

pimp my dinghy

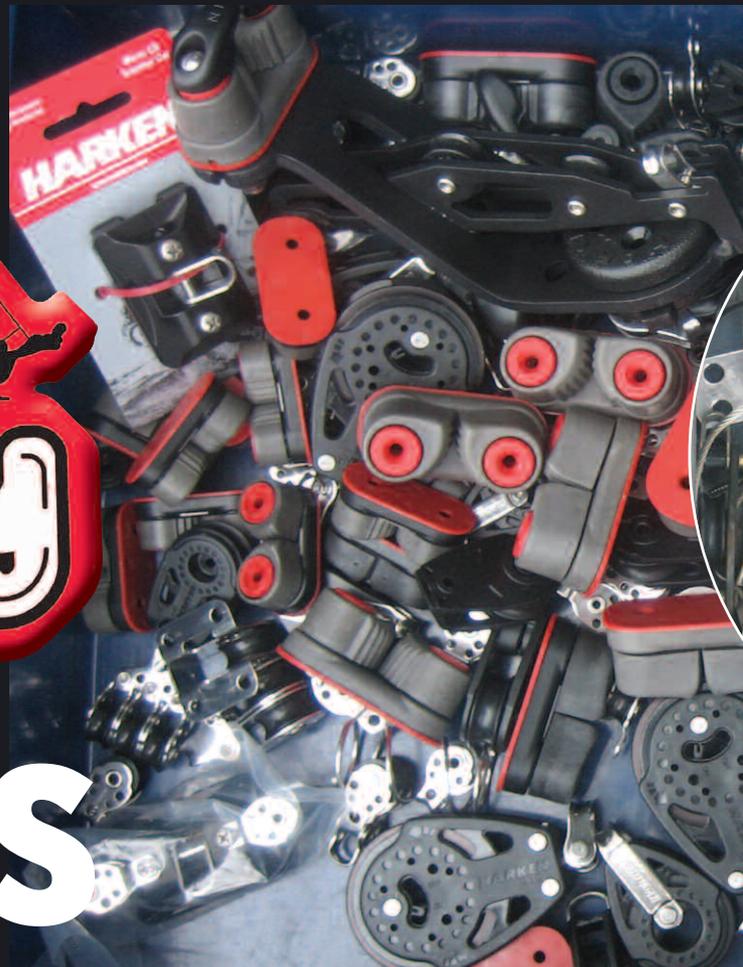
Fittings

pimp

Time for our Fireball to ditch its old fittings in favour of a full set of sexy new deck gear... Here's how the team at **Harken** brought our boat up to date.

Our initial thoughts were 'What have we let ourselves in for?' However, this soon changed when we got down to the job in hand (well, for a while anyway).

Our job at Harken (UK) Ltd was to bring this Fireball into the 21st Century. The very first thing that happened was that everyone gathered round the boat offering opinions, some of which were unprintable. Then we got down to business. When fitting out a boat it is usually a good idea to look at what they are doing at the front of the fleet and fortunately we have a pretty good idea of how things are done on the Fireball circuit.



The main aim had to be to lead all the controls back to within easy reach of the helm and make it as close to the modern Fireball deck layout as possible. The modern Fireball has a multitude of controls including mast strut, vertical and horizontal jib lead adjustment and a kicking strap that is lead back to a cleat mounted under the mainsheet swivel base to allow quick and easy adjustment (see below left).

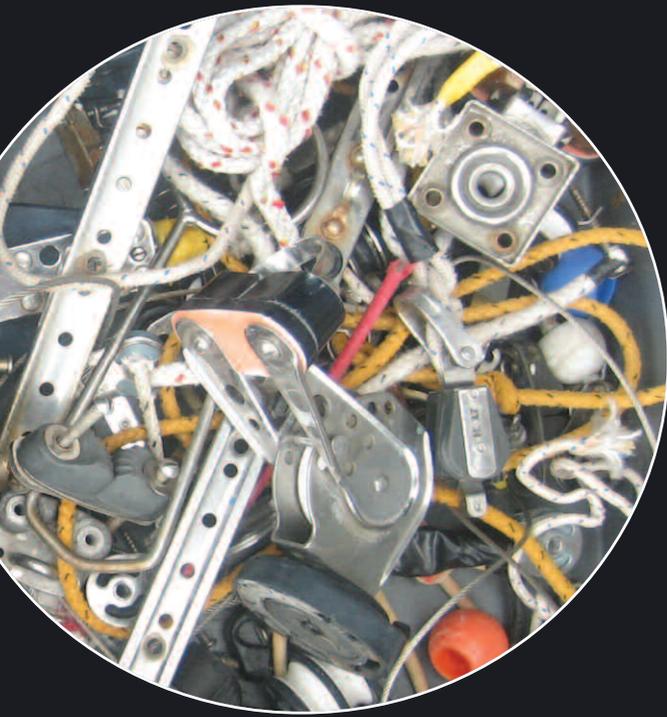
If we could get as close to this setup as possible with this... well, let's say 'a little older Fireball', then our mission would be accomplished!

The clock is ticking...

Our main problem was time, or rather lack of it. We only had two days for this transformation. The Fireball arrived at the Harken base in Lymington, Hampshire with all its original fittings still attached. This gave us a couple of issues, the first being removing all the old fittings before work could begin. Worse, when all the fittings were finally off, we were left with a multitude of holes around the deck. This instantly limited us as to what we could achieve. We simply didn't

Right The modern Fireball has a multitude of controls including mast strut, vertical and horizontal jib lead adjustment and a kicking strap, led back to a cleat mounted under the mainsheet swivel base.





have the physical space to bolt fittings in place.

The first step was to place the new fittings around the deck to see what we could do. Placing fittings around the boat like this gives a good idea of where they will fit, how they will function and how they can be integrated into a final deck layout.

Problem one: the kicker

It was instantly obvious that we would have to come up with another idea for the kicker. As mentioned, the modern boat has the kicker mounted under the mainsheet swivel base. This requires a lead up through the middle of the swivel base. On the project Fireball the mainsheet swivel base was positioned directly over the centreboard casing meaning this would be impossible without major structural changes.

We overcame this by mounting a couple of small Carbo Cleats with X-Treme angled fairleads on the thwart. The X-Treme Angle Fairlead allows the line to be released and cleated at angles up to 90 degrees to the cleat. This sets it apart from other fairleads where the line uncleats at extreme angles but can't be recleated without centering the line.

The kicker was made up of a 4:1 cascade leading to a 4:1 system running down the front on the mast, giving a total purchase of 16:1. It was then split to cleats either side of the thwart. This gave a good powerful system that was not too much in the way for the crew when crossing the boat. The main blocks used for this were high strength wire blocks that use low-friction thrust bearings and also feature ball bearings in between the sheave and the side plate to minimise friction from unfair leads – a great block for high load control lines. The first block in any purchase is always the most loaded and it is very important when looking at changing a system to think about how much load the fitting will actually see. In a cascade the load will decrease by half in each purchase. For example, if there is 100kg running through the first block of a 4:1 cascade the final block will only

Choosing fittings

When choosing a block there are a number of things you need to think about. **Harken's Mark Gardner** shares a few simple tips...

Loading

The actual load a block will see is dependent on a number of variables. The main and obvious one being what it is being used for. The first block in a kicker cascade will see a lot more load than the last block. The second, and not so obvious one, is the amount that the line is round the block – the 'rope wrap'. If there is only a 30 degree deflection, the block will only see 52 per cent of the line load; however if there is 180 degrees of wrap the block will see 200 per cent of that line load (see image below).

Line speed

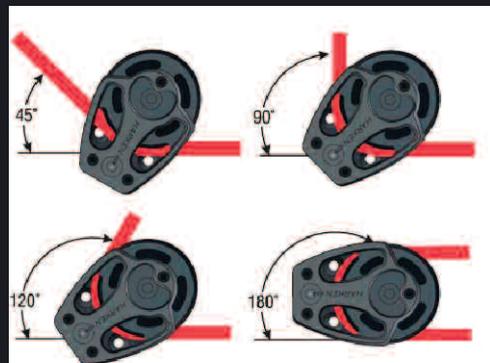
This is the speed that the line is working, for example the lines in a rig tension system have a much slower working speed than the spinnaker sheet. It is important to fit the correct sheave size for the job. A 16mm sheave will not allow the line to pass through it as fast as a 22mm sheave. In the case of the Fireball we fitted 22mm and 29mm sheaves in the spinnaker take up system for this very reason.

Ratchet blocks

When selecting a ratchet block the same principle applies. If you are sailing a dinghy with an asymmetric spinnaker it is very important that the sheet releases quickly through the jibe. The traditional on/off ratchets give unwanted resistance to the sheet when it is released so, by adding a Ratchamatic to the system, when the sheet is released the ratchet will turn off automatically giving much faster line speeds through the gybe. Once the load comes back into the sheet on the new tack the ratchet will turn itself back on again.

Alignment

It is important that the blocks used are able to align themselves to the line and load. When choosing blocks this should always be borne in mind. We used a variety of fixed head, swivel and flip-flop blocks on the Fireball, each one chosen to ensure that leads are fair and friction is minimised.



Above Out with the old and in with the new.

Right Working out the loads.

Angle of deflection	Load factor	Angle of deflection	Load factor	Angle of deflection	Load factor
30°	52%	90°	141%	150°	193%
45°	76%	105°	159%	160°	197%
60°	100%	120°	173%	180°	200%
75°	122%	135°	185%		

see around 25kg of that load – 25kg is also about the load a person can physically pull; this drops to around 16kg from a hiking position.

Rig tension

The next main control to fit was the rig tension. This was to be a 12:1 system made up from a 2:1 cascade and a 6:1 purchase running along the side of the centreboard casing. We used triple 16mm air blocks for this as they are very lightweight and can take considerable loading due to the use of stainless steel ball bearings. Positioning the tackle there has the added advantage that it is very easy to calibrate by just placing some pen markings on the side of the casing. This way it is easy to replicate rig tensions.

One of the other issues we had to deal with was the position of the spinnaker halyard. Because the

Fireball uses a bag system there is no downhaul within the system. This meant we could fit a very similar system to that of the modern Fireball. We used a 2:1 pump system with a 6:1 halyard tidy up attached to elastic. As the kite is hoisted the elastic pulls and tidies up the loose halyard.

We also fitted a kite bag tidy which helps to stop the kite from pulling out of the bag as you go upwind. This is really useful and very easy to fit as it is just a couple of Carbo Cams and some elastic. The spinnaker sheets were led back to 40mm Carbo Blocks on a stand-up spring which will give a better lead to the 40mm Carbo Cheek block mounted on the quarter. The sheet then runs to a 57mm Carbo Ratchet on another stand-up spring next to the thwart. The ratchet will give the crew as much as an extra 10:1 in holding power, this will make those windy reaches that little bit easier to handle.

For the guy cleats we used 150 Cam Cleats on risers to allow easy cleating when the twinning lines are pulled down.

Jib controls

The next challenge was to try to make the jib controls work. To make this similar to the modern boats, the case struts would have to be moved so that they ran straight across the boat. As things stood, the struts were angled forward, which meant that if you moved the jib lead inboard the leech tension would change – not ideal! The new system is designed to give total adjustment in all directions allowing a very precise jib shape to be obtained. So, the first job was to move the struts and then work out how the lines could be run back. We were running out of room at the back of the boat so we decided to make a joined system with the lead back to a couple of Micro Carbo Cams either side of the centreboard case – one line for up and down and the other would move the lead inboard or outboard.

By using a joined system it meant that both sides would be controlled by one line, so if you adjust one side the setting is replicated automatically on the other side.

The other controls that were led back to the centre console were the spinnaker pole height, cunningham and mast strut.

We chose to run the strut track on the foredeck as this allows the attachment point of the strut to the mast to stay constant, thereby reducing some stresses in the rig.

And next...

With the new fittings on, it just left the paintwork to be patched-up – we didn't have time for a full paint job, that would have to wait to the winter if our boat was going to make it to the nationals. In the next couple of issues, our boat visits Pinnell & Bax and Selden for a new rig and sails. Meanwhile, Marlow spend a day rigging the boat with new ropes, Grapefruit Graphics reveal how they gave the boat an amazing new image, and Gill turn their attentions to the crew. ■



Above With old fittings needing to be removed and replaced, the first step was to place the new fittings around the deck to see what we could do.

Right We fitted a kite bag tidy which helps to stop the kite from pulling out of the bag upwind. This is really useful and very easy to fit as it is just made from a couple of Carbo Cams and some elastic.

