DIY Building The 5.85m Sportsfisherman

Back in the second edition of PAB, we ran the hugely popular report on DIY building the Curran 485 Cuddy. At the time, the almost universal comment was *"What a brilliant concept - but I just wish the boat was a bit bigger so I could safely take it offshore fishing . . "* Well, thanks to John Pontifax's business in Melbourne, Plate Alloy Australia, we now have a complete step by step report on how you can go about building your own 5.85m offshore fishing platey.

A quick chat with PAB-4 editor, Peter Webster, about one of our most popular boat kits, and also what we teach students at our Boat Building Course, prompted me to offer to share our knowledge with the P.A.B readers.

We had this boat designed by Steve Bruyn back in 2003, and it is a high sided, stable boat, a runabout layout, large open deck and rear access for swimming and diving. With full chine, self draining deck, full height frames at 600mm centres, and plenty of deck space. It makes a great family boat, an excellent fishing or diving platform, and very capable to tackle blue water when you get the chance.

I'm possibly not the best storyteller, but I will tell it how it is, starting with welders, setup, jigs, and of course safety. Always wear appropriate safety equipment when starting a project like this. As this article was unplanned, we have used existing pictures from our own library, although some shots aren't necessarily the ones we would ideally use.

If the readers like the article, next time we will produce a more detailed account of the build, (or maybe a DVD – you will have to pressure Peter and Ruth for that one!)

Get Experience.

Firstly, I must say that we recommend all budding boat builders to attain some competence and formal training in welding. The local TAFE or University can help, and many offer welding courses. When building the boats, we use the MIG welding process for most of the welding.

The Machine.

A minimum requirement would be a 240 Volt welder, and we recommend 240 - 250 amps minimum. We use and recommend Unimig welders, and these are the machines we use at our Boatbuilding and Welding

course.

To set up a welder to weld alloy, we fit a Teflon liner to the mig gun, also "U" groove rollers and oversize tips. The issue with welding aluminium is the feeding of the wire to the welding tip. Aluminium wire is soft, and the combination of low friction liners, a straight lead (minimize the kinks), clean good quality wire, a clean tip and liner gives you the best chance of attaining excellent welds. We use 1.2mm diameter, 5356 grade aluminium wire (do not use cheap wire). We only use the best wire, and it is worth every cent.

So to recap, welder setup, 5356 wire, ("Safra" is our preference), Teflon liner, oversize tips (marked 1.2A, they are actually 1.4mm diameter), and "U" groove rollers. The reason for the "U" groove rollers, is with the soft aluminium, a standard "V" groove roller will put a flat on the two contact points of the wire. A complete half circle

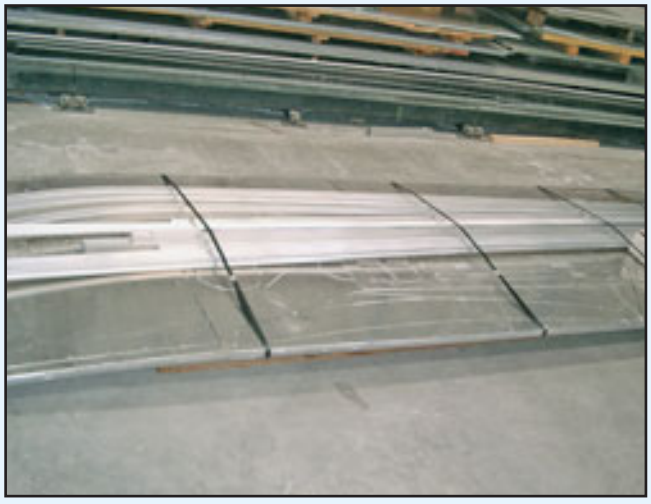
will give the wire the maximum grip, and have less chance of the wire sticking in the liner.

It is also important to blow out the liner every day. Small particles of aluminium dust are carried through the liner and can block at the contact tip, and accumulate at scratched areas on the inside of the liner. This increased friction and intermittent blockages inhibit smooth feeding of the wire to the welder tip. To reduce this possibility, pull out the wire and unscrew the tip and blow out the liner, and the brass neck feeder tube, as shown in the picture (inset), every day.

The Build.

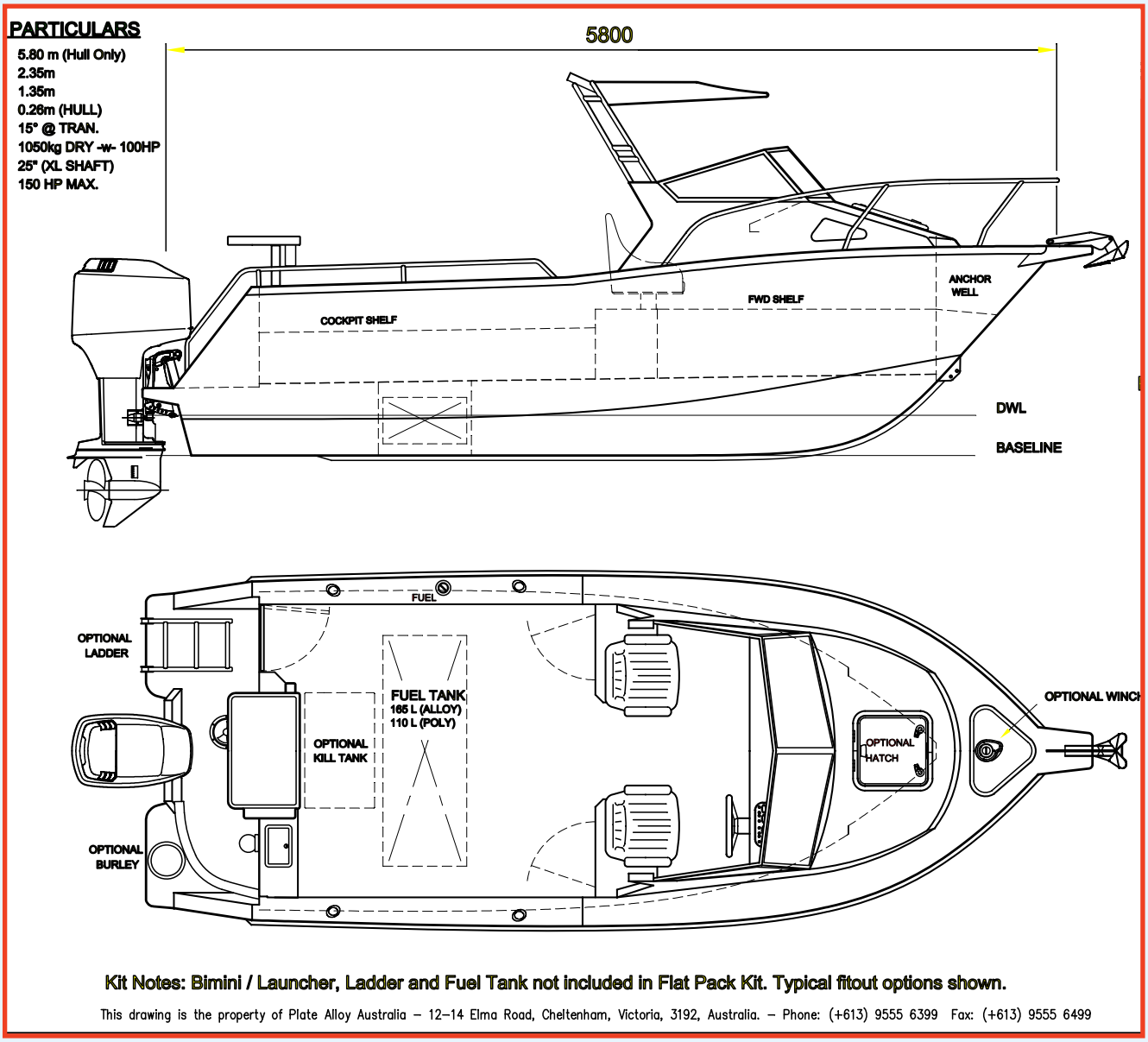
This is the boat we are going to build in this article. It can be built upside down, but for the home builder, we recommend to build it the right way up. Always be careful when lifting, and particularly rolling the boat over. If you are unsure about anything, consult a professional. The boat can be fitted out with various options, but for this boat, we have undertaken a basic fit out only.

We cut the kits on our CNC cutting machines. The kits are delivered in flat pack form, with normally 6.1 m x up to 2.0m wide sheets, in addition to extrusions, bollards, scuppers, drain plugs, inspection ports, construction drawings, a CD with build pictures and a jig drawing at full scale, (or 18mm timber CNC cut jig templates, for a few hundred dollars extra). Mostly, if collected, the kit can



be packed on top of a tandem trailer, or we can top load kits on trucks for interstate delivery. We have been asked if we can cut kits designed by other Naval Architects, and the answer is "Yes". In this instance, it is best for the Architect to contact us to discuss this option.

The first step is to setup the jig. Timber or a steel angle frame is setup to the measurements as shown on the jig drawing, and the frames are bolted to it. We make a steel frame, and put wheels on the corners, and jacking bolts to level it. Once put in place and levelled, the boat



can be tacked and then welded together, and once done, the jacking bolts can be removed and the boat moved in and out of the workshop as required, on the trolley.

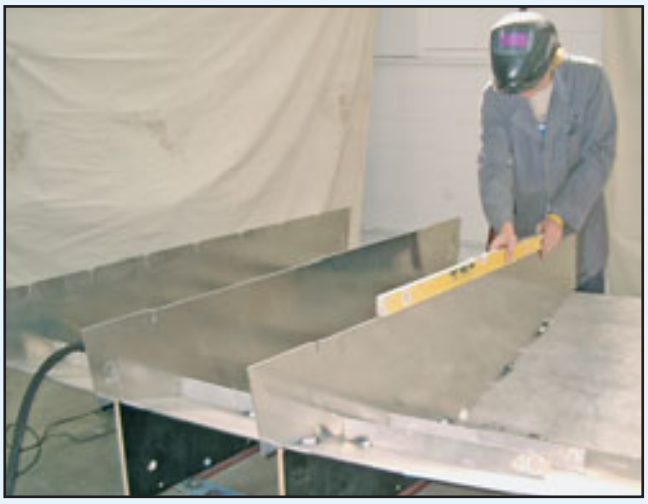
So, setup the jig and check the level. Cut all the parts out of the flat nested sheets, remove the tags and sand the tag area flush and clean the parts. We use methylated spirits to remove any grease or dirt, and put the parts neatly into piles.

It is recommended that any builder view the construction sequence on the CD provided with the kit, so they can get the overall idea in their mind in what order the boat goes together.

Place the bottom sheets into the jig, and align the jig number to the corresponding frame number.

Start by putting one of the rear frames in position and tack weld into place. The stringers are cut as intercostals, and are all numbered with the numbers facing toward the bow, and from the keelson, stringers are marked 1a, 1b,

1c etc, outward toward the chine. The frame numbers are marked and are aligned with the marks on the bottom plates. These numbers are also marked on the chine and side plates for alignment.



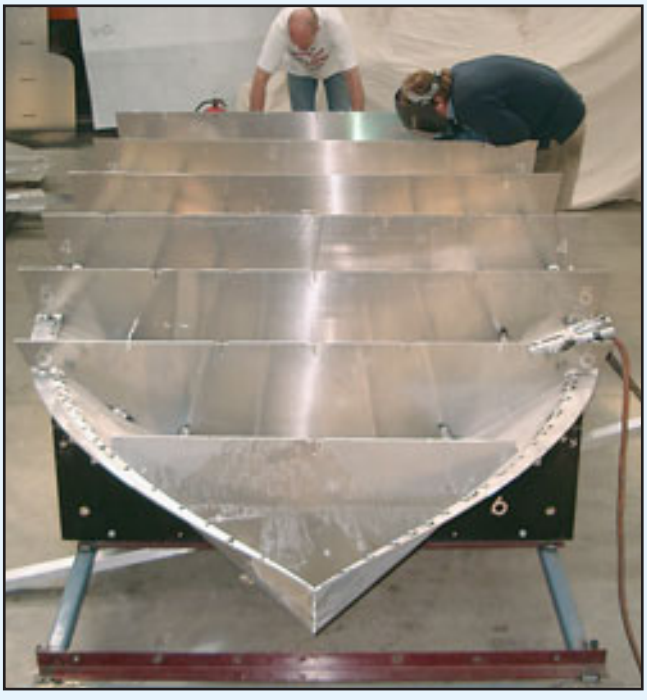
Fit the stringers and tack all plates into place. We recommend to tack weld the entire boat together, this way distortion (due to excessive heat) is minimized.

Working forward, fit the stringers to the next bay, then the next frame, tacking stringers into place as you go. The stringers are aligned with the marks on the bottom plates. After placing each frame into position, check that the frame is aligned and level.

To tack the stringers, we tack at each end on the frame, and 3 tacks on one side, and 2 tacks on the other side staggered arrangement. The stringer should be fitted so that it fits hard up against the bottom plates. In the bay where the fuel tank is fitted, we fit angle to support the fuel tank. The plates either side of the fuel tank bay are stiffened at the outsides, and also have gusset plates.

Toward the front, we use 2 Tonne rated “Come-A-Long” hand winches to pull the plates together. We can supply these if required, or they are available at your local tool shop for about $60 each.

After all the frames are in place, and the bottom sheets

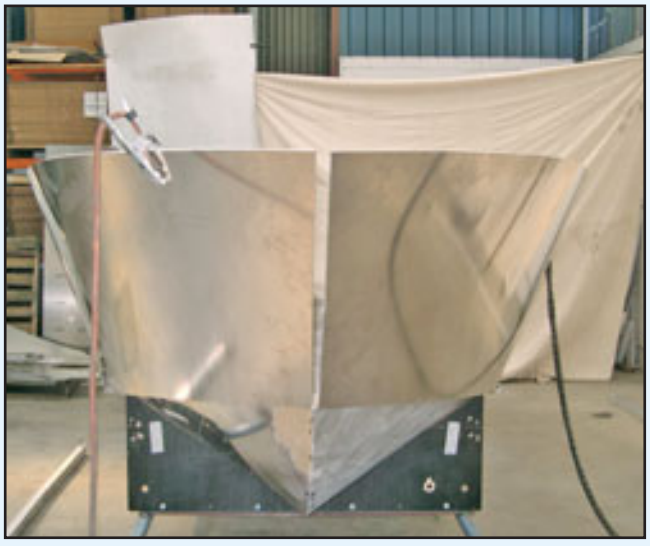


are together at the bow, it is time to fit the chine.

Starting at the rear, fit the chine plate, and tack weld all the way to the front, typically with tacks every 150mm. This is where the sanding of the plates is important. If the tags are not sanded flush, the plate will sit off on the tag, (such is the accuracy of the CNC cutting process).

After the chine has been fitted, we place small strips

under the chine to support the side plates when they are fitted. It is BBQ time, when you need to invite your mates around to have a look at THE project, (it is convenient to then get them to hold and support the side plates while you tack them in place). Starting at the rear, line up the marks on the plates with the frames, and tack the plates at the outer edge. Fit the plates corner to corner as shown in the picture. As mentioned, tack the plates in place, with a tack every 150 to 200mm. Work forward, until the plates meet at the bow. On the inside, the frame is aligned with the mark on the side plate, and tacked in position.



Once the side plates are tacked on, tack the front anchor plate in position, with a few small tacks. We need this in position, so we can position the forward gunnel plates, confirm the dimensions from the construction

drawings, and tack a temporary brace across the boat. Next, tack the rear gunnel plates, and the rear top plate in place. We also tack a strong-back, (or stiffner) across the back of the rear panel at floor level and also where the door opening is to keep the panel straight.

Next is the cab sides, align the marks, tack them in place. The dash plate is engraved to allow folding at

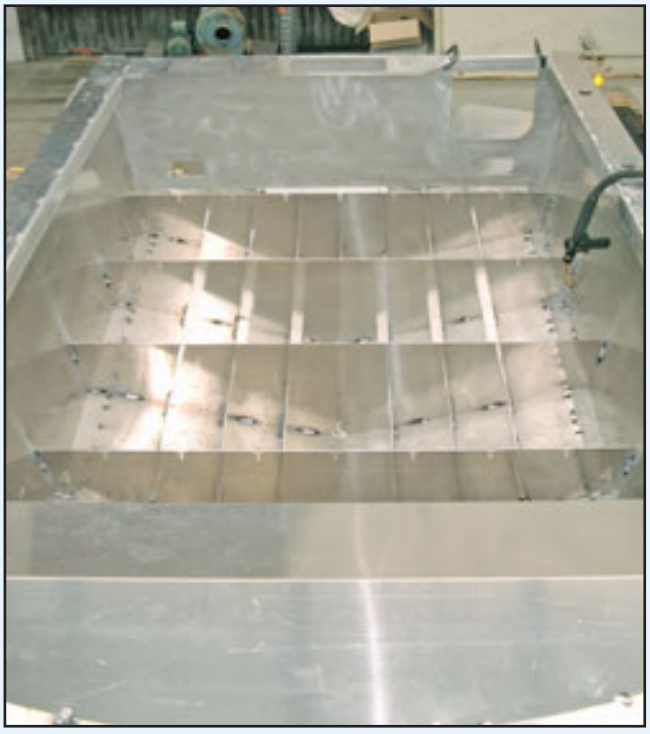
home. Fold the plate to the angle of the engraving marks on the inner cab sides and fit the dash panel and tack in place on both sides. With the dash panel fitted and the cab sides tacked on, the inner gunnel coaming can be tacked on.

With the gunnel coaming tacked on, check the construction drawing dimension, tack a brace from cabin outer top edge to edge, (gunnel edge), mark a midpoint and attach a plumb bob - it should sit dead on the keel. This level checking, and careful alignment now pays its due. The hull should be square, true and all panels aligned perfectly.

The inner coamings are tacked to the underside of the shelves, and the shelves fitted on the alignment marks.

Remember, to this stage, all panels have still just been tacked in place. Next, the cab front and cab roof panel. It is advisable to pre-bend the cab roof by tacking a curved brace to the outside, align the cab roof to the centre marks, and work from the centre out tacking every 100mm.

Now with all the main panels in place, the inner gunnels fitted and a stiffner across the rear panel, the welding can commence.



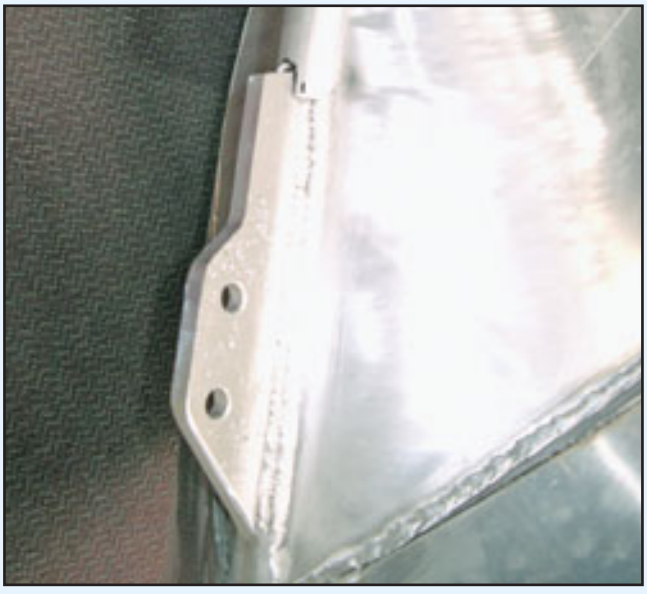
Tack two of the deck longitudinals in place. We tack these to keep the frames upright, but leave enough room to access the stringers for welding. Starting at the keel, weld intermittently the keel join, all the stringers, starting at the keel, working outwards, port to starboard, diagonally, and front to back. This zig-zag pattern of welding keeps heat build up to a minimum and will reduce the risk of distortion.

The inner chine and outer chine can be welded. We normally weld on the inside first, then back-cut the outer and get a good penetration weld on the outer chine and flush sand. The inner chine (underside), we weld and leave un-sanded. All the external welds on the hull are welded both sides.

Once the stringers have all been welded, and the internal welds all done, it is time to leak test the hull.

This can be done a few ways, you can use a dye penetrant, but the easiest and cheapest, is to use soapy water, a brush and compressed air. You will need to have someone help you to do this. Starting at the front (or rear) go along each weld with the air gun on the inside and blow air directly at the weld area while someone sprays soapy water at the same position on the outside. Work your way along on all the keel welds, inner and outer chine and rear transom welds until done. If small pin holes are found, these must be ground out and re-welded.

All the deck longitudinals are fitted and welded into place.



With the main external hull welds complete, and the hull leak tested, the keel coaming can be fitted. It is easiest to roll the boat over to do this. (Another BBQ, a few mates are needed, and the hull can be easily rolled over). Be sure to support the hull safely. Leave the weld proud on the keel, do not sand back, and fit the coaming around the keel edge.

Now that all the work has been completed under the

boat, and the hull leak tested, it can be rolled over and placed back in the jig, or on a trailer if preferred.

Fit the rear shelf and edge coamings, and the RHS frame around the door opening.

The transom has RHS supports to stiffen the area where the engine is mounted, also upright stiffners which connect the stringers to the swim platform top longitudinal "T" bar. Weld the longitudinals square up to the transom along the alignment marks. It is advisable to tack the two outer longitudinals in place, place a straight edge across the flat and fit the remaining longitudinals to the straight edge. This will ensure that the swim platform is flat. Fit the swim platform in place and weld in place. Fit the edge trim under the swim platform and a couple of additional stiffners underside.

Weld all top edges, fit and weld the inner rear panels and weld on the outer coamings. The bow sprit can be fitted corner to corner and welded in place. If a bolt on bow roller is to be used it is worth tacking a scrap of 5mm to the underside to allow a little more material if tapping with screws.

The floor panels can be tacked in place along the edge, and plug welded to the "T" bar. We use a stiffner (strip of 50 x 3 flat bar or similar), along the outer edge where the floor meets the side. This will keep the hull side fair and reduce the heat affected zone at the edge welded area. Once the floor has been welded in, the seat boxes can be welded in place.

Bow rails; decide the style and fit them to the boat. Also grab rails and rocket launcher, if you plan an alloy unit, now is the time for the brackets. All of these ancillary parts must be thought of and brackets welded before the paint is applied, otherwise it will be re-work.

There is a removable section of flooring in the centre of the floor. This is designed to allow buoyancy foam to be fitted to the hull once complete. This is a requirement for the ABP. We can supply ABP plates, but a receipt for the required amount of buoyancy foam must be seen, and a statutory document noting that the foam has been fitted to the hull must also be completed.

The hatch and fire extinguisher/EPIRB box cutouts in

the seat boxes are standard, as are the large and small storage boxes and bait station holes in the rear gunnel plate, and burley bucket cutout in the swim platform. We are also able to cut anchor winch mounting holes, rod holders, speaker cutouts, dash glove box cutout, front hatch cutouts and all other holes to save you time. When the kit is ordered, the customer can fill out a check sheet indicating which cutouts are required to be cut. Other parts included in the kit are under-shelf LED light brackets, bow roller brackets, transducer mounting plates, bilge pump mount plate, and tag pulling plates for pulling the bottom plates together.

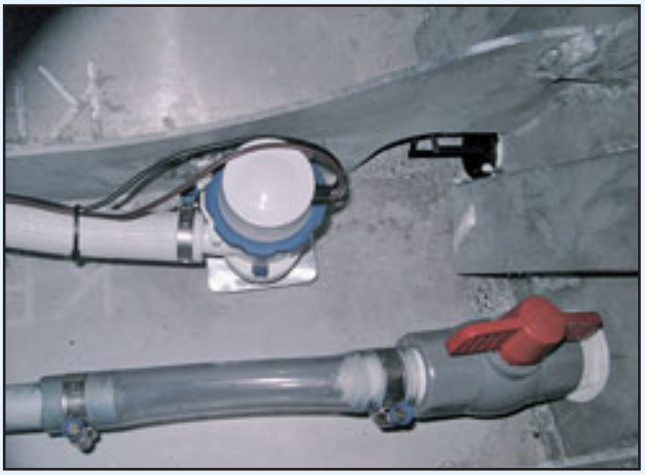
A slightly modified cockpit by a Queensland owner. Dash cutout and fabricated hatch can save $650-. Note the grab handle on the dash and side in-fill panel for engine control, (side mount).

The small mesh floor panels allow for tying down bags and buckets on those long trips to the outer shelf. The boys are giving the boat a good sand down and de-grease before the paint is applied.

With the boat now finished it is ready for paint. The sequence we use is 2 pack etch primer, epoxy filler, epoxy undercoat then epoxy topcoat. We use International HT9000 two pack epoxy, (with micro balloons), for filling. Previous PAB articles (PAB-3 especially) have a good explanation of preparation and painting, so I will not repeat what is a great article that you can look up if desired.

If you do not wish to paint the boat, a rough sanded finish is non-glary and easily achieved by sanding the panels using 36 grit then 60 grit sandpaper. If it is intended not to paint the boat before you start your project, (FYI it will save you lots of time and at least $1000- in paint and filler), it may be worth sanding all topside and visually seen parts (both sides) before assembling the boat.

After painting, the fit out can commence. Bilge pump,



and deck wash pickup are shown. At the helm, hydraulic steering, a switch panel, marine radio and 27 MHz, Depth / GPS Combo unit and swivel / sliding seats provides a basic fit out. The fit out can be an expensive exercise, but the boat can be designed with provision to upgrade when then funds permit. Always give thought to under floor connections and or wiring before the main plates are welded in. i.e.: Is a bilge pump needed, if so, wire for power and outlet to vent.

Trailers: we are always asked. Our preference is a skid type trailer, with keel roller support. A good trailer is expensive, and many kit builders make their own and end up with a product as good, or much better than you could buy anywhere.

All the major trailer manufacturers make a product which has to fit the largest combination boats in the market for that size. They are made with adjustable components, skids and rollers, to do just this. With a plate

boat, you have the bottom hull profile, so you can match exactly the support frames with Teflon skids, there can be no better. If you fancy building your own, there are companies which supply components, and it can be easily done.

When we do buy them, we buy Mackay, and there would be other very good trailer manufacturers in other states.

This next picture shows the engine fitted, with a burley bucket on the starboard swim platform. We are able to supply these drop in plastic components, fuel tanks, storage boxes, hatches, etc., when the fit out time arrives.

When fitting out, we try to minimize stainless fittings and use all alloy closed rivets where possible. This is normally on soft patches, removable deck panels, and other plastic parts. Where stainless must be used it is best to completely isolate with a nylon spacer, and use Durolec paste.

This picture shows the wide area for fishing, with large rear shelf big enough for 2 large batteries and an oil bottle for 2 stroke engines. If a 4 stroke engine is fitted,

you can build in a live bait tank in the starboard rear side and still have room for 2 large batteries.

This boat is one of our most popular kits, and makes a great family boat.

PAB-4

The 5.8 Runabout Kit

Technical Specifications and Build Data

What is in the Kit.

All plating, precision CNC cut and marked. Full height frames, all extrusions, bollards, scuppers, inspection ports and drain plugs. Also included, construction drawings, CD with pictures showing build sequence, and Jig frame drawing and jig support drawings (full scale)

Option: CNC cut timber jig frame (approx. $250- extra)

Technical Specifications:

Material: 5083 Marine Grade Aluminium
Bottom Plates, Stringers, Transom, rear plates - 5mm
Sides, frames, gunnel plates, cabin and floors - 4mm
Extrusions - Deck longitudinals, inner coamings, external gunnels and keelson (pre-rolled). Also flat bar, angle, and handrail tubes.
Hull Weight finished raw. - 800 Kg
Typical BMT weight - 1600 Kg. (Dry) approx.

Pack Size and Weight:

Skid 6.2m x 1.9m x 0.3m, Approx. 950 Kg
Plus 1 small carton. (Containing construction drawings, and Build CD etc..)

Costs:

Flat Pack Kit - 5.8m Runabout $9,850- +GST
(Prices correct at May, 2008, subject to change)
(Note: Kit price will vary with aluminium price)
Cut options, all kits are cut in-house and small customisations can be done.

Building Consumables:

2 “”G’ size bottles Argon (approx.)
3 rolls, 1.2mm diameter 5356 Welding Wire.
Sanding and cutting discs
Boat fitout components can be supplied, in addition to trailers, welders, Mig wire, seats, hatches, rod holders, etc.

Aluminium Welding and Boat Building Course:

We run 3 or 4 Boat building Courses per year, from February to November.
The courses are very popular and cover welder setup, welding of aluminium, and the sanding and finishing of aluminium.
A boat is built from the Kit range up to 5.5m.
Courses run 8 consecutive Saturdays 8-12am.
Cost Under $500.

Boat Kits Available From:

Plate Alloy Australia Pty Ltd.
Tel: (03) 9555 6399
Fax: (03) 9555 6499
Email: sales@platealloy.com
Full Boat Kit Range and Building Tips at:
www.platealloy.com
Picture Below: 2 kits ready for shipping

PAB-4

5.8m Runabout Kit ready for Shipping
(with Optional CNC cut Timber Jig)