SPECIFICATIONS

LOA	20' – 4"	6.2 m
Max Beam	8'	2.44 m
Power - Recommend/Max	25 HP	
Hull weight*	450 lbs.	205 kg
Hull Draft at DWL	2"	51 mm
PPI at DWL	413 lbs.	188 kg
Material	Plywood Cored Epoxy Composite	
Building Method	Stitch and Glue	

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

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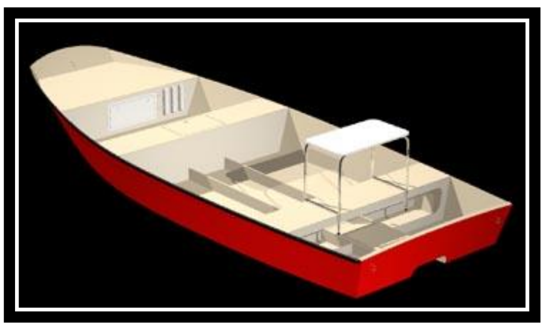
DESCRIPTION

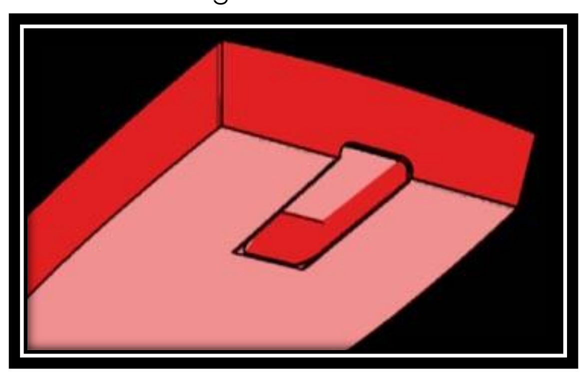
The XF20 was designed in collaboration with one of our Phantom builders. Ken Owens, an experienced flats fisherman talked for years about a tunnel hull. He was persistent, and we resisted: see our message board archives for some memorable arguments. Tunnel hulls have drawbacks, but many fanatic flats fishermen are willing to accept them to reach those elusive shallow areas where the big redfish hide.

Ken Owens approached us with an intriguing design idea: he had seen an interesting flats boat on Florida's West Coast. This wide and light 20' skiff, built by fishing guide Captain Henderson, had a tunnel common to many flats boats and looked like an enlarged version of our GF16. The boat had a great reputation. Ken suggested to enlarge and widen our GF16 then install a tunnel aft. After seeing pictures of the Henderson skiff, I decided that we could do better in several areas: lighter, better built composite hull and better hull shape. An enlarged GF16 would be easier to pole and behave better at speed. It also looks better than some of the hasty copies of the Henderson skiff that began to appear locally. During our emails and drawings exchanges, we first called her the Cool Boat and what came out of our collaboration is really a cool boat. We kept the rod holder location and designed a poling platform like the one seen on the Henderson skiff.



This new design is the best possible no-compromise extreme flats boat.

Features like the light weight, quiet hull and low freeboard for reduced windage are common to many flats boats but here we have a hull that can be built with a small budget and perform better than most carbon fiber machines costing 30K.



The XF20 is light and will run fast with a small outboard. Do not plan on anything larger than 50 HP. Keep the weight and draft low, the trim reasonable. She will top at 25 mph with a 25 HP, 30 with a 30 HP.

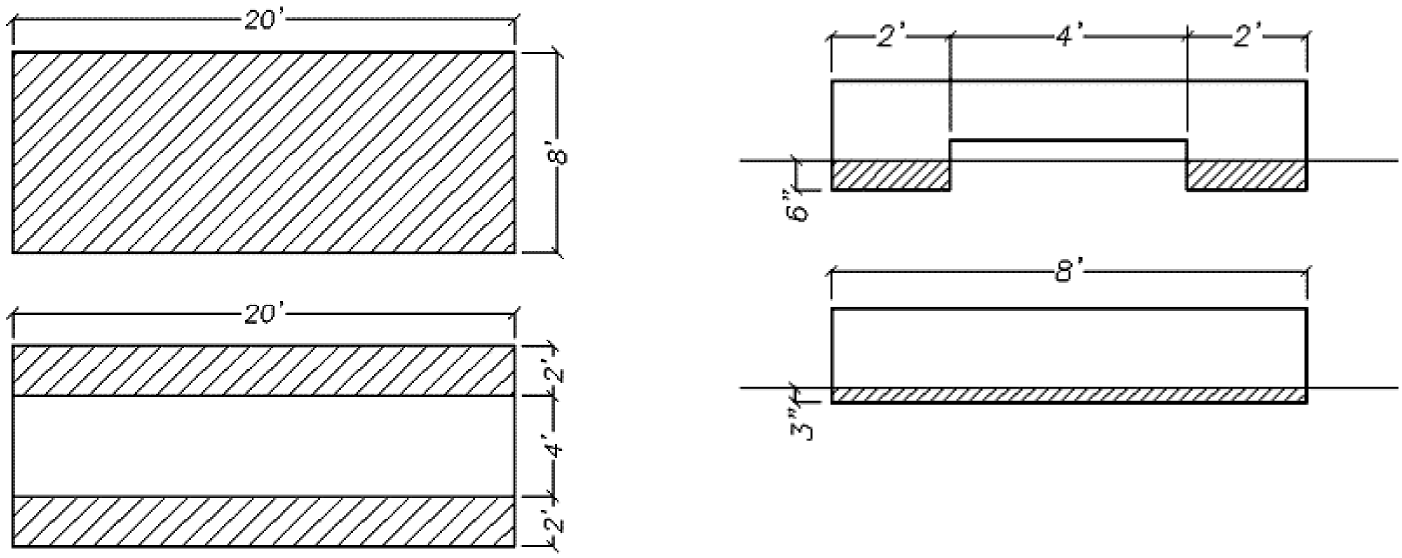
This boats transom is designed for a standard 20" shaft. The transom can easily be modified to accept other shaft lengths.

The XF20 hull weighs 450 lbs as designed. At a displacement of 1,000+ lbs., equal to two or three fishermen, engine and gear, the draft will be only 3". The buoyancy and stability are impressive: it takes 413 lbs. to increase the draft by one inch.

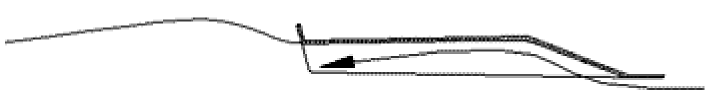
Pocket drive, catamaran tunnel and some theory:

There are different ways to design a flats boat with minimal draft. Some catamarans claim to have less draft than mono-hulls but that is simply not possible.

Let us demonstrate by comparing the geometry of two simple hulls. The sketch below shows the waterplane area of a mono-hull compared to a typical catamaran hull, each simple rectangle but the comparison works just as well for more sophisticated shapes. You can see that the catamaran hull as less footprint than the mono-hull: 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.



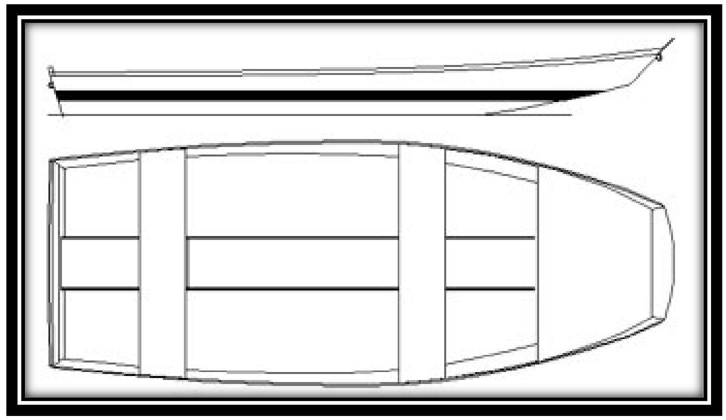
That is for static draft but what happens when running? There again the mono-hull is superior. The water between the hulls of the cat is turbulent. All kind of steps and other contraptions installed between the hulls have been tried to reduce that problem but despite the claims of some cat manufacturers, 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 was calculated.

BUILDING METHOD



The XF20 is strong but very simple, she will go together easily and fast. The construction is epoxy-fiberglass-plywood composite, a second-generation stitch and glue system. This building method combines the ease of stitch and glue (plywood-epoxy) with the strength, lightweight, longevity and low maintenance of a high-tech composite hull. The bottom material is a fiberglass sandwich with a plywood core. It will resist abrasion, grounding and IUS (Unidentified Underwater Stumps). The hull is built like a large flat bottom skiff with a few frames and a pair of stringers. The tunnel is built separately out of the hull, then dropped in the hull. The tunnel unit core is made of plywood panels. The inside angles are rounded with wide fillets and the tunnel is fiberglassed with biaxial fabric. Bottom and transom are cut to the tunnel size and the whole boat is fiberglassed inside and outside. In this boat, we deviate from our usual plywood frames. The frames are made of plain 1x3 boards.

REQUIRED SKILLS

The XF20 is one of the easiest boats to build. The plans include all dimensions to cut all the hull parts flat on the shop floor.

LABOR

The hull can be built in 30 hours, but a finished boat will require 80 hours or more depending on the level of detail and the skills of the builder. This boat can be built in a few weekends if kept simple.

BILL OF MATERIALS

	Sole Version		No Sole Version	
Plywood (4x8' – 122x244cm)				
9 mm (3/8")	14		10	
12 mm (1/2")	1		1	
Framing Wood				
1x3 boards	81 linear feet			
Also see our CNC Kit, which is a precut plywood kit that includes all the plywood needed to build the boat as designed. *Frames will be plywood, not 1x3 construction.				
Fiberglass Fabric and Tape (Based on MarinEpoxy System)				
Fiberglass Biaxial Tape 45/45 12 oz., no mat, 6 in.	250 yards	229 m	250 yards	229 m
Glass Cloth, 6oz., 50 in. wide	14 yards	13 m	14 yards	13 m
17 oz – 8 oz matte – 50" Biaxial Cloth	28 yards	26 m	28 yards	26 m
Resin				
Epoxy	15 gallons	57 liters	9 gallons	34 liters
Fillers and Fairing				
Woodflour	5 pounds	2,27 kg	5 pounds	2,27 kg
Blended Filler	1 ½ pounds	,68 kg	1 pound	,45 kg
Also see our Marinepoxy or Silvertip Epoxy kits which include all of the epoxy and fiberglass listed.				

This BOM covers all the supplies for this boat as designed. Usage of materials will vary in function of several factors. An experienced builder will use less resin. First time builders always use more resin, take that in account. Our resin usage calculations are based on a 50% glass content. Options, customization, and variations in fabric and foam cutting preferences will also affect the Bill of Materials. Our figures show an estimated average. Small variations in fiberglass specifications are acceptable, consult us for substitutions.

MORE

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

LICENSE

As with all our plans, you have the right to build one boat from those plans. The designer holds the copyright to the design and you purchase a license to build one boat. If you plan to build more than one boat, please contact us about licensing fees.

BUILDING STANDARDS

These plans were drafted according to the ABYC rules. The ABYC (American Boat and Yacht Council) defines the boat building standards in collaboration with the USCG. Professional builders may be subject to more requirements. Consult the designer.

The ABYC standards are very close to the ISO norms and CEE requirements but no European certification was applied for since this is not required for amateur boat building in Europe. CEE/ISO certification is available to professional builders for a fee.