

*Zipp*Kits

G30 Outboard Tunnel Hull



For .21 Nitro or 4S electric ~Length- 30.5 inches ~Beam- 11.5 inches
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Version 1.2

The G30 is a new Outboard Tunnel design by (IMPBA Hall of Fame member) Rod Geraghty.

Made for 3.5cc Nitro or Fast Electric outboards, this hull is a modern design with the most up to date improvements in the sponsons and fuselage.

The building technique is borrowed from Jerry Dunlap's WOF (Wood Over Foam) method.

We took it a step further by using the actual sheeting in a clever way to also be the cutting templates.

Using our exclusive ZippCut foam cutter, you can have the boat ready for waterproofing in a weekend.

Revision history:

V1- First release

V1.1 Modified stumble blocks based on test data from Ric Wally

V1.2 (this version) Added slots for Velcro battery straps and added setup gauge.

The G30 is an easy boat to build, easy to setup and runs great.

Please follow these instructions EXACTLY, and you won't have any issues.

Don't glue anything until told to do so. We will be using some parts as templates on both sides.

The very first cuts you will make are critical. They must be aligned perfectly, or the boat won't come out correctly.

If you are not sure of the next step, or are having trouble with your kit, please contact us and we will help.

We want you to have a great time building and running your G30, and will do everything we can to help.

Please read this entire manual completely before you begin construction, as this will help you understand what you are doing and avoid mistakes.

Spare parts are available.

The manufacturer assumes no liability for damages or other loss in the use of this product, as we have no control over the construction or end use of this product.

Sponsons

The foam blanks have two smooth sides and two rough sides. We will work with smooth sides.

Lay one of the foam blanks on the bench with a smooth side up.

Measure $\frac{1}{2}$ inch from the bottom edge. Use the included square to draw a line down the end of the block.

The line should go all the way from the bench to the top of the block as shown.

Be sure that the square is flat against the bench. This is important.

Repeat on the other end.
Be sure to measure from the same edge.
Bring your marks around the corner so you can see them.

Grab both Insides (marked INSIDE). Note that one side is curved and one almost straight. The curved side is the top.

On the side marked with INSIDE, put a piece of masking tape over the slots near the front of the inside.

This is needed to prevent glue from getting in the slots that are used later.

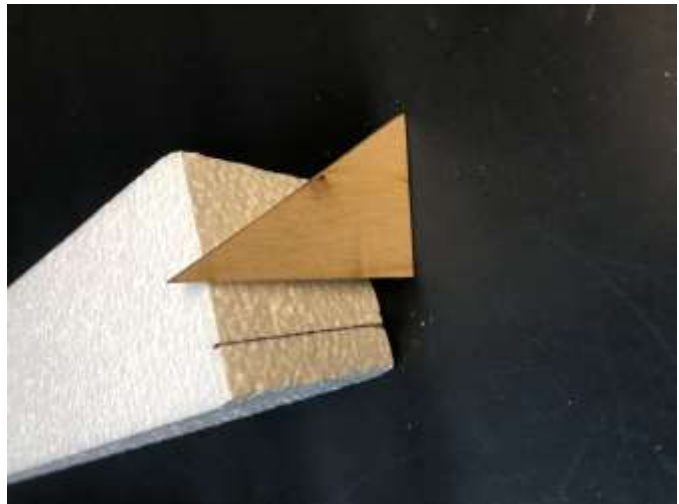
Tape each one. Be sure to do both pieces on the marked side. Use regular masking tape. We only used the blue low tack for the pictures.

Pin both insides (INSIDE) to **one** block of foam. Line up the back so that they are even with the foam.

Line up the bottoms of (INSIDE) on your marks on both ends.

Be sure that both parts are perfectly aligned with each other. Look at both ends and double check.

Photographs of very light colored ply on white foam are difficult to see. We will use some drawings to make things more clear.



They must be perfectly aligned with each other. This is absolutely critical, so take the time to get it right.

Cutting

Be sure to squeeze the templates together while cutting. If you don't squeeze them pretty hard, the template can be pushed down by the cutting wire. If this happens, the boat will be ruined. Don't allow the templates to move, even a tiny bit.

The best way to do this is by, you guessed it, **SQUEEZE THOSE TEMPLATES!**

Cut the foam on the top or bottom. Flip it over. Cut the other side. Be sure to squeeze...

Use a few light swipes of a sanding block to smooth the surfaces you cut and eliminate any bumps.

Repeat this same procedure on the other foam block. Don't glue anything yet.

Remember, the curved part of the sponson is the top. The bottom is almost straight.

Next, we will make these into right and left sides. It is very important that we make these mirror images of each other.

If not, you get to buy a new kit and do it again!

Honestly, take your time here and understand where you want to end up.

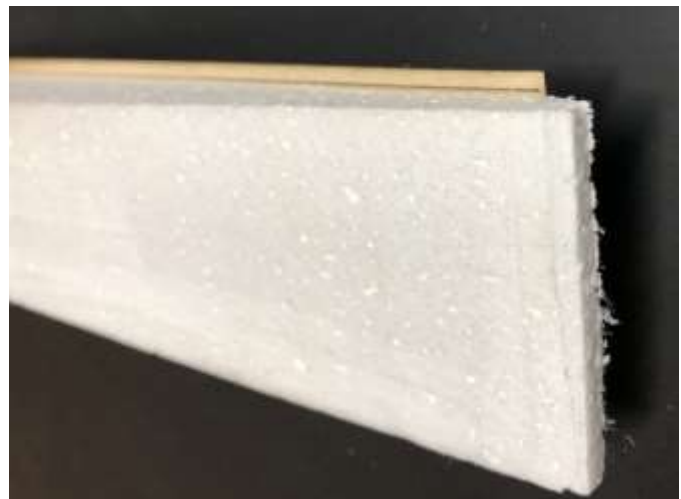
Pin both tops (TOP) to one sponson. Pin so that the etched line is even with the edge of the foam. There will be an overhang on this edge while cutting. Line up the back ends flush with the foam. It may help to use tape on the ends, to hold the tops in place.

Cut the excess foam off... Squeeze.

Now, very important, flip both tops over, align and pin to the other foam blank, except this side will be a mirror image of the other.

Double and triple check this before you cut. Both tops will be curved and both bottoms will be almost straight.

When you are positive that you have both a right and left side, go ahead and cut.



Now that you have two sponsons, this is starting to look like something. And look at what a good job you did with following instructions and all!

Since you are a foam cutting pro now, the rest will be easier.

Sponson Sheeting

Glue an Inside (INSIDE) in place on the sponson. Try to do this on a very flat surface.

To glue the sponson sheeting in place, we like to use 30 minute epoxy. Just use a scrap of thin ply or an old credit card as a squeegee, and put a thin coat on foam and plywood. Work quickly. Use pins and tape to hold in place.

Remove the pins after you tape, or they will interfere with the next step.

Put some waxed paper down and set the sponson on the waxed paper, inside down, until cured.

Put some weights on the sponson to keep it flat.

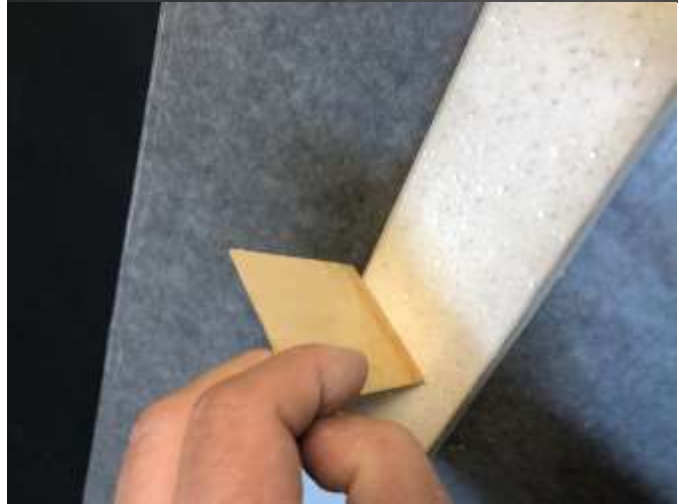
We do this so that the sponson inside will be straight and true. Everything else is based on the inside, so take the time and do this right.

Do the other side the same way. Allow to cure for at least 3 hours.

You can now glue the outsides (OUT) in place. This is also curved on top, and the pointy goes forward.

Line them up so that they are even at the ends of the top (curved) part of the sponson at the front and rear. See OVERLAY page at the back of this manual.

Pin, tape and weight the outside until cured.



Once everything cures, let's finish up these sponsons!

ZippCut the top and bottom of each sponson.

No need to squeeze anymore since the templates are glued in place now.

Sand the top and bottom of each sponson so that the inside and outside sheets are beveled.

We used 80 grit paper on a block for this.

We want a flat, smooth surface for the sheeting to bond.

Sand the back of the sponson so that it is flush and square with the inside and outside, and flat.

Glue the bottom (BOTT) in place. Let the bottom overhang 1/8 inch at the rear by aligning the etched line with the back of the foam sponson.

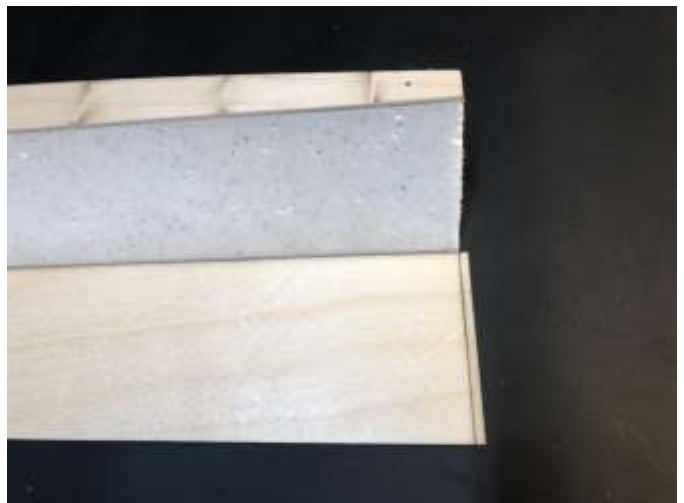
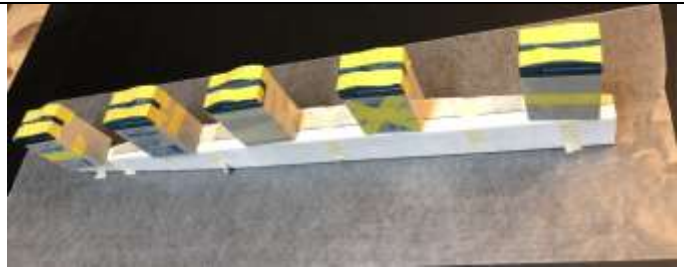
The bottom sheet should be the only one to overhang at the rear.

Allow an even overhang all around the bottom sheet.

Use tape tightly to hold the bottom sheet in place. Repeat on the other sponson.

Double check that the etched line is at the back edge of the foam, and you have some overhang all around.

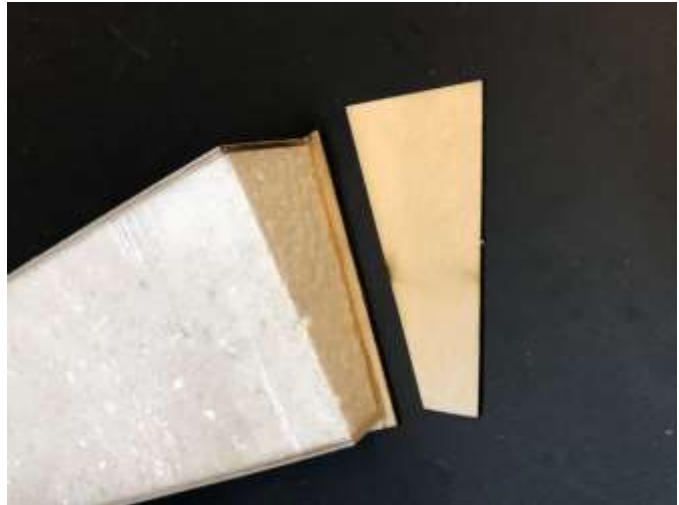
Allow to cure.



Glue the sponson rear cap in place, sitting on the bottom sheet. Tape in place.

When cured, sand flush with top and sides.

Be sure to leave the overhang on the bottom only.



Glue the top in place. Leave an even overhang all around. Tape tightly until cured. Repeat on the other side.



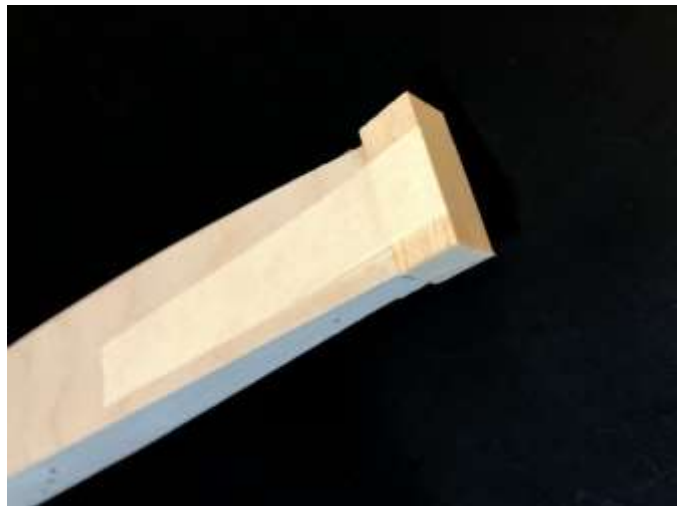
Once cured, sand all sides flush. **Be sure to leave the rear overhang.**

All sheeting should be sanded flush, except the bottom. It will have a 1/16 inch overhang when completed.

Sand the nose flat and flush with all sheeting.

Glue the pine nose block in place.

When cured, bevel and shape for desired look.



Repeat for the other sponson if you have not already done so.

Trim any excess and sand with 220 on a block. The sponsons are now ready for sealing.

You can round the corners on the outside of the sponson, but leave the inside edges sharp.

You can give them a quick swipe with sandpaper to lightly knock off the sharp edge, but don't round them.

The rear overhang should be sharp, and not rounded in any way.

Basically, any place that touches the water should have a sharp edge.



Fuselage

As you remove parts from the sheet, sand off the little bumps left by the holding tabs. They can interfere with the fit in some cases.

Build the fuselage flat on your building board.
Use waxed paper to prevent the fuselage from sticking to the bench.

We used medium CA glue for the entire fuselage.
You can also use Titebond or similar.

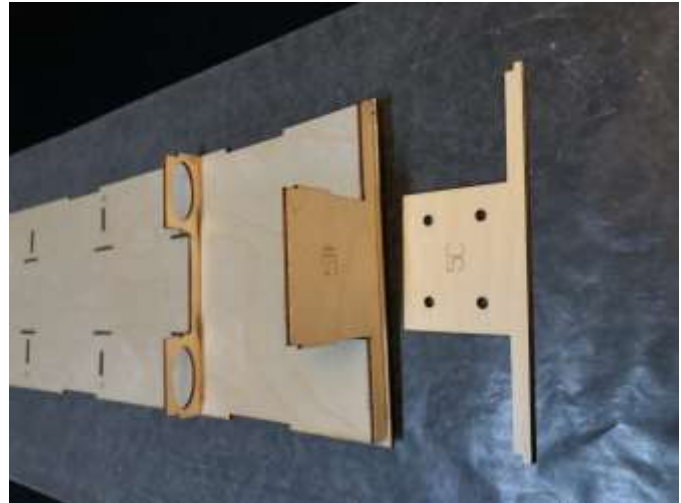
Glue bulkhead 4 to the tunnel floor. Glue bulkhead 5B, then 5C to the floor.
Use a square on these bulkheads.
Be sure that 5C is perfectly aligned with 5B

Glue the two 1/8 sides to the 1/16 floor.

Use a square to make sure that the sides are 90 degrees to the bench.

Be sure that the notches are fully seated in the bulkheads you glued, as well as in the floor.

Add bulkheads 1 thru 3, locking them into the sides.
Both bulkhead 3 parts should have the number facing out as shown.



Glue 5A to the front of 5B.

Glue the center section 1/16 (radio box) sides in place.

They fit into slots in the floor, as well as tabs in the bulkheads.

Make sure that all tabs are fully seated and that the bottom meets the floor.

Try not to get any glue fillets on the outside of these sides, as it will interfere with the installation of F6-F9.

One way to do this is with the glue fillet method, using medium CA.

Install both 1/16 ply sides, snapping all tabs in place and checking that everything is fully seated.

There is a lot going on, and there are tabs and slots everywhere.

Once they are in place and fitted properly, run a bead of CA inside the bottom.

Lift the side free of a bulkhead and put some glue in the gap and press it together.

Do this for all bulkheads.

Only use glue on the inside, otherwise the next step will be difficult.

Glue in F6, F7, F8 and F9.

They go against the center section on the outside, and provide a gluing surface for the top deck sheeting.

Numbers go forward as shown.

You may have to sand or bevel these to fit over any glue fillets.

Do it, as these must be fitted correctly or the top won't fit.

They should all sit flush with the top of all bulkheads.

They provide support for the deck sheeting.



Don't glue the top decks on yet. You need two coats of sealer inside the fuselage and on the bottom of the decks.



Glue the radio box lips to the bottom of the radio box top.



Remove the radio box lid and sand the little bumps off.

Use only a very small bead of glue and attach one end, the center pieces, then the other end.



Use the etched lines as a guide.

Clamp with paper clamps and allow to cure. Do not glue to the boat yet.



We want to end up with a nice lip all around. This prevents the lid from falling in...

If you are using the front mounted servo (nitro applications):

Attach your steering servo the servo tray and set it in the radio box.

Level the tray front to back, and side to side.

Mark the top of the tray onto the sides.

Glue the two 1/8 servo tray rails (R) in place at your line.

You can glue them anywhere (front to back), but we like the servo forward. We left about 1-1/2 inches in front of the rails.

These are used to support both sides of the tray, underneath. Don't glue the tray in yet, only the rails.

If you are planning on only using an electric motor for power, you can skip the servo tray.

Sealing

Wood boats need two coats of epoxy resin to all exposed wood, inside and out.

Here is the sealing method we use:

Put tape on the inside of the fuselage over the bottom slots.

These slots are for the stumble blocks added later.

If you get any sealer in these, you will not be able to properly fit the stumble blocks.

Tape over the slots and just seal right over the tape.

We will be sealing:

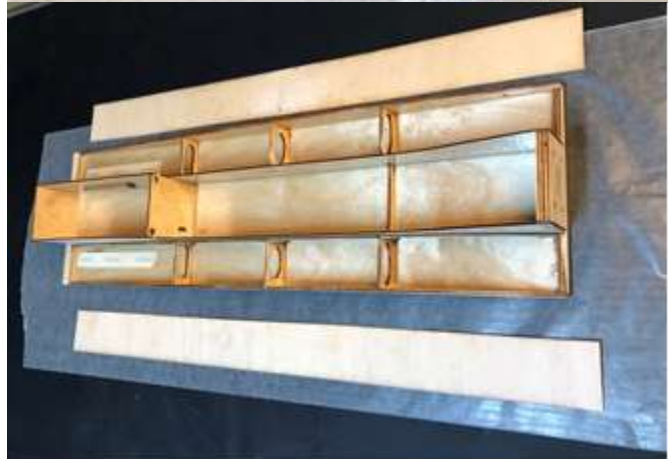
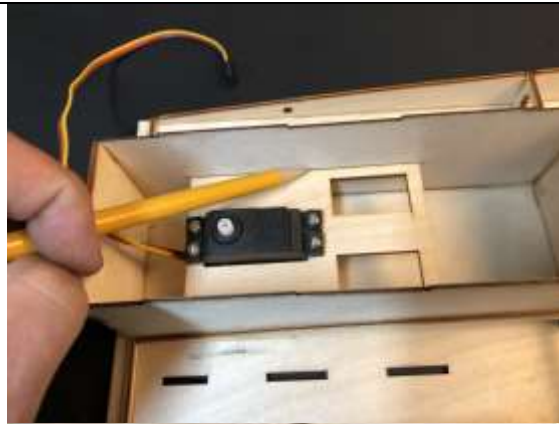
Fuselage insides

One side of cross grain decks (both)

Radio box top and lid

Mix about 4 ounces of epoxy sealer.

Brush on a coat of epoxy to the inside of the fuselage on either side. Get epoxy everywhere.



Get under the F6-F9 pieces and inside the holes in the bulkheads.

Coat the inside of the radio box and center section.
Only coat the inside now.
Don't do the outside of anything yet.

Work quickly if the temperature is above 70.

Don't forget to seal the radio box top and lid.

Coat one side of each cross grain deck piece.

Once you have a good coat of epoxy on the inside, wipe off everything.

Wipe off as much epoxy from the surface as you can.

Wipe off any sealer from the top of the fuselage and the radio box.

Wipe off any sealer in the "lip" that the radio box lid sits in. Wipe it off...

Be really thorough, as any epoxy left here will interfere with the fit of the tops, and you will have to carefully file and sand them to fit.

Easier to wipe off that epoxy now.

Wipe off so that the surface is no longer glossy.
Use a Q-tip to get into the recesses if needed.

Allow to cure overnight.

Scrape the sealer on the decks with a utility knife blade, or sand with 120 grit.

Repeat the exact same procedure for the second coat.
Wipe off areas that get glued (top of fuselage and radio box, radio box top and lid).
Don't wipe off the second coat of epoxy on the deck this time.

When cured, scrape and sand the top deck framework in preparation for the 1/16 cross grain decks.

If you wiped these areas earlier, you won't have much prep to do.

Glue the balsa fuselage nose in place against the front of bulkhead 1.
The balsa should be a little taller than the bulkhead.

Leave the balsa unsanded for now.



The decks should have two coats of epoxy on the underside of them.

Scrape the bottom of these decks so that the epoxy is smooth. Check the fit all around.

When you are satisfied that they fit everywhere, glue them down.

Use 30 minute epoxy, and don't be stingy. Tape and weight the deck in place and wipe away excess epoxy.

Work quickly.

Be sure the deck is pushed up against the balsa nose.

Check back periodically to be sure the deck has not creped outward.

Wipe away any epoxy that has oozed out.

Repeat on the other side.

Allow to cure.

Sand off the deck overhangs on the side and rear.

Round the balsa nose.

You only have to round the front of the decks.

You can leave the balsa square in the center.

The cowling will cover this.

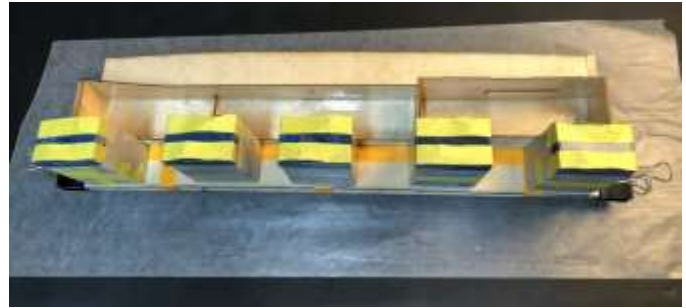
Sand the sponson insides and sand the fuselage outsides until they are flat and smooth.

Use a 3/16 drill bit to clean out all of the dowel holes if needed.

Sand a point on one end of each dowel.



Use 30 minute epoxy to glue ONE sponson in place.



Be sure to coat the entire face of the fuselage side with epoxy.

Get epoxy on all three dowels.

Wipe away excess epoxy.

Do not allow any epoxy into the slots on the sponson inside.

We used masking tape over them.

We wiped all traces of epoxy from the area, and removed the protective tape before the epoxy cured.

Tightly clamp in place and allow to cure, wiping away excess epoxy as you go.

When cured, glue the other sponson in place the same way.

If the sponson fit isn't perfect, clamp the front and leave any gap at the rear.

Fill the gap at the rear (after curing).

Do it this way so that if the sponsons are not parallel with each other, they have toe in.

Toe in=okay. Toe out=bad.

Anti-Stumble blocks:

Glue the 1/8" stumble block outsides into the tunnel floor as shown.

Use a square to make them 90 degrees to the floor.



Glue the 1/16 ply (cross grain) stumble block bottom into the slots on the sponson inside, as well as into the notches on the outside piece.

You may need to sand a bevel at the front so that the bottom fits perfectly.

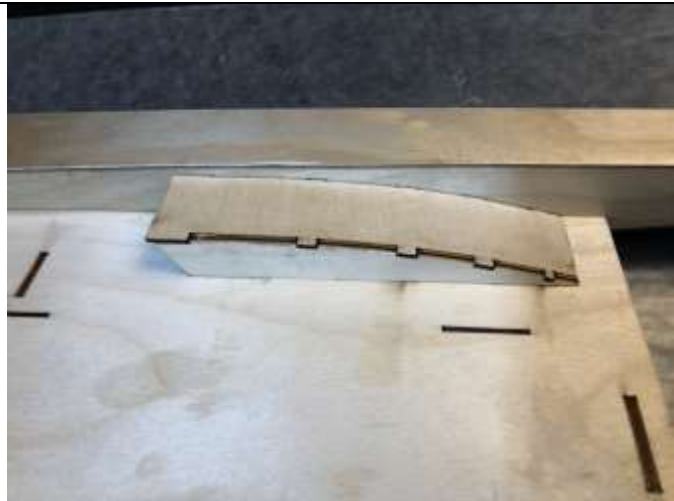
Repeat on the other side.

Glue the radio box top in place. Use epoxy or CA.

When cured, brush a coat of 30 minute epoxy inside where the sides and bulkheads meet the radio box top.

Flip the boat upside down and allow to cure.

This seals the radio box seams and makes it 100% water proof.



Now you can seal the rest of the boat. Do it the same way.

Coat everything with sealing epoxy, then wipe it off with paper towels.

Use lint free paper towels from a box.
They are much stronger than normal.

Wipe off the outside of everything.
Wipe off all epoxy until there is no gloss.

Allow to cure.

Scrape the sponsons, decks and fuselage with a utility knife blade held straight up.

Scrape back and forth.

You will find that this is very quick, and gives a smooth finish, ready for the next coat of sealer.

Use 220 grit paper to lightly smooth the corners and nose.

For the second coat of sealer, remember that this will be the finish coat.

A smooth, flowing coat will make painting much easier.

Thin the epoxy about 10-20% with lacquer thinner. Mix very well.

With a soft brush, paint on a smooth coat, and let it flow out.

Try for a smooth coat without runs or brush strokes.

Be sure to seal up inside the stumble blocks.

Allow to cure.



Cowling

The plastic cowling has 1/16 ply stiffeners that also double as cutting templates.

Follow along and you will have a perfect fit to the fuselage airfoil.

Notice that the two cowl stiffeners have small etched marks at one end.

These marks should face up when they are glued in place.

We will snap these small tabs off later.

Align the stiffener so that it is at the rear trim line, and even with the bottom of the raw cowling in the front and rear.

Use a little bit of medium CA or epoxy to attach them.

Don't put any glue on the small tab under the "X"

Before gluing, sand all around to about an inch up into the cowling.

Use 220 paper and wipe down with alcohol before gluing.

Note that CA will give an almost instant bond, so be sure you are lined up before you touch the wood to the plastic.

Do both sides the same way.

When cured, break off the little tabs at the bottom rear of the wood stiffener.

Score the bottom cut by simply following the curve of the template (stiffener).

Use a sharp blade, and score it a few times. Bend it and it will snap.

You can make the front and rear vertical cuts first to make it easier.

Trim the back part of the cowling a little long, to allow exact fitting to the length of your fuselage.

Sand the edges with 220 if needed.



Now look how perfectly that cowl fits!

Time to finish up the cowl chin.

Trim the chin so that the waste is removed.

You can do this by holding one of those cheap, snap off knives flat on the bench, and move it all the way around the chin to score it.

Make vertical cuts at the corners and snap off the waste.

Put the cowl on the boat, and flip everything upside down.

Now, using all 3 hands, hold the cowl in place on the boat, with it pulled all the way back.

Mark the rear of the front ends of the stiffeners in the cowl.

Remove the cowl, put the chin in place and (while holding it tightly to the front) mark the chin for your cowl marks.

This is where you cut the chin to length.

Now put the cowl back on, boat upside down again and fin the chin in place, pushing forward.

Make sure the cowling is pushed back, chin pushed forward and everything is seated.

Mark the front of the front ends of the stiffeners. Trim the cowl to clear the stiffeners.

It doesn't take much trimming. The stiffener is only 1/16 thick.

Sand the edges of the plastic chin and wipe it and the inside of the cowl with alcohol.

Put the chin in place, and align it so that both sides (at the rear) are even with the fuselage bottom. The center will have a crown.

Check to be sure it is level side to side and put 3 or 4 drops of CA at the 4 corners.



Continue to hold the chin in position and keep pushing it forward. Hold until the glue sets for a minute or two

Once the glue sets, remove the cowl and run a bead of CA on the inside of the chin.

You can fill the area on the bottom if you want, but it's not structurally necessary.

We used finishing epoxy and micro balloons to make a white filler for the seam. We sanded it for a nice smooth transition.

Check the fit of the cowling and chin.

Sand the inside 2 inches of the chin and glue in the cowl tongue (CT).

Glue it so that it is centered, and has 1 inch sticking forward.

Finally, seal the tongue and stiffeners with 2 coats of sealer.

Don't forget to add some floatation to the cowling. Plastic does not float. At all. Don't ask. Twice.

A piece of pool noodle glued in with Goop or silicone RTV works well.

The rear of the cowl can be held in place with screws, or with HD Velcro like we used.

Setup

Drill out the holes in the transom if using an OS lower unit.

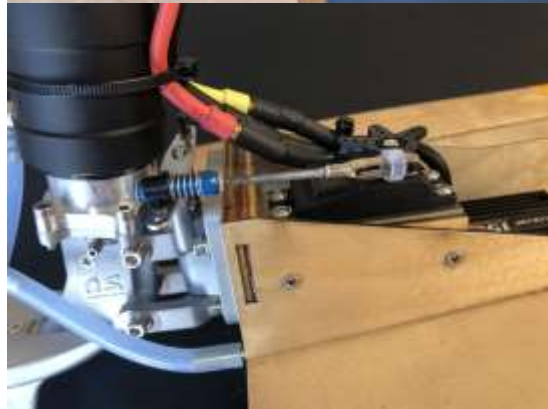
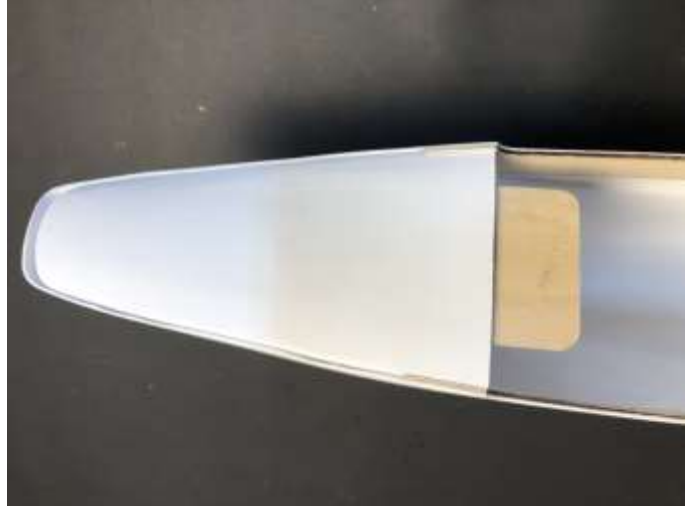
Install the blind nuts with a little glue.

The small rectangular hole in bulkhead 2 is for a servo extension when using an Electronic Speed Control.

We use GOOP to glue the female end of a servo extension here for the speed control.

Engine or Motor

Install the lower unit with either .21 engine or electric motor to the transom with the 6-32 screws and washers. Set the engine so that the propshaft center line is ¼ inch above the sponson bottoms and perfectly level.



The only way to do this accurately is to make a setup board.

It can be made from anything, as long as it is flat. A simple piece of plywood with a slot cut in it will do. It should be at least 8x24 inches. The slot should be centered at one end and be about 1/2x4 inches.

Steering servo

There are a few choices when it comes to steering setup.

The traditional way is to mount the servo in the radio box and use pull-pull cables.

The holes in the radio box are made for a steering arm that measures 2-1/8 inch from hole to hole.

We strongly recommend that you use an arm of this size.

If you don't, you will have to move the holes in the bulkhead.

The other method is to use a waterproof servo near the transom.

This is the method we used.

We mounted a standard sized servo on one of our 3711 mounts.

Use a 4-40 pushrod with solder clevis and Sullivan 4-40 ball link (Zipp 3574) for adjustment.

Be sure to keep the linkage inside the center section. It will hit the cowl if you don't.

If you look close, you will see that we added a 1/8 ply spacer behind the servo mount.

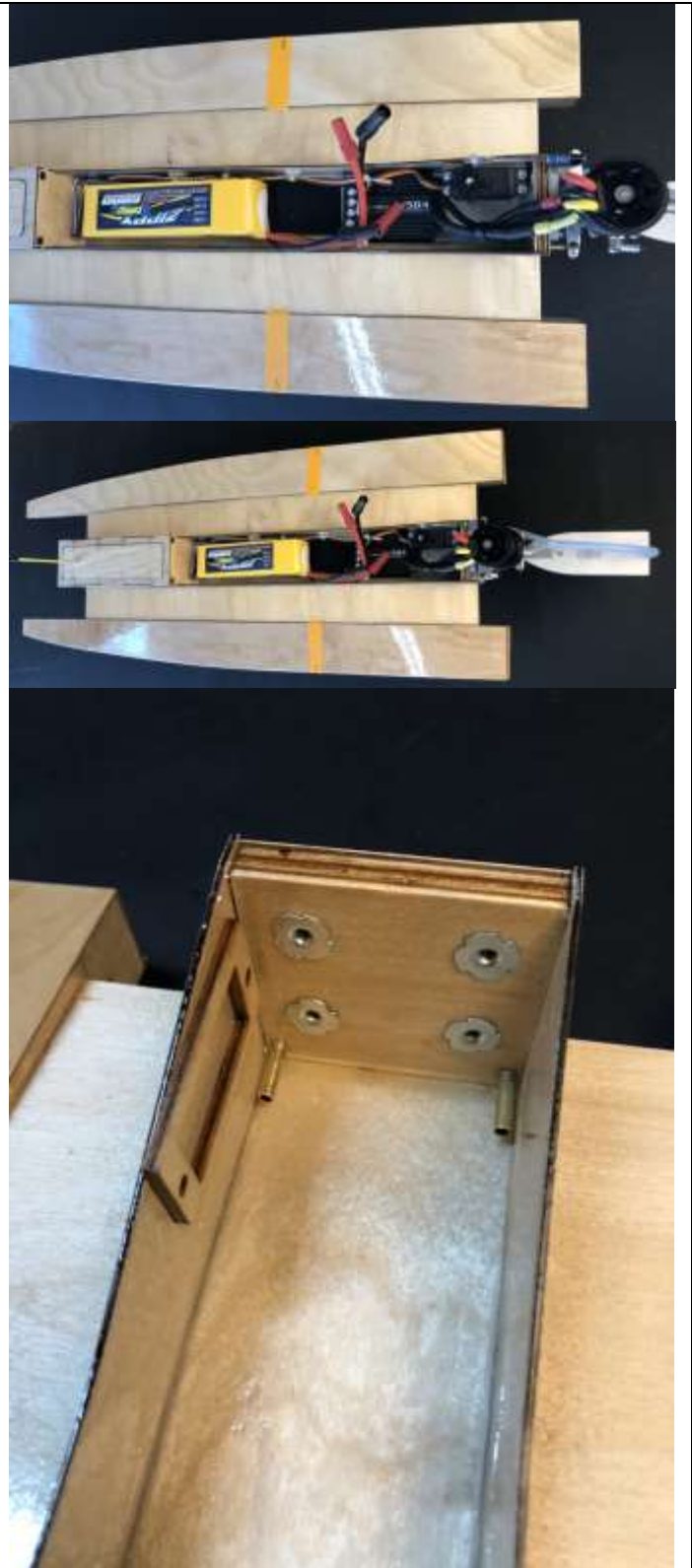
Water Cooling

For nitro, water cooling is contained to the engine.

For electric, you need to cool the motor and ESC.

We run a couple of brass tubes near the bottom corners of the transom.

Use 5/32 tubes about 1-1/2 inches long.



This is for water in and out of the ESC.

We simply run a cooling hose to one of these tubes, and split the line, add a “T” to the head and it takes care of both.

Notice the return loop in the 150 Amp ESC.



Running

Use a 4014/3 prop (Zipp 4031) for first runs.

You may use a slightly larger prop (42mm) once you have run a few packs or tanks thru the boat.

Be careful about over propping an electric.
We stock motors and speed controls, just in case...

Balance 9 inches forward of the sponson rear.

Be sure that your shaft is greased and batteries are fully charged.

Building Tips

How to stay out of trouble:

First, there are some areas where you don't want any glue or sealer during assembly. This boat has a few places that have tiny slots that are used in assembly, and if you fill them up with epoxy, it will be impossible to open them up again. You can still build the boat, but you will have to remove some building tabs and make other minor modifications. Plus, you lose the self-jigging feature of the part.

Do yourself a big favor and keep epoxy out of the slots...

There are several ways to do this;

You can simply tape over the slots with masking tape. This works fine on the interior, but you don't want any masking tape permanently attached to the outside.

You can seal near the slots, and use your finger or a Q-tip to work the sealer up to the slots.

The best way is to not seal close to the slots, and give the area 2 coats of sealer after the hull is finished, and those slots are used.

Second, take your time. Understand exactly what you will do, and how, before you do it.

If you think ahead, your chances of getting in trouble are greatly reduced. This works in all aspects of life as well...

Third, take the time to "blueprint" the bottom. This is done by simply checking the last 12 inches of both sponson bottoms for flatness. There should not be any hook (concave) or rocker (convex) in the bottom. Check it with a straight edge ruler. If you find any, either fill them or block sand them flat.

This makes the boat run true, and makes you look like a better driver!

Finally, enjoy what you are doing! If you start to get worked up or confused, stop and walk away for a while. Things are always easier when you come back.

If you are having trouble, or just don't understand something, contact us. We will do whatever it takes for you to have a positive experience and a great running boat!

Email is best, as we get a lot of phone calls.

Setup Tips

Set the boat up as recommended with the balance point at 9 inches forward of the back of the sponsons.

Use the recommended 4014 3 blade prop for first runs

Set the propshaft centerline 1/8 inch above the bottom of the sponsons. Use the included setup gauge.

If the nose rides too low, you can tilt the prop so that it is higher in the back for a positive angle.

This is a sensitive adjustment, so a little goes a long way.

Another adjustment is the depth. Deeper makes the boat looser on the water and higher makes the boat tight to the water.

Angle adjustment:

Controls the nose height when running.

Depth adjustment:

Controls the height of the whole boat on the water.

The reason why these adjustments work so well is that the prop always wants to ride at the water surface and be level. It will climb to the surface and level out, taking the entire boat with it.

Another way to think about it is to imagine the lower unit being fixed in a vise, and you are adjusting the boat depth and angle.

Balance is not critical, but will influence turns and when the boat blows off the water.

CG too far forward will keep the boat from blowing off, but the turns will be unpredictable.

The key is to find the correct combination of angle, depth and balance point for your boat.

That is a big part of the fun and pride!

That said, we currently like to run the lower unit with no negative or positive angle.

Shaft centerline ¼ inch above the sponson bottom and CG 9 inches forward.

Keep in mind that propellers will have a strong influence to setup.

Some props lift a lot more and require a totally different setup.

We urge you to start out as we recommend. You will have a great running hull, and more importantly, a good baseline to improve on.

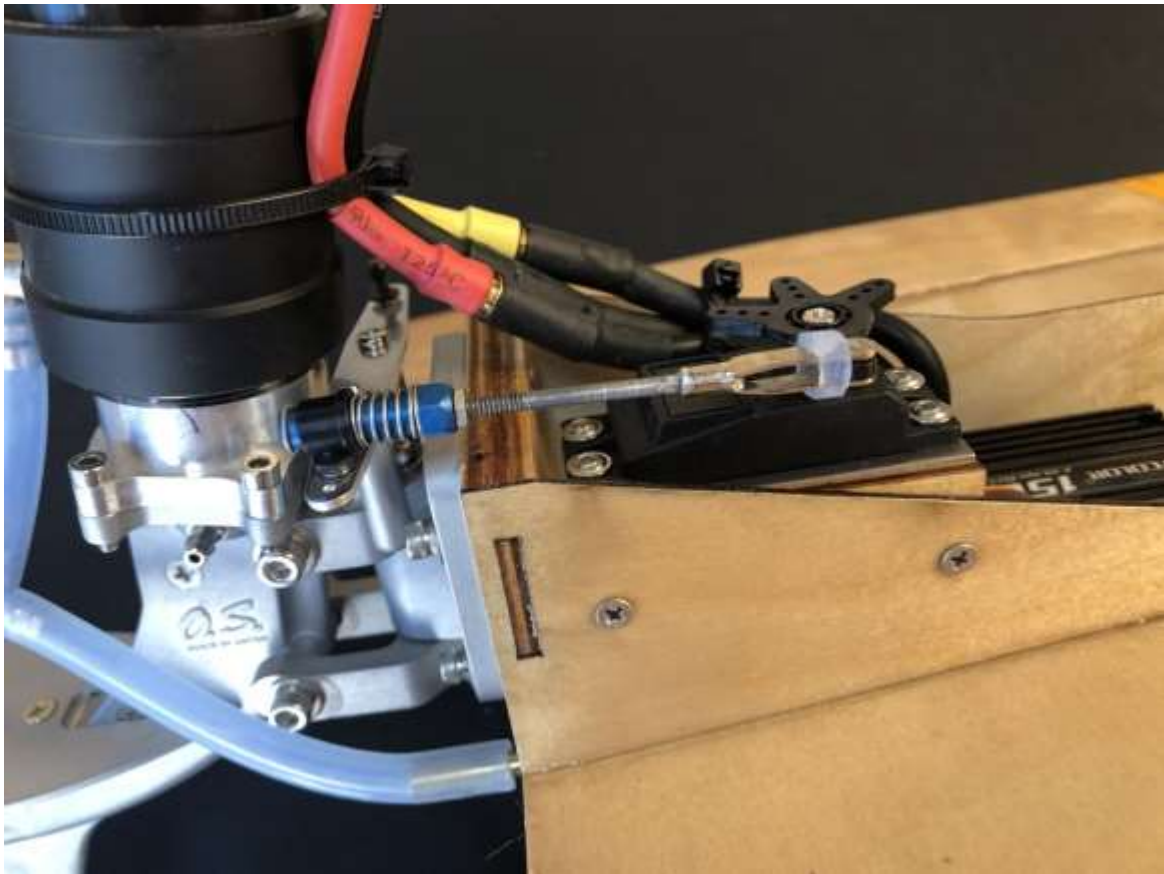
Driving Tips

Start off slowly, as the boat may flip if you hit the throttle too hard while getting on plane.

When turning, start wide, and tighten the turn as you get more comfortable with the boat. As you go faster, it helps to “set” the boat in the turns. To set, let off the throttle slightly as you begin your turn. As the boat begins to come around, gradually go back to full throttle.

You will notice that the boat will “lay down” and turn nicely if you set it.

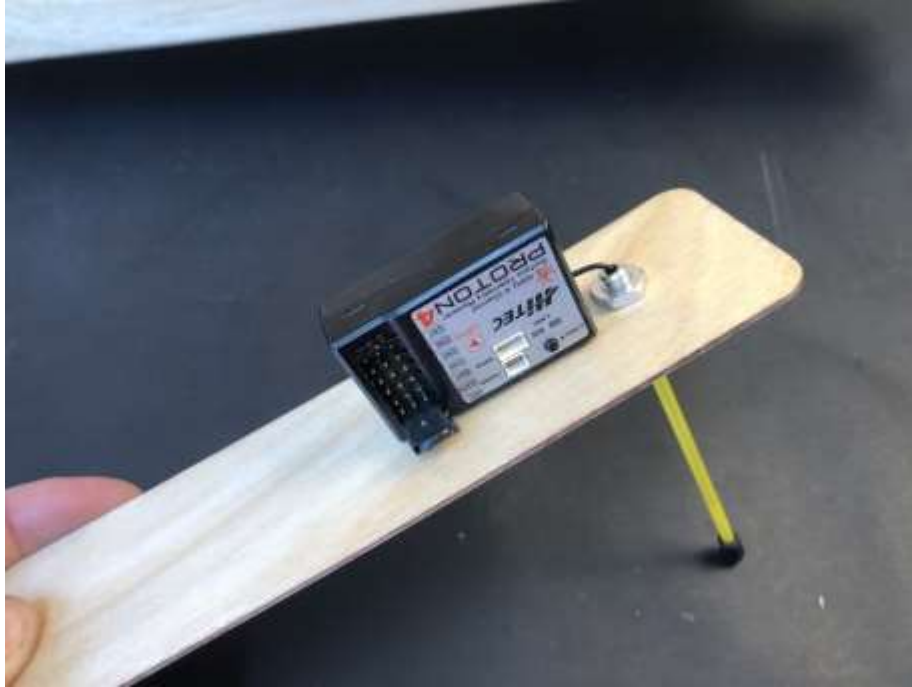
If it gets windy, the large side area of the boat will help and hurt. It will help the boat turn at one end, and prevent it from turning at the other. You can use throttle and “set” to overcome this, or at least minimize its effect.



Line up tops of OS to tops of foam



OVERLAY



Nitro Setup

Build the fuel tank stand from the included parts. Note that the vertical center is doubled.
Use foam rubber under the tank and a Velcro strap to hold the tank to the stand.
You can use Velcro or silicone glue to mount the stand.

We recommend pinning the transom if you use a nitro powerhead.
Drill 4 holes that are a tight fit on a bamboo skewer, and glue them in. Sand flush.

