

Radio Controlled Griffon 2000TDX Hovercraft



Construction Manual

1/30 Scale Model of the Griffon 2000TDX Hovercraft

Designed and manufactured by Griffon Hovercraft Ltd in Southampton, England the Griffon 2000TDX have become a popular workhorse hovercraft all over the world. Employed in both civil and military applications it is used for survey work, passenger ferries, patrol craft and as a cargo carrier in civil applications. In military applications it has proven invaluable providing a flexible and fast response craft in difficult terrain and has seen recent deployment by the British Army in the Iraq war. This hovercraft has been produced with many variations in livery and application specific craft construction. You can see many of the livery and construction variations on the Griffon web site at www.griffonhovercraft.com.

Please read this manual thoroughly before you start construction.

Note: This kit contains propellers that move at high speed on the finished craft and can cause injury. This craft is not a toy.



HOVERCRAFTmodels.com

Radio Control Hovercraft Kits, Plans and Parts

Manufactured in the USA by: Hovercraftmodels.com, PO Box 412, Germantown, MD 20875-0412 USA
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Acknowledgments

Hovercraftmodels.com gratefully acknowledges the assistance of Griffon Hovercraft Ltd. in preparing the design of this model. The design of the Griffon 2000TD and 2000TDX craft and related intellectual property as well as the Griffon logo are all copyright Griffon Hovercraft Limited and are used by kind permission.

Griffon Hovercraft's web site can be found at www.griffonhovercraft.com

To complete the model you will require the following:

- 2, 3 or 4 channel radio control system (comprising transmitter, receiver, one standard size servo)
- One electronic speed controller (Hovercraftmodels.com Part Number ESC 20 or ESC20R recommended, see electrical section of this manual for more details).
- 4.8 to 8.4 volt (4 to 7 cell) 600-1000mAh NiCad, NiMh or LiPoly rechargeable battery pack
- Battery charger for above battery pack.
- Pack of stick-on ballast weights to balance the craft with the battery weight on board. (Available at most hobby stores).
- Hinge Tape – Used for electric model airplanes (found in most RC hobby stores, DuBro #319)
- Servo Tape – For holding servos in place on small models (most hobby stores that sell RC airplanes will have this).
- Glue – One tube of Polystyrene Cement, as used on plastic model kits. This will be used to glue the parts of the kit together where required.

For construction:

Paint – Testors or Humbrol Paints can be used on this model, a 3oz spray can is enough to complete the model.

Sealing - Tube of silicone bath seal.

Hobby Knife – Any small sharp hobby knife or box cutter knife.

Scissors – For cutting out plastic parts. Lexan or Canopy curved scissors are ideal.

Note: Some knowledge of building radio controlled models is helpful to complete this model. Please seek help from someone who has experience in building model planes or boats if you have any doubt about a step in this manual.

The mast and light illustrated on the cover of this manual is an optional addition to the model and not included in the kit

Parts Preparation

Before construction starts you will need to prepare the parts for both painting and fitting together.

The first task is to cut all the pieces from the vacuum formed sheets. We recommend using small curved scissors made for this job called canopy or Lexan scissors. Normal sharp scissors will do the job but canopy scissors make cutting curved sections much easier.

Take your time when cutting the parts out to get a clean finish. The rudders and cabin especially require some detailed attention. Take care on cutting the small parts and regularly check the fit to other related parts to get the correct fit. It is possible to tear the plastic so take extra care and go slowly. Once you have cut out the parts lightly sand the edges with fine sandpaper to remove any burrs or rough edges.

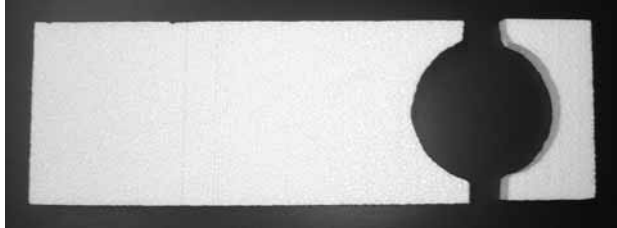
Painting

The craft should be painted after all the parts are cut out and some construction has been started. You will cut out the cabin windows and assemble the thrust duct and rudder supports and fit the engine cowl on the body before you paint the craft. The best painting results will be obtained by using spray cans of model paint or an airbrush if you own one.

The rudder, elevators and rudder supports require painting on both sides. The upper deck requires painting but it is not necessary to paint the lower deck as this is under the craft and cannot be seen.

Buoyancy Foam Preparation

The buoyancy foam ensures the craft floats with a good water clearance when the lift motor is turned off. Supplied in your kit is a 13 ½ x 4 ½ inch slab of white foam. It must be cut to the correct size for the craft comprising two sections. Measure and mark with a pencil on the foam two sections, one 10 ½ inches in size and the other 2 inches long. Cut these out using a hobby knife or hot wire cutter if you have one.



White foam cut to size

The two sections need to be carved so they fit around the lift duct. They only need to fit around a portion of the duct leaving the sides free for airflow into the skirt. Once these are cut set them aside for the moment.

Upper Deck Initial Preparation

Cut out the deck from its surrounding molding. The deck should be cut so that it is flush with the 1/8th inch step down at the edge of the deck. Once this is done you can sand the edge to a smooth finish if required. Now you will cut the cabin windows out at the front of the deck.

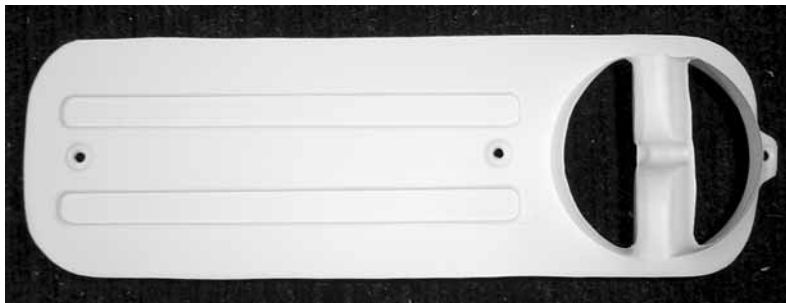


Cabin with windows cut out

The windows have been marked in the plastic on both sides of the cabin. These are opened up to act as lift air 'cheat holes'. Using a 1/16th drill (a Dremel drill is ideal but a handheld drill will work just as well), drill a small hole in each corner of the cabin windows. Now using a sharp modeling knife score along the window lines between the holes. Repeat this until the score line cuts through the plastic and you can remove the center of the window. Do this for all 4 windows. Once they are cut out use fine sandpaper or a small file to smooth any rough parts of the cut surface. If you cut the window too far along the line you can simply repair the cut with Polystyrene Cement and it will not show once the deck is painted.

Lower Deck Initial Preparation

Cut the lower deck out from its surrounding mold. This time the deck is cut out on the inside of the 1/8th inch step down so that the deck is flat at the edges.



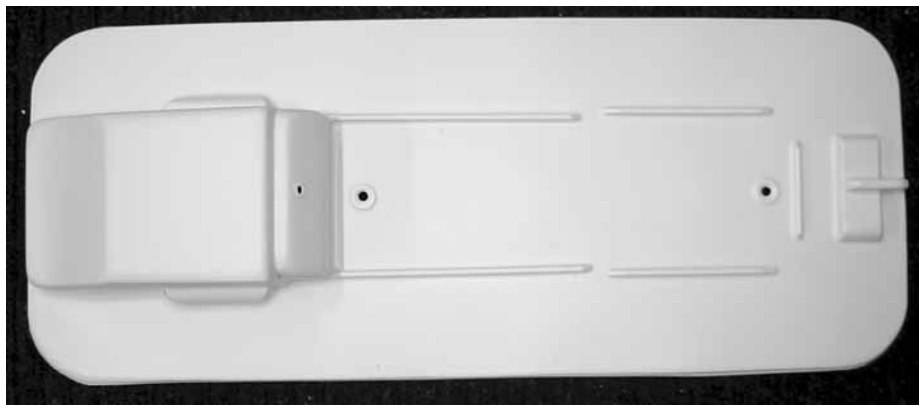
*Cut out and prepared lower deck.
Note the deck bolt holes cut out*

To prepare the lower deck for assembly the top of the lift duct should be cut off to open up the duct. This should be cut 1/16th inch below the curved part at the top of

the duct. Only cut out the semi-circles either side of the bleed duct, not the entire hole. The air from the lift propeller duct goes down into the skirt via the center bleed duct and inflates the skirt all around the craft perimeter. The balance of the air continues down the semi-circular lift duct and provides air pressure inside the plenum chamber made by the skirt for lift.

Upper and Lower Deck Bolt Holes

The major parts of this model are the upper and lower decks and these now need to be prepared for painting and assembly. There are two holes marked by doughnut shapes in the top deck and three holes marked in the same way on the lower deck. This is where 10-24 by 1 inch nylon deck bolts go to hold the upper and lower decks of the craft together. Cut, drill or punch out these holes using a 3/16 drill or punch.



Upper deck with bolt holes cut out

Now set the deck bolt holes in the correct place in the buoyancy foam cut earlier. Place each of the two slabs onto the lower deck in their correct positions. Using a 3/16th drill bit make a hole through the foam at each deck bolt hole using the lower deck to align the drill. Once all three holes have been made remove the buoyancy foam from the lower deck and move onto the next step.

Installing the Front Strut

The upper deck requires the addition of a fixing strut to be added to the cabin floor. A 10-24 bolt and nut will secure the front of the upper deck to the lower deck. Using the supplied strip of white 0.04 thick material cut a piece that is 1 ½ inch wide by 4 ¼ inches long. Mark the bolt hole location on this piece by first finding and marking the center line along the 4 ½ inch length. Now measure in 5/16th inch along that line from one side. Punch, drill or cut a 3/16th hole center on that point.



Strut installed

Now test fit the lower and upper decks to locate the strut on the upper deck body. First pass one 10-24 by 1 inch bolt through the center hole of the lower deck from the underside (the side this will be on the ground when the craft is operating) and then one bolt through the front deck bolt hole. Now set the deck flat on the bench in front of you with the bolts sticking up. Now pass the front and rear foam buoyancy sections in place on the deck over the bolts. Place the strut over the bolt end protruding from

the front section of foam. Secure lightly in place with a nut. Now place the upper deck over the center bolt and set squarely over the strut at the front. With a pencil mark where the strut contacts the underside of the upper deck. Once that is done disassemble the decks. The strut can now be glued in place on the underside of the upper deck of the craft at the marked location using Polystyrene Cement.

Motor Cover

The motor cover dome is cut out to cover the thrust motor body. This molding is on the end of the lower deck part. It should be cut off above the webbing on the part. Trim the molding so that it covers the wiring end of the motor and just comes over the front of the motor body. It will be painted and then attached to the motor using hook and loop at the final construction stage.

Engine Cover Preparation

Cut out the engine cover leaving a 1/8th inch lip around the outer edge of the part. The step down on the part that faces the cabin should be cut so that it is 3/8th inch long. Again, smooth any rough edges with fine sandpaper. A small doughnut mark on the back of the cover needs to be drilled out to 1/8th inch. This is where the thrust motor wires will be run through later.



Engine cover cut out and prepared

The engine cover is now glued in place so that it rests against the rear stop molded into the upper deck. Put a small amount of glue around the lip of the part and then place it onto the upper deck. Set the deck aside so that the glue can set in about 20 minutes.



Engine cover attached to the upper deck

Cutting out the thrust Duct

First the duct is cut from the cup shape molding. Measure 3/16th inch down from the closed end of the duct. Mark a line all around the duct at this point and cut the closed end off at this mark. Trim the open end to the point where it curves outward.

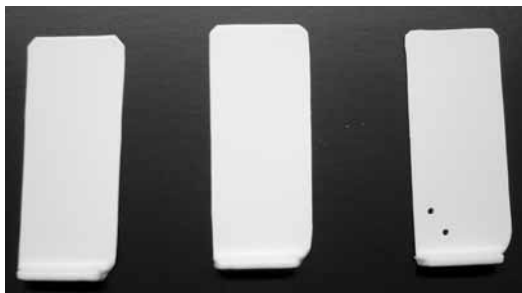
Prepared thrust duct

The thrust duct is now cut open so that the lower edge is open and shaped into a curve. This allows it to be glued to the duct support on the upper deck later on. The curve guide is marked into the plastic. Cut the part to that guide. You may have to trim the curve further for propeller clearance when testing its fit onto the craft.



Cutting out the Rudders

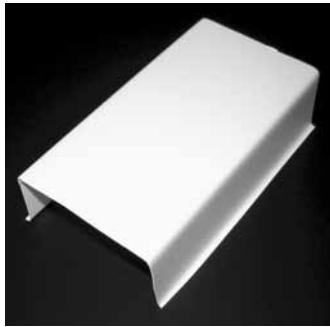
The rudders are cut so that the tab is left at the base of the rudder and the rudder surface is flat. Holes are drilled where the rudder horn goes and these are indicated by small depressions in one of the rudders.



Rudders cut out and prepared.

Holes also need to be drilled in the bottom lip of the rudders to accommodate the tie bars that join them. Measure in 1/8th inch in on the lip from the back of the rudder and drill a 1/16th inch hole at this point. Note that the center rudder needs two holes, one on either side of the lip. The rudder with the horn in only needs one on the outer edge. The left-hand side rudder only needs one on the inner edge (see page 13 for more detail on the rudder tie bars).

Cutting out the Passenger Cabin Cover



This cover is cut so that fits between the engine cover and cabin on the upper deck.

Cutting out the Rudder Support Structure

The rudder support structure is cut and then folded from the long strip molding. Cut out the entire strip from its molding and fold down the two sides carefully away from the top bar.



Rudder support cut out and prepared

DO NOT score the fold lines with a knife blade as the plastic will simply break apart. It will help to warm the fold lines slightly with a hairdryer or model aircraft cover shrinking hot airgun first. Slowly and carefully fold the sides down so that they are at 90° to the top bar of the structure. Now fold the tabs at the bottom of the side pieces inwards at 90° to complete the rudder support shaping.

Support top bar with side bent down ready for assembly



Assembly of the Rudder Support

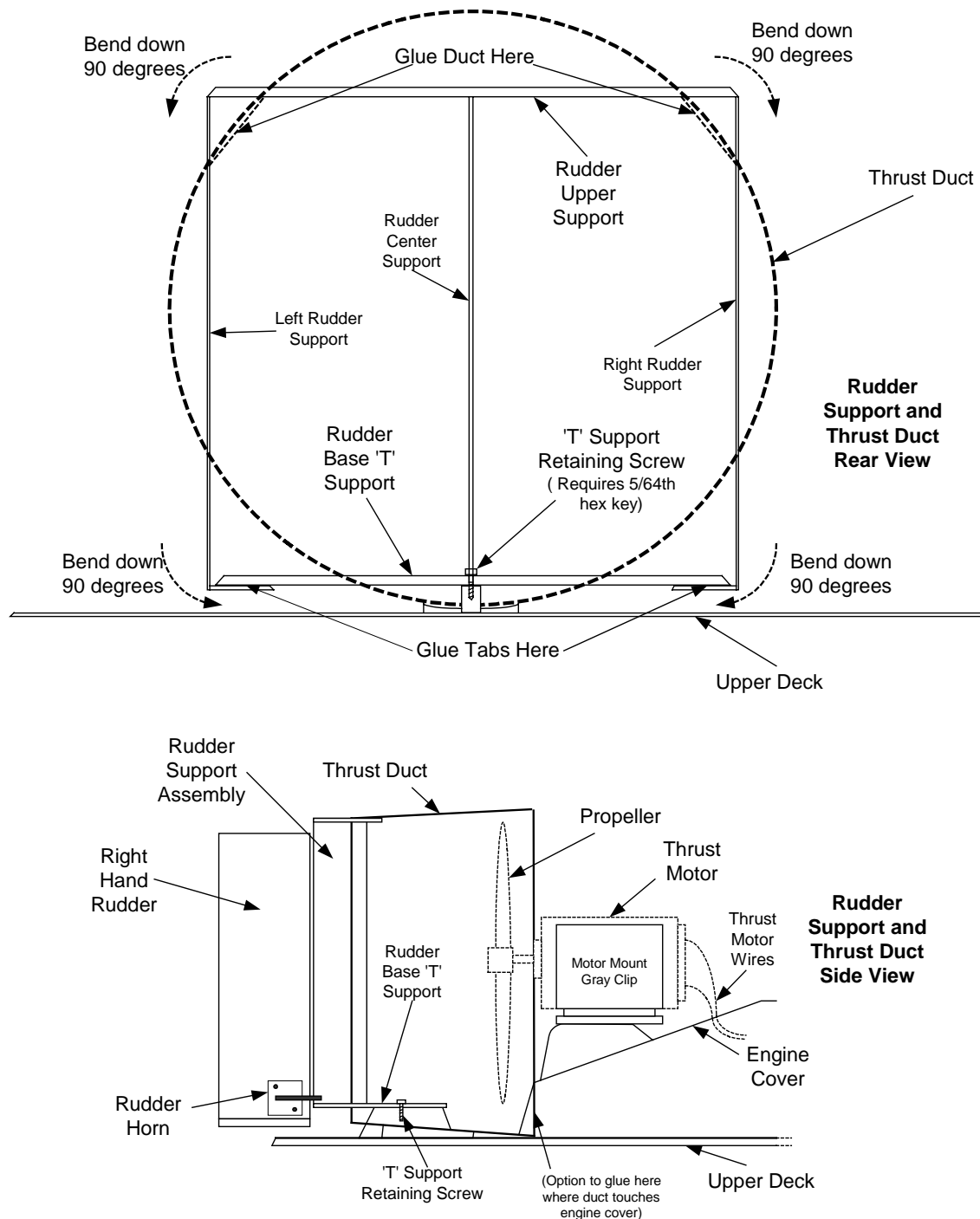
Now cut out the 'T' shaped base of the rudder support. The curved sides of the molding should be left in place all around the piece to add strength except on the base and each end of the 'T'. This needs to be cut flat so it can be fitted onto the upper deck and glued to the rest of the assembly. Drill a 1/16th inch hole where marked by a small dimple in the piece.



The center rudder support must now be cut out. Remove the molded edges so that it makes a flat part.

Start assembly by gluing the tabs at the base of the sides of the support, under either side of the 'T' base. Use small clamps to hold it in place while setting. Glue the center support into the assembly using the groove in the base and the line in the top of the rudder support as a guide for location. The rudder support is now complete.

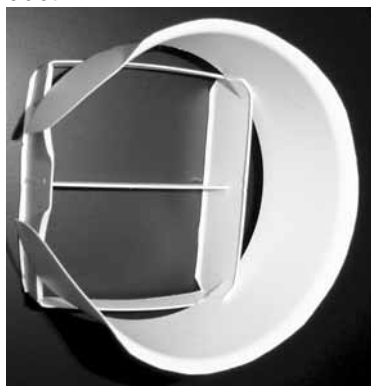
Assembly and Installation the Rudder and Thrust Duct



Note: Drawing is not to scale

Assembly of the Rudder Support and Thrust Duct.

The rudder support is attached to the thrust duct using two sloped tabs on either side of the top bar. Test fit the thrust duct onto its upper deck supports so that the open curve is evenly spaced at the base of the duct. Now put the rudder assembly into the rear of the duct and mark where the sloped tabs meet the duct.



View of the completed rudder assembly attached by the tabs glued to the thrust duct

Remove the duct and rudder support from the upper deck and glue the rudder support in place where it was marked. Small clamps or clothespins will be needed to keep the parts in place until they have set. Once set it can then be fitted to the upper deck.

Attaching the Thrust Duct to the Upper Deck

Before assembly can begin, the thrust motor with its propeller has to be mounted on to the craft temporarily to test for clearance. Slide one of the motors in the kit into a gray motor mount clip. Fit a propeller to the motor by drilling its hub out to 5/64th (1.9mm). The propeller should be fitted so that the molded writing on the propeller blade is facing the motor body. It will be a tight fit onto the motor shaft. Push the propeller down on the shaft until there is 1/6th of the shaft still showing at the base where the shaft meets the motor body. Now using some painters tape or sticky tape, mount the motor by locating the motor clip base onto the thrust motor post. The propeller will be just inside the thrust duct when it is mounted.

Thrust duct and rudder support mounted onto the upper deck



Offer up the thrust duct into place at the rear of the upper deck. The front of the duct should be touching the outer corners of the engine cover and its base should rest on the upper curved deck support. The 'T' base of the rudder assembly should be rested on the upright mount molded into the rear of the upper deck. Using a pencil mark through the hole on the 'T' base of the rudder assembly so that a mark is left on the upper deck upright mount. Now remove the duct assembly and drill a 1/16th hole where the mark shows. Once this is done relocate the thrust duct and using the supplied self-tapping #2 x 7/16 hex head screw, attach the 'T' base to the upper deck.

The base of the thrust duct should be temporarily taped to the thrust duct mount molded into the upper deck. Now rotate the propeller as see that it does not touch the thrust duct at any point in its travel. If it does, adjust the position of the duct and if necessary trim the curved parts at the bottom of the duct to give the propeller free travel all around.

Once the thrust duct is located correctly, mark its position and glue the thrust duct lower edges to the upper deck curved support. You may also add a small amount of glue to each lip where it touches the engine cover to firmly fix the duct in place.

Fitting the Lift Motor Mount

The lift motor is located inside the front cabin on a beam glued between the cabin walls. A white 3 inch long by 1 inch wide strip of plastic is supplied in your kit for this. The strip is located inline with the back edge of the rear windows (towards the center of the craft). Cut and carefully fit the plastic strip so that it's a snug fit in this position. Locate the center of the strip you have cut and fix one of the self-adhesive gray motor mount clips at this point so the open end of the clip faces downwards.

Take the remaining motor in the kit and drill and fit the propeller as you did for the thrust motor by drilling the hole in the hub out to 5/64th inch and pushing the propeller onto the motor shaft. Be sure that the propeller faces with the molded writing on it towards the motor body. Now push the motor into the gray motor mount clip to check its fitting.



Cabin with lift motor mount fitted

Offer the whole assembly up into the cabin, locate it correctly and temporarily hold it in place using painters or sticky tape. Rotate the propeller and see that it turns in the center of the widened area at the base of the cabin. It should be evenly spaced from the walls throughout its entire rotation. The propeller must also sit so its front edge (the edge towards the base of the cabin) does not protrude below the cabin base.



Underside view with the motor with propeller fitted in the motor mount and the lower deck fitted

You need to now test fit the lower deck and foam buoyancy to test the correct lift duct clearance. Using the 10-24 by 1 inch bolts located the lower deck, buoyancy foam and into the upper deck check that the lift motor propeller does not touch the top of the lower deck lift duct. If it does, then trim a small amount from the lift duct top to give the correct clearance. Once the duct clearance is correct carefully disassemble the decks and mark the motor mount position. You can then glue the motor mount strip in place on the cabin walls and put to deck aside to set. Don't be tempted to remove the motor until the glue has fully set! Once the glue is set remove the motor and the upper deck is ready to be painted.

The upper deck, duct, passenger cabin and rudders are now ready for painting.

Radar Cover/Hatch Cover

Supplied in your kit is a small two-part radar dome that also doubles as a hatch cover if your finished craft is going to be a military type. Cut both halves out from the molding and if assembling the radar cover trim one shorter than the other so they nest one inside the other. They are then glued in together and put aside to set.

Radar cover installed

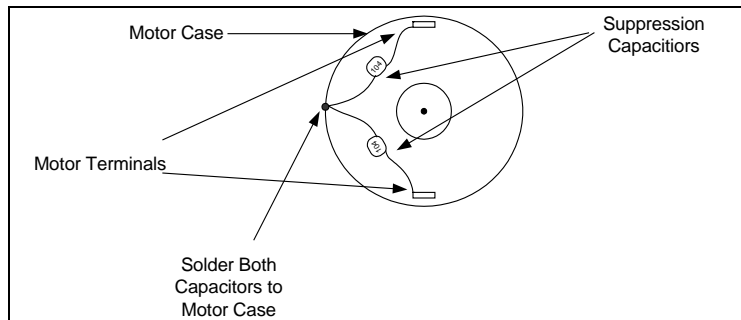
If you're using this as a hatch, then cut one half so that it has a 1/16th lip all around it and glue it onto the center of the cabin on the upper deck.



The radar is painted separately from the rest of the parts and should be white and attached to the craft cabin later when the craft is complete. If the parts are used as a hatch it is glued on immediately and painted with the upper deck.

Wiring and Fitting the Lift Motor

Before we can finally assemble the craft the lift motor wires have to be soldered on. Cut the supplied length of motor wire in half. One piece will be used for each motor. The wire tabs on the rear of the motor are marked for polarity. The red wire goes to the tab next to the small round dot depressed in the motor rear housing. The black wire goes to the other tab. Two capacitors supplied in your kit need to be fitted to the motor to suppress noise, which will interfere with the radio system otherwise. The two capacitors should be fitted to the motor as shown below:



*Capacitor Installation on the Motor
(Note: also fit these capacitors on the thrust motor)*

The propeller is now fitted. First drill out the hub to 5/64th to accept the motor shaft. This will make the propeller a tight fit on the 2mm motor shaft. Add a small amount of silicone seal around the inside of the gray motor mount clip and then snap the motor into the clip in the craft cabin. The silicone seal will stop the motor moving. The wire is routed out of the cabin via a small hole at the rear that enters the passenger cabin area where the radio equipment and battery will be housed. The hole is marked on the rear of the cabin by a small doughnut mark. Drill this hole out to 1/8th inch and pass the wires through it. Once the wire is fitted seal the hole around the wire with a little silicone seal to stop water ingress.

Now final assembly of the craft can begin.

Final Assembly of the Griffon 2000TDX

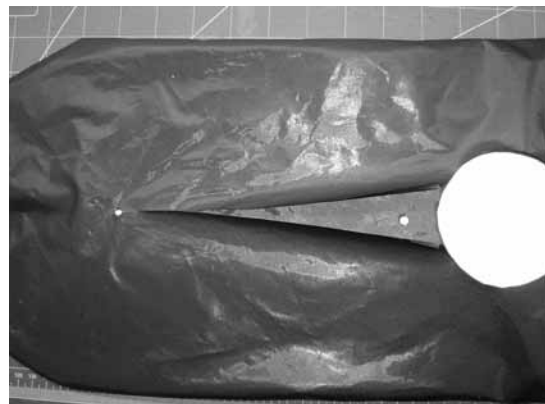
Final construction starts with the lower deck and works upwards towards the upper deck.

Preparing the Skirt

The skirt is in the form of a bag and is ready made with bolt holes punched into it. First you will need to turn the skirt inside out so the sealed edges are on the inside.

Now a slit needs to be cut in the top side of the skirt to allow the buoyancy foam to be inserted. **Be sure to only cut the top layer!** With the lift duct end of the skirt to your right (the craft bow end) cut a slit down the center line of the skirt from the furthest bolt hole to the lift duct opening. **Again this should be done on the top side of the skirt only!**

Skirt top split



Lower Deck

Three 10-24 deck bolts are now inserted into the three holes (in the center, under the engine cover area and in front of the lift duct) from the bottom of the lower deck.

You may want to temporarily tape the heads of the bolts against the deck to hold them in place while assembling the rest of hovercraft base. Now place the lower deck with the threaded shafts of the bolts upward on the bench.

Before proceeding with the skirt assembly a 1/8th inch bead of silicone bath seal compound should be run around the top side (opposite side from the deck bolt head) of the deck and the lift duct. This is important, as it will seal the skirt against the deck and stop water ingress.



Silicone seal is put around the lower deck

Fitting the Skirt Assembly

Place the lower deck on the bench in front of you with the lift duct to your left. Now pass the lower layer of the skirt over the deck bolts and lift duct so it rests on the lower deck and makes contact with the silicone seal compound.

The hole around the duct is cut slightly smaller than the duct itself to get a tight fit so you may have to stretch the skirt a little to make it fit. Next the buoyancy foam is inserted into the skirt through the opening in the top layer of the skirt. Insert the front section first and align the hole in the foam with the bolt. Repeat this with the rear section of foam. The skirt top layer can now be pulled over the two bolts protruding from the topside of the foam.



Skirt fitted with foam installed inside

Fitting the Upper Deck

The upper deck is now placed over the bolts protruding out of the top the skirt. The front bolt protrudes through the strut and a nut is now placed on it by reaching up through the lift duct. Put a 10-24 nut onto each of the two other bolts. Be sure to get them tight enough to hold the deck in place but do not over tighten them, as this will distort the deck. The craft decks are now complete.

Front nut on top of the strut

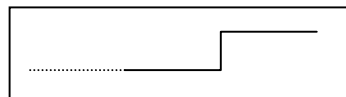


Fitting the Rudder Servo

A hole must be cut in the motor housing left-hand side (viewed from the front of the craft). This allows the servo shaft and arm to protrude through. A wide range of servos can be used with this model. It was designed to take standard servos such as Futaba 148, Hitec or an Airtronics. It can also be used with any of the mini and micro servos if you want to make the craft lighter.



*Servo arm protruding from the engine cover
Note the 'Z' bend in the wire through the servo arm as shown here:*



It is worth running some silicone sealant around the servo case to ensure that any water that gets between the superstructure and the upper deck does not get into the servo. The servo is mounted using servo mounting tape or it can be glued in place.

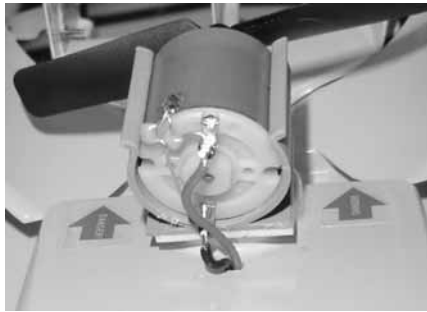
Balance Weights: Stick on weights must be added to the craft to obtain a final balance if required. They are used to counterbalance the craft against the weight of the battery and radio equipment in the front of the craft. They may be located in the cabin roof, but before adding any weight try to shift the battery and radio etc. to balance the craft.

Fitting the Passenger Cabin

The cabin is molded to be longer than the distance between the front cabin and the motor housing. You must trim and fit the passenger cabin cover to be a snug fit between these two points. Carefully cut off the excess a small piece at a time using a hobby knife or scissors until it fits. Once complete, carefully clean up the edge using fine sandpaper. The cover should be held in place using the supplied hook and loop in several locations to hold the cover firm under all operating conditions.

Thrust Motor Fitting

The thrust motor wires can now be soldered on just as with the lift motor and the propeller now fitted. First drill out the hub to 5/64th to accept the motor shaft. This will make the propeller a tight fit on the 2mm motor shaft. As with the lift motor fit the two supplied capacitors using the same diagram shown with the lift motor instruction on page 10 for placing them. The gray clip is self-adhesive and is stuck onto the thrust motor post at the rear of the engine housing. Be sure it is level. The motor can now be fitted into the gray clip and as with lift motor, first add a little silicone seal to the clip. Feed the motor wires down through the hole in the engine housing back and into the passenger cabin area.



Thrust motor installed and wired

Fitting the Rudders

The rudders are fitted using hinge tape, a tape commonly used with miniature RC electric aircraft. You can also use strapping or other tape as long as it is waterproof. The rudder horn is located on the rudder nearest the servo output arm. Small bumps have been molded into one of the rudders where this horn fits. Drill 1/16 inch holes at these two locations. Secure the horn using two 0-80 x 5/16 nut and bolts supplied in your kit. Once this is done the rudders can be fitted.



Two views of the rudder horn in place on rudder

The rudders can now be fitted on to the supports. The flanges at the base of each rudder go below the 'T' base of the rudder support

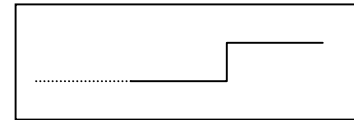
assembly. Cut three 1 ¼ inch lengths of hinge tape and fit them to the center of each rudder starting with the rudder nearest the servo (with the horn on). Fix the rudder to the upright support leaving a 1/2mm gap between the two parts. Repeat this for the center and far side rudder. Test each rudder to make sure it moves smoothly 20-25° either side of its center position.

Connecting the Servo to the Rudder

The length of the rod depends on the servo and servo arm that you use. To locate the push rod correctly on your servo, first make a 'Z' bend in the servo end of the supplied 0.025inch steel wire. Connect this through the white servo arm at the 2nd hole. Center the rudder and servo in its travel. Now mark on the wire where the push rod crosses the 2nd hole on the rudder horn. Remove the push rod and bend a 'Z' bend at that point in the arm and connect up as shown in the photo.



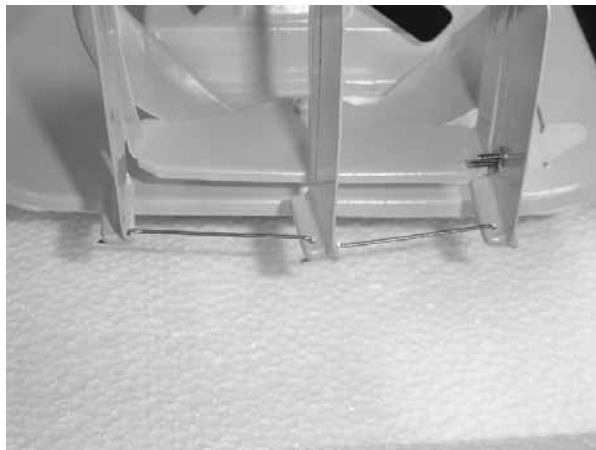
Servo push rod fitted. The 'Z' bend is used at both ends of the rod as shown here:



When the servo moves the rudders should freely swing 20-25° either side of center for full throw of the transmitter stick.

Installing the Rudder Tie Bars

The rudders are now joined together using tie bars made from 0.025inch steel wire. The ties are cut from the steel rod supplied in your kit. Cut two, 2 inch sections of rod. Bend a 'Z' bend in one end of each rod.



Rudder tie bars installed

Line up the rudders so that they are parallel with each other in the center position. Measure the distance between the rudder tie bar holes in the lip of the rudders.



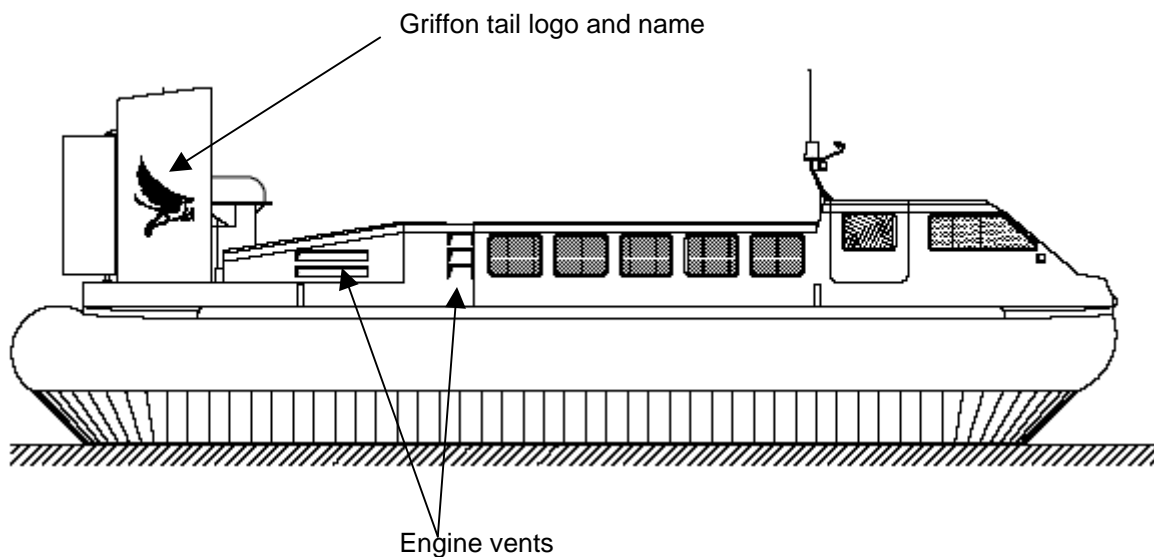
Bend another 'Z' bend in the other end of the tie bar at the point where it will cross the hole in the opposite rudder lip. Fit the tie bars by flexing the rudders slightly to accommodate the 'Z' bends. Once fitted, cut off any excess wire after the 'Z' bend.

Radio, Speed Controller and Battery Fitted into the Craft

This model is set up for forward/reverse thrust using the ILC™ module

**Final Preparation**

Your Griffon 2000TDX construction is now complete! Check the craft over and be sure it's ready to run. You can now install the thrust motor cover and then apply the decals. The diagram of the real Griffon 2000TDX below gives general placement for the decals.



NOTE - The propellers on this craft reach high speeds, NEVER put your hands near the crafts propellers when it is powered on or is running. Always check for those around you before running the craft and keep it well away from spectators and animals.

When starting the Griffon 2000TD Model ALWAYS take these three easy safety steps:

- 1 - Never fit or remove the battery when the model is power on**
- 2 - Turn the transmitter on before powering the craft on**
- 3 - Turn the craft power off before turning the transmitter off**

Here is a simple checklist to run for the first and each subsequent run of your RC Hovercraft:

1. Check the clearance of the lift propeller in the duct. It should rotate freely and not touch any part of the duct in its rotation.
2. Check the clearance of the thrust propeller in its duct. Adjust the motor position if required to get the required clearance.

First Runs

On your first run briefly check the lift and thrust propellers are rotating in the right direction. The lift fan will suck out air from the skirt if it's incorrect so this is obvious! The thrust propeller is a little more subtle.

The thrust propeller will produce some thrust if it is rotated in either direction however a marked reduction in forward thrust will be seen if it is fitted backwards. When fitted correctly the writing on the propeller faces the motor body. To produce forward thrust the propeller will rotate in a counter clockwise direction when viewed from the front of the craft looking towards the rudder.

Once you have this all working correctly, check the balance of the craft. Watch the craft as it rises to hover. This is the pitch or front to back balance. When the balance is correct the front of the craft should rise very slightly before the rear. You should also watch the lateral or side-to-side rise. The craft will tend to rise on the left side (when viewed from the back of the craft) first. This is due to lift motor torque and the weight of the servo on the right hand side. You may need to adjust the battery and radio position to get the lateral and pitch balance correct. Take your time to get it right and the craft will run better.

When you are happy with the balance you are ready to start RC hovering. Get a feel for the craft, as it is very different from a RC car or boat. On land it will always move with the camber of the land. On water the waves and wind affect it. Note that the lift requirements vary with the surface the craft is running on.

Take your Griffon 2000TD onto a lake, boating pool or swimming pool when there is smooth water. Place it on the water and start to increase the motor speed. The skirt will inflate and the lift air pressure will increase. Very quickly it will reach the pressure boundary and you will see the craft suddenly rise off the water. Now slowly add throttle as the craft moves away compensating for any wind drift with the rudders. You will notice a bow wave in front of the skirt at first. As you apply full thrust and accelerate you will see the craft rise over the bow wave and continue to accelerate without applying more power. This is the hump speed and is the point at which the craft moves out of the depression it makes on the water when hovering on water. It will now be hovering over the surface at full speed.

To slow down just decrease the motor speed and the skirt drag will pull you back below hump speed to a standing stop very quickly.

There's a lot of fun to be had on land or at your local lake. Take your time learn how all the controls interact and you will be running rings round those RC boats in no time!

Have fun Hovering!

Griffon 2000TDX RC Hovercraft Construction Manual

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Printed and bound in the United States of America

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2003/2004

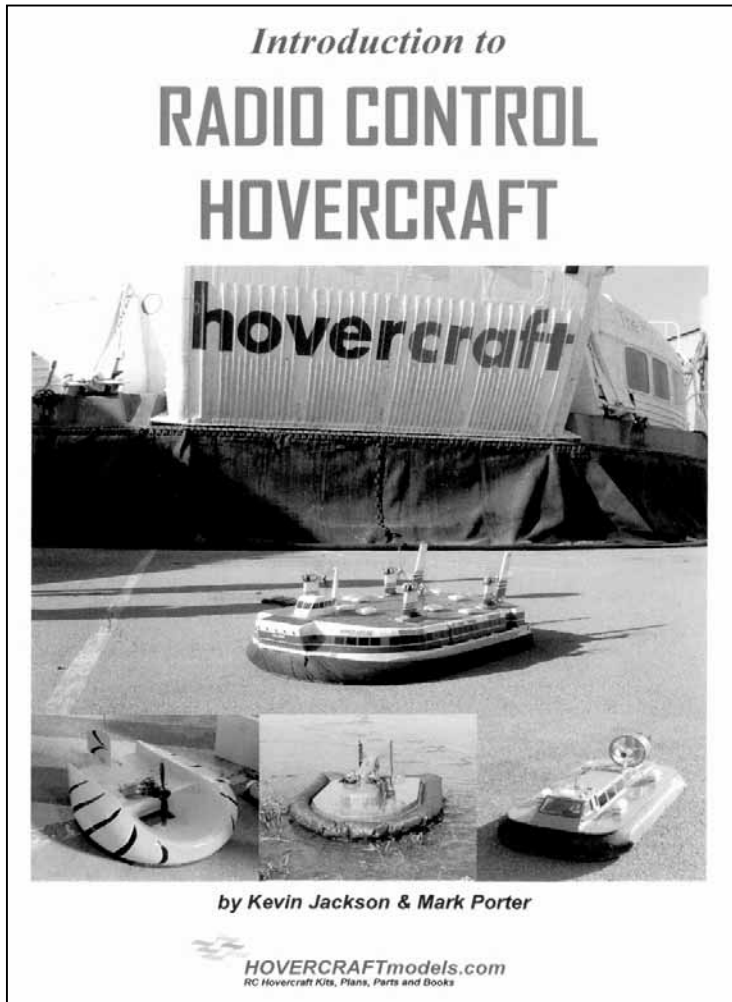
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***Want to learn more about RC Hovercraft?
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by Kevin Jackson and Mark Porter

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