

Welcome to the **ProBox** Installation Guide

This guide goes step by step through the entire installation process. Each major step is represented by a separate page with details and photos related to that step. The guide concludes with a number of helpful reinforcement tips, and information on the different routers that we recommend.

Please be sure to review the reinforcement techniques as these are very important, we strongly recommend adopting one of these techniques!

The **ProBox** Fin System has been designed to be very easy to install, but even though the process is highly intuitive we still recommend that you take the time to review the entire process in order to familiarize yourself with the various steps.

We also recommend visiting our website and watching the installation video that is posted up there, this will provide a good visual guide to the process.

If you are unsure about any of the steps in the installation process don't hesitate to contact us for clarification.

We think you will find that in practice the installation process is very straightforward and should not pose a problem for any surfboard builder, amateur or professional.

A More Advanced Fin System

If you have been looking for a fin system that is easy to install, delivering adjustability in the directions that make a difference, then this is the system for you.

Its new and its different and it delivers an unprecedented level of control over your fin setup. Allowing you to tune a surfboard to the exact characteristics needed for any given surf break!

Pro♦Box has a revolutionary patented insert mechanism that allows the cant to be changed to 0°, 4°, 6°, and 8° degree angles. Cant adjustment affects the performance and turning characteristics of a surfboard, more cant more looseness!

But not only can the cant be adjusted but the fins can be moved up to 1/2" forward and backwards allowing even greater flexibility in fine tuning the performance of the board. Moving the entire cluster forward will loosen the board, move it back for bigger waves to tighten it up, or spread them apart to draw out the turns. Then try moving one side fin forward and the other backward to really tune the board to improve cutbacks or bottom turns.

Unprecedented adjustment that is easy and fool-proof, what you have been waiting for - **Pro♦Box**

Pro♦Box Advantages

The **Pro♦Box** introduces another level of adjustability to surfboard fin systems by allowing adjustment of the position forward and backwards, and the cant (fin angle). All in a system that is easy to install. Here are some of the advantages of this new fin system.

- The system utilizes a fin with a solid base that has no built in angle making for a system that is both strong and simple, with improved performance characteristics



- A V-notch in the base provides a platform for the screws to land on, when tightened this creates a compression fit of the fin and insert into the box
- Works with fins from some of the older fin systems so the surfer does not immediately have to invest in new fins
- Custom fiberglass fins can easily be manufactured for the system, allowing surfboard designers to provide custom fin designs
- Uses a simple installation system that requires a single jig which is used for alignment, routing, box holding, and resin dam. Without the need for a fin in the box slot during installation
- The installation jig eliminates many installation errors that can occur by providing a mechanism that locks the box into the correct position while it is being glued in place



- **Pro♦Box** provides a variety of insert angles that allow manufacturers and consumers to pick the ideal fin angle for the surfboard or surf conditions
- Inserts are color coded and asymmetrically shaped so that they cannot be incorrectly placed

Fin System Parts

The **Pro♦Box** system is very simple and consists of only four primary parts.

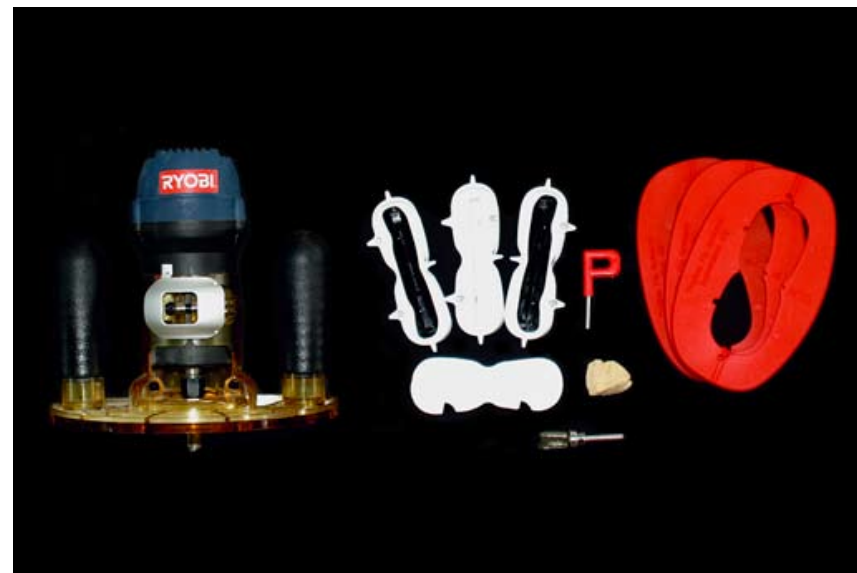
- Box & screws (separate side & center boxes)
- Insert (Blue 0°, Red 4°, Black 6°, and White 8°)
- Installation jig (for aligning, routing, locating, and gluing)
- Allen key



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During the laminating process of the board, it is wise to plan for the reinforcement of the tail area of the board where the boxes will be installed. The simplest approach is to put an additional layer across the whole tail area of the board. If this is not desirable then 6oz patches can be placed where the boxes will be installed. These can be placed either under the glass or on top depending on whether the board is colored or not! If patches are being used we strongly recommend placing them on top of the glass, the reason for this is that way there is less risk of sanding through the primary layer during the sanding process.

The parts needed for the installation are - a set of **ProBox** boxes [with inserts], installation jigs, die-cut peel & stick installation covers, Allen key, 1/2" x 3/4" router bit, 3M Super 77 spray adhesive, and a panel router.



The key to a smooth sailing installation is to be well prepared so that there are no surprises in the middle of the process.

ProBox boxes are very easy to install but it is still smart to be well prepared.

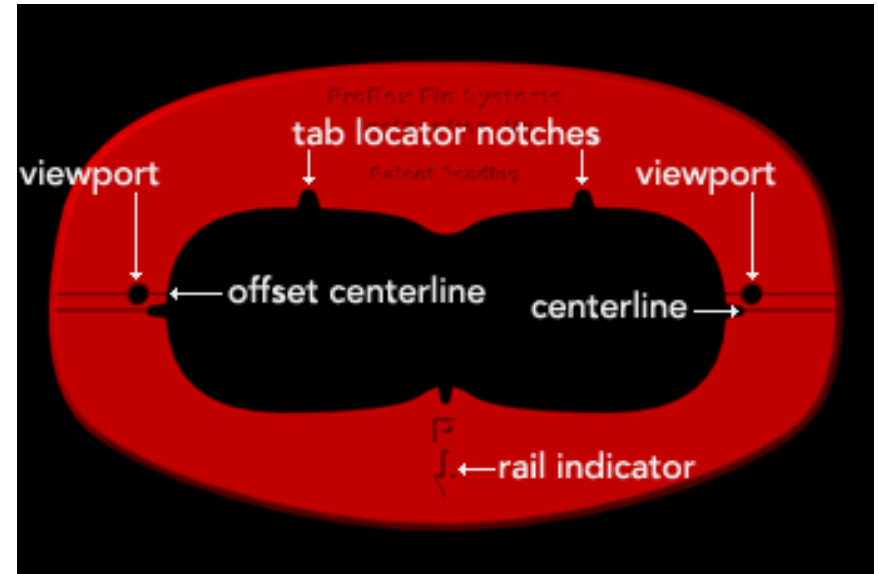
Before proceeding to the Alignment step of the installation process prepare the bottom of the board for the attachment of the installation jigs. The installation should take place after the board has been hot coated. Start by sanding the bottom in the area of the installation so that the surface is smooth, there should be no bumps or unevenness that might cause the jig to not lay flat, or that might result in the jig being tilted in anyway.

The goal is to ensure that the jig is flat relative to the bottom contour of the board!

The **ProBox** installation jigs are designed to be positioned on the shaper's marks on the board. Ensure that these marks are clearly visible and that a line has been extended through the front and back marks, this line should be longer than the installation jig.

The installation jig has a number of different lines along its center that are used to correctly position the jig depending on whether its a center or side box. Additionally, there is a small circular cutout in the jigs called the viewport, this is used to align the jig with the shaper's mark. The viewport is offset slightly to the side of the center line of the jig so that it can be aligned with the inner face of a side fin.

For a center fin installation the shaper's mark must be extended at 90 degrees to the center line so that it will be visible in the viewport. A drawing of the installation jig is shown pointing out all of these details.



Prepare the installation jigs and the board by spraying a small amount of adhesive on the underside of the jigs and on the bottom of the board. A cutout masking template can be made from a piece of cardboard or door skin, using the jig as a template. This template can then be used to spray the adhesive on the board to minimize over spray.

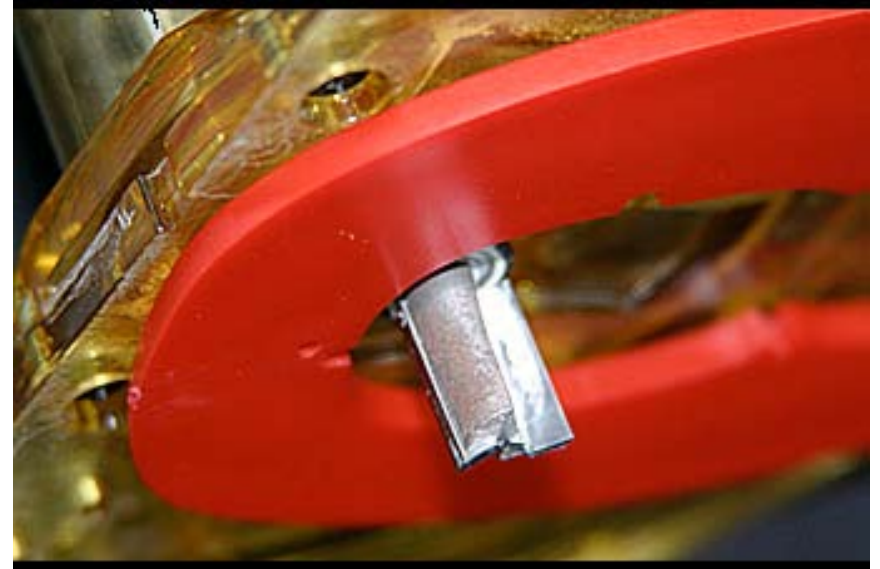
Allow the adhesive to tack up and then start attaching the jigs to the board. For side boxes the jig must be positioned with the arrow and "R" pointing to the rail. The offset center line is used for the side boxes, the viewport is centered on this line.

Place the back viewport over the back shaper's mark aligning the jig on the mark by looking through the viewport. At the front end of the jig simply align the offset center line on the extended line. Ensure that the jig is pressed down flat on the board. The procedure is the same for a center box except the center line is used.

The cleanliness of the installation is determined by how cleanly the hole is routed. So once again preparation is the key to success for this part of the process.

Before starting out make sure that the router bit is sharp and that the router bearing is rotating freely. If the bearing does not rotate freely it will spin against the side of the jig generating heat and melting the jig, not good!

The first step is to correctly setup the router bit in the router. The bit has a 1/4" diameter shank, a 1/2" diameter cutter, and a 5/8" diameter bearing. The cutting depth is 3/4" but it will be setup at less than this depth. The simplest way to setup the depth of the router bit is to place it in the router, then place a jig against the bottom of the router base, then adjust the depth till the top of the cutter is a 1/16" above the bottom of the jig.



Routers can be very dangerous as they rotate at extremely high speeds and therefore must be handled with care. We recommend using panel routers for this reason as they are smaller and easier to handle. The key to doing a successful route is to not force the tool, let it cut at its own speed and make sure you are cutting in the correct direction. You want to be cutting against the rotational direction of the cutter.

Start out by removing the inner part of the hole before finishing by going around the inner edge of the jig. Ensure that the bearing is against the edge of the jig, a lot of force is not needed against the jig.

Once the hole has been routed there should be a lip around the inner edge of the jig, so the hole is inset from the edge of the jig. This lip makes it easier to pour resin around the box and also helps during the sanding process. The photo shows a routed hole with the lip visible.

The boxes are glued into the board using a mixture of resin, pigment, and catalyst. Roughly 1oz of resin is required per box. Additionally, one of the recommended resin reinforcement methods discussed on the Reinforcement page need to be used. These reinforcement techniques add additional strength to the resin surrounding the box and eliminate the need to use milled fibers in the resin. The preferred technique is the strand of roving wrapped around the box.

The outside of the **ProBox** should be cleaned and sanded to improve the bond between the box and the resin. **ProBox** provides a die-cut adhesive sheet that has been shaped to cover the top of the box, clay is also provided for plugging the screw holes, making it easy to protect the box from resin intrusion.

The adjacent photo shows a box that has been prepared with a die-cut peel & stick cover and clay in the screw holes.



Add catalyst to the resin mixture and pour it into the hole until it is roughly 1/3 full of resin, now snap the box into the jig, it only fits one way. Push down on the **ProBox** to ensure that all of the tabs are down flush with the bottom of the board. It is critical that the **ProBox** be all the way down with all of the tabs touching the bottom of the board, this will ensure that the box is correctly aligned.

Fill the remainder of the hole with resin so that the level is slightly below the top of the dam on the box, the jig will serve as a dam for the resin. This topping off can be accomplished with either a syringe or a squeeze bottle, ensure that there is enough resin as it will settle.

We strongly advise wrapping a strand of glass roving around the box when it is being installed, this can be done with dry roving, use enough to go twice around the box. This dramatically improves the strength of the resin surrounding the box.

Once the resin is fully cured remove the jig by gently peeling it away from the bottom of the board. The jig is flexible enough to make it easy to peel it up.

Screw the set screws in, using the Allen key, until they are below the level of the top of the **ProBox**. Now grind the box down flush with the bottom of the board, this will remove the resin dam and tabs from the box. This process might result in a very slight sanding of the insert that is installed in the box. Do not over sand the bottom of the board as that could weaken the reinforcing glass around the box!

The picture shows a box that has been sanded down flush with the bottom of the board. At this point in time the installation is completed and the sanding process can be performed on the rest of the board.



All the boxes can be installed simultaneously as **ProBox** provides enough installation jigs to perform a complete installation.

If the board is going to have a gloss coat and be polished the box and screws should be covered with our die-cut peel & stick gloss cover, or masking tape, to prevent resin from getting into the insert and the screws holes. **ProBox** can provide die-cut peel & stick gloss covers that are shaped to fit the boxes to simplify this process.

Insert Color Coding: BLUE - 0°, RED - 4°, BLACK - 6°, and WHITE - 8°.

This completes the basic installation process for the **ProBox** Fin System!

The remaining pages of have some helpful hints on how to reinforce the installation, more information on the recommended routers for the system, and some tips and tricks.

There are two preferred techniques for reinforcing the installation one of these techniques has to be used to reinforce the resin. These techniques are simple and effective and **do not** require milled fiber in the resin.

Glass Roving: This is our recommended technique that applies extra strength directly to the resin surrounding the box, helping to bind the resin together. Once again this is a very simple and effective technique that does not cause much complication to the process, but has a huge impact on the durability of the installation.

This technique involves wrapping a strand of fiberglass roving twice around the box. The best source for the strand of roving is from a piece of 24oz woven roving cloth. The reason this works better is because the glass strands in the woven roving are sized with a material that binds the fibers together making them easier to manage. A single strand is all that is needed.



The roving should be long enough to be able to wrap twice around the box. Before installing the box wrap the roving around the box while still dry and then place the box into the routed hole and pour resin to top off the hole following the standard installation process. Typical length for the roving strand is 18”.

Because of the shape of the box, tabs and nubs make it is easy to position the roving around the box and have it stay in position.

Glass Cloth: the alternative technique is to line the routed hole for the box with a strip of 4 or 6oz cloth. This cloth can either cover the entire interior of the hole or can be spread around the vertical surfaces. The cloth can be applied dry before pouring any resin into the hole, this makes it very simple to add this step to the process. This cloth helps the strength of the installation by helping to spread the loads to the surrounding foam and binding the resin.

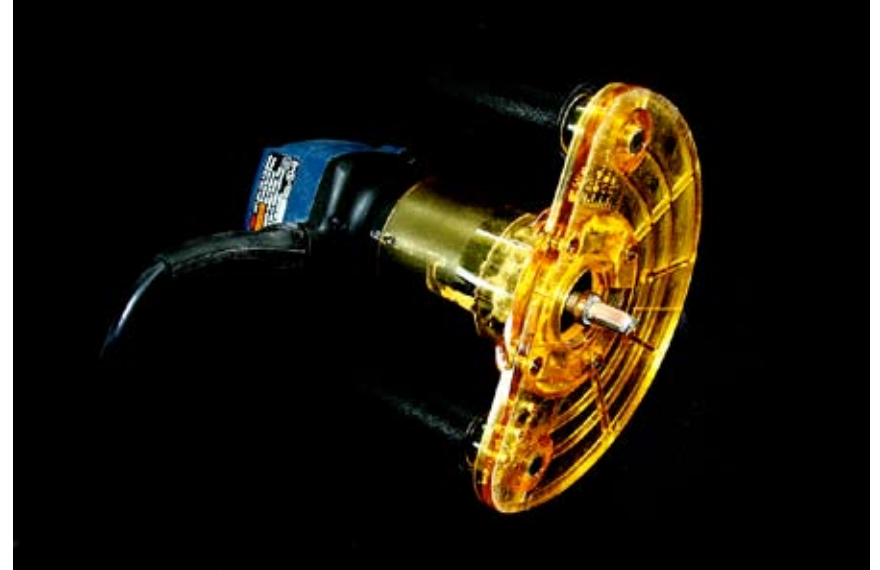
Recommended Routers

There are many routers available in the marketplace and the reality is that any one would probably work for a **ProBox** installation, but we recommend using a panel [trim] router. There are a number of reasons for this recommendation - inexpensive, easy to handle, lightweight, and they fit better on our jig.

Normal panel routers do not have a plunging mechanism which makes them a little less safer than a plunge router, we have sourced a small plunge router that has all of the characteristics of a panel router but with the addition of the plunge capability.

Ryobi TR45K Trim Router

These routers are commonly available at places like Home Depot and sell for around \$89! This router package includes an extra two handled transparent base that is perfect for doing **ProBox** installations. This



is an extremely handy little router that is very easy to handle.

Trend T3 Variable Speed Plunge Router

This router is an amazing package, it is a variable speed lightweight plunge router that handles like a panel or trim router, but with the plunging ability. This is an ideal router for safely doing **ProBox** installations. The amazing thing about this router is that they can be bought for \$80! They are sold online from Klingspors Woodworking Shop.

In the coming months we are going to be offering a slightly modified version of this router that will feature a clear plastic insert for the router base that makes it easier to see what you are doing, as opposed to the metal one provided with the router. The modified base will feature an integrated router guide that eliminates the need for a bearing on the router bit!

These are some tips and tricks that we have learnt over the years that might be useful when using the **ProBox** Fin System.

- When starting to route a box hole with the Ryobi panel router, to avoid the router grabbing or kicking and to prevent cutting the jig, use the router like a plunge router. Place the woodworkers base on the router and then set the half-circle of the base down on the jig/board, then with both hands on the handles, slowly allow the bit to rotate down into the board. This technique gives you a lot more control over the router, when compared to trying to drop the router down free hand. If you are using the Trend router this problem is solved by the fact that it is a plunge router and therefore inherently more secure.
- Don't store your jigs in acetone after they have been used. Acetone will not damage the jig, but it is not necessary to completely clean them very often. Leave the spray adhesive on the jig after it has been used. If it is placed in acetone then the adhesive will need to be applied to the jig every time. Clean off any resin from the inside edge of the jig by twisting the jig, or by using your thumb, fingernail or knife blade to remove any pieces of resin on the jig. Lightly add more spray adhesive before the next use, this saves on clean up time and adhesive.
- For resin reinforcement, cut some 24oz woven roving cloth into 18" squares, then pull out the individual strands, one strand will do one box. You can also get 2 yards of woven roving, then cut it in half and pull out 36" long strands that can then be cut in half to achieve the 18" length needed to wrap a single box.
- When topping off the resin, be sure to pour between the screws first, this helps the resin flow underneath the large tabs. Then pour from the screws out towards the ends of the box, and then from there on towards the single tab on the rail side of the box. Make sure enough resin is added to completely fill the area between the resin dam and the jig as the resin will soak into the foam a little and settle down. Not enough resin and it can settle down below the level of the glass, leaving a dip around the box.
- Clean the adhesive off the boards before sanding, as this saves sand paper and minimizes the chances of over sanding around the boxes as the tendency is to chase the adhesive gum around the board. A very light coat of WD40 can be used, but any adhesive remover will work as well. Use just enough to release the adhesive, then use a razor blade and cloth to remove the adhesive.
- For a slick shiny finish, after sanding, spray a light coat of clear acrylic on the boxes. A simple mask can be made to prevent over spray from getting onto the rest of the board. This is a little extra work but it looks really clean.
- When routing the center box on a board with a large stringer, it is wise to make shallower passes during the routing process to prevent the router from catching. One trick if you don't want to be adjusting the depth of the router bit for these cuts, stack two additional jigs on top of the base jig, holding them down with masking tape. Then do the routing of the stringer, then remove one jig and repeat the process until the routing is completed. If you are using the Trend plunge router just make shallower cuts by not plunging all of the way down. Or plunge down through the stringer like a drill, then cleanup horizontally with the router.