



# Moonlight Shadow

a CX19 from [www.bateau.com](http://www.bateau.com)

by CHRIS SPOONER

**I wanted a boat for taking my lads fishing in and big enough to dive from. Something big enough to go out to the reef from Townsville, which is where we were living when I started thinking about this idea.**

**The boys wanted to learn to water ski, maybe knee board, and be towed behind the boat on one of those tubes that are so much fun. So a boat big enough for all those boating activities that we all wanted to do.**

Searching around some boat plans sites on the web, I spotted the C19 at Bateau's site. An open boat, centre console, especially suited to fishing and yet still very suitable for all the above activities. It looked great.

I showed the site to my wife who immediately said "no way - it hasn't got a cabin". If I wanted her to come out in it, it needed to have a cabin like the last boat we had owned.

Reluctantly I passed on the C19, and gave up thinking about building one.

About 18 months later while living in Brisbane, I happened to browse the Bateau site again and there was an addition to the range - the C19 Express, or CX19. This was the same C19 I had liked earlier, but a cabin had been added. Yippee. Here was the boat I had liked the look of, and by having a cabin met the only stipulation my wife had set. I quickly printed off the site pages, and showed them to her. The cabin was fine. The all clear was given. Before she could change her mind, a set of plans was ordered.

Being 'metricated' here down under, I had ordered the metric version of the plans not realising that there could be a few errors with the conversion from the original imperial plans.

Another thing that came became apparent, was that I was building one of the first of the cabin versions, and that had its own inherent set of problems. But that comes later.

Being just a little busy building the Joey 'Not a Bug' as published in AABB #46, and subsequently the Diva Kayak 'Twins' as published in AABB # 47 and #48, I had to bide my time with regards to starting to build the CX19, but at least I had the plans to drool over.

With the kayaks nearly complete, I ordered the ply, some resin and fibreglass tapes from BoatCraft Pacific, as per the bill of materials. The ply was listed as eight sheets 6mm, 10 sheets of 9mm and two sheets of 12mm. I was able to pick it all up during the visit to Brisbane to launch the Twins.

The CX19 is built upside down on a jig, using stitch and glue techniques. The frames on the jig, with one exception, are what will eventually be used inside the boat. The one exception is the cabin frame which would put the boat too high on the jig, so a 'scrap' one only as high as the others is used temporarily.

Four big stringers separate the bottom and the floor, and align and support the frames.

When the hull is complete and totally glassed, strakes added and finished - painted too if you want - it's turned over and the frames and all stringers etc removed. Then the inside is glassed, and all the bits and pieces put back in or on, all glassed in as you go, until it's complete. If you count all the layers of cloth and tape at the transom and bottom join, there is a total of 11. That should be super strong!

The hull is a composite of timber and glass, and reputed by the designer to be lighter and stronger than most fibreglass or alloy craft. Depending on how you want to look at it, I am either building a wooden boat with a fibreglass skin inside and out, or a fibreglass boat with a wooden core.

The cabin is stitched together on the boat but not attached to it until after it has been fully filleted and taped over the seams, which is done with it off the boat. It is nearly completely finished before it is attached to the hull. The console is built completely separate, and joined to the cabin bulkhead later.



**FRAME D.**

I decided I would make all the parts required to build the boat before starting any assembly. I was essentially making myself a kitset, and quickly got busy marking out and cutting all the parts.

That's when the first problems arose. Some dimensions were found to be missing from the stringers, transom and frames details. Luckily for any builders of their boats, Bateau has a web forum where builders have raised questions and got answers to these sorts of problems. By searching I managed to get the answers to my problems. If something I needed to know was not on the forum, then I only had to raise the question and generally within 12 hours I'd have a reply. The joys of the global time difference and the internet - I was working and finding a problem while they were asleep, and they would post me a reply while I was asleep.

The forum also revealed that someone else in Sydney was starting to build one as well, and I managed to get in contact with him so we could compare notes and help each other through any problems.

Something else I noticed was that the plans are aimed at first time builders, and evident in the 'nesting' drawings was a lot of wasted ply as a result of helping to simplify the marking and cutting out.

Being the frugal bloke I am, I quickly rearranged my measuring and layout, and at the end of the job I had saved myself a whole sheet of 9mm ply. Well worth the thought and effort.

The transom is a hefty affair - two layers of 9mm ply, with an engine mount made from a 25mm x 240mm plank of hardwood going right across it. Just finding a piece of hardwood big enough was an

effort. And when it was all glued together, it became a 'two man and a horse' job to move it around.

Once I had the stringers, frames and transom made, I started on the cabin and deck. The nesting drawing has them all laid out, and again I was frugal and saved myself about half sheet of 6mm ply. Next came the bottom and side panels. That's when another discrepancy was noticed. The bill of materials calls for eight sheets of 6mm ply. The nesting drawing shows the cabin and decks requiring six sheets of 6mm ply. Each bottom panel takes two sheets each, and each of the two sides panels take over two sheets each - where was I going to get all of the side panels from when I was only supposed to need a total of eight sheets and had already used six of them? Then I noticed that the BOM for the CX19 was the same for the C19, but the CX19 has the cabin and all the extra bits that a cabin boat has. Darn, that bill of materials should have read 14 sheets of 6mm. About this time I also noticed that the main cockpit floors were made from 9mm ply, yet the parts that fit into them, like the fuel tank hatch, were from 12mm. Another mistake! All the floor parts should have been from 9mm and I'd wasted over half a sheet of 12mm ply. Ouch! There had been half a sheet left over anyway, so really I had only needed to buy one sheet. I ordered more 6mm ply, and persevered with making my 'kitset'.



**TRANSOM complete.**

Before long, a large pile of parts was stacked up in the shed, and I was utilising my evenings gluing the side panel parts together into what became very long and wobbly panels that needed to put somewhere out of the way. Ditto with the stringers, where 16 pieces mostly 8' long become the four double thickness stringers which align the frames and separate the bottom and the cockpit sole. All the parts were becoming a nuisance - taking up a lot of shed space. I decided to make a rack suspended from the shed ceiling at one end of the shed to store them all in, and only after it was all up did I suddenly think that having a rack long enough for the panels was all very well, but

could I get the panels up into it? They are about 20 feet long after all. Nothing else to do but try it! Luckily the 'approach' to the rack was just long enough to get the panels fed into the front of the rack, with a couple of inches to spare. Phew!

Something I had found a little strange at first, was that I was now handling pieces of wood that were over two times longer than a sheet of ply.



**UPPER side panel.**

A far cry from the 8' Feather, Firebugs and Joey I had built previously.

Once I had all the hull, deck and cabin parts ready, I decided to tackle building the steering and controls console. And that's when the real trouble started. Nobody else had built one of these consoles before, and it didn't have a lot of information or detail in the instructions and plans. The plans showed side panels which have six different lengths around their perimeter, but no reference to any one place for the dimensions to tie to. The result is you can lay out six sticks to represent the six lengths around the sides, and come up with a variety of shapes which do not represent the intended console shape.

After a couple of letters to the forum, I was given a new dimension detail for the side panels and managed to continue with the console construction. At this stage it was apparent that there were more parts to the console than what the plans detailed, and nobody, not even the designer, could help. I'm still waiting for him to get back to me on this one ... So I just made it up the best I could, based on the vague pictures supplied in the plans. The end result is quite 'console looking', so I'm hoping it will do the trick. At least it appears to have more than sufficient space for a wheel, the controls and any instruments I care to have.

With all the parts cut out, joined where needed, and given a seal coat or two of resin, and the console finished, I was ready to assemble the boat proper. I had to start assembling it so I could reclaim some shed space!

Now it was time to start on the jig.

The plans suggest the jig should be made from some beams 200 x 50 and nearly as long as the boat.

Luckily for me, a couple of huge floors from some crates that had housed some large equipment were available for me to take away from a wharf. The beams under them were nearly 6m long and about 115mm square. I took eight beams home on my 2.4m box trailer, plus some shorter and slightly smaller ones. More than enough for my jig, but you never know when large pieces of wood like these would be needed, available, and best of all, free!

Did you know you can only have stuff overhanging a trailer or vehicle by a maximum of 1.2m?

Well, that's the law here in Queensland, according to the local man in blue that pulled up and came to have a chat with me just as I pulled into my driveway. He was a decent bloke and didn't fine me as I had my load secured, a flag on the end, and was generally behaving myself on the road. I later figured that even if I had been fined, I was still getting the beams cheaper than buying them!

My next task was to split some of them down the middle and glue each of them edge to edge. My Triton saw bench was not really intended to handle such large pieces of timber, but has survived the monumental task of splitting three of them. That gave me two long ones to be the main beams, and the other to be cut up as the cross pieces of the jig. Lots of glue and plenty of clamps saw the beams joined, and then I had to work out how to set the jig up so it would not move during construction.

I decided to mount the jig on verandah post supports which would be concreted into the ground. So I drilled two rows of three holes in the ground with a post-hole borer. I set up one beam on blocks, all level and square over three of the holes. I bolted the verandah supports under it, poking down in to the holes, and then filled in the holes with quick setting concrete. Half an hour later with the concrete set, I levelled up the other beam in the same manner, and attached it to the first beam with the cross pieces, all the while making sure it was level with the first beam as well. Again the post supports were attached, and the holes filled with more concrete. Another half an hour later the whole arrangement was set, still level and square, all ready to build on. That was the easy bit, and I still had half a day left!

I had to manufacture a sloping support for the transom, and set it up at the right height while

being square across the jig, and centred as well. Working forward from the transom I marked where the next couple of frames were to go, but only set up the third one along. The real trick was to get that frame set at the right height, while being vertical, parallel to the transom and with measurements across from the corners of the transom to the opposite corners of the frame both equal, all at the same time. It was a two person job that took a long time to get done. Once those two critical corner to corner measurements were equal, and everything else plumb and true, I fixed that frame onto the jig.

Then I ran a string line from the transom centre line to the front of the jig, and fixed it in position when the string line also touched that newly positioned frame's centreline. From then on the rest of the frames were quite easy - I only had to make sure they were centred over the string line, and vertical, and the right distance from each other.

Once the transom and that first frame were in place, I put two of the stringers in position which helped align the subsequent frames as they were fixed to the jig.

With the rest of the frames in position, the last thing to add was the bow mold piece. This was supposed to help keep the panels separated but still close to each other as they came together at the bow.

Now I was ready to start boat construction.

The two bottom panels were placed on the frames, and I started lacing them loosely together with cable ties, every 150mm along the keel. Where the bow started to curve, I had the ties only 100mm apart.

With those two done, I started attaching the first (lower) side panels. The sides are made of two panels which overlap by some 110mm, which gives a style-line along the boat and breaks up what would otherwise be quite a 'slabby' looking side, and creates a strong and rigid stringer effect right along both sides of the boat. These two

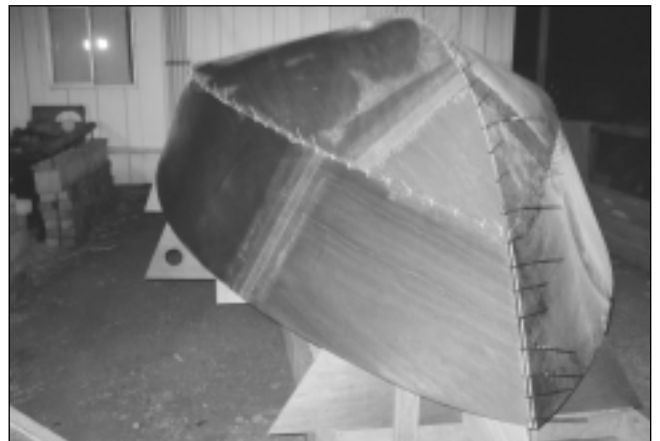


**FRAMES and stringers on jig.**

panels were quickly attached to the bottom panels, and where they curved around at the bow, were laced to leave about a 10mm gap. The instructions call for this, and the designer says to span the gap with fibreglass cloth later and it will form a nicely rounded bow.

Lastly the upper side panels were glued to the lower ones, and laced together at the bow with the same 10mm gap. I wasn't happy about spanning a gap with the cloth as per the instructions, so once I had all the panels in place I filled the gap with thickened glue after sticking some tape behind it. I rounded that over, and feel more comfortable knowing my bow is a solid piece.

Standing back, I was amazed. Where just a weekend before there had just been bare ground, there now was an upside down boat hull. And it was huge.



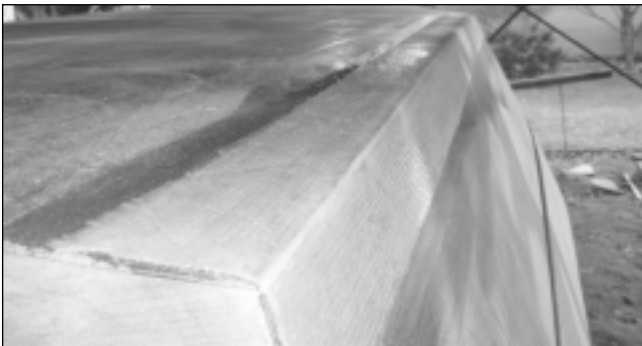
**BOTTOM and lower side panels stitched.**

During the evenings over the next couple of weeks, I glued all the seams between the ties, removed the ties and glued the gaps and filled the holes where the ties had been. Then I sanded the joins, making sure the chines were well rounded over to ensure the cloth would have a rounded corner to sit on. I glued the panels to the transom, and generally got it ready to fibreglass. I wanted to glass the sides completely, although the plans say you can stop at the panel overlap join, and so I ran a fillet along the edge of the overlap and also rounded off the remaining edge, so the cloth would sit over the join. The style line is still very apparent.

The plans call for the joins to be glassed with 150mm wide double biaxial tape, with the keel and transom joins having two layers overlapping by 50mm. Once they are done, the hull gets wide strips cloth laid on, with overlaps at the keel and wherever else they happen to fall. The tape strips were easy, and the wider cloth not difficult but

very time consuming. One 6m long strip, 1.25m wide, takes me about three hours to lay and takes about three litres of resin!

With the cloth, I overlapped the keel by 150mm, which meant the rest of the cloth went over the chine and stopped part way down the first of the side panels. The second cloth went from the sheer line, back up over the chine and finished part way towards the keel. Although the plans don't call for it, I capped it all with another run of cloth, this time centred on the keel line, and it overlapped the two coming up from the sheer. It also ran down over the transom to the motor well, right where the engine will be bolted.



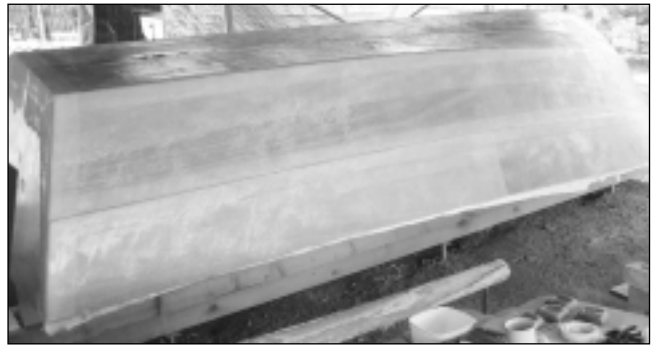
**CHINE tape.**

With the cloth all complete over the hull, I put on a full layer over the transom covering all the overhangs from the hull. I still had strakes, a chine rail and the gunwales to add, and the huge task of fairing it all.

The strakes are simply a long square piece of timber sliced along the diagonal. The plans detailed a piece of 25 x 25 cut diagonally, so that's what I did. Sitting on the hull, they seemed tiny. I hopped on the forum and checked for some other strakes queries, and found that they were supposed to be from a 2' x 2' cut diagonally. Rats! Another conversion error, and more wasted timber and time.

Luckily I had plenty of spare timber left over from the beams. The chine spray rails are made from some 40mm x 20mm, as are a couple of 'fenders' which mount just above the chines at the stern, so I cut another long beam in half down the middle, and managed to get all those parts from one half of it.

The gunwales are also 40mm x 20mm. The plans suggest to laminate them from some ply instead of trying to make some timber fit around the curve at the bow. No problem. I quickly ripped a series of ply strips to 40mm. When I went to fit them, I found that they wouldn't follow the sheer line. Ply only bends one way. Rats, more wastage. I had to cut the ply strips to the same curves as the top of



**ONE side glassed.**

the top panel, and laminate those in place. I purposely made them a little oversize, knowing that I wouldn't get them to sit perfectly aligned being slippery with glue while I was clamping them together. I ran some wide packing tape along the sheer, and laminated the strips over the top of it.

When it was dry, I took it off and cleaned up the edges, making the final product the correct size. A 6m long piece of 40 x 20 ply laminate shaped like an extra long and thin mammoth tusk is an unwieldy thing to handle! It looked strange, but it fitted back in place just perfectly. Ditto for the other gunwale, and that was the hull appendages all taken care of.

Just the fairing to go. Easy said, relatively easily done, but it takes a lot of time to fair a hull this size, especially working by yourself.

### **Why the name *Moonlight Shadow*?**

It is a reflection of both my nocturnal boat building habit, and the marks around my eyes the next morning after any particularly long evening sessions.

To be continued in the next issue, where you will see the hull finished and turned, the insides glassed and the stringers, floors and frames going back in. ■



**LAMINATING gunwale 2.**