact Sheet No 5 Sails		



Hull Design

The design of Cherub hulls has changed significantly over the years as designers have strived to search for the best hull shape to suit particular crews and particular local conditions. The design rules for the class allow for significant differences in hull shape while maintaining the basic performance parameters of the class.

The most successful designs among the modern Cherubs have been:

- The *Matthews* design
  Developed in Brisbane by the Matthews brothers Mark and Brendan, this design has become the most prominent and successful of the modern Cherubs. Matthews hulled Cherubs have won every Australian National Championship since year 2000. New Matthews hull shells are built under license by Complete Composites. Recently built examples include 3164, 3163, 3161, 3160, 3158, 3157). Read more about the Matthews design here.

- The *Howell Mk 1 and Mk 2*
  A design by Richard Howell from Perth. These boats have proved to be very effective in their home state of WA with consistent top placings. (Examples include 3140, 3139, 3132). Read more about the Howell design in the November 2007 newsletter here.

- *The Lairy Canary (and variations)*
  Proven fast and effective design capable of being built from a jig without specialist tooling. (Examples include 3152, 3147, 3143, 3062)

Many other successful designs are also prominent in fleets across Australia.

Most modern Cherubs share some key measurements. Most have the narrowest possible chine width at the central 6ft measurement station, close to minimum chine width at the transom and as close as possible to the maximum beam at deck or sheerline level. These features make the hulls as narrow as possible while maintaining deck width to give righting leverage for the crew.

The approach taken by designers has changed since the advent of asymmetric sailing. In the 1980s and 1990s before the introduction of asymmetric kites, the *Foreign Affair* design kept the chines as high up as possible to try to keep them clear of the water when sailing to windward thereby reducing drag. This was done by putting the maximum amount of hull shape or buoyancy as low as possible in the hull. The various versions of the *O'Mahony* designs are conceptually similar to *Foreign Affair* but tend to have more rounded sections towards the bow. Boats built to these designs are still competitive in club racing.

By contrast, the more modern designs that have emerged since the introduction of asymmetric kites and the higher downwind speed brought on by asymmetric sailing have taken a different approach. The *Matthews , Howell* and *Lairy Canary* designs have aimed at creating more dynamic lift, inducing planning early and shedding water when planning at high speed. In practice this seams to give the more modern designs an advantage on the high speed downwind legs that make up so much of contemporary Cherub races.

Over the page are some example of modern Cherub hull designs.

The *Matthews* design (pictured right) is easy to identify due to the prominent shoulder or bump created in the chine line at the mid point measurement station. The chine line is quite high in the forward sections, giving a fine entry. In the run of the chine going aft from the mid point, the chines are quite straight and do not rise much. This, combined with the flat sections near the centrecase, gives the boat a powerful planing hull. It can be prone to nosediving and it trades off light air performance for exceptional efficiency at higher planning speeds.

The *Howell Mk 1* design features smoother lines on the chine and rounded U sections throughout. The result is that it planes at lower speeds than a Matthews hull. At 6 to 7 kts of wind speed it is up and planing while the Matthews is still bow down. Because of this feature it accelerates faster out of a tack or when a small gust hits. It is also a forgiving shape with its fuller ends. This means that it is not as sensitive to the crew's fore and aft trim. It can be a handful if it is driven into a nosedive downwind. The design is at its best sailing to windward and in lighter and moderate breezes.

The Lairy Canary design was developed by Brendan Matthews and Trevor Fay. It has many similar features to the *Matthews* shape being a predecessor to the *Matthews*. It has V sections forward of the centrecase resulting in a relatively fine entry. The chine line is smoother than a *Matthews* and the aft sections similar to the *Matthews*. The fair curves make it a good option to build from scratch on a jig. It is a very good all round performing hull.

Pocket Rocket, (3154) is a one off design by Denis Phillips. It features fuller V sections from the centrecase forward to the bow. It has one of the narrowest sterns of the modern Cherubs with a very narrow chine width at the transom. The aft sections are more rounded . The hull has proven to be very fast in lighter, non-planning conditions and competitive at higher speeds.

Deck Layout

Australian Cherub Fact Sheet Number 3

November 2010

Deck Layout

The Cherub measurement rules, the Rules and Restrictions of the Cherub National Council of Australia, set out all the necessary dimensions for a Cherub hull. In addition to all the rules that define the external shape of the hull the rules cover the required buoyancy, width and areas of decking, floor heights and a number of other aspects of the overall decking layout. The rules allow significant degree of scope to vary the general arrangement of the decking of the boat allowing Cherub builders to develop decking designs to suite the individual needs of sailors and also to suit a variety of construction techniques.

In recent years Cherub builders have experimented with and tested a number of layouts. In many instances the experimentation has been aimed at developing decking layouts that simplify the construction processes making it easier for a home builder to product a fast, light, durable and utilitarian hull.

This Fact Sheet illustrates a number of different deck layout that have been used on Cherubs recently. All the boats illustrated here have proven to be fast and effective.

There is no one correct way to design and build a Cherub. The class encourages design experimentation and the layouts shown here are intended only to serve as a guide or a thought started for a prospective builder.

Trevor Fay's *Wally* (3144) is a good example of a layout that is comprised virtually entirely of flat panels that can be layed-up and laminated on a work bench, cut to shape and fitted to the boat. The results is quite "boxy" in appearance but the finished product is simple and utilitarian. The result is also effective, with *Wally* having won two National Championships. The layout features a flat foredeck with the self-tacker track set above the deck on carbon brackets. The flat floor is supported on minimal framing with just two longitudinal frames running from bulkhead to the transom. There are no transverse frames beneath the cockpit section of the floor. The floor is flush with the top of the centrecase and runs through to the bow providing open access to the bow pole spinnaker and sail control systems. High resolution photos here.

KISS , built by Duncan Groome also uses predominantly flat panels for a simple yet effective layout. The floor, which sits flush with the top of the centrecase, is supported on a central longitudinal frame and two transverse frames one at the rear of the centrecase and one half way along the cockpit. The cockpit floor has a very slight concave dish and the foredeck a simple dish to allow flush mounting of the self tacker track. Side decks are minimal and their vertical return panels join the hull sides to stiffen the shell. High resolution photos here.

Ben Lawrie has built three Cherubs with this deck layout 3148, 3157 and 3158. The floor sits low below the top of the centrecase which is protected by a centrecase top moulding. The side decks are wider and built integrally with the side buoyancy tanks. The foredeck is dished for flush mounting of the self-tacker track and includes a mast gate that extends aft of the bulkhead. The foredeck is integral with the front buoyancy tank with the bow pole retracting into a rectangular channel. The kite shute also runs through the front tank with the mouth of the shute being a specialised moulding. Ben now has a mould for this foredeck allowing for easy production. High resolution photos here.

Wayne Torpy has now built four Cherubs to this layout which features a low floor, curved side tanks and a concave dished foredeck. 3136 and 3152 were built from scratch and 3070 and 3055 were full boat rebuilds of old hull shells. On each of these boats the foredeck is integral with the front buoyancy tank with the bow pole retracting in a triangular channel that has openings cut in its top to allow easy access to the control lines that run in the channel. The floor is supported on three longitudinal frames that run from the front of the centrecase to the transom and three transverse frames one each at the front and rear of the centrecase and one at the mid point of the cockpit. This layout is more complex to build with the curved side tanks requiring the fabrication of a specialised jig or mould but the result is a very elegant hull . High resolution photos here.

Neil How has built two boats to this layout 3161 and 3145. It is the most intricate of the layouts shown here. The floor is located flush with the top of the centrecase and is slightly dished. The curved side tank on the starboard side is integral with a buoyancy tank while the "tank" on the port side is in fact open over half its length and incorporates the kite shute, with the retriever line emerging from a small opening in the side of the tank The foredeck is open on the port side and integral with a forward tank on the starboard side. The foredeck is dished for flush mounting of the self tacker track. The open section of the forward area allows easy access to the control lines. 3145 has a mast gate integrated with the foredeck but 3161, pictured here, does not. High resolution photos here.

Construction methods

Australian Cherub Fact Sheet No 4

November 2010

Building your own Cherub

All modern Cherubs are built using composite construction often referred to as or foam sandwich construction. Most current boats are built from laminates composed of carbon fibre reinforcing over closed cell foam with epoxy as the resin system. It is possible to also use glass reinforcing and polyester or vinylester resins but epoxy laminate systems can produce stiffer lighter hulls and are therefore more generally preferred by home builders who are aiming for a top performing boat.

There are two basic construction methods. The first is to build the hull from scratch using a jig to form the foam panels into the designed hull shape. This method allows you to chose your design or even design your own hull. It does require some significant experience in boat building and a well detailed design to ensure that the finished hull fits the Cherub measurement rules. In recent years several boats have been build to the Lairy Canary design using this method.

The second method is to purchase a bare hull shell from Complete Composites in Perth and construct the frames, floor and decks at home. This second method is the more popular with some many boats having been built in this way over the past ten years. Complete Composites produce shells to the Matthews design. They can also provide moulded parts to form the foredeck, side tanks, rudder pod, and other key parts. These parts are constructed in a female moulds from carbon fibre over closed cell foam in an epoxy resin system. The quality of the shells is very high.

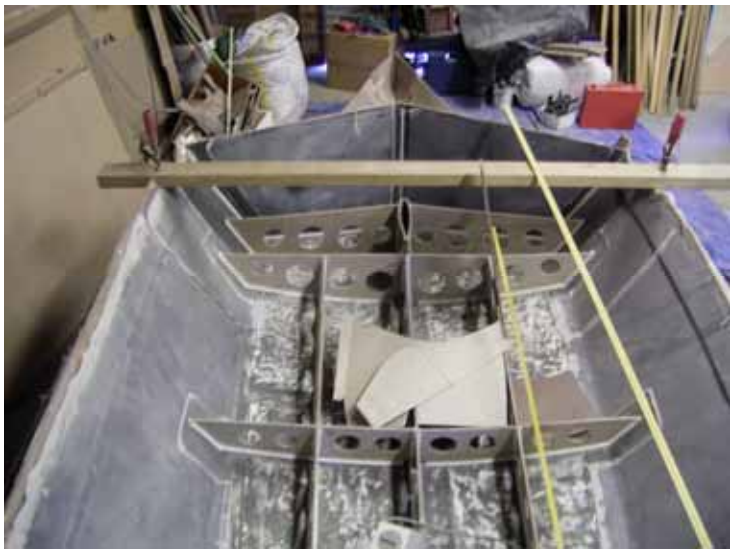
A home builder working from a hull shell is in a position to design the topsides of the boat to suit their own individual needs. Many recent builders have developed topside designs that are comprised primarily of flat panels. These deigns allow most of the panels to be laid up and laminated on a flat workbench prior to fitting and bonding to the hull. This system allows the full boat to be built without the need for any specialised moulds or tooling. Trevor Fay's Wally (3144), which has won the Nationals twice, is a good example of this type of construction. Australian Cherub Fact Sheet No 3 provides details of some of the more popular layouts. High resolution photos of these layouts are available at Cherub Central.

Building a Cherub at home is not a project that should be taken on lightly. There is a considerable investment required in the shell and the materials to finish the hull and there are important health and safety issues that you need to be aware of and manage. However, for someone who has an understanding of composite construction techniques and basic skills building your own boat is a very manageable and rewarding project..

Below Top: A hull shell as it arrives from the manufacturer with transom and centrecase fitted. Bottom: Duncan Groome's finished hull Kiss was built from the shell above. It is an example of a design that is finished with predominantly flat panels that can be layed-up on a workbench and then bonded into place in the hull.

Finished hull weight

The finished hull weight is an issue for home builders. The minimum hull weight for a Cherub is 51 kg. To achieve this weight the finished hull needs to be about 46 kg before painting and fittings. While this is very achievable for a home builder, some care is required to keep the boat to weight while still making it strong enough to withstand the stresses involved in high speed downwind sailing. Several builders have found that the first boat they build is 3 to 4 kg overweight while their second one is on weight.



Above: Frames and the bulkheads bonded in place on Wayne Torpy's rebuild of Rope City 3055.

Below: Simon Blatchford's partly finished new hull with the bulkhead fitted and first longitudinal frame fitted and bonded. Flat panels make for easy construction. High res views one, two and three here.

Vacuum bagging

In composite construction vacuum bagging can be of great assistance in achieving consolidation of the laminate and ensuring that the finished product is well bonded. When used with peel ply it can also ensure that the cured laminate is minimum weight without excess resin. The downside of vacuum bagging for the home builder is the need to acquire the necessary equipment and the additional consumables involved.

When home building a Cherub, using vacuum bagging techniques can be an advantage but, on flat panels, it is possible to achieve the same curing pressures with simpler technology such as a sheet of plywood and some bricks.

Customised parts

Homebuilding is becoming even more viable as more customised Cherub parts become available. Ben Lawrie at Complete Composites in Perth now has a mould for a concave foredeck that fits a Matthews shell. His foredeck, which includes mounting points for a self tacker, can be use either to form the top of a forward buoyancy tank or as an open deck over a floor that extends to the bow of the boat. He also has mouldings available for a bow pole assembly, rudder pod, curved side decks, centrecase support and other parts.

Building a quality boat and staying healthy

The most important priority in any boat building project is making sure that you stay healthy, so that you can continue to enjoy sailing your boat for many years. This is particularly important in composite construction which involves many chemicals that may be hazardous or may have potential health risks. When undertaking a home building project there is always a temptation to jump straight into the project without carefully familiarising yourself with the health and safety messages that are so important for many of the products used.

Making sure that you are well informed on health and safety issues, the properties of the materials you are working with and the recommended techniques for their use will go a long way toward ensuring that you end up with a quality boat.

Extensive information on product specifications, materials data sheets and health and safety messages are available from the web sites of many composite materials suppliers. A number of these site also include detailed "How to" information on composite construction. These include:

Fibre Glass International
ATL Composites
West System
Epiglass

Cherubs

Fact Sheet Number 5 Sails

June 2008

Sails

Many Cherub sailors support their local sailmakers. One of the great advantages of sailing a Cherub is that you are not bound to a single class sailmaker and you do not have to pay the premium prices charged by monopoly suppliers of sails. In most locations around Australia your local sailmaker will most likely take an interest in your Cherub campaign and help you with tuning and sailing advice as well as cutting your sails.

Several prominent sail lofts have current Cherub sailors on their staff ready to help you with any questions that you may have about your Cherub. Lofts with current Cherub sailors on the staff include UK-Halsey in Fremantle, North Sails in Brisbane and Ian Short and McDiarmid Sails in Sydney, McKellar Sails in Belmont, Avalon Sails in Mandurah.

Several recent Cherub National Champions now manage major sail lofts across Australia. Leigh Ashwood is the manager of Tasker Sails in Perth, Brent Frankcombe is manager of Quantum Sails in Melbourne and Joel McDonald is the manager of Allwood Sails in Brisbane. Many more of Australia's leading sailmakers have some experience sailing Cherubs and are capable of producing effective Cherub sails tailored to your particular rig and crew needs. The heads of some of the most well know sailmaking lofts are former Cherub sailors including Ian Lindsay at Hoods in Sydney, Steve Walker of Walker Sails in Tasmania, Craig Phillips from the Team New Zealand America's Cup loft and many others. If you are looking for a sailmaker in your local area with whom to work on your sails, look for one who has some association with Cherubs.

It is almost guaranteed that new sails will make your Cherub go faster. There are three well established ways in which new sails work. *Better Shape* - Your new sails will have a more powerful or more efficient shape adding speed. *Better Advice* - In acquiring your new sails you will get the opportunity to work with your sailmaker, gain his or her advice on tuning and sailing tips. This effect can be just as influential as the new sail shapes. *Better Headspace* - The placebo effect. Having new sails makes you feel better about you boat and makes you sail faster. They take away your excuses to loose.

How to order a sail

Simply rocking up to a sailmaker and asking for a Cherub sail will not guarantee you a fast and effective sail. If you are looking for sails for a new boat or replacement sails for an existing boat the following easy steps will help you get and effective product:

Step 1 Research and detail your needs
Cherub sails can be designed to be optimised for sailing in flat water or rough water, in light, medium or heavy breezes and for light or heavy crews. You need to discuss your specific needs with your sailmaker early on in the project. If your sailmaker does not ask you questions about your specific needs, go and see another sailmaker.

Step 2 Roughly tune your rig.
Particularly in the case of your main you will need to go through the basis tuning steps before you order your sail. This ensures that your mainsail can be cut to suit your mast and its specific bend characteristics. Your sailmaker will probably want to measure your mastbend as part of the design of the main, so make sure that the rig is working the way that you want it too before you start. If your sailmaker in in another town and you are doing the measurement on his behalf make sure that you follow the detail of his measurement process exactly. See Fact Sheet No 6 for information on the basic tuning steps.

Step 3 Acquire the sails
Getting the new sails is the fun part. Make sure that you talk to your sailmaker about the what you need to do to care for your new gear.

Step 4 Fine Tune you rig and new sails
Go sailing. You will need to spend time on the water with the new sails experimenting with sheeting positions and vang and cunningham settings to get them working to their best. Two boat tuning sessions with another Cherub can help with this process. Another method is to get someone to follow your boat photographing it from behind. The photos will tell you a lot about the way that the leech of the jib and the main behave in different breeze conditions. At the end of this detailed tuning process you need to know exactly how your new sail respond to different vang and cunningham and lowers settings.

Measuring up a Cherub for sails

Jib

It is important the a Cherub jib fits the boat precisely. Proper fitting will allow the jib to be positioned on the forestay so that the foot of the sail is as close to the foredeck as possible while the clew board is in a position to allow the correct sheeting angle. Most Cherub jibs are designed to the class's maximum luff length of 4.170m. The primary class rule for the jib is a maximum perimeter measurement of 9.54m. Once the luff is subtracted from this length the lengths of the leech and the foot need to be designed so that the position of the clew lines up with the desired fore and aft sheeting location on the boat.

Small variations in the location of the clew can significantly change your sheeting angle and the flexibility that you have to adjust the sheeting angle.

One importance jib measurement rule is the maximum cross width of 795mm measured at a point on the leech 1.915m from the head. Small changes the way that the head of the sail is finished can make a significant difference in the location of the measurement point and therefore the measured width of the sail. This cross width measurement is a common cause of jib measurement problems at national championships. Make sure that your sailmaker double checks this measurement after he has finished the head of the sail. It is better to sort out all your measurement issues when the sail is made rather than on the eve of the first race of a championship.

Spinnaker

When you sailmaker designs your spinnaker he or she will probably ask you for a set of measurements that will become inputs to their computer based spinnaker design program. Each of these should be measured to the bearing surface of the knot. These are not the measurements of the finished sail, but they are the measurements that allow calculation of the final flying shape of the sail. Getting them right allows the sail to fit the boat and sheet correctly. Typical measurements are:

Hoist height	Distance from the tip of your bow pole when extended to the halyard sheave or block.
Foot	Distance from the tip of the bow pole when extended to the sheeting point on the gunwale
Leech	Distance from the sheeting point on the gunwale to the halyard sheave.

The kite sheeting point varies greatly depending of the particular cut of the spinnaker. It can be as far back as 1m form the transom for flattish kites with small shoulders and long foots. It can also be as far forward as 600mm forward of the shrouds for kites with short foots and high shoulders. When you have acquired your new kits make sure that you talk to your sailmaker about the best sheeting point for you new sail and take a close look at the way that it sheets on the boat. You need to ensure that the leech does not close up too much when the sail is sheeted on. At the same time you need to be able to maintain an even shape as you ease the sheet.

Above: Typically the luff round needed for a mainsail can be measured by loading the mast to a pre-determined load, and then measuring the resulting deflection of the mast from a string line running from the tip to the gooseneck.

Mainsail

The two issues for a Cherub mainsail are the mould shape of the sail and the amount and distribution of the luff round.

The mould shape is an issue you will need agree with your sailmaker taking into account the conditions for which the sail is being optimised. The sail can be optimised for flat or rough water conditions and light or heavy breezes.

The luff round will need to be matched to your mast. Your sailmaker may have his or her own method of measuring your mast bend and calculating the necessary luff round. If so, get their detailed instructions on how to do it before you start measuring. If your mast bend characteristics are way out he may get you to go away and re-tune the rig before remeasuring it. If you have adjustable lowers you will need two sets of measurements, one set with the lowers on hard and one set with them off.