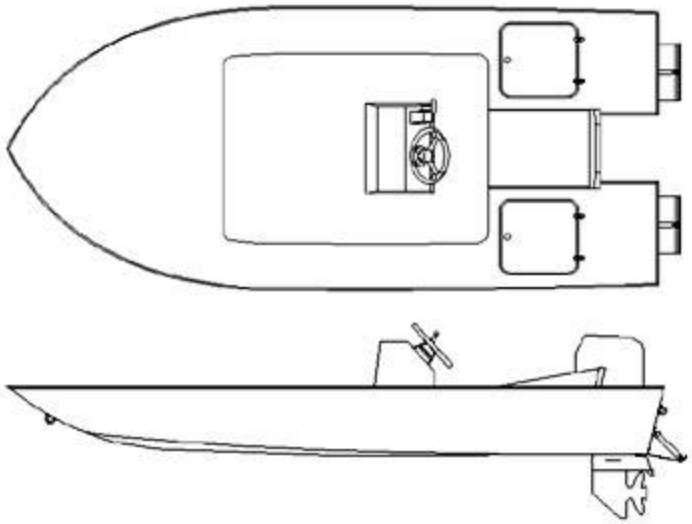
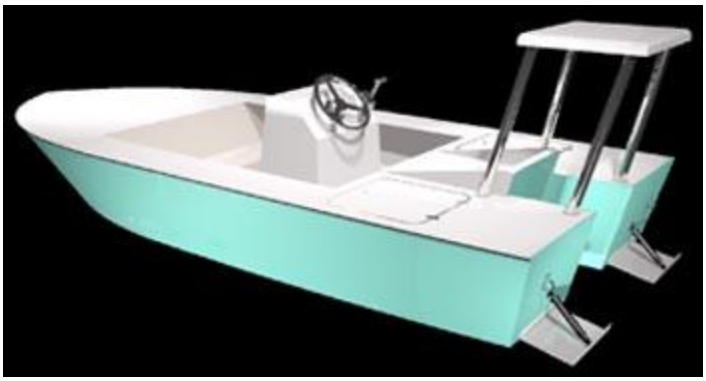


Specifications:		
Plywood Core		
LOA:	14'-6"	4,42 m
Max. Beam:	6'-4 "	1,93 m
Hull draft:	4"	10 cm
Hull weight:	600 lbs.	273 kg
Recommended HP	25	40 Max.
Material:	Composite	
Foam Core		
LOA:	14'-6"	4,42 m
Max. Beam:	6'-4"	1,93 m
Hull draft:	3.25"	8 cm
Hull weight:	375 lbs.	170 kg
Recommended HP	25	40 Max.
Material:	Composite	

Draft is shown in each case for a 400 lbs total load. This means displacement = 1,000 lbs for the plywood version and 775 lbs for the foam version.

Phantom 15: the ultimate shallow water tool!



The PH15 (Phantom 15) was designed to answer several requests for a flats boat:

- Small footprint
- Foam sandwich construction
- Tunnel drive

The PH15 shares some characteristics with our Phantoms 18 and 16, in particular the generous beam to length ratio but differs from the 16 and 18 in several areas: the chine is kept low at the bow and the deadrise at the transom is almost inexistant.
Those characteristics result from the very focused program of this boat. She is a pure inshore or back country flats boat with no claim to offshore capability. If you routinely cross choppy waters of large open bays or bring more than one passenger, then a Phantom 16 or 18 is the way to go but nothing (except our XF20) will beat this small skiff to reach the extreme shallow waters.

The light and small hull has very little windage and make this skiff very easy to pole.
To provide sufficient and balanced lift to the hull despite the relatively large tunnel, we had to move the tunnel forward and this resulted in two sponsoons behind the true transom. This give a stable ride and fast hole shot.

The Phantom 15 is a very light skiff and as such, require less horsepower and less fuel to perform at the same level or better than other boats of the same length. The ideal engine is 25 HP, max. HP is 40. The transom is designed to take a standard 20" shaft, preferably on a jack plate.

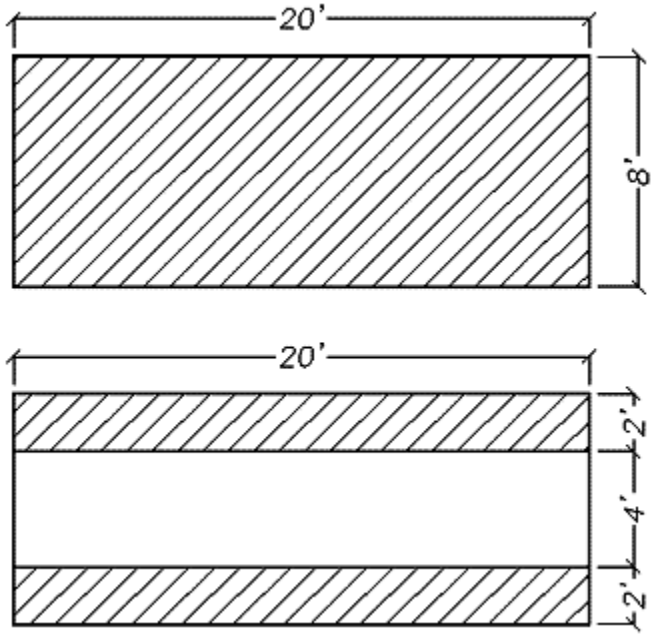
With two adults and gear onboard and a 40 HP, we expect more than 35 mph at WOT and a cruise speed of around 22 mph at 3600 rpm.
Other advantages of the light weight are less hull slap, less draft and to take up less space making it possible to store her inside most garages.

The large deck and wide gunwales (12") provide the same nice uncluttered layout that on the other Phantoms.
One of the unusual features of our Phantoms is their wide beam. This not only increases the waterplane resulting in less draft for the same weight and length but also produces exceptional stability. The boat will barely heel with two fishermen standing on the gunwale.
The low chine of the Phantom 15 results in a very stable foredeck: the Phantom 15 will allow the fisherman to safely walk to the extreme tip of the bow.
A trolling motor fits easily on the wide foredeck and thanks to the width, there is enough room for a forward platform.
Under the casting deck, there is room to store life vests, anchor etc. in addition to a fuel tank and trolling motor battery.

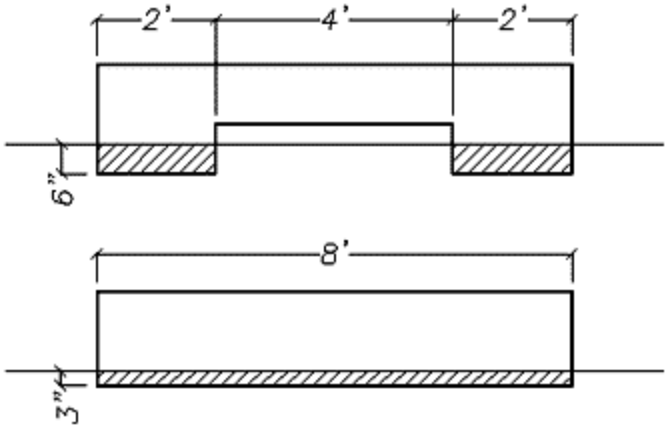
The cockpit is self bailing up to a displacement of 1,300 lbs.
The designed waterline is at 4" draft and corresponds to a static displacement of 980 lbs.

Pocket drive, catamaran tunnel and some theory:

There are different ways to design a flats boat with minimal draft. Some catamarans claim to have less draft than monohulls but that is simply not possible.
Let's demonstrate by comparing the geometry of two simple hulls.
The sketch below shows the waterplane area of a monohull compared to a typical catamaran hull, each simple rectangles but the comparison works just as well for more sophisticated shapes.



You can see that the catamaran hull as less foot print than the monohull: at equal draft, the cat displaces only half the water of the mono hull and therefore, at equal boat weight will have two times more draft.



Even if the tunnel is narrower, the cat hull will always need more draft but there is more: a cat structure is more complicated and the hull area is larger, therefore heavier.
A cat type tunnel will always have more draft because it has less waterplane area and a heavier structure.

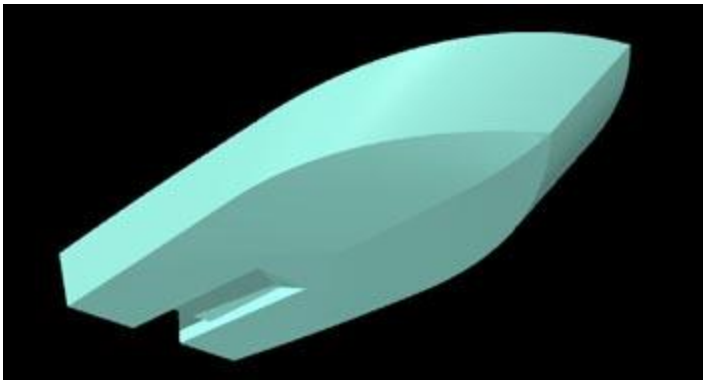
That is for static draft but what happens when running?
There again the monohull is superior.
The water between the hulls of the cat is turbulent. All kind of steps and other contraptions installed between the hulls have been tried to reduce that problem but despite the claims of some cat manufacturers, the prop runs in aerated water and is not as efficient. The prop has to be lowered to run in "hard" water but this increases draft.

This is where the tunnel is clearly superior. Not only does the water coming out of the tunnel rise higher than along the hull sides but it is compressed by the tunnel shape: the prop will cavitate much less than between the cat hulls. The correct name for our type of tunnel is pocket drive. The theory is well known: the forward part of the tunnel is higher than the exit and the aerated water is compressed before it reaches the prop. At the transom, the water makes a hump and that is the level of the cavitation plate at planing speeds. For the hole shot, the prop must be deeper but once the pocket drive is "primed" the engine can rise on a jack plate allowing the boat to run in 4 or 5" of water.

A pocket drive is not perfect: there will always be a turbulence at the mouth of the tunnel. There is simply no way around it. At planing speeds, the water going through the pocket has to cover a longer distance than the water running under the straight parts of the bottom. This will create cavitation but we can reduce its consequences with the shape of the tunnel. The tunnel is not a plain box: it is tapered in profile and all corners have large radii fillets. It is heavily reinforced to withstand the pressure variations.
The pioneer of this type of tunnel is Uffa Fox: he designed the first ones for the British Navy boats during W.W.II. Today, we know what the ideal shapes and proportions are and that is how the XF20 pocket drive (and subsequently the PH15 tunnel) was calculated.

The engine should be installed with the cavitation plate flush with the top of the tunnel. A jack plate will allow to raise the engine a few inches above that level. On plane, the tunnel flow sends water upwards and shoots clean hard water to the prop and engine's lower unit cooling system intake.

All specifications are approximate and subject to changes in function of the mood of the designer and the skills of the builder . . .



Building method:
The PH15 is a true composite boat.

Two types of core can be used: plywood or foam.

The plywood cored version is built the same way as our other Phantoms. See the HowTo file describing that method here.
The PH15 is a more complicated to build than the 16 or 18 because of the tunnel but the assembly and fiberglassing techniques used in the plywood cored version are identical to the Phantoms 16 and 18.
The weights shown in the specifications for the plywood cored version are based on a lamination with a 40% glass content, something easy to achieve by a builder that has completed at least one boat with our method.

The plywood version can also be built as a hybrid: a plywood cored hull with all other parts made of foam. We did build a Phantom 16 that way in 1994 and saved almost 200 lbs. compared to a standard boat.

The foam cored version will produce a very light and stiff hull.
The resistance to puncture is not as high as in the plywood cored version but is similar to production boats using foam core.

The foam core version is built differently.
The method is described in detail in our building notes. From the building notes, we extracted an HowTo file available here.

As you will see, several variations are possible but each require more skills and more expensive materials than the plywood cored version.
The foam we recommend is Divinycell™ for the hull and Renicell™ for the transom. Those materials are not available everywhere but we sell them either in a kit or bulk at BoatBuilderCentral.com. We also sell the vacuum bagging equipment and books if that method is chosen.
CoreCell and Airex can also be used but not NidaCore.
The fiberglass specifications for the foam cored version must be followed very exactly: do not use cheaper materials.

The aramid (Kevlar™) option uses Kevlar™ for strength and weight reduction, not for resistance to abrasion. When Kevlar is used for strength, it is part of the inside skin laminate. For resistance to abrasion, you must add a layer of Kevlar to the outside skin. This is only possible with vacuum bagging or resin infusion.

The foam option plans cost more not only because of all the extra drawings and specifications but also because it will require more technical support.

Required Skills:
We do **not** recommend the PH15 a first boat building project.
Despite it's relatively small size, this boat has sophisticated features like the tunnel and sponsoons that require a minimal understanding of our material and methods.

Options:
Foam under the sole will make the boat unsinkable.
We recommend a 4 gallon foam kit that will give almost 1,000 lbs. additional positive buoyancy. The foam sandwich version will take advantage of the buoyancy of the foam hull and will require only a 2 gallons kit.

The Phantom 15 can be built with or without a console. Tiller steering is perfectly adequate for the small engines specified for the PH15. The plans show a small console without a seat. This leaves a maximum of room for fishing but you can also build a console with a small seat or use an ice chest secured in front of the console.

To minimize hull noise, we designed the Phantom 15 without strakes or chine step but strakes or even after market chines can be fitted.

Trim tabs are a nice addition to this hull, not only for the usual advantages of trim tabs but to compensate for the trim changes resulting from the tunnel.

The Phantom 15 is designed to use a portable fuel tank of 12 gallons fitted under the casting deck but a fixed tank can be installed in the same location. Keep the capacity around 12 gallons, you will not need more even with a 40 HP.
This boats transom is designed for a standard 15" shaft. The transom can easily be modified to accept other shaft lengths.

A jackplate is not exactly an option, it is almost a must to make the best use of the tunnel and shallow draft capabilities of this boat.

A shallow water lower unit is a nice addition to a standard outboard.

Poling platform and forward platform are almost standard.

The layout plan shows two deck hatches on the aft deck, Those give access to a baitwell and tackle box but the builder is free to customize the layout as long as he understands that excessive weight in the stern should be avoided.

Bill Of Materials:
(Excerpts from our BOM)
The BOM list materials based on our standard layout and includes a 15% waste factor for resin and fiberglass. For plywood and foam, we use standard sheets 4' x 8' (122 x 244 cm). Please read the building notes and see the plans for detailed specifications. Plywood must be Meranti or Okoume to BS6566 or better.

Plywood Core		
Plywood 4x8' (122x244cm)		
1/4" (6mm)	10	
3/8" (9mm)	3	
1/2" (12mm)	2	
Fiberglass (totals)		
Biaxial tape	160 yards	150 m
Woven fabric	7 yards	7 m
Biaxial fabric	22 yards	20 m
Resin		
Epoxy, total	10 gallons	40 liters
Foam Core		
4x8' (122x244cm)		
1/2" (12mm)	12	
2" (50 mm)	1	
Fiberglass (totals)		
Biaxial tape	150 yards	145 m
Glass fabrics	160 yards	150 m
Resin		
Epoxy, total	15 gallons	60 liters

Note:

- The foam version uses 4 different types of fiberglass fabrics: biaxial 12 oz. 45/45 and 0-90, with or without mat plus woven 9 oz. Exact lamination specifications are listed on the plans. Length is for 50" wide fabrics, waste is included.
- Some of that fabric is Kevlar when that option is selected.
- The amount of resin is calculated for the vacuum bagged version, The open mold version will require approximately 5 more gallons.
- Fillers are not listed. We specify micro-balloons, silica mix and milled fibers.

Cost:
Please see our kit costs.

Labor:
The PH15 should take 200 hours to complete. The foam core version will require a more elaborate set up but once the jig is up, will come together faster. A vacuum bagged hull will also require much less fairing.

More:
Visit our message board, help pages, tutorial pages and read our FAQ: most questions are answered there.

Plans Packing List:
9 Detailed drawings, large scale with all dimensions required to cut the sides, bottom and the bulkheads from flat plywood sheets: no lofting, no templates required.

Drawing List (Plywood Version):

- D259_1 Plan and Profile
- D259_2 Nesting
- D259_3 Construction & Frames
- D259_4 Expanded Plates
- B259_5 Tunnel Construction
- B259_6 Lamination Schedule
- D259_7 Full size pattern: Bow mold
- B187 Standard Center Console and Notes
- B221 Typical Small Boat Electrical
- Building notes including a detailed description of the assembly sequence and building tips.

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