

# Bringing an old boat back to life.

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March 18, 2015

## 1 Something New

Those of you who were racing last year probably dreaded the appearance of the black sail of the Phantom Menace. To tell the truth, a combination of losing a couple of stone in weight and tiring of the brutality of Phantom Sailing led me to think about trying something different-like swimming. I decided to dispose of the Phantom and find out whether my knees were still up to sailing a Contender. I have had one of these years ago and enjoyed sailing it but found righting it from a windy capsize rather difficult because of its tendency to flip downwind quickly. Experience getting the Phantom back up taught me that the only way in a breeze is to Eskimo roll it going under the boat with the centreboard first time round. It's surprising how quickly you pop out the other side. Then you have the wind behind you rather than in your face and once the sail comes up out of the water second time round the wind slows everything down rather than tipping the boat on top of you again. Anyway, I took the plunge and decided to buy a wreck. The M5 is a great venue for the clandestine exchange of boats and one wet afternoon Contender 341 became mine for not too much money. This article documents putting the boat back together.

## 2 Assessing the Damage

As soon as the boat came home, the first thing was to identify what needed to be done. The previous owner had put a number of good pictures onto Apollo Duck to show all the bits and pieces that needed attention (figure 1). Perhaps the most important structural issue was the cracking along the gunwales due to trapezing causing flexing (figure 2) but there were other problems with dents and holes (figures 3 - 5) caused by impacts and the hook of the trapeze harness during capsizes.

An early job was to wash out the tanks with a pressure washer because the boat had been sailed at sea and would have had salt inside the tanks which would hold water and moisture. After the tanks were washed out and everything dried out properly the next step was to pressure test the hull to find out where IT leaked. This was done by making a masking plate with some bicycle inner tube stuck to it to create a seal applied to one of the hatches (figure 6). A makeshift pressure valve made out of drainpipe with one end blocked off dipped in to a big bucket of water means that an electric car tyre pressure pump can be connected to the system to pressurise the tanks (figure 7). The key thing is to ensure that you don't pump the tanks with high-pressure air as that would have a chance of splitting watertight joints. If the pressure builds up too much, the sealed drainpipe starts bubbling thereby reducing the pressure. The options are then to either use your



Figure 1: Contender 341 with sail



Figure 3: Transom damage

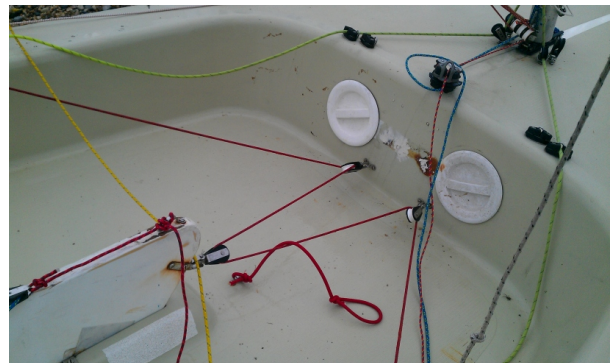


Figure 4: Forward bulkhead damage



Figure 2: Gunwale cracking



Figure 5: Bow damage



Figure 6: Makeshift blanking plate covering a transom hatch

hand to feel the escape of air through leaks or paint on some water with washing-up liquid and then watch for bubbles (figures 6 - 10).

In this case there was a leak between the centreboard case and the floor of the boat. The only way of dealing with this is to tip the boat on its side (figure 11 ) so that the defect can be cleared out with a Dremel rotary file (figure 12 ) and then with plenty of protection from newspaper (figure 13 ), run epoxy into the gap to create a seal.

### 3 Gunwale Reinforcement

The next step was to turn the boat upside down and reinforce the gunwale where trapezing had caused cracking of the gelcoat on the deck. I made some mahogany strips to go neatly between the side of the gunwale and the hull and pre-coated them with two layers of epoxy (figure ??). Protection was applied to the hull and clamping blocks used to secure the reinforcement in place (figure16).



Figure 7: Makeshift tank pressure tester

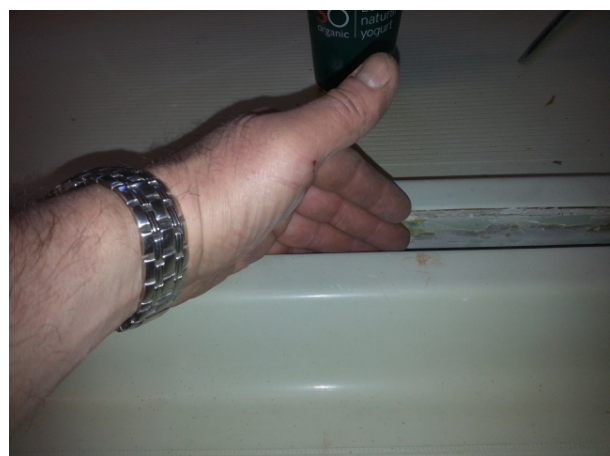


Figure 8: Feeling for air leaks



Figure 9: Painting on water with washing up liquid



Figure 11: Hull propped on its side making the defect easy to prepare and fill



Figure 10: :- ( looks like a case for Dr Dremel!



Figure 12: The flexible attachment to the Dremel file makes the job easy to do.



Figure 13: Whenever you use epoxy, make sure you cover the adjacent structures with newspaper and masking tape to ensure you don't spill epoxy where you don't want it.

#### 4 Making Good Gelcoat Damage

When refurbishing a boat you need to consider whether repainting the fibreglass or patching the holes is the best way to go. Applying a new coat of gelcoat is tricky. Using an epoxy paint is an alternative but either way every coating will add extra weight to the boat. I decided to try and match the colour using a Llewelyn Ryland chart (figure17) and then mix up a litre of coloured gelcoat and apply it in patches to defective areas. Of course, fading due to ultraviolet light and the passage of time will inevitably mean that you're not going to get a perfect colour match by this means. Any defects need to be either chiselled out or reamed out using the Dremel so that there is enough space to put in a layer of gelcoat (figure18). A problem during the winter is that you need to have a temperature of about 12 degrees C as a minimum to enable curing. A fan heater and in my case a wood burning stove helped with this. It's a rather time-consuming process applying layers of gelcoat and then rub-



Figure 14: Mahogany pieces hanging up to allow epoxy to cure

bing them down with wet and dry paper to give a smooth finish. There are a number of tips when patching holes with gelcoat. Firstly for a small patch, put some Sellotape close to the edge of the defect and then masking tape a little further away to hold newspaper in place. After the gelcoat cures sanding with wet or dry paper can be done until the Sellotape starts to be abraded. Use a fairly coarse grit (240) initially and then once the Sellotape is starting to be rubbed at go to something finer such as 800 grit. Towards the end you will need to change to a very fine 1400 grade. It's important to use a little washing-up liquid with the water and a cork block to give you a flat surface. Stop frequently and check that you're not starting to lose too much in the way of surrounding gel-



Figure 15: Mahogany strips in place ready for bonding in with epoxy mixed with a filler. This one has a pulley built into it to take the trapeze elastic through a hole in the deck

coat. If you have a light-coloured gelcoat the darker colour of the fibreglass underneath will start to show through. It's already too late then! Eventually the hull has all its defects filled and you can then use some cutting paste to remove the powdery coat on the surface of the gelcoat. I used a proprietary coating to give a seal to protect against ingress of water and ultraviolet. I spent quite a bit of time on getting this right because I expect it'll be the bit of the boat that most of you see as you sail past me whilst I try to get back in! (figure 19).

## 5 Fitting Out

In the Contender, the mainsheet jammer is on a stainless steel tower (figure 20). This needed removing, cleaning up properly and the new mainsheet jammer set up installing. Because you need the mainsheet jammer to "self tack" an offset is needed between the block and the pivot point on the tower. I mounted the block on some aluminium channel and then mounted



Figure 16: Again with protection using masking tape and newspaper, the strips are clamped in with epoxy and filler. Cling-film is used to make sure that the wooden clamping blocks don't end up being incorporated into it

that onto the jammer pivot. This means that when you tack the cleat is always facing you when you're on the new side (figure 21). Finally a couple of eyes needed mounting on the base of the tower to take the pulleys for centreboard up and down.

Because of all the damage to the side decks I decided to upgrade the boat with a covering of pro-grip. This is a 2 mm thick foam product. You can either get it plain and purchase some adhesive or have it preglued with a protective backing strip. I chose to have the protective backing strip and preglued version. The pro-grip was applied across the transom (appar-



Figure 17: Once you choose your colour, you can order a pot of paste that allows you to mix at 1 to 10 ratio with gelcoat to give you your new colour.



Figure 19: Hull after burnishing and sealing



Figure 18: Defects prepared for Gelcoating in the bow

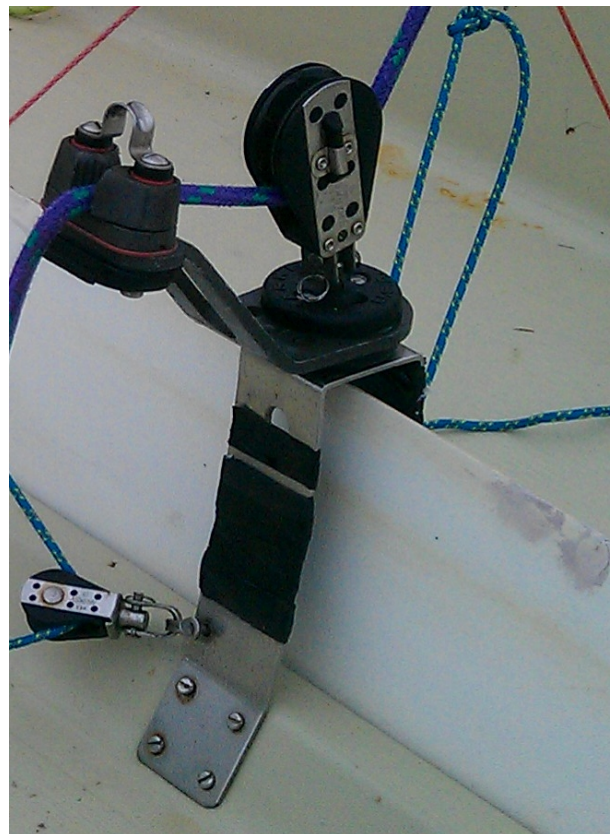


Figure 20: Original mainsheet tower



Figure 21: New mainsheet tower



Figure 22: Layout of pro-grip on decks



ently I will need to stand on that when I'm sailing) and in two strips along the side decks. It is quite fiddly getting it all lined up. Having some pro-grip leftover I decided to put a couple of prayer mats at the front where I would be likely to be kneeling when going downwind in light weather (figure 22). Towards the back I left the cockpit floor in its natural nonslip state. All the cracks in the gelcoat along the gunwale were filled after being cleared out with the Dremel and the dents where a trapeze hook had penetrated the side decks were also filled. A belt sander was used to remove the grit from the gunwales. Apart from one or two patches the pre-applied adhesive worked well but a little bit of contact adhesive was needed in a few places to finally tack the pro-grip onto the edge of the gunwale.

Quite a few Contender sailors use tack sticks. These are carbon fibre tubes with a trapeze ring on the bottom and a pulley on the top. This enables you to hook on and hold yourself up with one hand. I decided to make a cheap and cheerful pair with some pieces of mahogany. A channel routed along the centre took high tensile line from a trapeze ring to a pulley. The two sides of the mahogany were then clamped together with epoxy. After that the pro-grip we used to make a comfortable handle.

The rudder was generally in good condition but like all foils that have been used regularly it was scuffed along the leading edge towards the tip. After cleaning off thoroughly I painted on three layers of epoxy and then spent a long time smoothing it off to get a good finish. The locking mechanism on the Cee-Vee Rudder stock was missing so another one of these was ordered. This is in the form of a plastic cam with a groove in it. When the groove faces down the rudder can lift it and up when the cam is rotated through 180° the cam engages in a round recess in the head of the rudder locking it in place. It's important



Figure 23: Tapped studs to take the centreboard mounting

to line it all up properly in the unlocked position before hammering the locking lever into the cam.

The centreboard was in a poor condition. It had an ominous crack in the gelcoat running transversely at the point where it crosses the keel in the fully down position and also a longitudinal crack on one leading edge suggesting some flex in one of the laminated joints of the wooden core. I decided this was a bit too much hard work for me and passed the job over to Chris Walker at First-Class Fibreglass on the Wirral. The centreboard is mounted on a couple of metal brackets screwed into the top of the centreboard case. The wood inside the case was good on one side but gave no hold for the screw on the other side. A friend ma-

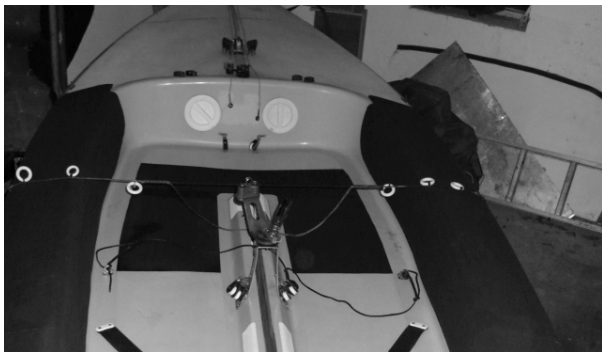


Figure 24: Elasticated line with rings for control lines

chined a couple of 9 mm steel rods with an M5 threaded hole and these were mounted in (figure 23). Although the Contender is a relatively straightforward boat in terms of rigging there does need to be a bit of thought given to setting everything up properly. I elected to have continuous control lines in 4 mm Marlow Excel for the outhaul and Cunningham. These have an elastic recoil going to ring at the bow to take up the slack. The outhaul is more often adjusted than the Cunningham and on that basis I mounted it outside the Cunningham control line. A Dynema line running from one gunwale to the other has some large rings on it attached with cable clips (figure 24). A central elastic piece is spliced into the line to make sure that it's always taught.

Splicing a continuous control line is a bit fiddly. You will need a sharp knife, a long wire splicing fid and some Tipex. There is a very good video on the Marlow ropes website showing how to do this.

Options for the kicking strap include a cascade, a conventional multi-purchase pulley system or a lever and I decided to make a lever from a couple of plates of aluminium. These have a ball bearing pulley at the top end and pins at the bottom end to take a line the foot of the mast and from the boom. In all, this gives me about 16 to 1 purchase. Because of the

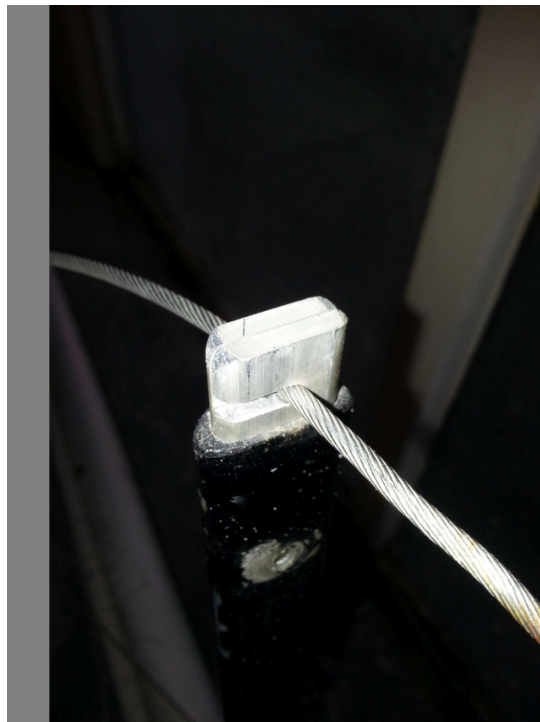


Figure 25: Aluminium plates forming the spreader tip have cut outs that secure the shroud in place

way I've rigged it it might be possible to operate the outhaul and Cunningham automatically from the kicking strap lever completing all three adjustments in one. This requires a bit of experimentation in the future.

## 6 Rigging

The spreader tips had worn away and were corroded and fractured. Thankfully this type of spreader tip is formed from two plates of aluminium. With a blow lamp to heat the spreader and the judicious application of a hammer I was able to remove the spreader tips, reverse them, cut slots out in opposite facing directions for the shroud and remount them (figure 25). On a relatively still day I took the boat out and put the mast up. There are some

basic settings needed to make sure that you are in a good starting position from which to work out the precise set up of the rig. The foot of the mast needs to be as far back as possible so adjustment of some of the bolts on the maststep on the foredeck was needed. Next the rig needs to be raked back quite considerably. A long tape measure run-up the main halyard until it gets to the top black band can be used to measure the rake which should be about 6050 cm from the top edge of the transom. I managed to get reasonably close to this before I ran out of length on the forestay. After that, fiddling is needed to get a reasonable amount of tension in the shrouds with the lever on. Class rules prohibit adjustment of the rig during sailing. A reasonable amount of tension (about 300 lbs) in the shrouds is recommended. Being an old boat I didn't want to overdo things and settled for approximately 280 lbs as measured with a rig tension gauge. After that the lower shrouds can be put on and adjusted. There are some rather expensive Vernier adjustment devices available but I set things up using a screwdriver instead of a pin to get the right length. Essentially these need to be just tight and balanced enough so that the mast is straight from side to side when under tension. Finally adjustment of spreaders and lower shrouds is required to achieve some pre-bend. I'm just over 80 kg now and the recommended amount of pre-bend is about 20 mm. I was slightly under that.

## 7 Weight

It is generally known that all old ladies tend to put on weight. If you're buying a boat for not much money this is expected and such a boat needs to be seen as a training and learning opportunity rather than something that is going to win you the world Championships. Obviously you don't want too much weight.

The question is how overweight is the boat? Stripped of all its loose fittings and the centreboard out a Contender should weigh not less than 83 kg. My boat weighs in at 89Kg. This means that any opportunity to shed a bit of weight is going to help. I have already opened negotiations with Mrs Roberts about replacing the rig with a carbon fibre spar set. Likewise it is possible to have carbon fibre for the centreboard but as with all things carbon fibre cost is the big issue.

Hopefully with new rubber O rings on the hatch covers and the leak points fixed the boat should be reasonably watertight. I purchased a silica gel bag from Halford's and will keep that in the boat when it's not in use to try and gradually absorb moisture from the internal structures. The extra weight arises as a result of water permeating the polyester resin, any internal woodwork that has not been properly coated with epoxy and 100 kg buoyancy of foam stipulated in the class rules. Weighing a dinghy can be done with some bathroom scales placed at the bow when the transom is supported and the transom when the bow is supported but it's not particularly accurate. I had some 200 kg digital scales and suspended the boat with a rope through the centreboard case and a block underneath to give me a very precise understanding of the boat's weight. By weighing the gel pad when it goes in and when it comes out I might get an understanding of how much moisture I'm able to extract over the next few months with a concerted programme of dehydration!

Hopefully I will be able to sail the boat for a season or two to get used to it and then upgrade to a lighter hull once I'm back into the swing of Contendering. I expect quite a bit as swimming but a lot of fun over the next 12 months. Don't forget to wave to me as you go by!