

PRO VEE

ZIPP MANUFACTURING

PRO VEE

Full Race Mono Hull



A Zippkits RC Boat

Building Instructions

©2016 JMP Hobby Group LLC
Indiana USA

(866) 922-9477

www.zippkits.com

Introduction

Thank you for purchasing this kit. We are sure that it will provide you with many hours of enjoyment.

Please take the time to read this entire manual before building this boat. You will become familiar with the building order, and less likely to make mistakes.

This kit is not a toy. Although R/C boating is a fun and rewarding hobby, it can be dangerous if not done with common sense and safety in mind. Just about anyone should be able to build this kit, but it should not be operated by children without close adult supervision.

Here are a few safety tips:

- **Never operate your boat alone. If you get hurt, you may not be able to drive for help.**
 - **Never, ever operate your boat in an area where there are full size boats or swimmers. If something happens, a 14 pound object traveling at 60+ mph can do serious damage.**
 - **Always use a failsafe if not racing. This shuts the engine off in the event of radio signal loss. Test the failsafe each day of running, by shutting off your transmitter.**
 - **Always carry a fire extinguisher, as gasoline is extremely flammable.**
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PRO VEE

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.

Purpose

This boat was designed as race boat from the start. It is legal for racing in any mono class, due to its vee bottom, if you choose to race.

The Pro Vee was designed for big power and big water. It will handle as much power as you can get, and go through water that would upset most other “race” hulls.

You can build this boat without having the engine or radio, but it does make it easier to have them available when you build.

You can use any gasoline engine (check the rules), as long as it has mounts for 5 inch rails.

Please note that this boat is a very high performance product. This is the current state of the art in Mono hull design as of 2015/2016.

The Pro Vee requires that you build it squarely and set it up perfectly. If you do so, you will have one of the fastest, most competitive hulls available.

Don't eyeball anything. Measure EVERYTHING to be sure you are 100% correct.

Use a straightedge and a square to build and setup a perfect boat. Nothing else will do.

That said, this is one of the easiest building gas boat kits you can buy. Really! You can do it!

Tools and supplies needed to build:

- Small wood plane (mini plane)
- Sanding blocks with 80 and 220 grit paper
- Drill with bits
- Square
- FLAT work bench (the thicker the better)
- Medium CA glue and accelerator
- Titebond III glue and/or Good quality 30 minute epoxy
- Epoxy finishing resin
- Medium sized rubber bands (#64 work well)
- Screws or nails
- Waxed paper
- Lots of clamps! Spring clamps, paper clamps, c clamps, etc.
- Razor saw
- Wide tape
- Wood filler
- Primer
- Paint

P R O V E E

Additional items needed to complete:

- Gasoline engine with 5 inch mounts (Zipp 3409 Zenoah mounts)
- .250 Collet for engine (Zenoah type engines) (Zipp 3440)
- .250 24 inch cable w/welded stub shaft (Zenoah type engines) (Zipp 3444)
- Tuned pipe w/dropped header or canister muffler (Zipp 2018/2011 or 2037)
- 2 channel surface radio with 1 standard and 1 heavy duty servo (150 in/oz minimum)
- Throttle pushrod (Zipp 3462)
- Rudder pushrod (at least “4-40” size) (Zipp 3463)
- 2 pushrod seals (Zipp # 3422/3404)
- Medium Fuel Cell and tubing (gasoline compatible) (Zipp 3506)
- .250 stinger type drive (Zipp 3401)
- .250 drive dog (Zipp # 3446)
- 75 mm prop (Zipp 4102/4105)
- Prop nuts (Zipp # 3450)
- Cable grease (Zipp # 3532)
- Large rudder (water pickup type- Zipp 3413)
- 3 feet large silicone tubing (water line, Zipp 3461)
- Trim tabs and turn fin (Zipp 3417 and 3410)
- 18 inch length of 5/16 brass tubing (Zipp 3568)
- Floatation (pool noodles, foam, etc.)

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The Zipp 3610 Ultimate Hardware Set includes everything needed except engine and radio.

PRO VEE

Before we can start building, we need to do some prep work. Good prep work will pay off later with a straight, true running boat.

First, we need a flat work surface. Nothing else will do.

If you don't have a perfectly flat bench, you can make one with a piece of 12x48 plywood.

Simply screw a couple of 2x4's lengthwise to the bottom. Make sure the 2x4's are straight!

You can then put this on a bench, and shim the corners to make it steady.

Or, if you are really pressed for space, you can set it on a couple of saw horses.

The Build

We are ready to start the build!

Remember- The boat is being built upside down. Any reference to the top or bottom refers to the boat's top or bottom. If you are going to attach something to the top, it would be closest to the bench. Right and left are always as you are sitting in the boat, or from the rear.

Got it? If not, stand on your head as you build.

Please note that in some of the pictures, the boat shown may look different from yours.

This is because we make a whole series of boats that are assembled in exactly the same way. Where it is important, we show the correct hull in the pictures.

Also, some of the pictures may be out of sequence with what we are doing. This is to clarify a point.

Take your time, read ahead in the manual and understand what you are going to do before you do it.

If you need assistance, we are here to help.



We like the Great Planes 11 inch bar sanders



Your life will be much easier with one of these



Use good quality epoxy and finishing resin



Acid brush trimmed for fast epoxy application



Let's get started.

Attach the jig board to your FLAT bench (or 12x48 ply) with screws, nails, clamps or whatever you need, to make sure it's attached to the surface.

Remove bulkheads 1, 2, and 3 from the sheet.

Note that the bulkheads are marked. These should face the rear, when glued into the jig.

Put bulkheads 1, 2 and 3 into the jig, engaging the tabs in the slots.

Starting from the front of the jig, glue the tabs of bulkhead 1 to the jig.

Use a square to ensure that it's 90 degrees to the jig. Also make sure that the tabs don't protrude under the jig.

Use CA and accelerator or Titebond III.

When dry and square, glue bulkheads 2 and 3 the same way. Use the square.

Remove both keels.



Using CA or **Titebond III**, glue both keels together. Be sure that the keels are aligned with each other. Clamp while drying.



Laminate 4A to the back of BH4. The back of the bulkhead has BH4 engraved on the tab.

Glue bulkheads 4 and 5 to the jig as before.

Find the four 1/8 ply engine rails. Laminate both sets. Sand them smooth with 80.

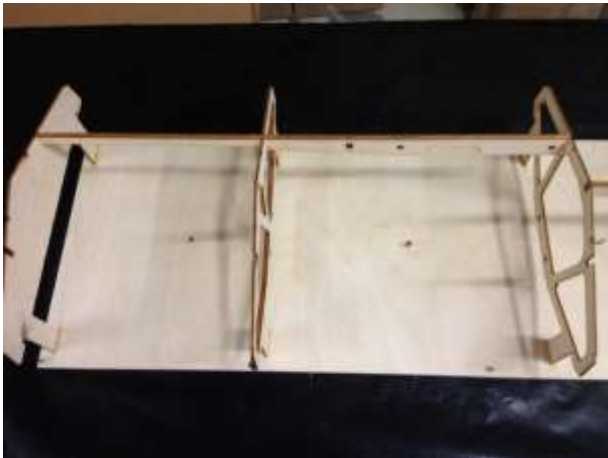
Laminate the two shaft supports together. Clamp until cured.



The keel should be dry by now.

Check the fit of the keel into bulkheads 1, 2 and 3. If okay, glue it into the slots in the jig board.

Glue to the bulkheads, making sure that it is fully seated. You may need to tap it into place. Make sure that both front tabs are fully seated in the jig. The keel will be higher than the bulkheads.



Now look at bulkhead 5. Is it twisted or warped? If so, clamp a piece of wood to the back of it for the next few steps.

Check the fit of the engine rails into bulkheads 3, 4 and 5.

Be sure that the cutout rail is on the right side of the boat. This will be on the **left** (from the rear), when looking at the boat **upside down**.

You may have to tap the rails down into the bulkheads.



Check to be sure all bulkheads are square to the building jig (90 degrees).

Glue in the engine rails with **30 minute epoxy** or Titebond III.

Bulkhead 5 must be 90 degrees to the building jig. Use the engine rails to establish this.

Double check this, as it is the most common mistake made.



Glue the laminated shaft support into the slots. You will have to spread the rails apart slightly to do this.



Note that the engine rails fit fully in their slots. No part of the engine rails should be above the bulkheads.



Glue in both bulkheads 1A. These support the chines. Use your square.

This kind of looks like a boat, doesn't it?
Take a break, and give the glue a little while to completely cure.



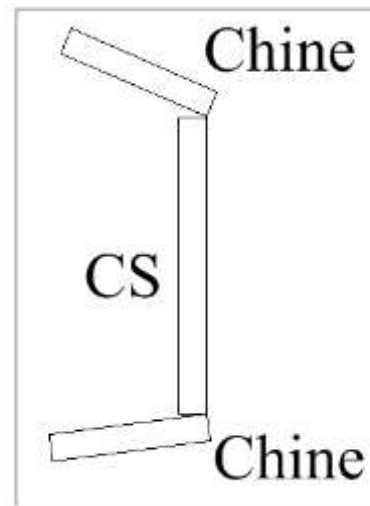
Chine Supports

The chine supports have a very important role in keeping the bottom of the boat straight and flat.

The chine supports are marked CS, and that mark should face out on both sides. The lettering for "PRO VEE" should be upside down as well.

You will be gluing the chines to the edges of these supports.

It is important that the chine supports not protrude past the chine edge, so that you can sand the chines later (see drawing).



Glue in the chine supports. Make sure that "CS" is facing out. Glue them to bulkhead 5, then 4 and 3.



Chines

Next, we will install the Chines. Make sure you follow along closely, as these are very important to the final shape.

When fitting the chines to the notches in the bulkheads, they should be flush with the top (and bottom) of the bulkhead.

This is important as the chines set the angle for the top and bottom sheeting.



Test fit the chines in place. Note that the chines have small tabs at the front. These key into the keel.

The chines will end up with a small angle at the front, which is correct.

Do not glue the deck chine to bulkhead 5 at this time. We need to wait until the other glue joints are secure before we glue this.

All bulkheads have water drain notches, and we can use them to hold rubber bands. Bulkheads 4 and 5 will need rubber bands looped around the tabs. The others can use the spine notches.



Using **Titebond III** or epoxy, glue one of the deck chines (UC) in place.

Put glue on the edge of CS, but only from bulkhead 4 forward. We don't want to glue the support to 5 until the chine is in place there.

Use rubber bands in the provided slots to help hold them in place. Do the other deck chine before this one cures.

In other words, glue both top chines, then glue both bottom chines. We don't want to pull on one side and not the other.



Note that you should not clamp the chines to bulkhead 1A. Put glue down, and let the chine rest on 1A in its natural position. The chines may or may not contact 1A.



Repeat for the bottom chines. Glue to both CS as well.

You can make great clamps from some 3 inch PVC pipe.

We sliced it into 1 inch pieces with the band saw, and cut out a small section of the circle.

These clamps are cheap, and work very well.



Add a little extra glue at the nose. We need some strength here.



Glue the rear of the deck chines into bulkhead 5. You will have to twist the chine so that it is flush with bulkhead 5 (flat). We used medium CA with accelerator, and held them for a minute until cured. Glue to CS at the same time with Titebond III.

Double check that all chines are flush with their respective bulkheads and the CS are in the proper position. Allow to cure.

Note that the CS may or may not exactly follow the curve of the chines. They really don't need to. They are there to provide vertical support for the bottom sheet.



Blending the chines

Before we can glue the side sheeting in place, we need to make sure the chines are flat. Do this with your sanding block and fresh 80 grit paper. Sand the chines, using your sanding block to blend them at the front.

Check to see if your sanding block sits flat on the chines at all points. If it does not, the side sheeting won't either. The front of the chines will need a little bit of blending. The rear will need very little.

Sand the front of the keel where the side sheeting will lay.

Only sand enough to get the bevel. Don't change the shape of the keel.

Side Sheeting

When the chines have been sanded and blended, it's time to start the sheeting.

Dry clamp the side sheeting in place. Use the rubber bands to hold in place.

Clamp and adjust the sheeting so that it overhangs an equal amount on the top and bottom. Leave a little hanging off of bulkhead 5 as well.

Sand a bevel on the front edge so that it will meet the other side sheet.

When it looks good, make a reference mark somewhere that is easy to see. I make it between 3 and 4.

Mark a line on the chine and the sheeting, so that you can align the marks quickly when gluing.

Remove the clamps.

Using **30 minute epoxy** or Titebond III, glue the side in place.

Using a small stick or acid brush, coat the chines and bulkhead edges. Work quickly.

Make sure that all surfaces that will touch the sheeting are coated. Try not to use so much that it runs all over.





Align the marks and start clamping with rubber bands as before, adjusting the sheeting for equal overlap on the top and bottom. Line up the nose, so that the side covers half of the keel. You will need a few clamps. Clamp lightly, but be careful not to distort the chines.

Check all over to be sure that the side is in contact with the frame. If not, add clamps until it is.

Allow to cure at least 3 hours.



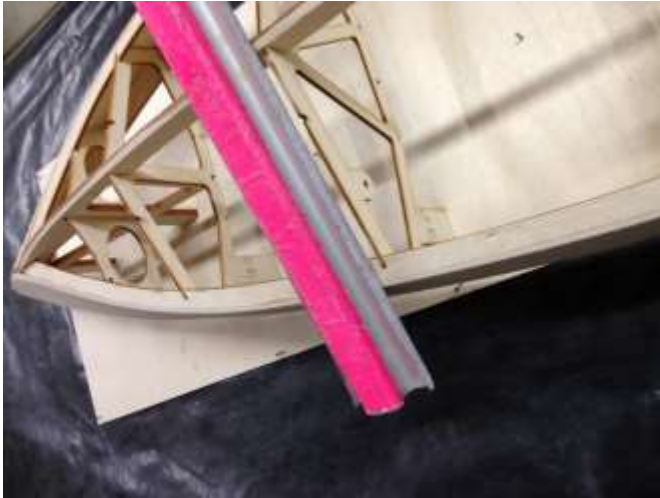
Repeat for the other side. Get the nose to fit as well as you can. If there is a gap, don't worry about it. That's what wood filler is for...

After the sides have cured, sand the rear of bulkhead 5. Sand the chines and sides flush with the bulkhead.



Using 30 minute epoxy, glue the transom to the back of bulkhead 5. Try to match the bottom "vee", and leave an equal overhang on the sides. Clamp until dry.

Note the correct orientation of the transom. If you don't, the holes will be in the wrong position.



Bottom Sheeting

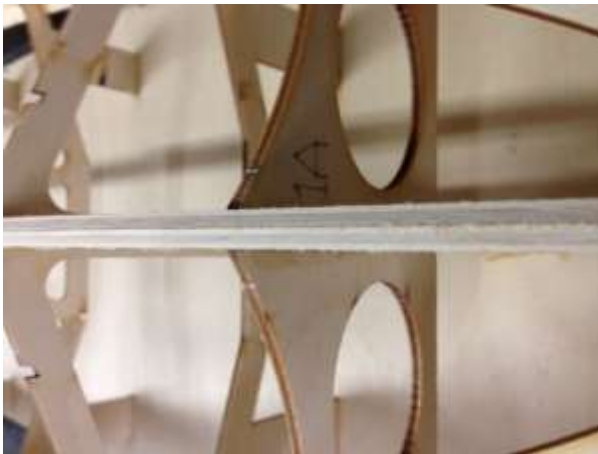
Use the angle on the bulkheads to determine the angle that you hold the sanding block.

Use fresh 80 grit on your sanding block.

This is one of the most critical parts of assembly, as it sets the shape of the bottom. **DO NOT** over sand the chines.

Take your time and sand until the side sheeting is just flush and no more.

You cannot do this with any kind of power tool.



Match the angle of the bulkheads. Also, **lightly** sand half of the keel at the same time, so that the bottom sheet lays flat on the structure. Do not change the shape of the keel, just match the angle. The keel will have a slight "V" shape when you are done.

Be very careful not to sand the keel too much, or the bottom will not fit!

Make a mark in the exact center of bulkheads 4 and 5. Make this mark on the edge, so that you know how far to glue the sheeting.

Note that the bottom sheets have the position of the strakes marked on one side. This side must face outside the hull.

Test fit the bottom sheeting in place. It should cover exactly half of the keel. Also, sand a gradually increasing bevel on the inside (center) edge, so that both bottom sheets will meet squarely.

Make sure the front is accurately aligned with the center of the keel and that there is some overlap at the rear.

When satisfied with the fit, make an alignment mark on the bottom sheeting and the keel.

Mix up some 30 minute epoxy.

Using a small stick or acid brush, coat the chines and bulkheads where the bottom sheeting will contact. Work quickly.

See Printed Version

See Printed Version

See Printed Version

See Printed Version

Also coat half of the keel.

Brush epoxy onto the first 6 inches of the front of the bottom sheet, to help the glue joint here. This should be done on the side WITHOUT the strake outline.

Make sure that the strake outline is facing out when you glue the sheet in place.

See Printed Version

Align your marks and put a couple of clamps along the keel, clamping the sheeting firmly to the keel. Check your center marks on bulkheads 4 and 5. Wipe all excess glue off of the keel, as it will interfere with the other side sheeting.

If everything looks good, start clamping the bottom sheeting.

Bulkheads 3, 4 and 5 should have weight over them.

Also put weight over the engine rail and shaft support, to help hold it against the sheeting.

See Printed Version

After the glue fully cures (at least 2 hours), remove the weight and clamps. Check for any glue that may have squeezed onto the keel. Use a sharp knife to scrape any away.

Take your time on the next step, it's important.

Test fit the other bottom sheet, and make any adjustments before you glue.

Make sure that both bottom sheets meet as perfectly as possible.

Take your time here. Start from the rear. Put the sheet in place, and note any areas that touch, keeping the sheeting from meeting perfectly. Use your block with 80 to sand these "high" spots. Move forward and sand, fit, sand, fit, until it fits perfectly. Be sure to sand a progressively sharper bevel, so that the bottom sheets fit tightly together.

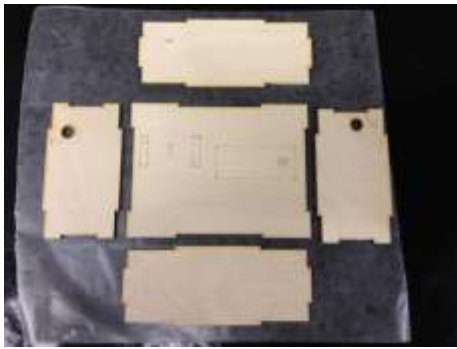
The goal is to have a nice, tight joint that is straight. Try to keep the gap to less than 1/16 inch.

Glue the other side of the bottom sheeting on the same way as the first, only this time you can't use as many clamps.

Put weights on it, and set aside.

Make sure that the bottom sheet is in contact all the way around. Clamp the nose.

You can also tack glue the bottom sheets together at this time. Put a drop of medium CA about every two inches or so, check that the bottom sheets are properly aligned, and hit the drop with a shot of accelerator.



Let's build the radio box while the glue cures on the hull.

Radio Box

Remove all of the radio box parts: Two long sides, two short sides, the top and bottom, as well as the 1/16 ply top.

Lay a piece of plastic wrap or waxed paper on your bench.

We use Titebond III and glue all of the 1/8 ply parts at once.

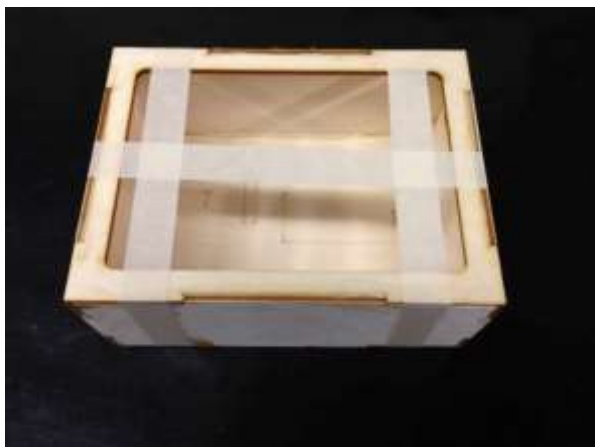
We tape it together to cure for a couple of hours.



Using CA or Titebond III, glue the two long sides and two short sides to the bottom.

The small sides have a "T" and "R" on them. These face inside.

The "R" on the short side should be on the same side as the "R" on the radio box bottom.



Glue the radio box top on.

This is the 1/8 inch Birch top.

Take a break for a while, so that the radio box glue joints can cure.

Lightly sand the top of the box.



Glue the 1/16 ply top to the radio box. It has a slightly larger hole for the lid, so try to center it so that the "lip" is even all around. Make sure that you don't get any glue in the "lip", as it will interfere with the way the lid seats. The plastic lid will be sealed with tape when running the boat.

Sand the entire box with 220.

Stand back and admire your awesome radio box!

Back to the boat:

Make sure that it has been at least 2 hours since you glued the bottom sheeting to the hull.

With your plane, remove the overhang of the bottom sheets at the sides.

Sand all over with 80. Do this while the boat is still attached to the jig, as it is far easier than trying to do it in your lap!

Keep the bottom corners sharp at this point.
Do not round off the bottom to transom junction, we need it sharp.

With your razor saw, cut all the tabs that are holding your hull to the building jig.

Ditch the jig. We don't need it any more.

Hey, this is really starting to look like something now!

After you finish admiring your cool new hull, let's move on.





Deck Framework

The first step is to test fit and glue the spines in place. We used Titebond III. The center spine (CS) and the two spines (S). The marks go forward. Note that the spines go under the chine at the front.

All spines should be flush with the bulkheads.

Test fit the deck supports (DS). These should set parallel with the chine and not bow at all. If they are not, find out why and correct it before gluing in place. If okay, glue in both deck supports.

Sand the top so that all spines and supports are flush with the bulkheads.

Trim the building tabs, and sand the bulkheads to match the top contour.

DO NOT sand off the top of bulkhead 4.



Reinforce the engine rails as follows:

Mix filler with 30 minute epoxy to make a paste for the engine rails.

This paste should create a small fillet on each side of the rails.

Make the paste thick so that it will not run or sag.

Do the inside and outside of the engine rails. Make sure that you pack it in on the inside.

Use your finger to make a small fillet.

Wipe off any excess filler.



Fiberglassing seam

Use the supplied fiberglass cloth, and some epoxy finishing resin.

Mix 2-4 ounces of finishing resin.

Brush resin onto the center seam and lay the cloth down, centered on the seam.

Brush in a very heavy coat of resin, so that the cloth is completely wetted.

Glass the seam from bulkhead 3 back. You will have to cut it into 3 sections.



Sealing Interior

Now we need to seal the inside. It is vital that all exposed wood be sealed.

Mix up about 2-4 ounces of epoxy finishing resin.

Start from the front.

Using a brush, coat all areas of wood inside the hull. Get inside the holes.

Try not to get too much resin on the top edges of the bulkheads and chines, as it will make it more difficult to sand later. Be sure to get the bottom edges of the spines.

Seal over the glassed area as well.

After you are 100% sure that all exposed wood inside the hull has been coated, let it sit overnight.

Recoat the interior with a second coat. This will use much less resin.

You can use any excess resin to seal one side of the deck sheeting (3 pieces) at any point. You should scrape or sand when cured and coat a second time.





Floataction

Now is the time to put floatation in the hull.
DO NOT OMIT THIS STEP! Without floatation YOU
WILL LOSE YOUR BOAT!
Don't ask me how I know...

Find a pool noodle and cut it into sections that will fit
between bulkheads 1 and 2.

You can also glue a couple of pieces on the left
side, between bulkheads 2 and 3. Leave the right
side so that we can mount the fuel cell.

You can get pool noodles at the dollar store or
Wally World.

Be sure the floatation will not interfere with the top
sheeting.

Let's get this puppy closed up!

A boat stand is a good idea at this point.
You can make a boat stand out of PVC pipe or
wood.



Fuel System

Before we can put on the deck, it is a good idea to
get the fuel cell mounted.

This goes in on the right side, between bulkheads 2
and 3, ahead of the engine.

Note that the only way to access the fuel cell is by
removing the engine. Because of this, we
recommend a magnet mount for your fuel cell. If
needed, you can find somebody with really small
hands and they can slip the cell in place and snap it
to the magnet without removing anything.

Attach the (optional) magnet cup to the right side of
bulkhead 2 with the included long screw, washer
and lock nut.

Pop the magnet into the cup.

Attach the magnet washer to the fuel cell with the
short screw and plastic acorn nut. You may have to
poke a hole above the mounting portion of the fuel
cell.

You can now snap the fuel cell into place, or quickly
remove it.

There is no need to add any additional support. The
Zipp Fuel Cells are pretty tough.





Hatches

There are quite a few parts to the two hatches, but they are all precision laser cut for exact fit.

We used Titebond III for most of the hatches, and medium CA for the hatch sheeting.

Glue in 2 of the H10 parts. These are stops that prevent the front hatch from falling in. These go against the bottom H4 at the rear.



Slightly round all 4 dowels.

Glue one set of dowels to 3A, leaving just over 3/16 inch sticking out of the front.

Put 1/16 ply spacer "SP" between 3 and 3A. This is a **temporary** spacer. Used for the front, then rear hatch.

Tape strips of wax paper to the corners, as well as the front and rear of the forward hatch opening. We don't want to glue the hatch frame to the boat...

Put 4B in place. Use dowels to hold it but **DO NOT glue the dowels in place.** Make sure wax paper is in place.



Test fit H4 in place. You want it to be parallel with the deck support. You can flip it over or swap it side to side. Get them as parallel as you can.



Glue both H4 parts into place. Make sure there is Be sure to put wax paper at all glue joints, otherwise this will be a display only boat.

Glue both H1 parts (H1 marks forward).
Glue in both H3 with the tops flush.
Glue in H1A.

Glue in both H2 parts. They should be flush with the bottom of H1. Marks face forward.

You can lightly tape the scoop (H1) to keep everything in place, but not too tightly.



Allow to cure.

The rear hatch is done much the same way.

Glue in all four H10 parts. These are stops that prevent the front and rear hatches from falling in. These go against the bottom of the deck supports, against the transom and against BH4.

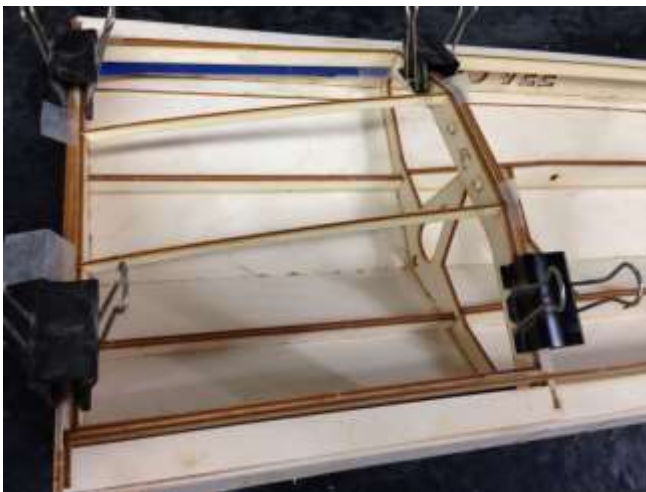


Glue the dowels into 4C so that a 1/2 inch extends from the front.
Put this into BH4 **with 1/16 ply spacer SP in place**. The 1/2 inch of dowel sticking out should face forward.



Put waxed paper in as you did before.
Clamp 5A against the transom with the notches up.

Glue in both H7 parts.
Again, be sure that they are parallel with the deck supports on each side.



All parts are marked at the front.

Allow a while to cure.



Top Deck

This is usually the most difficult step in building a boat. Not so with the ProVee! It's very easy to get the deck attached properly.

The ProVee has a main deck and two large hatches. There are a lot of parts, but they assemble quickly.

The main deck has 3 parts: The center deck and two deck sides.

Sand the top of the framework to get rid of any sealer bumps, or other irregularities that would prevent the decks from laying flat.

Check the fit of the center deck. It should not overhang any of the spines. It should be flush with the back of bulkhead 3, and overhang at the front.



The bottom (inside) of the deck pieces should have 2 coats of epoxy finishing resin on them by now. If not, get it done first and allow to cure.

Sand or scrape the underside of all decks.

Mix about 1/2 ounce of 30 minute epoxy. Using a stick or acid brush, coat the tops of the bulkheads and spines with resin. Only coat the areas that the center deck will cover.

This includes half of the spines.
Also coat all around the perimeter of the deck. Be sure you are working on the inside. Work quickly.

Align and clamp the center deck at bulkhead 3.
Then align and clamp the nose, then the sides.



Check all around to make sure that the deck is tight against the top of the spines and bulkheads.

Scrape any excess epoxy from the spines. We will be gluing the deck sides here.



Once cured, do the same thing with each side.
Test fit the side decks first, and sand as needed for a good fit.
Clamp to the deck support and bulkhead 3. Clamp along DS. Use light clamp pressure.
Tape the rest. Clamp **lightly**.

Continue adding tape until the entire deck side is in contact all the way around.
Add weights if needed to get full contact all the way around.

Repeat on other side deck.

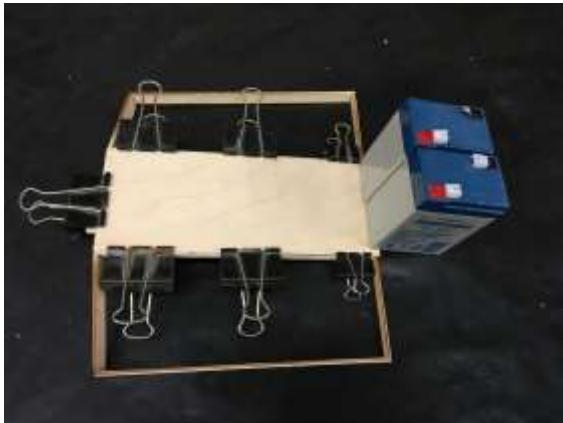
Allow to cure.



After the deck sheeting is fully cured, use your 150 grit to sand the seams flush.
Give the whole boat a good sanding with a 150 grit block. Round off the nose.

Make sure that the deck sides are flush with the deck supports. Sand flush if needed.

Hatch Sheeting



Test fit each sheet in place, before gluing.

Rear hatch:

Using medium CA or Titebond III, glue (1/16 ply) H14 in place on the center of the rear hatch. Clamp until cured.

Use medium CA to glue the (1/32 ply) H15's in place as follows.

The H15 decks must be glued in the right sequence to get that "fastback" look. If you don't, it will look "bumpy".

Test the fit of H15. Make sure that you have scraped any glue that may have squeezed out from H14.

This is the process we use...

spray accelerator on the bottom of H15.

Run a bead of medium CA along H9 and H7.

Press the sheet onto H9 and hold for a few seconds until cured. You will not have any time to re-position.

As soon as that is cured, press the sheet onto H7 along the full length. Only press on the very edge, so you don't distort the sheet.

Once this cures, do the other side the same way.

Once that cures, glue the rest of H15 from underneath. Hit it with a little accelerator.

Repeat for the other H15.

Place on a flat surface and weight down until we need it again.

Front hatch:

Sand the sides of H2 so that they match the angle of the hatch.

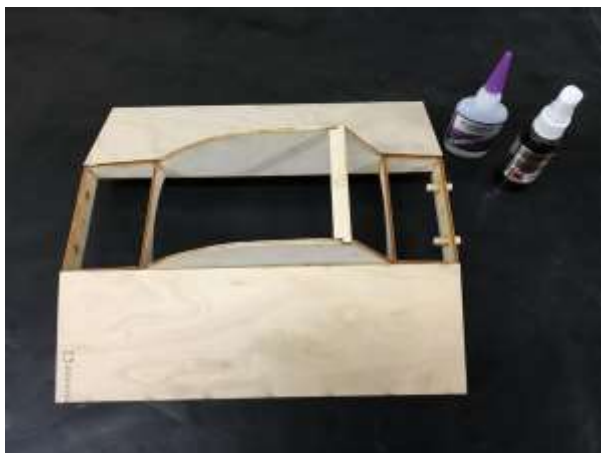
You won't be able to sand against H1 very much (without cutting into it), so do the best you can.

We used Medium CA just like the rear hatch.

Note that H2 has a "hump" near the front. You can pre-bend H12 to fit nicely.

Glue to H2, hold until cured, then glue to H4.

Repeat on other H12, then glue from inside just like the rear hatch.

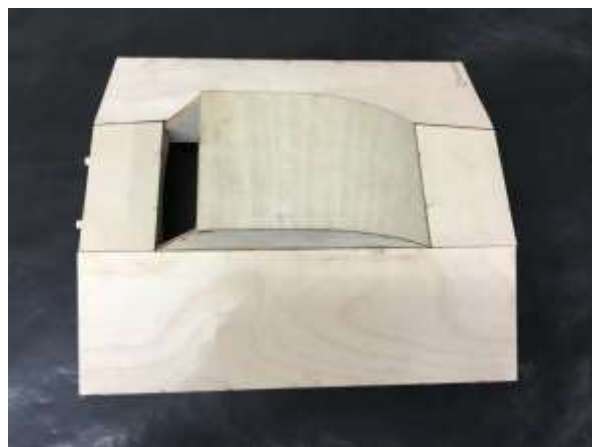


Put the front hatch on a flat surface while we finish the sheeting.

When cured, glue H16 (1/32 ply scoop top) in place the same way.

We recommend not spraying H16 with accelerator until after you glue it. That way, you can make sure that it is positioned correctly before you spray it.

Sand and fit 11 and 11A to fit, and glue in place.



Glue the transom cap in place on the top of the transom. You will need to sand this to length. Sand flush with the transom when cured. You can round this outside edge if desired.

Sand the inside of the deck sheeting, all around. Sand it flush with the deck supports and bulkheads.

Make sure that the hatch dowels are not a tight fit, and are easy to remove. Sand if needed.



Sand and fit the overhang on the hatches for a nice fit.

Pay attention to the gap between the hatch and the deck. Not only is this a cosmetic thing, but large gaps will also let water in.



Keep the gaps small. We like about 1/32 all around, to allow for paint and clear coat.

Drill a 1/8 inch hole in the transom at the location marked for the hatch latch (Zipp 3451). Carefully drill through the transom and hatch. Remove the rear hatch and drill the transom only with a 7/32 drill.



Glue H17 over the hole, using the latch to center it. Don't glue the latch in place until the boat is finished.

Shaft tube

Set up for surface drive, this will exit the rear of the boat, through the transom.

The shaft tube is a piece of 5/16 brass tube.

The ProVee comes with the shaft tube holes pre-drilled.

Cut your brass tube about 16 inches long, and make a mark about an inch from one end.

Heat the tube with a propane torch, at your mark, for about 5 inches until it changes color.

Let cool.

Slide your 5/16 brass tube through the holes, and out the transom, slip the 1/4 cable inside. Carefully bend the brass tube where it was annealed to roughly match the engine collet. Make this a gradual, large radius bend.





Mount the engine with all four mounts, and check the cable fit to the collet. Bend tube as needed.

When you can easily slide the cable in and out of the collet, it's time to secure the stuffing tube to the hull.

Cut the brass shaft tube so that it is about $\frac{1}{4}$ inch from the end of the collet.

Cut the rear so that $\frac{1}{8}$ inch protrudes from the back of the boat.

Sand the outside of the brass tubing.

Mix about $\frac{1}{4}$ ounce of epoxy, and add filler to thicken to the consistency of toothpaste.

Use this mixture to secure the tube to the hull at the front and rear of bulkhead 4, at the shaft support, and inside the transom.

Work it under and around the tube.



Don't get any resin inside the stuffing tube.

Make sure the cable still slides in the collet easily. Let sit at least 3 hours.



Next, we will mount everything we need, to make this boat go!



Trim Tabs

Mount your trim tabs to the transom so that they are flush or just a hair up from the bottom.

Use the pre-drilled holes.

We like to use 6-32x1/2 bolts and blind nuts.

Use a grinder or disk sander to remove part of the blind nut, so that it won't interfere with the hull bottom. This is only needed for the trim tabs, due to their low mounting position.



Rudder

Mount the rudder with blind nuts as you have done. If using our 3413 rudder, be sure to check that the set screw for the pin is tight. Do this before you put the rudder blade on.

Make sure the rudder is not slanted right or left. Use a square on the top of the boat to sight the rudder for square.



Stinger Drive

Mount the stinger to the transom using the pre-drilled holes.

We like to use 6-32x1/2 bolts and blind nuts.

Loosen all adjustment screws slightly.

Adjust the stinger so that the flex shaft slides in without any resistance. This is important. If the shaft does not go in freely, it will eventually break.

The Zipp 3401 stinger is fully adjustable.

Final adjustment will be done in setup.



Turn fin

The turn fin should be mounted on the extreme right side of the transom, above the trim tabs. Use the pre-drilled holes.

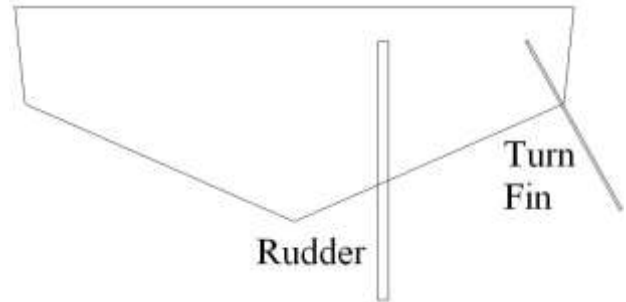
We like to use 6-32x1/2 bolts and blind nuts.

Make sure the fin is 90 degrees to the bottom. It will be canted outward with the hull level.

The ProVee turns much tighter with a turn fin, although you can run without one.

If you are racing in the offshore category, or using the PV for sport use, we recommend a fin on each side, for right and left turns.

Normal heat racing requires only a RH fin.



Flex cable

Get the flex cable, drive dog, prop and prop nut. Put the drive dog on the stub shaft, then the prop. Engage the drive dog into the prop, and slide this assembly back until there are about $\frac{1}{2}$ inch of threads on the stub shaft. Tighten the drive dog set screw.

Mark the stub shaft at the front of the drive dog. Remove the dog and prop.

Measure $\frac{3}{16}$ inch back from your line, and file a flat spot, about $\frac{1}{8}$ inch wide and $\frac{1}{16}$ inch deep. This is for the set screw. File off any burrs, and put the drive dog back on, tightening the set screw into the flat.

Put the prop and prop nut on. Slide the flex cable into the stinger, until the cable gets to the engine.

Slip the cable into the collet. Be sure that the cable is fully seated into the collet!



Measure from the back of the stinger to the drive dog. Subtract $\frac{3}{8}$ inch. This is the length to be cut from the cable.

When we are done, with the cable fully seated in the collet, the drive dog will have a $\frac{3}{8}$ inch gap from the stinger.

We need this gap, as the cable “winds up” and shortens under load, and we don’t want the drive dog to rub the end of the stinger.

Measure carefully, as we can’t add to a cable that is too short!

Carefully cut the cable with a Dremel and cut off wheel. Deburr the end.



Radio

Laminate all of the servo mount parts as shown. Make sure that the parts do not slide out of alignment while curing.

Do not laminate S1 and S1A at this time.

Note that S3 and S4 have their doublers even at the top.

Glue S1 to S3 and S4 laminates as shown.

Glue the S2 and S2A laminates together so that the holes line up.



Glue the doubler S1A to the bottom of the mount.

TS gets laminated into two pieces.

When all parts are cured, set your $\frac{1}{4}$ scale servo into the mount and slide the locknut into its slot (you may need pliers to press it in).

Slip the S2 laminate into the square hole and lightly run up the screw. Do not tighten yet, as you may break or distort the mount.



When cured, set the mount inside the box, over the area marked "R". Look in from the rear. Move the mount to the right, if necessary, so that the servo arm is centered in the pushrod hole. Mark this offset from the engraved line.

Remove your rudder servo from the mount.

Glue the mount to the radio box bottom in the area marked. Make sure that it doesn't slide out of position while it cures.



Set your standard size rudder servo on its mounts and drill $\frac{1}{16}$ pilot holes for the screws.

Bolt the servo to the mounts with the rubber grommets, bushings and screws.

Glue the throttle servo mounts to the radio box bottom in the area shown.

Be careful not to glue the servo or servo wire to the box...

Remove everything from the radio box, and coat the inside and outside with finishing resin.

Be careful not to get any buildup in the lip, where the lid seats. It will make it impossible for the lid to seal properly. To get inside the upper part, bend an acid brush about 120 degrees, and it works very well.

You can seal the inside, and all four sides of the outside in one session. Allow to cure overnight.





Set the radio box between the ply rails, about 1 inch behind bulkhead 4.

Sand the insides of the rails where the radio box goes.

Set the radio box in place, ½ inch behind bulkhead 4.

Make sure the box is in correctly (rudder servo in rear).

If all is well, attach the radio box.
We use silicone or hot glue on the sides only.

Put a little blob of glue on each corner. Only glue the sides, not the bottom.
If you ever need to remove the radio box, you can simply run knife blade through each glue blob.





After the radio box is cured, make the rudder pushrod. You have several options as to what to make it out of. Just make sure it's strong and stiff. We like to use a 4-40 pushrod, which is threaded on one end.

We attach the rudder end with a 4-40 ball link, and the servo end with a solder clevis.

Get the length perfect before you solder the clevis in place.

For the throttle, we like the bellcrank system.

Use a 2-56 pushrod with a nylon clevis on the throttle end, and an EZ connector at the servo.

Be sure to use the metal retainer on the EZ connector. Only use the plastic retainer to test throttle adjustment, then switch to the permanent retainer.





Exhaust

There are a few options for tuned exhaust for the PV.

Our Super Tuned pipe is one of the best pipes you can buy for this application. It has won many races and holds several records in this class (gas mono).

You can run the entire system inside the boat (recommended), or you can bring the pipe up thru the rear hatch.

If you do this, we recommend using epoxy and glass cloth on the inside of the rear hatch, as most of the left side will be cut away.

For internal installation, you can use either a 2 inch offset 90 degree header, or our dropped header. The dropped header will get the system a little shorter overall, and require a smaller hole in the transom.

One thing to remember is that you don't ever want to put any sideways pressure on the pipe. If you do, something will eventually break.

When mounting the pipe, let it rest naturally (side to side), before marking any hole locations.

Also, since these pipes are hand made, they are not 100% concentric. You can rotate the pipe on the header and the center will change slightly.

Assemble the pipe and header to the engine (out of the boat). You want a tuned length of 13-1/2 inches. This is measured from the face of the exhaust port (exhaust gasket) to the maximum diameter, measured around the centerline of the header and pipe.

If using our dropped header, run it as short as you can. Leave 1-1/4 inch of header inside the pipe.

Slip the engine back into the mounts and put the pipe on the top of the transom.

Spin the pipe around and try to find the center. This gives you a little bit of sideways adjustment if you need it.

Mark the exact position on the transom. Be exact. Draw a line 5/8 inch below the top of the transom. The center of your hole cannot be any lower than this.



Carefully drill a hole.

Double check the position and keep drilling or file the hole to size.

You want the hole to be just big enough for the end of the pipe, with silicone tubing around it.

This is the ½ inch tubing supplied with every Super Tuned pipe.

The hole will end up between ¾ and 7/8 inch.

You will have to take the engine out a few times to get it right.

Good thing we have quick change mounts...

Cut a ½ inch long piece of the silicone tube, and push it onto the pipe stinger and through the hole. It should be a nice fit. Not too tight since the sealer will make the hole smaller.

Water Cooling

Assemble the engine with complete exhaust. Install the rudder and RH turn fin (bracket).

Figure out where your water lines will go through the transom.

Keep the holes low enough to be under the hatch former.

Route them to the lowest fittings in the cylinder head and the exhaust flange.

Use the hole in the engine rail for the exhaust flange exit hose.

Determine where the water outlets will be, and drill the holes.

Mount the water outlets and secure them finger tight.

Make the water exit hoses so that they don't touch the exhaust. They can be really close, but can't touch.

Remember, in low and out high.

This pushes all air out of the cooling system.





[See Printed Version](#)

[See Printed Version](#)

Surface Prep

Sand the entire hull with 150.

Fill any dings, dents, craters, valleys or chips with wood filler.

When dry, sand again with 150. Check to make sure that all imperfections are filled.

If not, fill and sand again.

Spend a little time getting this right, as it will make your boat look so much better when done.

After the filler is dry, sand it with 150 grit, using light pressure.

At this point, you can round the deck where it meets the sides.

Make sure that the bottom to sides and bottom to transom corners are not rounded.

Blow off the hull with compressed air, or use a vacuum to get the dust off.

Strakes

The ProVee features turning strakes on the bottom. These help the smooth bottom “grip” the water when the boat turns, minimizing slide.

These are necessary for the hull to turn, so don’t skip this step.

The strakes come pre cut, but must be rounded on the front.

The strakes are marked. These marks will be face down when the strakes are glued in place.

Sand and blend the front of each, so that it blends into the hull at the front.

The strake positions come pre-marked on the bottom sheets.

Use medium CA after the hull is sealed.

We only get one chance at this, so take the time to make sure everything is correct before you glue.

Sealing

Mix about 1 ounce of finishing resin.

Use a credit card to spread out the resin on the top and sides.

Squeegee as much as you can. Get a thin even coat of resin on all areas.

Use a small acid brush to get the edges.

Scrape as much resin as possible. You just want to wet the wood with resin, any excess will just have to be sanded off later.

This first coat is easy, as the wood will darken as it gets wetted with resin.

The second coat will be a little more challenging, but will use far less resin and be faster to cover.

When you are sure that all areas of the boat are covered, let it cure overnight.

When cured, sand lightly with 150. Just make it smooth. It's ok if you sand through the resin on this coat.

When done, blow the dust off and do the bottom.

Repeat the whole thing for the second coat, only this time, after the second coat has cured, sand with 220 wet.

Sand with a bucket of water, a dribbling hose or in your bathtub.

Use one of those rubber sanding blocks.

Don't worry about the hull, it's waterproof now...

Sand the inside of the hull if you want.

Sand until all areas are smooth, but don't sand through to the wood. If you do, you have to re-coat the area with resin, and re-sand.

Make 100 percent sure that there is no glue fillet between the strake and the hull bottom.

This would make the strakes useless, as we need the edge to "bite" as we turn.

Finishing

Once the hull is dry, wipe it down with alcohol. Use a tack cloth lightly to remove any dust.

Spray a light coat of primer. Let this flash for a few minutes, and spray a heavy coat on.

Let sit overnight.

When the primer is dry, use spot putty to fill any nicks or surface imperfections.

When dry, wet sand with 400 on the rubber block.

If you are happy with the surface, spray on another medium coat of primer.

When dry, wet sand with 600 or 800.

Use compressed air or a vacuum to remove the dust on the inside and outside of the hull.

Wipe down the entire boat with alcohol.

Use a tack cloth to lightly wipe all surfaces.

Spray your color coats.

When cured, wet sand with 800+ and clear coat the entire hull. We like automotive clear in very light coats. Allow to flash and apply 2 medium wet coats.

Make sure the clear is completely cured before final assembly.

Apply your decals.

Wipe the area with alcohol, allow to dry.

Remove the backing from the decal. If you have trouble removing the backing, press or squeegee it firmly, and try again.

Align the decal and press firmly to surface. Roll or squeegee in place.

Remove transfer sheet from top of decal.



Final assembly

Put the boat on your stand. This is where it will live, when it's not in the water.

Install everything. It may be necessary to clean out paint from some of the holes.

Install the aluminum pushrod seal mounts through the radio box and stretch on the rubber seals. Push the threaded end of the rudder and throttle pushrods through the big end of the pushrod seals. Attach both ends of the pushrods, making sure the seals are on the outside of the radio box.



Setup

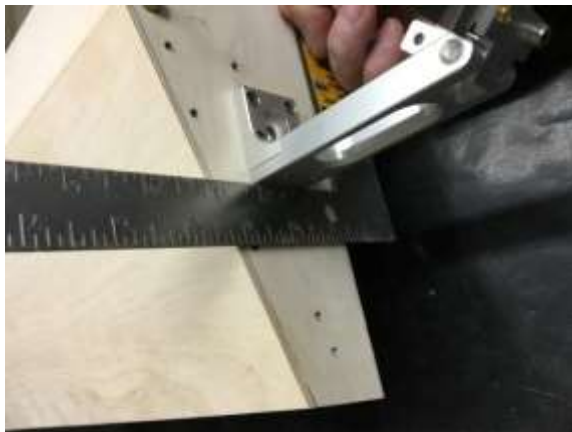
Adjust the stinger so that it is parallel and flat with the bottom of the boat. This will be a zero setting. Use a straightedge ruler.

Adjust your trim tabs so that they are parallel with the bottom of the boat. Not angled up or down. This is a zero setting.

Get them as close to the bottom as you can, without being below the bottom.

Use a square to adjust the turn fin. It must be perfectly square (90 degrees) to the bottom.

Do the same for the rudder. You can square the rudder bracket to the top of the transom.





Grease the flex cable.
Slide the cable through the stinger, into the engine collet.
Leave a 3/8 inch gap between the drive dog and stinger.
Tighten the collet.



Wrap your battery pack in foam rubber.
You can wrap the receiver in foam rubber or you can use double sided tape to attach it to the underside of the radio box lid.

We leave the receiver antenna inside the radio box for racing in protected water (2.4 ghz Futaba FHSS).

Mount the switch.

Turn the transmitter on first, then the receiver.
Make sure the trims are centered.



Put the rudder servo arm on. It should be parallel with the servo, and 90 degrees to the pushrod. Use the sub trim function, if your radio has it.
If not, get it as close as you can.

Try to use innermost servo hole that you can. The PV needs very little rudder throw.

Attach the rudder to the pushrod. Is the rudder straight? If not, adjust the clevis or ball link until it is.
Be sure to put the screw in the servo arm...

Adjust the throttle so that the carb is wide open when you pull the trigger all the way back, and closed when you push the trigger fully forward.
When the engine is running, you can use the throttle trim to set the idle speed.
Take the time to get this right. It's no fun running your boat onto the shore because the engine won't shut off...

Make sure all your water lines are firmly attached.
Use those teeny little tie wraps at each fitting.

Running

If you are using a new engine, you should run it on the stand before going to the pond.

This will do several things; It will allow the engine to loosen up a little, making starting a simple matter, as well as get YOU familiar with its starting and running characteristics.

When new, the engines are very tight, and starting is difficult at best.

If it won't start, 9 times out of 10 it is flooded.

Under no circumstances should you ever run a marine engine for an extended time without cooling water.

Use some kind of water cooling.

We use a Zipp garden hose adapter.

We simply hook this to the garden hose; it has an inline valve to regulate the water flow so that it squirts out about 2 or 3 inches from the water outlets.

It doesn't take much water pressure.

If you are going to run the boat on the stand, take the prop off, but leave the shaft connected to the engine.

This will help to "break in" the strut bushings.

Really take some time to go over the entire boat. Check every nut and screw.

Make sure that the throttle opens fully, without stalling or binding, and closes fully when you push the trigger forward.

Make sure the rudder is straight, or trimmed slightly left.

Take pride in a job well done!

Don't forget to contact us if you have any issues. We are here to help!

At the pond

Make sure your transmitter and receiver batteries are fresh, or fully charged.

Do a range check with your transmitter antenna down, or the transmitter in low power if available, and note the distance. You should do a range check every day that you run. Should a problem arise, you can fix it before you damage anything.

Tape the lid on the radio box with radio box tape, Make sure that your prop is sharp and balanced.

Fill the fuel cell; turn on your transmitter, then receiver.

Wiggle the rudder so you know it works, and then start the engine.

Don't rev the engine much, as there is no load on the prop until it's in the water.

To launch, have a helper drop the boat in level.

You can give it a little gas as it gets to the water, but not too much. Most people don't like getting sprayed with water...

Let the engine warm up for 30 seconds or so before giving it full throttle.

Drive past yourself, and make sure you have a stream of cooling water.

If you don't see any, bring it in pronto!

If all looks good, hit it!

Notice how the boat rides in the straights. Does it lean or pull to one side?

Is the deck level or nose high?

How about the turns? Does the nose rise or fall in the turns? Does it slide or hook?

It's a good idea to have a helper write down your comments as you run the boat. After the run, you can use the included "Tuning Tools" sheet to help you sort out any problems.

Have fun, be safe, and send us your pictures! Send pics and videos to pics@zippkits.com

Troubleshooting

Boat bounces in the straights-	Stinger angled up CG too far back Speed too slow
Boat blows over at high speed-	CG too far back Stinger angled up Inner tabs too high
Boat “plows”-	CG too far forward Stinger angled down Inner tabs too low
Boat is very “light” and unstable-	Inner tabs too high Stinger drive too deep
Boat needs left trim to go straight-	Prop walk Prop walk Prop walk Rudder not aligned correctly Prop walk
Boat slides too much in turns-	Strake missing Turn fin loose or missing
Boat hooks in turns-	CG too far forward Turn fin too big Rudder angled back
Boat “chine walks”-	Center tabs too high Stinger too deep
Boat “heels” right with power-	Right inner tab too high
Boat leans too far and turns poorly	Rudder angled left
Boat is slow and won’t turn-	Get a Zippkits boat!