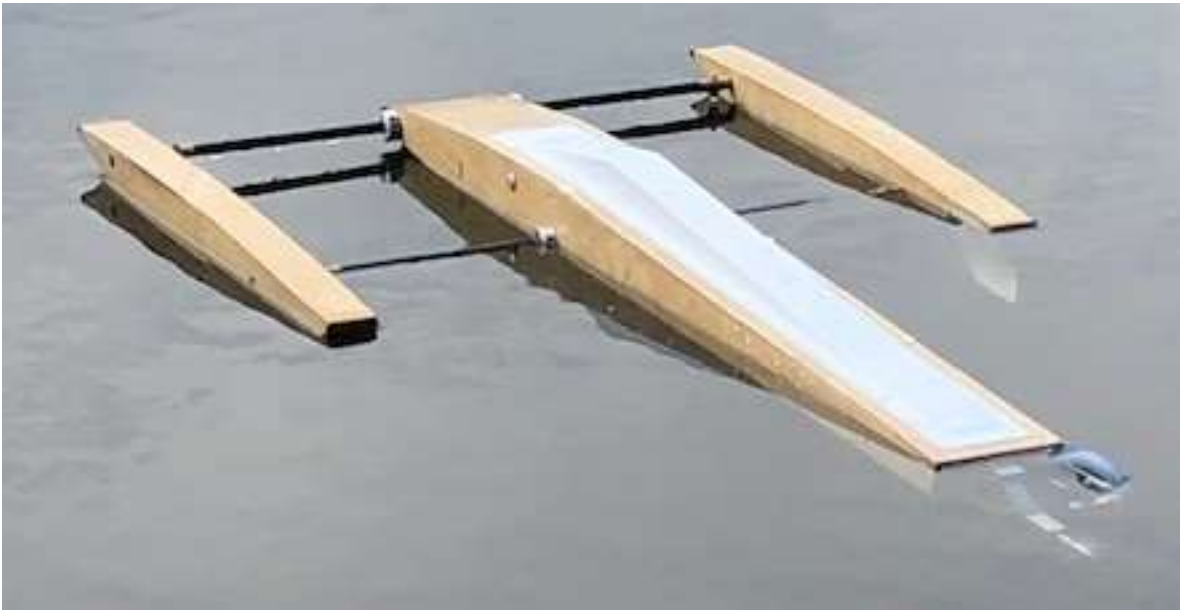


ZIPP MANUFACTURING



JAE 26FE

Fast Electric Outrigger kit

A Zippkits R/C Boat

Building Instructions

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www.zippkits.com

Toll Free (866) 922-ZIPP

The JAE series was designed and developed as a result of a joint venture between IMPBA Hall of Fame member Rod Geraghty, David Hall, Ron Zaker Jr. & Martin Truex Jr.

The main difference between this hull and all the others is the use of sharp edges on the bottom of the sponsons and tub, as opposed to curved surfaces. This helps break any surface tension of the water and makes for a faster boat.

This design approach has been built, developed and tested a great deal.

The 26FE kit is an electric version of our popular JAE 12GT kit. The JAE 12 holds several world speed records.

The 26FE was designed for 3S operation, and does quite well. If you want to go with a higher cell count for more speed, space is the only limitation. The hull can handle just about any power level.

The kit is not hard to assemble, as all of the hard stuff has been done for you.

That is no excuse to do a poor job with assembly. The better you build this boat, the better it will run. Often the difference between an excellent building job and a poor one is a simple sanding block.

A note about overhangs:

This boat is designed to shear water and prevent any capillary action of water. To do this the tub, ski and sponsons have sharp edges and rear overhangs. These shear the water off and must be left in place and not rounded in any way.

Take the time to read this entire manual, so that you are familiar with all the buildings steps and their proper order. Take your time; make sure you understand everything before you do it and you will be rewarded with an impressive running hull...

Note that the pictures in this manual may be of a different boat to better illustrate a point.

This boat is built exactly like the nitro version, so we used some of the same pictures.

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.

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.

Tools and supplies needed to build

- Sanding blocks with 80 and 150 grit paper
- Drill with bits (3/32, 1/8, 5/32 inch)
- Flat file
- FLAT Workbench
- 1/2 ounce Medium CA glue and accelerator
- Good quality 30 minute epoxy
- Epoxy finishing resin
- Spring clamps, paper clamps, c clamps, etc.
- Razor blade or X-Acto knife
- Masking tape
- Waxed paper
- Wood filler
- Primer
- Paint

Additional items needed to complete

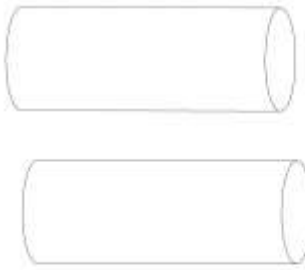
- 28-29mm motor. 3500-4200 kv
- 90-120 amp ESC
- 3000-4000 mah 3S battery. Use at least 60C rating
- .150x16 inch cable w/welded 3/16 stub shaft (Zipp 3475)
- 2 channel surface radio with 1 servo (Hitec HS-225MG or Zipp 5005 recommended)
- Rudder pushrod (.055 Size) (Included in Zipp Set)
- pushrod seal (Zipp 3702)
- 1/8x .150 Collet for motor (Zipp)
- Z12 Strut (Zipp 3494)
- .187 drive dog (Zipp 3485)
- 3816 prop (Zipp 4035)
- 10-32 Prop nuts (Zipp 3489)
- Cable grease
- Rudder (Zipp 3477)
- Radio Box Tape (Zipp 3563)
- 5/32 silicone water tube (Zipp 3461)
- Tubing bezel (Zipp 3569)
- ¼ OD shaft tube

Note that all hardware items need to complete your 26FE are available as a complete set.

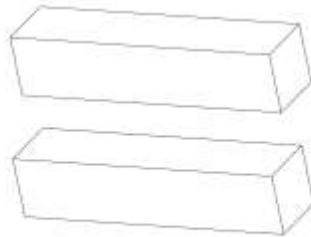
Order part number 3607-U Ultimate Hardware Set

DO NOT REMOVE ANY TOP DECK PARTS FROM THEIR SHEETS! WAIT UNTIL TOLD TO DO SO!

Miscellaneous parts



Wood Dowels



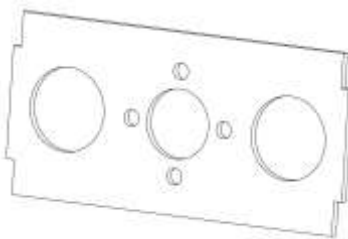
Sponson Nose



Tub Nose Block



Brass Sponson Tubes

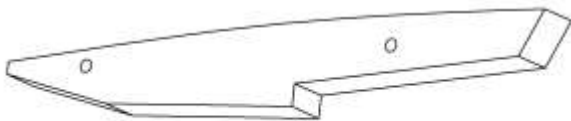


Motor Plate



Brass Tub Tubes

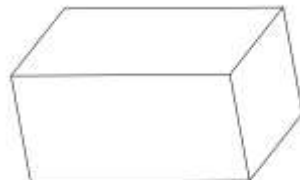
Foam parts



Left Foam



Right Foam



Foam Nose Block

Do an inventory of all the parts, to be sure that everything is there. If anything is missing or damaged, contact us as soon as possible, so that we can get replacements to you quickly.



Tub

Let's build the tub.

First, mark the insides of the tub right and left. The sponson boom hole is toward the bottom of the tub side.

Lay these out in a mirror fashion.

Make some R and L marks in the front portion of the sides, where it won't be seen later.

Check the fit of the bulkheads in the right tub side.

Once you are happy with the fit of the bulkheads in the tub side, glue them in with CA. Use the square provided in the kit to ensure each bulkhead is perfectly square.

Do not glue the aluminum motor bulkhead in yet.

Assemble the tub sides on a flat surface. Check the fit of the bulkheads in the left tub side. If all is well, glue the bulkheads in place one at a time, using the square from the kit.

When cured, use epoxy to glue in the aluminum motor bulkhead. You can bow the sides apart to do this.

Allow this assembly to cure for a little while. At least until the epoxy is firm.



Flip the tub over and test fit the bottom.
The arrow goes forward.



If all is well, glue the bottom in place.
Use tape to keep it in place.



Wipe away any excess glue at the bottom
to side.

You may also want to glue in the 1/8x1/8
bottom strips while gluing the bottom in
place.

These go on both sides, from bulkhead 1 to
the rear bulkhead.

They should be the correct length as
removed from the sheet.



Glue the transom in place so that the large
hole is on the left.

The transom should be fully in the cutout.
The bottom sheet will overhang slightly. Do
not sand this overhang off.

Glue in the transom doubler (TD).
This goes against the front of the transom,
and should be flush with the transom top,
not the tub top.

Be sure to match the holes.
Clamp and allow to cure.



Add the two transom braces (TB).
These brace the transom against the
bulkhead just forward.
Clamp and allow to cure.

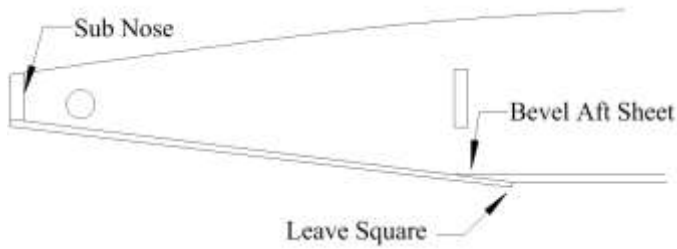


If you did not glue in the 1/8x1/8 bottom
strips, now is the time to do it.
Scrape away and dried glue before you do.



Use the two "X" braces to keep the tub
sides from bowing in while everything
cures.





Glue in the sub nose.
Clamp at the very tip, to prevent bowing of the tub.

Sand the aft bottom so that the FWD bottom sheet fits flush.

You will be sanding a bevel into the front of the bottom sheet.

See drawing at left.

The FWD bottom gets glued so that it just covers your bevel, and is left square.

Allow this to cure with the tub upside down and weighted.

We don't want to induce any twist.



Test fit the brass tub sleeves and ply doublers.

Do not glue anything yet.

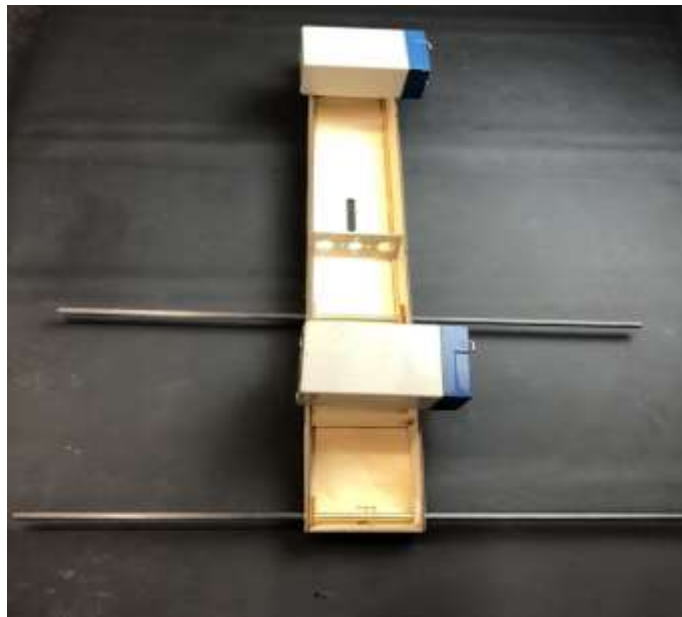
Fit the front and rear brass tub sleeves and ply doublers.



We need to measure the ends of the boom tubes and make sure they are equal.

Weight the tub flat on the bench.

Slide in both carbon boom tubes (rods) and put them in approximate center.



Don't glue anything at this point.

In the following steps, we will measure the distance from the end of the boom tube to the bench.

What we want is for both sides to be equal.

It doesn't matter what the actual measurement is, as long as they are the same.

Note that the front and rear will be different.

Check each boom tube several times.



Once you determine what side is high or low, remove everything for that tube and file the top or bottom of the hole in the tub only, so that the tube is level.

It only takes a tiny bit, so go easy.

Once you have the tub hole so that you can get the tube level, prepare to epoxy everything in place.

Rough up the ends of the brass sleeve for about $\frac{1}{4}$ inch.



Re-install the sleeves, doublers and tubes.

Double check that you can level the tube.

Epoxy the brass sleeves and doublers in place.

Clamp the doublers so that they hold your tubes level.

Don't get any epoxy on the carbon booms.

Double check before you walk away.

Allow to cure.

Do the other boom the exact same way.



Once everything has cured, sand the brass tub sleeves flush with the tub sides.



Ski

Assemble the 3 parts of the ski using epoxy or CA.

We clamp the sides to a piece of $\frac{3}{4}$ inch thick board.

Let the long side of the ski stick up a tiny bit off the board.

Use medium CA to tack glue the sides to the ski bottom.

Leave a little ($\frac{1}{8}$ inch) overhang at the rear. The front needs a lot of overhang.

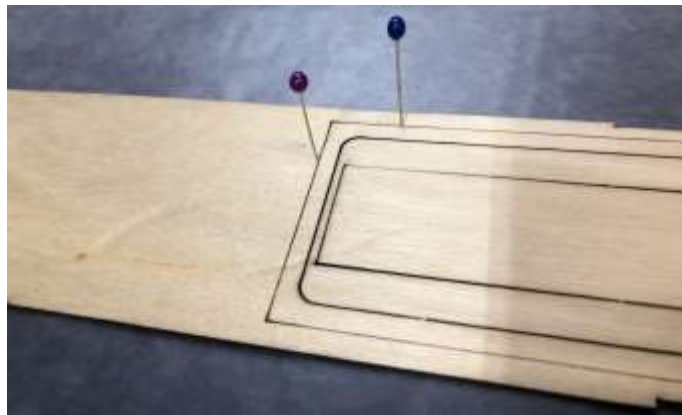
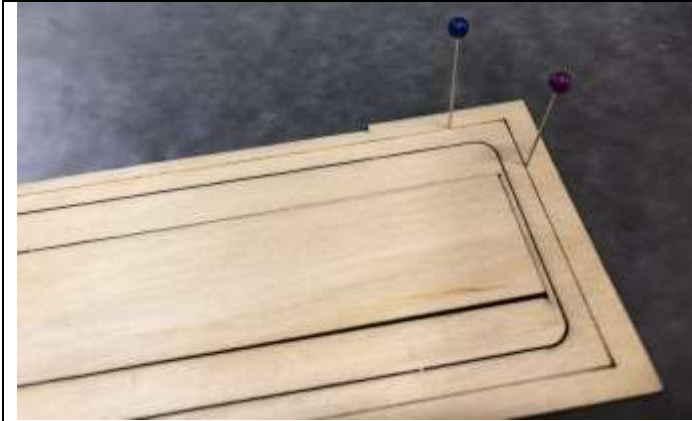
Once cured, carefully remove from the board and either epoxy the ski sides to the bottom, or simply run a bead of medium CA in the corner on each side.

Sand a sharp bevel on the front of the ski bottom sheet, so that it blends into the tub bottom.

Sand the rear to match the angle of the ski sides.

Do not glue the ski to the tub yet.





Deck

Prepare the tub top by installing the radio box "lip". This 1/32 ply lid frame goes inside of the radio box opening to provide a lip all the way around for the radio box lid.

Leave all deck parts in their sheets.

We will add the lid frame while the parts are still attached to the deck.

This prevents the thin deck sides from warping, or pulling in while we glue in the lid frame.

Put wax paper down onto a flat surface that you can push pins into.
Ceiling tile works well.

Using 5 pins, push them into the deck so that they are just touching the outside of the lines for the lid frame.

Two at each rear corner and one near the center.

These will be used to align the lid frame, as you only get one chance to make it perfect, and this makes it easy.

Test fit the lid frame in place.

If all is well, put a teeny tiny bead of medium CA glue along the inside of the etched lines on the deck. Go easy on the glue.

Grab your lid frame, carefully align it against your pin "stops" and drop it into place.



Carefully weight it and allow to fully cure for 10 minutes or so.



Make sure it has not moved.



Once cured, you can carefully remove the parts inside the deck.

You are left with a perfectly centered "lip" under the deck!

Good job! Let's get this thing done!



Carefully bend the front of the remaining 1/8x1/8 strips and glue them to the insides of the tub sides.

Make sure that you glue them evenly at the bottom of the "slots" in the tub sides.



These go from bulkhead 1 to the back of the compartment, to bulkhead 2. They provide needed support for the deck.

Make double sure that they are at the bottom of the "slots" in the tub sides. This is where the deck sits.



Use epoxy finishing resin (or West Systems epoxy) to seal the **inside** of the tub. Be sure to seal around the boom tube sleeves, pushrod holes and all around the servo mounts.

Use any excess epoxy to seal the underside of the deck, as well as the inside of the ski

Set these on waxed paper while they cure.



Repeat with a second coat and allow to cure.

Every part needs 2 coats of epoxy sealer before we can finish up.

Allow to cure overnight.



Glue in foam nose block with epoxy.

Mark and trim to fit as close as you can.



Sand the foam flush with the tub sides. Be careful not to sand the tub sides too much.

This foam is needed for floatation, in case you shear off both sponsons...



Check the slots in the top of the tub and the deck for any glue or epoxy.

Remove anything that would prevent the deck from fitting correctly.

Put both "X" braces into the tub to keep it square. Do not get any glue on these.

If all is well, glue the tub top sheeting in place with 30 minute epoxy.

Use plenty of epoxy and put the tub **upside down** on waxed paper.

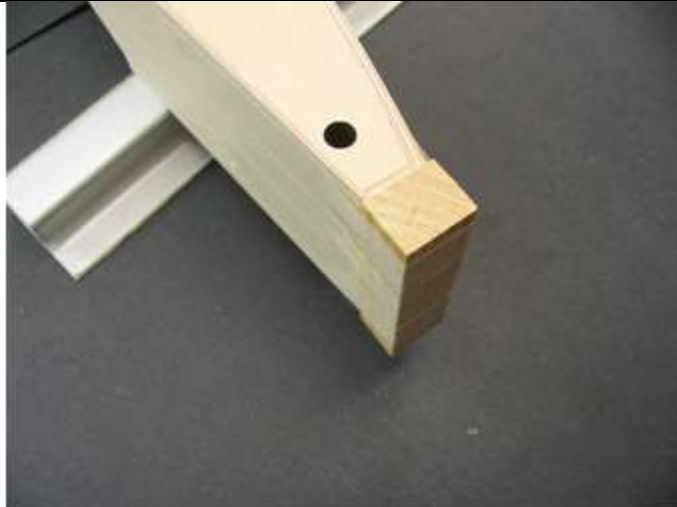


Tape and weight until cured.

Make sure that the sheeting is fully seated and in full contact everywhere.

If you have glue in the "lip" area, use a Dremel tool with a fine bit to grind it out as shown. We used a cheap diamond bit.





Once the top sheeting has cured, sand the front of the tub flat and square.



Glue the pine tub nose block to the front of the tub.



Shape the block to match the tub.

Finish the nose block with a round, blunt shape.



Mount your motor to the motor plate with M3x8 screws with lock and flat washers.

With the motor in place, we can move on to the shaft tube.

This is another area that will need to be done perfectly for a good running hull. Bending the shaft tube is a piece of cake, if you know the secret.

The ¼ inch brass tubing needs to be annealed.

This will make it easy to bend by hand, without kinks.

To anneal the tube, simply heat it with any propane torch, until it changes color.

You will see the brass color change to a sort of blue. It only takes a couple of seconds, so watch for it.

Put a screwdriver in one end of the tubing to hold it while you heat it. Try not to anneal the last inch on each end.

When the tubing has cooled off we will be bending it

Put the shaft tube through the hole in the tub bottom.

Put the end of the tube about ¼ inch from the collet.

Now study the side view of the shaft tube, and carefully and slowly bend the shape into the tube.

Try to make sure that the tube sticks through the bottom the proper amount, and the rear of the tube is about ¼ inch above the tub bottom.

Take your time, and go a little at a time. If you try to rush it, and kink the tube, you will have to start over with a new tube.

When you finish, you should have a nice tube that starts about 1/4 inch behind the motor collet, and continues past the rear of the boat (we will trim it later).

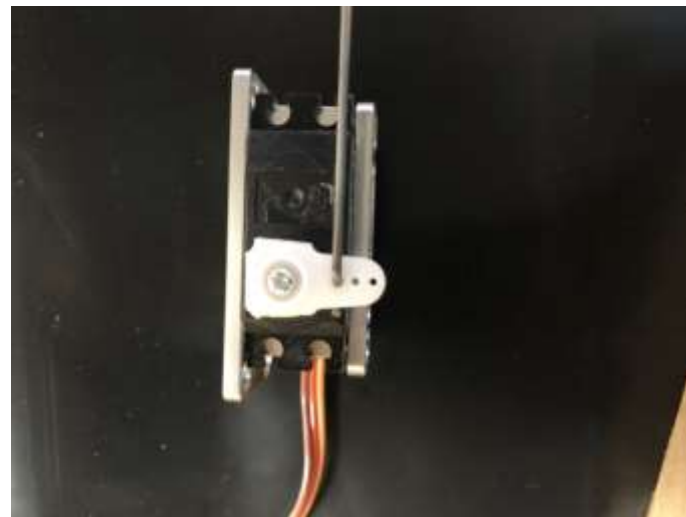




If all else fails, contact us for a pre-bent shaft tube...

Glue the shaft tube in place with epoxy. Tape the tub bottom so that no epoxy runs out.

Note: These pictures don't show the deck, but yours should be installed.



Put your servo in to an aluminum servo mount.

Plan your equipment installation.

The servo should go in the rear compartment.

Don't glue in the servo mount yet.

Install everything to make sure it fits, and to get an idea where everything will go.

We used a 3S 3300mah and a 120 amp ESC.

The boat will handle a 4S to about 3300mah as well.



Remove everything from the boat in preparation of outside sealing.

Sponsons

The sponsons are assembled in a specific order for a reason. It is not the fastest way, but it's the only way it can be done right.

Lay out the sponsons so that the thinner 1/32 ply side plates are on the bench, in a mirror fashion.

The outside plates are 1/32 and the inside are 1/16. You will start assembly with both outsides down.

The right sponson holds the turn fin, so it has dowels in it,
Grab the right foam sponson.

Test fit the 3/8 inch wood dowels in the 2 rear holes. Also test fit the 2 brass tubes.

They should be a nice fit, without slop. Prepare the sponson inside and outside plates by lightly sanding the edges.

Note that the thicker (1/16 inch) plate should go on the inside (facing up).

We will not be gluing the brass tubes in yet. This will be done during setup.

Mix up some 30 minute epoxy, and coat the inside of the sponson plates.

Do the same for the 2 wood dowels.

Put the inside plate in place, being sure that the tubes and dowels protrude on the other side. They should all stick up above the side plates.

Work quickly.

Put the other sponson plate in place, aligning the brass sleeves and dowels. Make sure that the sleeves and dowels go through the sponson plate. The tubes should protrude through, and be above the outside plate

Use tape and small weights to hold the sponson and allow to cure on waxed paper.

You can also use small pins to pin the plates to the foam.

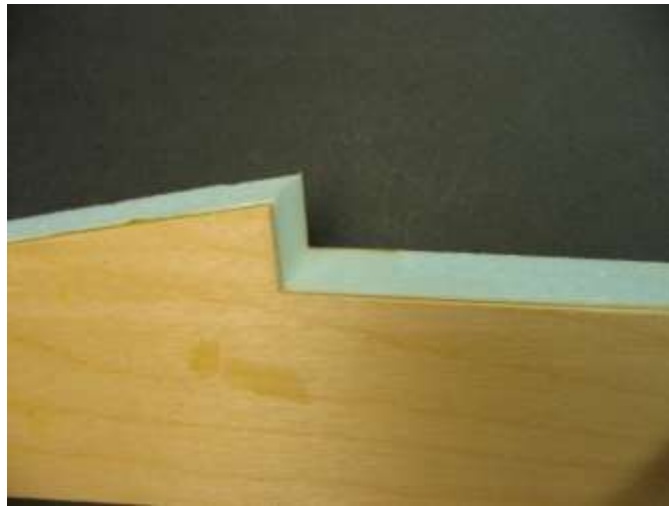




Carefully remove the brass tubes and clean off any epoxy before it cures.

While the right sponson is curing, you can glue the left sponson. Everything is the same, except the left sponson does not have dowels.

Be sure to make a right and left with the thinner plates on the outside.



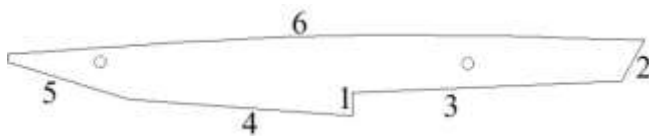
When the sponson sides are cured, let's do the sheeting. This is where the strange order comes in. The sheeting is done in this order because it has to overlap in a specific way.

Follow along and you won't have any trouble. If something doesn't seem to fit, stop and find out why.

Epoxy is impossible to remove from foam...

Grab all the sheeting pieces, including the ones you marked earlier.

Use a file to sharpen the inside corner of the sponson step as shown at position 1.



Use your sanding block with 80 grit paper to sand the foam flush with both sponson plates.



Using epoxy, glue R-1 in place on the sponson step. Use masking tape to hold it in place while it cures. It's okay to repeat the steps on the other sponson.

Glue R-2 to the sponson rear. Leave overhangs all around.

Once these have cured, carefully sand the bottom and sides of R-2 and R-1 flush.

Glue R-3 in place, leaving an overhang on the rear.

Glue R-4 with an overhang in the rear.

Note that these rear overhangs don't get sanded completely off.

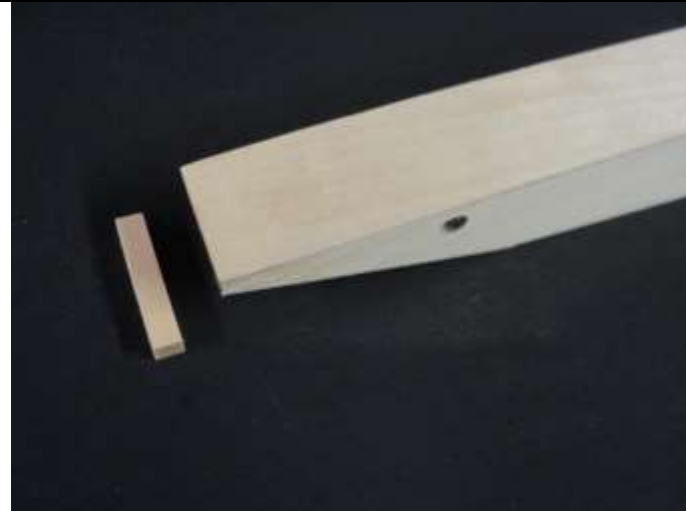
Sand the rear overhangs of 3 and 4 to about 1/16 inch.



Once R-4 is cured, sand the front of R-4 flush with the forward bottom. This is exactly like the forward tub bottom. Do not round any corners.



Glue R-5 in place. Match the rear to just cover the bevel you sanded in R-4. Leave the rear of this square, just like the tub bottom.



Sand the top of R-2, and glue the sponson top on (R-6).

When cured, sand the sponson so that the dowels and sheeting are flush and sand the front until it is flat and square.

Glue the pine sponson tip in place with epoxy.

When cured, sand the nose block to a nice blunt tip.

Do not sand off the overhang on the sponson bottom or rear. They should protrude about 1/32 to 1/16 inch beyond the sponson to shear water.



Don't round off any sharp edges...

Place the sponsons so that the right side has the dowels showing, and mirror the left side.

Put some waxed paper under the sponsons.



Glue in the brass sponson tubes with 30 minute epoxy.

Be sure to rough sand the part of the tube that will be in the sponson.



Leave a glue fillet on the inside.

Make 100% sure that you glue them as right and left as shown.

If you have not done so, repeat on the other sponson.



Mock up

Test fit the ski to the tub.

The rear of the ski should line up with the rear of the transom, and the front should blend into the tub bottom.

Sand the front of the ski sheeting so that it blends to nothing.

Be sure the shaft tube is just touching the ski sheeting, and level with the tub bottom.

Measure from both sides and make small alignment marks for the ski.

Adjust (bend) the shaft tube so that the ski fits on without having to push it down.

Tape the ski in place on the tub bottom.

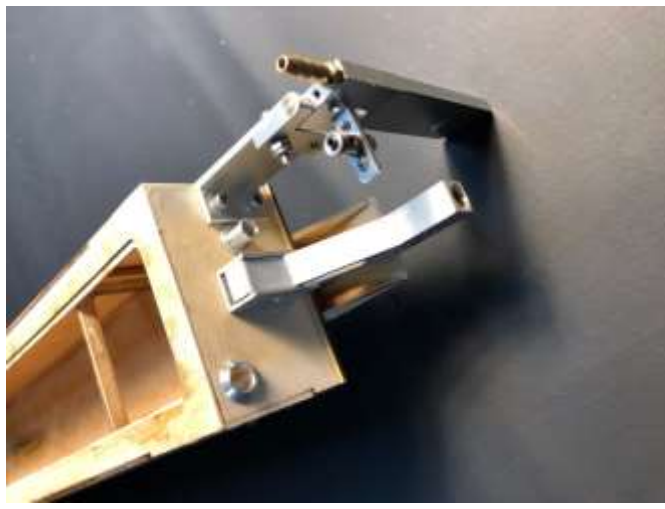


Strut

Mount your strut bracket to the transom with the cap screws, and blind nuts.

You may have to adjust the shaft tube.

Note that the strut slips onto the ¼ inch brass tube.





The strut needs to be at the very bottom of the ski for the proper propeller depth.

The strut should touch the ski and be level with the tub bottom (straight).

Mark the brass shaft tube where it exits the strut.

Remove the strut and carefully cut and deburr the brass tube so that it is 1/16-3/32 inch **shorter** than your mark.

With the strut in place and level, the tube should stop short of the end of the strut.

Rudder

Mount the rudder bracket to the right side of the transom with the two socket head sheet metal screws.

Slip the rubber pushrod seal over the aluminum bezel and pop it into the hole in the transom. Clean the hole with a round file if needed.

Do not glue yet.

The rudder pushrod is next. We like to use .055 music wire for pushrods with a "Z" bend at the servo.

The rudder pushrod is 4 inches long.

Put the rudder pushrod in the servo arm as close to the center as possible (all the way in).

This gives reduced throw needed for the rudder.

Carefully poke the pushrod through the tiny hole at the end of the rubber pushrod boot.



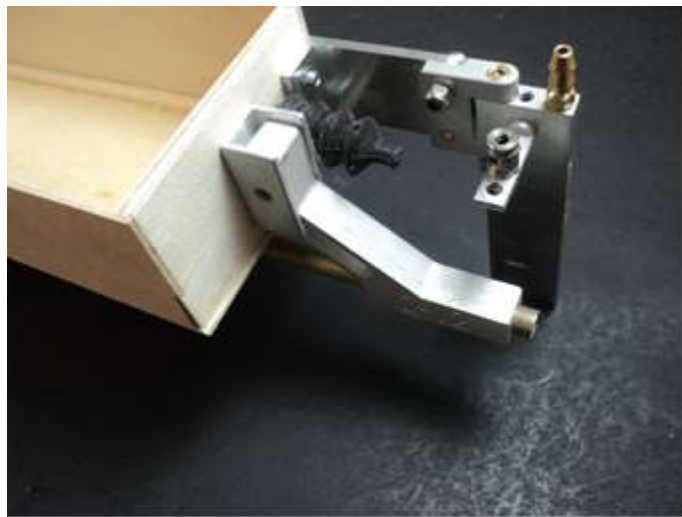


Drop the servo into the aluminum mount and put the aluminum retaining strap in place.

The rudder pushrod simply goes straight to the rudder arm.

Zipp 5005 servo and 3428 aluminum servo mount shown.

The boat was designed to use these.



Turn Fin

Mark the center of the turn fin dowels. Drill 5/32 holes on your marks. Use a drill press, or drill halfway through from each side to maintain center.

Attach the turn fin with the supplied screws, nuts and washers.

Note that you can later fine tune the fin with the oversized holes.



Slip the boom tubes into the tub, and put a boom tube collar against the tub on both sides (4 total).



Slide the sponsons onto the tubes. Make them flush with the outside of the sponsons. Drill $3/32$ holes through the brass sponson tubes and through the carbon boom. Secure with the 2-56 screw and nut. Do all 4.

Remove everything from the boat in preparation for finishing.



Cowling

Trim the plastic cowling on the lines drawn on the cowling. Use a sharp knife to score the line two or three times, then break away the plastic.

Sand to the line and sand the corners round.

Check the fit in the cutout and sand the cowling more if needed.

When done, sand all edges with fine (320) paper. Wash the cowling with detergent (Dawn) and it is ready to paint.



Glue the ski to the tub, over the shaft tube. It should be centered on the tub. Make sure that it is touching the tub all around.

Tape it down until cured.

Finishing

Sand the tub and sponsons, but be sure to leave the rear overhangs.

Fill any holes or imperfections with wood filler.

Sand everything with 150.

Seal the tub and sponsons with epoxy finishing resin or West Systems epoxy.

Be sure that all wood is sealed.

Scrape off as much epoxy as you can. It will make sanding easier.

Also seal the other side of the radio box top.

When cured, sand with 150 and recoat with epoxy. This coat will use far less resin than the first.

When this cures, wet sand the bottoms of the sponsons and ski with 220.

If you are painting sand the entire boat with 220. Now is the time for primer. Wet sand the primer with 400, and use spot putty to fill any imperfections. Wet sand with 400 and lay on a heavy coat of primer. Wet sand with 600-800 and paint.

Use fuel proof paint or fuel proof clear.





Before assembly seal all intersections inside the tub with 30 minute epoxy.

We use an acid brush bent over. Brush epoxy along the sides to bottom, bulkheads to bottom, as well as the bulkhead to sides.

After that cures, flip the tub over and do the same with the deck to sides, and deck to bulkheads.

This step, if done carefully, will ensure that your tub is 100% water tight.

Final Assembly

Assemble the boom tubes with the tub and sponsons.

Slide on the boom tube collars.

Bolt the sponsons to the booms
Center the sponsons in the tub.

Use boom tube clamps against the tub to keep the tubes in place.

Be sure that you have 1/4 inch from the end of the collet to the shaft tube.

Bolt the strut to the transom.

The strut needs to be at the very bottom of the ski for the proper propeller depth.

Slide your drive dog onto your flex shaft, then your prop. Leave about half of the threads showing past the prop.

Tighten the drive dog set screw.

Remove the prop and measure the exact location of the set screw from the end of the shaft. Remove the drive dog and file or grind a flat spot on the shaft about 1/8 inch wide.

Put the drive dog back on the shaft, aligning the set screw in the flat you made.



Push the flex shaft into the shaft tube, and into the collet. Make sure that the shaft goes all the way into the collet. Measure the distance from the back of the strut to the front of the drive dog. Subtract 3/16 inch.

Cut this amount off of the flex shaft. This allows you to put the shaft all the way into the collet, and still have a 3/16 gap between the strut and drive dog.

This is needed because the flex shaft will twist slightly at high speeds, and actually get shorter.

Setup



Set the strut so that it is parallel with the tub bottom, and touching the ski bottom sheeting.

Turn on the radio.

Make sure that the steering trim is in the center. Move the steering servo arm so that it is straight up. Put the servo arm screw in.

Assemble the rudder servo and aluminum servo mount.

Sand the bottom of the servo mount with coarse sandpaper.

Slip the Z bend into the servo arm, and route the pushrod through the hole in the transom and into the rudder connector.

No need for the rubber seal yet.

Scrape the epoxy on the tub floor with a razor blade.

Use epoxy to glue the servo mount to the floor, right in front of the transom.

By gluing the mount this way, you are assured of perfect alignment.

When cured, glue in the aluminum bezel for the pushrod seal.

Add the seal and reinstall the pushrod.





Set your rudder throw to about 3/16 inch either way using your transmitter.

Make sure your prop is sharpened and balanced.

Grease the flex shaft with cable grease or high quality marine grease.

Check and double check all screws and lines.

Center Of Gravity

This hull has a wide range as far as the CG is concerned. If you are using an unusual setup and suspect that your CG will be substantially different than designed, try for anywhere on the turn fin.

The designers strongly recommend that you run you boat first, and don't be too concerned with the CG unless the boat handles funny. Even then, 99% of the time an ill handling boat is either built crooked or has a turn fin issue.

Running

The main thing is to get the boat running smoothly and turning well. After that, try different props,

Good luck and happy boating!

Additional information

The best general setup we have to date is:

2960 motor with 4100 KV (Zipp 630)

3816 prop (Zipp 4035)

3S pack (60C discharge)

Strut resting on ski and level with tub bottom

Fin angle adjusted for lightest ride

This should get you into the mid 50 mph range, and be a lot of fun.

You can run the same setup on 4S, but keep an eye on your temps.

This should get you into the 65 mph range.

If you see temps above 120 F, you must prop down.

The best way to get top performance is to test different props.

When you find a prop you like, adjust the turn fin angle for the lightest ride without lifting a sponson.

