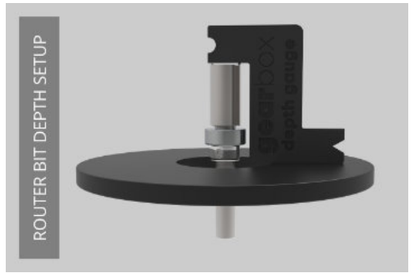
SETUP INFO

START HERE

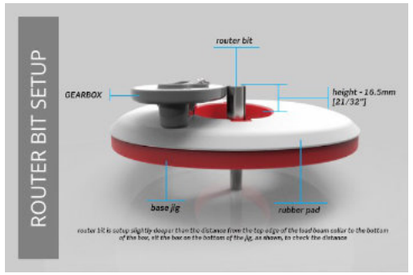
ROUTER BIT SETUP

To adjust the router bit to the correct depth use the depth gauge that is provided with an install kit. Place the router upside down on a table. The gauge has two different depths on it, defined by the side notches. The CIRCULAR notch is the STANDARD depth and the TRIANGULAR notch is for use with double concaves. The concave depth is deeper than the standard to compensate for the concave depth.



Set the gauge on the bottom of the base, as shown in the illustration. Then adjust the router bit until the cutter touches the underside of the gauge.

Alternatively, a box can be placed on the bottom of the jig, then adjust the bit until it is slightly above the top of the upper surface of the load beam collar. A better install can be achieved by always having the box be slightly below the lip of the routed cavity. It is a good idea to do a test run on a scrap of foam to ensure that everything is correct before proceeding.

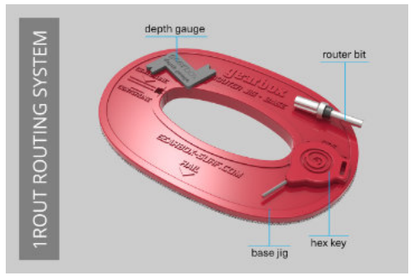


Once the router bit has been setup it will not need to be adjusted again for the installation procedure as the routing system automatically adjusts the depth for the different cavities.

NOTE: for installation in deep double concaves it is advisable to set the bit slightly deeper in order to allow the box to sit below the bottom surface, at the concaves lowest point. A measurement of about 31mm (1 7/32") from the router base to the tip of the router bit cutters can be used as a starting point! This results in a cavity that is slightly deeper than the depth of the box when installed in a deep concave. The concave side of the gauge adds this additional depth to the standard on.

ROUTING SYSTEM

The regular GEARBOX routing system is made up of seven pieces. But for this guide we are only going to be using the **1ROUT** system, which is made up of five pieces - the base router jig, router bit, hex key, height gauge, and this guide.



The base router jig is the primary positioning jig and serves as the host for the two working jigs (it is also utilized on some of the other installation options, see the 1ROUT Install Guide). It has a rubber pad on the bottom to prevent slippage and to protect the bottom of the board. The bottom router jig is used to rout the cavity for the bottom of the box. Finally, the top router jig is used to rout the shelf onto which the box rests during installation. All jigs have markings on them to help with orientation and placement. Specifically, there is a RAIL marking that indicates which side of the jig needs to be oriented towards the rail of the board.

The router bit features a bearing that is larger than the 3/8" diameter cutter, so there is a small offset from the edge of the jig during the routing operation.

ROUTER

Trim routers are recommended because they are small and easy to handle. Plus they are relatively inexpensive. Our two favorites are the **Ridgid R2401** or the **Makita RT0701C** trim routers, both of which have amply powerful motors and round bases. Larger routers can be dangerous as their bases are larger and do not fit as well on the jigs.

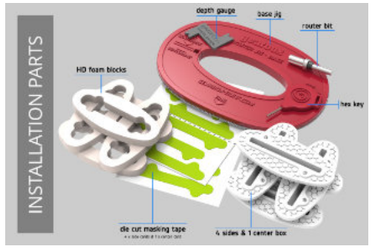
INSTALLATION

PREPARATION

A GEARBOX install is very simple and only requires our 1ROUT routing system, hex key, die cut tape, boxes, and a router that you provide.

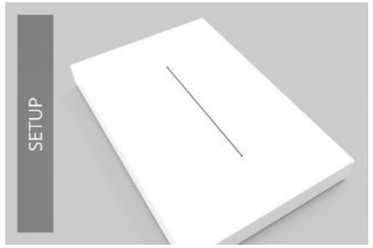
Routing will most commonly be performed on the shaped surfboard blank. But an installation can be performed after the bottom has been laminated, but the boxes will still need to be capped with glass. This is covered at the end of this guide.

The 1ROUT installation technique utilizes a single jig and HD foam blocks to house the box within the routed cavity. This technique is the simplest and is always used for low density EPS foam installations. It requires that the HD foam blocks be purchased for the installation.



SETUP

As part of the setup, the blank needs to have the shapers fin layout lines, for the desired fin setup. To ease the process there should be a line drawn connecting the two dots that mark the fin location, if these are not already present.



These lines will help with the positioning of the jigs, and are typically placed on the blank by the shaper to their desired fin layout.

The front and back shapers marks should be 4 1/2" apart in order to work best with the base router jig, as this will allow the layout lines to extend the full length of the inside of the jig.

BASE JIG PLACEMENT

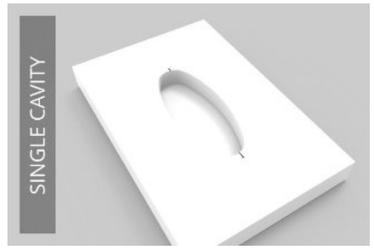
Place the base router jig on the blank oriented with the rail marker pointing towards the rail. Place the back shapers mark window on the back shaper's mark, then use either the centerline for a center box, or the side centerline for a side box to align the jig between the marks. Use the shapers mark crosshatch to position the mark within the window.

Typically, the jig does not need to be anchored to the blank as the weight of the jig and the rubber pad on the bottom keep the jig in place.

ROUT SINGLE CAVITY

Start the routing by plunging the router carefully into the foam away from the jig. Start removing foam from the center of the cavity first. Then finish off by moving the router in a clockwise direction around the perimeter of the jig. This will protect the outer edge of the cavity from debris flying around inside the cavity. Resulting cut is always a 1/16" offset from the jig.

When finished wait for the router to stop spinning before removing it from the jig, this prevents accidentally nicking the jig. Remove the base jig from the board.



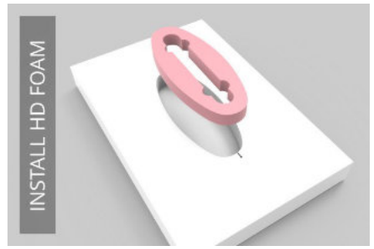
Be very careful when routing a center box as the stringer can cause the router to jump. If there is a lot of vee in the board some tape might be needed to hold the base jig. We suggest making several shallow passes along one side of the stringer, slowly removing material. When inserting the router bit into the foam make sure that the bearing on the router bit is completely within the jig cavity. Ensure that the bearing is not sitting on top of the jig.

WARNING: When routing a stringer, hold the router firmly while slowly plunging alongside the stringer, then remove small amounts of the stringer at a time to minimize the risk of the router bit catching! Once the stringer has been removed run the router clockwise around the perimeter of the jig to finish the cavity.

There is now a single cavity routed into the blank into which the HD foam block and box will be installed.

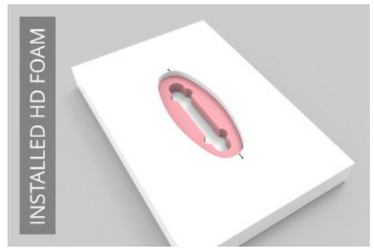
INSTALL HD FOAM & BOXES

Before starting the installation, the boxes need to be prepared. Start by using the provided hex key to make sure the grub screws are well down into the box so that they cannot be touched when sanding the board. Next cover the dams on the boxes with the provided die cut tape, or masking tape cut to fit the dam. Make sure the tape is pressed down tight to prevent resin from leaking into the slot.



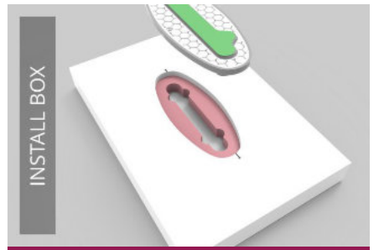
The HD foam block and the box will be installed into the board at the same time in two steps.

First the HD foam block will be installed. Start by coating the bottom and lower sides of the routed cavity with a light coat of epoxy resin (for EPS) or clear laminating resin (for polyurethane foam). Push the foam block down into the cavity making sure it is flush with the bottom, it should look like the rendering to the right.



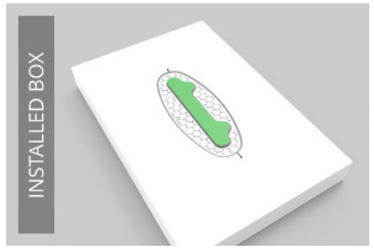
Now that the HD foam block has been inserted into the cavity, proceed with the installation of the box. To install a box, pour some resin into the narrow cavity in the HD foam block. Make sure all of the inner surfaces of the cavity are covered with resin and that there is enough resin in the bottom cavity to almost fill it.

Press the box down into the HD foam block and cavity, resin should squeeze up around the edges of the box and cover. Make sure the box is fully pressed into the cavity, the upper surface of the load beam collar flange should be slightly below the lip of the cavity when installed correctly.



WARNING: side boxes must be oriented with the screw side facing the stringer!

Spread the excess resin around the top of the cover.



Now the box can be covered with fiberglass and the lamination process can proceed. An additional reinforcement patch should finally be applied over the boxes. NOTE: it is always advisable to put this layer on the top of the bottom lamination to minimize the chance of sanding through the primary bottom layer. But if a 6-oz or heavier cloth is being used it is easier to place it underneath the bottom lamination. In this case it should always be a layer of 4-oz in order to get it to drape as tight to the dam of the box as possible.

After lamination, before the resin gels, check for air around the boxes and rub in extra resin, if needed, to remove any air, or use a pin or scratch awl to pop the air bubbles.

NOTE: there should always be at least two layers of fiberglass over the boxes. The additional layer should always be placed on top of the bottom lamination. Ideally, the second layer should be added after the bottom has cured, but it can be applied with the bottom laminate.

FINISH

During the lamination process the box is capped with layers of glass, some of which is designed to be removed during the sanding process.

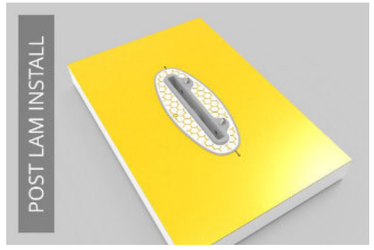
Once the board has been hot coated and has cured it is time to sand the board and boxes. The shape of the dam on the box creates a raised area that needs to be sanded down flush with the bottom surface of the board.

Sand down the protruding dam on the boxes until it is completely flush with the bottom of the board. This will expose the slot of the box, and the grub screw holes.

If the board is going to be glossed and polished another die cut tape, or masking tape, will need to be applied to the top of the box to cover the exposed slot and screw holes. Now the glossing process can be completed. Once the gloss coat has cured the board can be polished as with any other fin system. Remove the cover at the end of the process to keep the box slot clean.

POST-LAM INSTALL

PREPARATION



In addition to the two installation options described in this guide and the 1ROUT guide, there is another option that is very useful in certain situations.

It is a post lamination installation where the boxes are installed after the board has been laminated, before the hot coats are applied.

The advantages of this approach are an increase in strength. More time to complete the installation, without the pressure of laminating the entire bottom of the board. Improves the strength of the bottom lamination as it is not interrupted by the box installation so the fiberglass can be laid down more symmetrically.

The process is identical to the standard installation technique with the exception that the board is first laminated before performing the installation.

STEP 1: Laminate the board, as normal

STEP 2: Proceed with the installation, by following one of the install guides already described previously. The only difference in the process is that the routing will be also going through the bottom lamination. Boxes will still need to be capped with two layers of glass, as with the standard approach.

STEP 3: On completion of the installation, apply the hot coats as per any normal lamination.

NOTE: due to the lamination on the bottom of the board, the base jig may be more inclined to want to move on the board. This can be countered in one of two ways. NOTE: the bit depth might need to be tweaked if these techniques are utilized as they will slightly raise the jig.

1. Apply a few pieces of adhesive backed (PSA) sandpaper to the bottom of the board and then place the base jig with its pad on the sand paper, this will help prevent the jig from sliding
2. Apply double-sided carpet tape to the board on either side of the box location, then place the base jig on the tape to lock it in place, peel off the tape when done

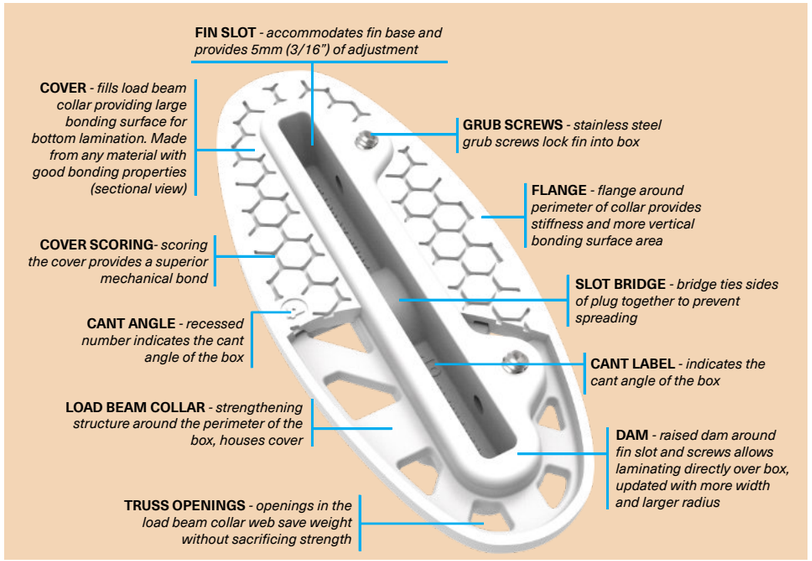
The appearance of the installation will change if this approach is used on a board with a colored bottom. In this case there will be no color over the cover, so it will show as WHITE in the install, unless there is a custom or color cover, in which case the color or material will be visible!

This installation technique is also easier for anyone wanting to check the cant angle of the box. The box can be glued into the board with a fin in the slot. This allows the fin cant angle to be checked before applying the caps of glass over the boxes.

The additional strength for this install technique comes from the fact that the side of the box is bearing onto the edge of the lamination once installed. This helps dissipate loads into the laminate making it stronger.

BOX DETAILS

There is a lot of additional information about the system and all of it's parts on the GEARBOX website. This rendering shows some of the features of the box.



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1ROUT/EPS Install Guide

GUIDE TO INSTALLING THE GEARBOX FIN SYSTEM INTO LOW DENSITY EPS, OR USING THE 1ROUT INSTALL TECHNIQUE

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