

PAINTING

If you have taken delivery of a boat which has the basic undercoat finish and you intend to paint the boat then there is a bit of preparation to do before the paint is applied.

I have found that two-pack polyurethane is the product best suited to the job. It is fast drying, tough, yet able to flex with the boat if you have a collision. Unfortunately, the drawback with two-pack polyurethane is that it really needs to be applied with a spray gun, so unless you are confident using one it is best done professionally.

Enamels are good too, but they need extended drying time before the boat can be handled. Acrylic car paint can be used but has a few problems. It doesn't seem to flex well so a collision with another boat could see all your hard work flaking off.

The undercoat on the hull, deck, keel and rudder is a two-pack epoxy primer and if you wish to sail sooner rather than later it is quite adequate left as a finish. If/when you do decide to paint your boat the sanding down of the epoxy primer is quite important. Use 240 to 320 grade aluminium oxide sandpaper but **no finer**. In the past I have got away with using 400 grade but I don't recommend it because the polyurethane needs a good mechanical bond to stick to the epoxy, as they will not bond chemically. I also don't advise using any coarser than 240 grade as you will probably see the sanding marks through the finish once the paint has dried and shrunk back a little.

Aluminium oxide sandpaper is sometimes called Free-cut or Dri-lube. It has an off white or grey appearance and is available at most hardware and paint supplies. You could use "Wet or Dry" sandpaper remembering that in practice the grading of the grit doesn't translate exactly to the grading of the Free-cut paper. 400 Wet or Dry paper will do the same kind of job as the 240 Free-cut. I prefer to dry sand mainly because of the mess that wet sanding creates.

Whichever method you use the undercoat must be sanded back so that there are no visible shiny patches, but be very careful not to rub right through to the fibreglass. A good wipe with a solvent rag to remove any grease, and then a Tack rag (available from most auto paint supplies) to remove any dust and you are ready to paint.

I won't try to explain how to use a spray gun as this is something that takes quite a lot of practice and not just a couple of paragraphs of reading. Like I said if you haven't ever used one it's best left to the professional.

Polyurethane paints are produced by most of the big paint manufactures. Here in Australia there are many different brands available. I personally use Dulux Luxethane, mainly because it is available in small quantities at a reasonable price. By the way, don't let any body tell you that you must use a special marine paint, if you can get hold of a good industrial two-pack polyurethane then that will do the job.

Some of the other manufactures are: Mirotone, International, Wattle, Epiglass, AWL CRAFT, AWL GRIP, BUF (British United Formula) and Glasurit.

In England and Europe I'm sure that BUF, International and Glasurit are readily available. Some are more expensive than others, but this doesn't necessarily mean that the quality is in direct proportion to the price.

FITTING OUT (DECK)

This part is relatively simple. There will be two jib sheet leads, five 3mm eyebolts and two sheaves, one of which will hang from the small U shaped saddle on the forward bulkhead. The holes for the eyebolts and sheave will already have had the threads tapped, so you won't need to do that. If the boat has had a finish coat applied then just be aware that some of the paint may have found its way into the holes and could make it difficult to screw the fittings in.

The eyebolts that I use are standard 3mm x 20mm eyebolts available from Radio Yacht Supplies Australia (Malcolm and Shirley Kampe). Graham Bantock's eyebolts (Sails etc.# 37) are available from most other suppliers that stock his products.

Firstly, four of the eyebolts can be cut off so as to have only 10mm of thread showing. I leave one of the washers on each eyebolt so that when they are screwed into the deck the head of the eyebolt can tighten onto the washer and not chew into the deck. So with one washer on the eye-bolt there should still be 10mm of thread showing. The fifth eyebolt is for the backstay and can be cut to have 6-6.5mm (max) of thread showing. Don't cut this any longer than 6.5 mm because there is only about 8mm between the deck and the hull at the point where this eyebolt screws in.

Fitting out continued.

To help keep the boat watertight, put a drop of thick super glue or epoxy in each hole before screwing the eyebolts in. Put the glue/epoxy in the hole and not on the thread or the glue will squeeze out all over the deck.

With the flat mount sheave you will need to remove all the washers and nuts that come with it and cut the 2mm metal thread bolts off so that 6-7mm of thread protrudes below the sheave. Put one of the tiny washers back on the front bolt so the sheave will sit up at an angle from the floor at the front. Use a small drop of thick super glue or epoxy in the holes once again and if using "pekabe" sheaves be very careful when tightening down the bolts. They are made out of brass and are quite delicate, and if you are too heavy-handed it is quite easy to strip the slot off the top of the bolt. This makes it extremely difficult to get them out again. Guess how I know that...? Robert Hales sheaves (Hales Instruments) come with stainless steel fasteners, which can take a lot more force. The front free hanging sheave simply hangs off the back end of the mast step.

The jib sheet leads should be pushed into place with only enough protruding above the deck to feed the sheet with a knot through. Or, if you prefer, enough to be able to feed through the sheet hook that connects to the boom. If the leads are left sticking up too high there is a possibility of a loose sheet catching on them during a gybe or at any time the sheets are slack. Once again a bit of thick super glue in the hole first and push them into place using a pair of multi-grips or pliers.

SWITCH

The switch that I use is available in Australia or New Zealand from Dick Smith Electronics at a cost of about \$3.50. It is a double pole, double throw, miniature switch and the catalogue no. is P-7656.

When soldering on the wires, it is best to have both the negative and the positive wires running via the switch. This means both conductors will be isolated when the switch is off, which will help stop corrosion around the negative contact in the battery plug. Beware of the dreaded Black-wire effect!

If you are using a Guyatt winch then the switch will be wired in between the battery and the winch, if you use an ATLAS Whirlwind then the switch is wired between the battery and the receiver. As yet I haven't had much experience with other makes of winches so it's probably best to refer to the instructions supplied.

Weatherproof hood

This is also available from Dick Smith in Australia and costs about \$3.40. The Catalogue number is H-1914.

To ensure that the hood seals correctly against the deck, you should unthread all the washers, etc, from the shaft of the switch except the last nut. Leave it down the shaft about half way then place the large flat washer back on top of the nut with the indent in the washer facing down. Now screw the hood down as far as it can go making sure the nut is still out of the way.

Once that is done tighten the nut back up until the washer touches the O-ring on the under side of the hood. Now remove the hood. Put a bit of thick super glue between the nut and washer so they can't move during installation. Make sure you let the glue dry before you install the switch. Put a bit of Vaseline (petroleum jelly) under the O-ring and you shouldn't have any leaking problems.

SERVO

One of the sensible things about the One-Metre class is the practical minimum weight. This means you don't have to use super light receivers, servos, batteries, etc. I usually supply the boat with the servo mount installed, which has been cut to fit most standard servos. Hiteks' standard servo is about 41mm

long, so that is what I allow for. There is no need to use a miniature servo but if you want to and didn't inform me before the servo mount was glued in then you could just cut a small piece of plywood to fit on top of the existing mount.

Once you have the Servo and Receiver installed, power them up and turn on the transmitter. Centre the trim adjustment on the steering gimbal and check that the servo arm is at 90 degrees to its centre line of the servo. If not, you will have to remove the screw that holds the arm on the shaft and move it to a new position. Sometimes it can be quite difficult to get it right on 90 degrees. If this is the case then try turning the servo arm right around 180 degrees, sometimes this does the trick.

PUSHROD

After you have installed the servo it is time to connect the pushrod.

Check that the nylon snap lock is wound about halfway on to the threaded terminal end. This means that if, when bending the out board end of the pushrod to go through the steering arm you get the length a bit wrong, it will then be possible to adjust the nylon snap lock either way to get the pushrod length correct.

Use a pair of Multi-Grips or Vice-Grips to bend the outboard end of the push rod (see next section on boot seal) and then cut it off so that there is about 6-mm sticking down. Push this end through the hole in the steering arm that is the furthest from the centre of the rudder shaft. Use a pair of bolt cutters or a swaging tool to flatten the tip of the rod. This will stop it coming out of the hole. (See deck layout diagram)

BOOT SEAL

If the boat is to be painted after you have taken delivery of it, then, I will have supplied a small "boot seal" which is to be installed on the aft end of the push rod exit tube. (See deck layout diagram) This should be done after the boat has been painted.

The seal needs to be slipped onto the pushrod prior to it being bent to fit the steering arm. When you have finished fitting the pushrod to the steering arm you can then fit the boot seal. There will most likely be a small ring of masking tape about 2 mm wide that I have wrapped around the exit tube to stop paint building up the diameter of the tube. Remove the tape and slide the seal up over the exit tube until it hits the ring of paint that has been created in the painting process. To hold it in place I use thin super glue. You need to be especially careful that glue doesn't get between the seal and the pushrod, I use a piece of rigging wire or something very fine to transfer a tiny drop of glue and place it right in the join at the front end of the seal. The thin super glue should wick its way around the join and create a good and reliable seal. Smearing a thin film of "Vaseline" (petroleum jelly) on the pushrod where it goes through the seal will guarantee the smooth operation of the steering system.

RUDDER SHAFT

There will be a small flat filed on the rudder shaft for the steering arm screw to tighten against. This makes sure the steering arm locates at 90degrees every time you rig the boat. I strongly recommend that you remove the rudder when you store the boat after sailing, especially if you sail in salt water. It is also a good idea to rub a small film of Vaseline on the shaft every now and then.

RECEIVER

I can say with some confidence that my boats don't leak, but every now and then, for whatever reason, some water may get in. So just in case, I prefer to mount the receiver up under the floor next to the keel case on the starboard side. I use Velcro to hold it there and I install this as standard. The piece of Velcro that I have installed under the deck is the hook side so you will need to obtain about 50mm x 25mm wide of the soft side (available from haberdashery stores; i.e. In Australia Lincraft or Spotlight).

AERIAL

It is tempting to just run the aerial inside the boat, but personally I have found it best to run it externally. The boat comes with a plastic tube installed so you can feed it through and out up to the backstay. You may need to rub a little Vaseline on the first few centimetres of the aerial to make it slip through easily. If you can't find the tube it will just up under the deck on the starboard side adjacent to the aft hatch.

Shrink the piece of heat shrink tubing that I supply around the top of the plastic tube and on to the aerial at the end that exits the hull. This should stop any chance of water getting down the tube and in to the boat (see cockpit layout diagram).

At the top of the aerial attach a small hook made out of a fishing tackle clip or thin stainless steel wire. Then use a rubber band to connect it to the backstay.

It's advisable to tie a knot in the aerial at the forward end of the plastic tube inside the hull to stop the aerial being pulled out of the receiver in a collision or during rigging.

Some of the cheaper modern day radio sets have a short aerial on the receiver, only about 500mm long. This is fine for sailing on your own, but in a race situation when there are lots of signals being transmitted in a small area, interference is highly likely. I have found it worthwhile unsoldering the existing aerial from the receiver and soldering on a new piece of aerial wire exactly twice the length of the original.

Don't be tempted to wrap the aerial around the backstay. The experts tell me that this will connect the receiver to the whole rig, which will in turn be in contact with the water. Water contains minerals, which makes it conductive. Result = interference with signal, maybe.

Batteries (Boat)

There are quite a few options in this department, so I will explain the set-up I use and why.

I use a Rob Guyatt winch, which is able to take from 6V to 7.2V. The higher the voltage, the faster it goes! This sounds great for that leeward mark rounding coming off a run, but speed comes at a price. It is important to have a smooth winch operation, especially around the close-hauled position, but with the higher voltage comes faster acceleration making it more jumpy.

If you have an earlier model Guyatt winch than the 380, then using five Ni-cad cells (6V.) will be nice and smooth but a little slow. These early winches can take eight cells (10.6V) which makes it really fast but a bit too jumpy, so I opt for 6 cells (7.2V). If you have a 380 model Guyatt winch then 5 cells (6V) is the size pack I would recommend. Rob's latest winch the 280c is the one I would recommend if you intend using a Guyatt winch.

The ATLAS Whirlwind winch is available in 6 or 7.2V. It is really important that you only use the recommended Voltage. I have seen what happens to these winches if you stick to much voltage into them. And it's not the winches fault!

I use 1000mAh Sanyo Nickel Cadmium cells arranged in what is called a flange pack. That is, two rows of three standing beside each other (see cockpit layout diagram). There are many suppliers but in Australia I get mine from Battery Specialties; 240 Boundary Road, Braeside, Victoria 3195. Ph. (03) 9587 2101. Each cell costs about \$5.00. Get the supplier to make up the pack and also to solder the leads on.

It is possible to get higher Milli-Amp-Hour batteries, that is a battery that will supply a certain current for a longer period of time, e.g. Instead of 1000mAh it is possible to get 1200 or 1400mAh packs. Personally, I find that my 1000mAh pack lasts me all day long no matter how much racing I do, but it does need recharging to do a second day. For this reason I get into the habit of charging before every days use, but with a longer life pack, I have seen people lose track of how much charge is left, simply because there was no need to recharge after a days racing

A final word on the batteries. I feel it is important to waterproof the battery pack in case of a mishap. I do this by putting heat shrink tubing over the pack in both directions and sealing the second one with some silicone rubber around the ends as it shrinks down. The heat shrink tubing should be available from the supplier of the batteries, if not most electrical trade supply stores should carry a variety of sizes. A five or six-pack of AAs makes a nice neat size that will fit behind the servo just in front of the main sheet post. I hold it in place with Velcro just like the receiver.

Battery plugs

There are many types of plugs and it comes down to personal choice. I use a plug from RS Components; 2094 Salmon Street, Port Melbourne, Victoria 3149. Ph. (03) 9330 3666. They come in a red and black pair with separate silver-plated contacts. The part numbers are: Red housing 534985. Black housing 534979. Silver plated contacts 534963.

The only draw back is that you have to buy 10 pairs at a time and that will cost you around \$40. Most auto electrical plugs will suffice. Some people use more expensive gold plated connectors, but whichever you choose you need to make sure that the connectors are capable of handling the current required by the winch that you have chosen.

WINCH INSTALLATION

The winch compartment in the boat will take most of the commonly used winches. The Deck Layout diagram for the Guyatt winch shows the winch drum slightly offset to starboard, this is because the Guyatt winch does not have its centre of gravity at the centre of the drum.

I supply the winch plate already cut for either the Guyatt or ATLAS Whirlwind winch depending on what I am told at the time of order. The ATLAS Whirlwind winch has to be mounted from up under the ply floor, so I supply the winch plate with a couple of pieces of 9mm ply glued up under the floor to take the fastening screws (see diagram).

Special Note for Whirlwind winches.

There are a couple of very important points to fitting the Whirlwind winch. The first is, when the winch is fitted up from underneath it should protrude just a little above the floor (.5mm-1mm). This is done so that any water that comes in via the winch drive line or return elastic will run off the top of the winch and not sit in a depression as would happen if the winch were lower than the floor.

I am told that the winch has the best water proof seal available on the output of the drive shaft, but you only need a tiny bit of moisture to somehow creep inside the sealed electronics and the winch will stop. So if the winch is a bit low it may be necessary to sand or file a small amount off the plywood mounting blocks.

The next important point is the small cut out in the aft plywood-mounting block that accommodates the lead into the winch. This may have to be made slightly deeper or wider to allow the wires and silicone to sit without pushing on the plywood. It's probably best to do this with a file but be careful if you are making the cut out wider not to take so much off that there is none left for the mounting screws.

Also care must be taken when fitting the winch not to break the silicone rubber seal around the wires. If the seal is broken then it is only a matter of time until moisture will find its way in and the winch will stop working.

When the winch is properly fitted and screwed in from underneath I then advise running silicone rubber in the small gap around the winch. Do this from the top and if the winch is protruding about 1mm it gives you an edge to work against. Don't use too much as you are only trying to keep the water from running down beside the winch, you are not trying to glue it in.

The Futaba FP-S5801 winch is basically the same, and if I am informed at the time of order I can cut the floor to take it. I've never installed a Hitek winch but I know of other who have, so it should fit right in without a problem. For any winch that I'm not told about at the time of order I will supply a blank 3mm-plywood winch box floor.

With the winch screwed in place and the wires run you can now seal the winch box floor in place. I use a silicone bathroom and kitchen sealant to do this and if you purchase a tube with the long spout you can quite accurately push silicone down into the crack around the floor. I then use my finger to complete the job. With a rag or tissue clean off any excess and you'll be left with a nice neat white line around the floor.

Whatever you do **don't let any silicone get under the floor** or you'll never get it out again.

SHEETS AND DRIVE LINE

After the winch is in you can run the sheet drive-line and return line.

For the drive-line it's best to use Dacron or Spectra, also known as Dyneema or spider wire. I wouldn't use anything less than 24kg or 50lb breaking strain, and the same for the sheets. I've experimented with many different weights of Spectra and have settled on 36kg for the sheets and the drive-line. You'll have a lot less trouble with broken sheets if you use this strength or heavier. You can get both Dacron and Spectra from fishing stores or kite shops.

I use hat elastic for the return of the drive-line, it works extremely well and keeps constant tension on the drive-line throughout the whole operating length. The black elastic is better in the UV rays than white and will therefore last longer. Refer to the deck layout diagram for the direction that the drive-line runs onto the winch drum.

I use a fishing clip (available at any fishing tackle supply) for joining the sheets to the main drive-line. It's rated at 20kg and is way strong enough for the job. In its close-hauled position it should be just ahead of the rudderpost and should run forward about 320-340mm. This is enough to get the jib boom forward of 90degrees if necessary.

BOW BUMPER

If I painted the boat for you then chances are that I will have glued on the bow bumper, but if not then a little preparation will go a long way to keeping it on. It's best not to glue it on until the boat has been painted, as masking tape won't stick to it.

Firstly you need to give the bow a light sand just in case there is any over-spray or paint drips from putting the finish coat on. I use a bit of 240 grade Free-cut sandpaper glued onto a small piece of timber so it's nice and flat. After sanding the bow it is then advisable to wipe both the bow and bumper with a cloth containing some kind of solvent like MEK, Toluene, Acetone, or even Metho (alcohol)

Using Selleys Bathroom and Kitchen sealant (Silicone Rubber) spread some on both surfaces then push the bow bumper into position and slide it up and down a little to make sure that it is seated properly and the silicone rubber is spread right over both surfaces. There will be quite a lot of silicone squeeze out but don't worry about that yet as it is more important to first get the bow bumper aligned before the silicone starts to cure

Use a bit of eyeola (good eye judgement) to push and pull the bumper into what looks to be the correct position. I use a worn 6" metal rule and slide the end up the join line to remove the excess silicone and at the same time this also helps to correct the alignment of the bumper if it is still slightly out. Do this a little at a time so as not to spread the silicone everywhere. You could also use a putty knife or old butter knife to do the job.

I then use my fingers to get it just right. Most of the silicone has already been wiped off so the mess is minimal. It is best to leave the silicon dry before wiping off the excess, once dried the residue will wipe off the paint very easily.

The silicon cures fairly quickly so if necessary you could use the boat in half an hour.

Once the silicone has dried use a new single sided razor blade to trim the top of the bumper down level with the deck. Hold a small piece of timber against one side of the boat on the join line at deck level and then using a bit of spit as lubricant start slicing the bumper with the razor coming in from the other side. Lay it flat on the deck as a guide, and make small strokes without much pressure.

If you're careful and keep enough spit on the blade then the deck shouldn't get scratched. Keep slicing until you reach the piece of timber, which will help to finish the cut off neatly. This isn't an easy job and unfortunately there isn't a lot of chance to practice

MAST STEP

This is best glued on after all the masts have been rigged completed. It should be glued down using the same kind of silicone rubber as was used to glue on the bow bumper. So once you have a rigged mast with the side stays the same length, spread some silicone rubber on the mast step and with the boat sitting in a cradle and the keel in place put the step down over the keel-bolt and tighten the nut up gently.

Put the mast in place with side stays, forestay and the backstay on. I look from behind the boat when lining up the step, sighting through the mainsheet post to get it straight. It is a good idea to somehow get above the boat and make sure that the mast isn't being pushed one way or the other at deck level. If it is then maybe the step will need to go one way or the other to counteract it.

Tighten down the keel-bolt nut a bit more and just let the excess silicone squeeze out. Let it dry overnight and then run a blunt blade along the edge of the step to slice the excess silicone away and then peel it up.