



How to Build a Top Bar Hive Layout and Milling

Introduction

You can build your own top bar hive using basic woodworking tools and construction materials that are readily available in local home improvement stores. Following these step-by-step-instructions will enable you to lay out and cut all of the parts and pieces, including the hive box, the insulated lid and the leg assembly. This hive has bee entrances at the front and back.



Tools, Materials & Supplies

Tools

- Table saw
- Circular saw
- Jig saw or tin snips
- Tape measure
- Regular framing square
- T-square or straight edge (48" long)
- Combination square for marking angles
- Razor knife
- Pencil
- Black marker

Materials for 1 Top Bar Hive

- 4 *untreated* boards (pine, cedar *or* redwood), 1" x 12" x 8'
- 2 *treated* boards, 2" x 4" x 8'
- 1 sheet tin roofing – 5V, crimped metal. (24" wide. Ask your dealer to cut it 48" long)
- 1 sheet ½" reflective, styrofoam roof sheathing

Supplies

- 4 sheets beekeeping starter comb foundation*

* See *Beekeeping Suppliers Supplement*

The Parts of a Top Bar Beehive

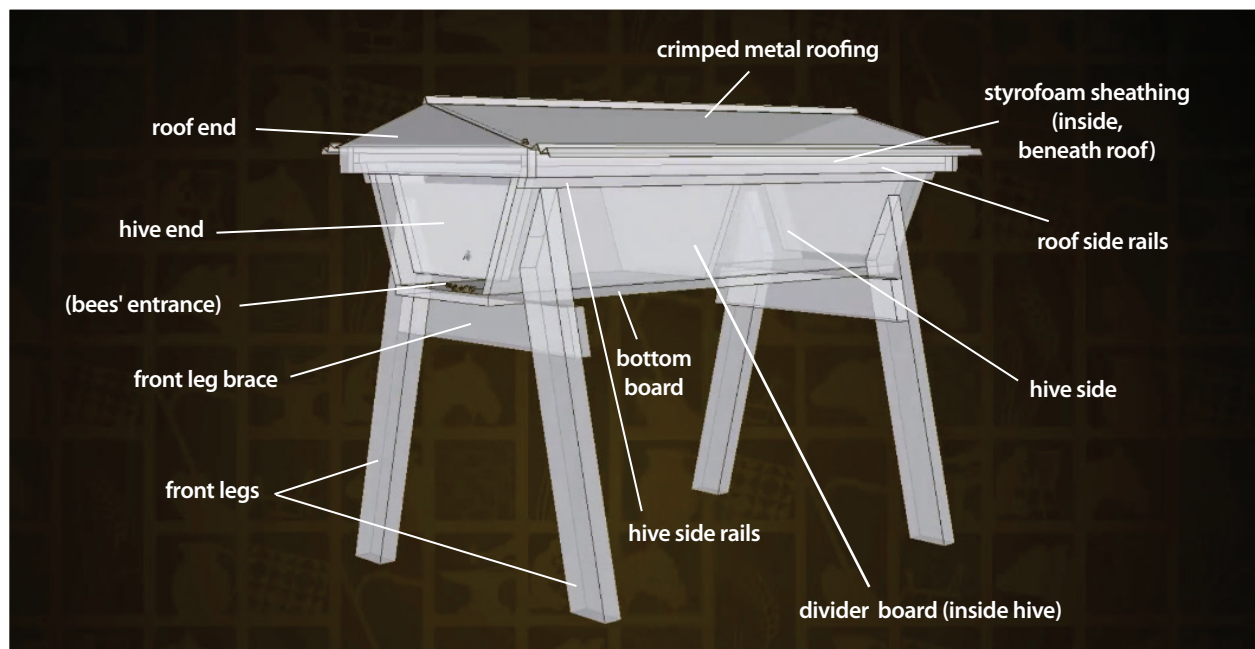
Part	Qty	Width	Height	Notes
The Hive				
Hive Ends	2	16 ½"	7 ½"	Trapezoid sides cut at 22 ½° angle
Bottom Board	1	45 ½"	approx. 11 ¼"	Height will be the board width
Hive Sides	2	45 ½"	9"	Long edges 22 ½° parallel angles
Hive Side Rails	2	45 ½"	approx 2"	Use cutoffs from hive side board
Divider Board	1	17 1/8"	9 ¼"	Trapezoid sides cut at 22 ½° angle
Top Bars	30	18 ¾"	1 ⅜"	Short edges at 22 ½° opposing angles

The Lid

Roof Ends	2	22"	2" at edges	5" tall at the center peak
Roof Side Rails	2	46 ¼"	2"	
Foam Stops	2	46 ¼"	¾"	
Styrofoam Sheathing	1	46"	20 ⅜"	
Sheet Metal Roofing	1	48"	24"	

The Leg Assembly

Legs	4	4"	30"	Bottoms angled at 12 ½°, tops at 58°
Leg Braces	2	4"	21 ¼"	Trapezoid sides cut at 12 ½° angle



Layout

Leg Assembly Layout

2" x 4" x 8' Treated Boards

Step 1. Mark the First Leg Set

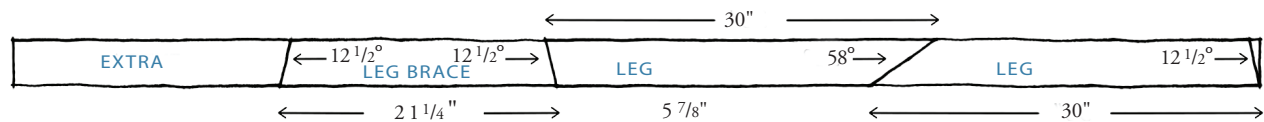
Once cut, the pieces on this board will form two legs and one leg brace. Measure carefully; your pencil marks will be your cutting lines.

- Set the combination square to $12\frac{1}{2}^\circ$. Make a pencil mark across one end of the first board. This will be the bottom of a leg.
- Measure 30" from the *long* point of the angle mark. Set the combo square to 58° . Draw a pencil line at 30", forming an acute angle.
- Measure 30" down from the *long* side of this angle line and mark.

- Reset your combo square to $12\frac{1}{2}^\circ$ and draw an angled line. This will form the bottom of the leg and one end of the leg brace.
- Measure over $21\frac{1}{4}^\circ$ from the *long* side of the leg/brace angle and mark.
- Change your combination square to $12\frac{1}{2}^\circ$ in the opposite direction. Mark across the board. The remaining board is extra.

Step 2. Mark the Second Leg Set

- Repeat all markings on the second 2 x 4.



Layout of Hive Parts

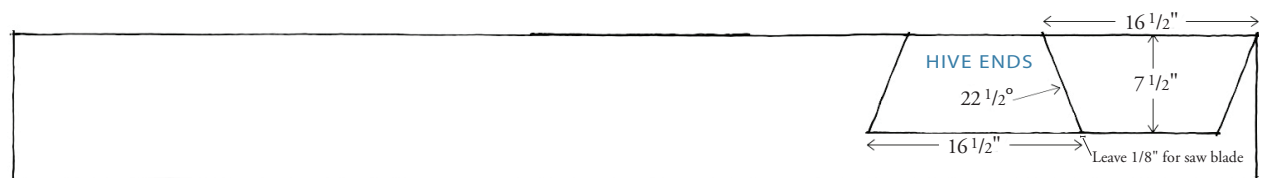
1" x 12" x 8' Untreated Boards

Board 1

Step 1. Lay Out Two Hive Ends

- Set combo square to $22\frac{1}{2}^\circ$ and mark one end of the board.
- Measure over $16\frac{1}{2}''$ from long side of the angle line. Mark.
- Set the square to $22\frac{1}{2}^\circ$ in the opposite direction (flip the square if it is a dual-sided combo square) and mark. This will form the sides of the first hive end.

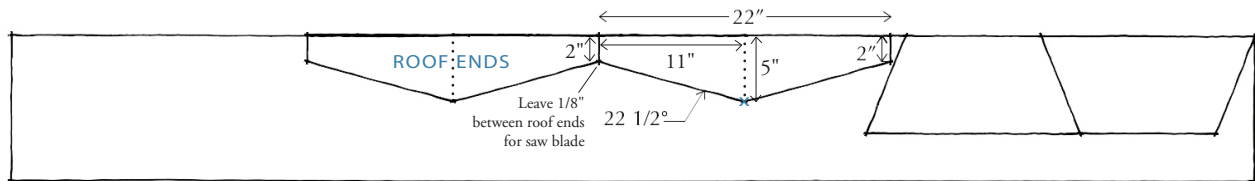
- Measure down $7\frac{1}{2}''$ from the short side of both angled marks. Draw a line between these two points to mark the bottom of the hive end.
- Layout the second hive end next to the first using the same dimensions. Leave $\frac{1}{8}''$ between the 2 hive ends for the saw blade width. For the final hive end mark, be sure to set your combo square angle at $22\frac{1}{2}^\circ$ in the opposite direction.



Step 2. Lay Out Two Roof Ends

- To lay out the first roof end, square up a 2" mark near the second hive end.
- Measure over 22" and mark your board.
- Then mark the center at 11". Measure up 5" from the center mark. This will form the peak. Mark a small "X" at the peak.

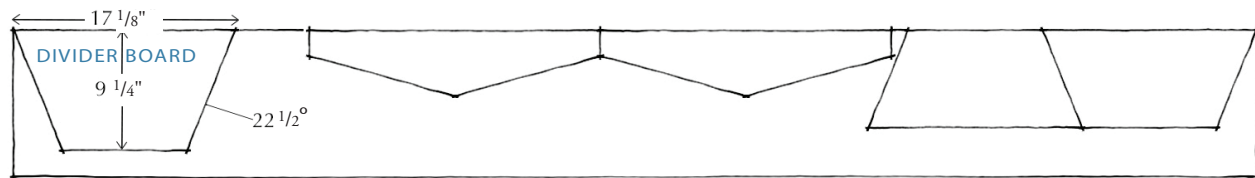
- From the 22" mark, square up 2" and mark.
- Draw a straight line from the center peak "X" to top of 2" straight sides. That creates the angles at the top of the roof end.
- Layout the second roof end next to the first, using the same dimensions. Remember to leave 1/8" for the width of the saw blade.



Step 3. Lay Out the Divider Board

- Set your square at $22\frac{1}{2}^\circ$. Starting at the opposite end of board, draw the end angle.
- Then measure over $17\frac{1}{8}$ ".
- Reset (or flip) the square to an opposite $22\frac{1}{2}^\circ$ angle. Draw the side line.

- Measure down $9\frac{1}{4}$ " from the center of the divider board. Draw a straight line connecting to the 2 sides, marking the bottom of the divider board.



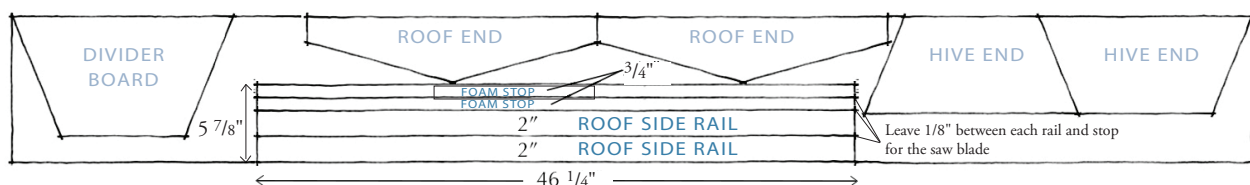
Step 4. Mark the Roof Rails & Foam Stops

You now have an empty space above the roof ends, between the divider board and hive ends. Use this area to lay out and mark the roof rails and styrofoam stops.

- Beside the divider board on the far side of the board, square up a line to $5\frac{7}{8}$ ".
- Measure over $46\frac{1}{4}$ " lengthwise on the board. Square another line $5\frac{7}{8}$ " tall.
- On your square mark line, measure up 2" for the first rail and mark. Allow 1/8" for the saw

cut. Measure up another 2" for the second rail, marking at $4\frac{1}{8}$ ".

- Continue measuring and marking the 2 foam stops at $\frac{3}{4}$ " each, allowing 1/8" between them for the saw cut.
- Repeat the marks for the side rails and foam stops on the other end of the $46\frac{1}{4}$ " length.
- Using a long T-square or straight edge, draw lengthwise lines to connect the marks for the rails and foam stops.



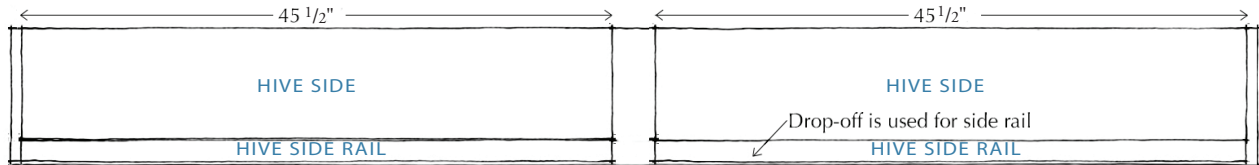
Board 2

Layout the Hive Sides & Side Rails

- Square off the end of your board. From there, measure over $45\frac{1}{2}$ " and mark. Square up that end.
- Repeat on the opposite end of the board. Always be sure to square the end of your lumber.

Note: You will cut the hive side pieces to width using a table saw. The cutoffs will be used for the side rails.

This completes the layout of the second board.

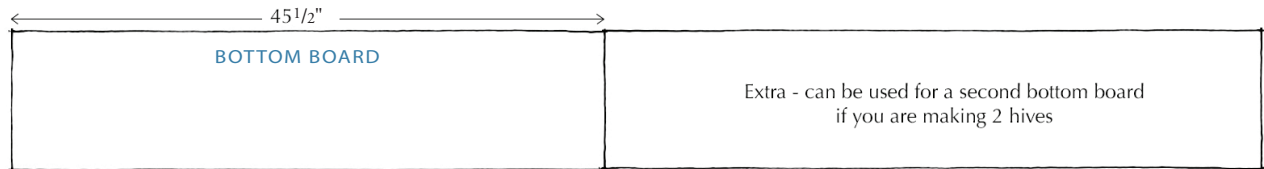


Board 3

Mark the Bottom Board

- Square one end all the way across the board.
- From there, measure over $45\frac{1}{2}$ ". Square that end.

This completes marking the third board.



Board 4

Mark the First Top Bar Slab

For the top bars, you will measure and cut as you go, first cutting out the individual slabs and then the bars themselves.

- Square off one end of the final board and mark it with a straight line.

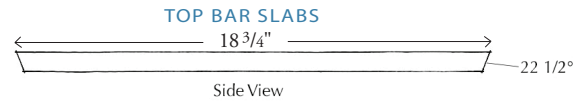


Cutting Out

Step 1. Cut the Top Bar Slabs

- Set your circular saw to $22\frac{1}{2}^\circ$.
- Then set the width of the saw blade just below the depth of your board.
- Following the line that you marked on Board 4, saw through the board.
- Flip the board over. This will give you an opposite angle when you cut.
- Measure $18\frac{3}{4}$ " from the long point and mark a square line across the board.

- Following this line, saw off the board. You now have the first slab. Note that the angle is opposite from the previous one.



- Continue flipping the board, measuring at $18\frac{3}{4}$ " and then sawing the board. Repeat this process until you cut the entire board into 5 slabs.

Step 2. Cut the Top Bars

- Set your table saw guide (fence) at $1\frac{3}{8}$ " against the inside of the blade.
- Then set the height of the blade to just above the board itself.

- Now saw each top bar slab into $1\frac{3}{8}$ " top bars.
- Sort through the cut bars. Discard any that are broken or are narrower than $1\frac{3}{8}$ " wide.



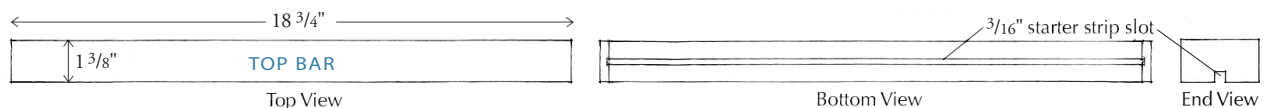
Step 3. Cut a Channel in the Top Bars

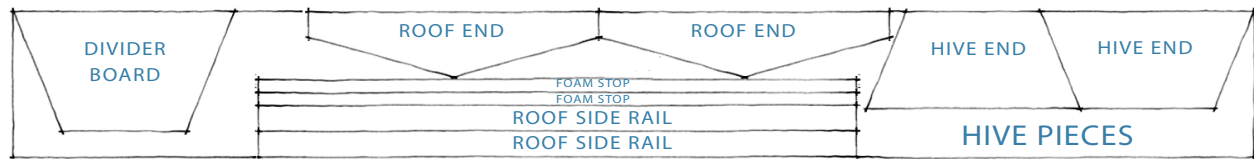
- Set the table saw blade *height* to $\frac{3}{8}$ ".
Note: It is very important to set blade at proper height. You don't want to cut all the way through the bar, you just want to cut a channel.
- Set the saw guide at $\frac{11}{16}$ " on the inside of the table saw blade.
- Bottom down, run a test bar through once, making a channel groove on the bottom.

- Then turn the bar around and cut again, starting at the opposite end. The two cuts together should create the right size channel for the foundation starter combs.

Note: Test the width by inserting a piece of foundation in the channel. You may need to adjust your fence in or out a bit to create a slot the right width to accept your comb starter.

- Once you have the guide set correctly, continue sawing channels on the bars.





Step 4. Cut Honeycomb Starter Strips

Next you will need to cut at least 30 starter honeycomb strips.

- Set your table saw guide to 14". Cut the foundation sheets 14" long one at a time, using the push stick to guide the sheets.
- Reset the fence to 1".
- Cut the 14" sheets into 1" widths. You will need enough starter strips for all of your top bars. You might want to cut a few extra.

Step 5. Cut the Hive Pieces

Before you begin cutting the hive pieces marked on the first board, make sure your circular saw is set to a square cut.

- Cut the hive ends out of the first board using the circular saw.
- Rotate your board. Then cut out the divider board.
- Next you will want to cut off the roof side rails. Using the circular saw, trim off the triangular piece between the last divider board cut and the 5 7/8" square mark at the end of the roof rails.
- Set the table saw fence at 2". Cut the 2 roof side rails.
- Reset the fence to 3/4" and cut the 2 foam stops.
- Using the circular saw, trim the roof rails and the foam stops to length, using your previous markings.

- To cut out the first roof end, begin with the square end. Then cut the square cut between the two pieces. Then cut the square end from the second piece.
- Now make the diagonal cuts at the tops.

Step 6. Cut the Hive Sides and Side Rails

- Use your circular saw to cut off the square ends of the hive sides from the second board, cutting all the way across the board.

The next cut will be done on your table saw.

- Tilt the blade on your table saw outward toward your left at a 22 1/2° angle.
- Then set the fence 9" from the inner edge of the saw blade.

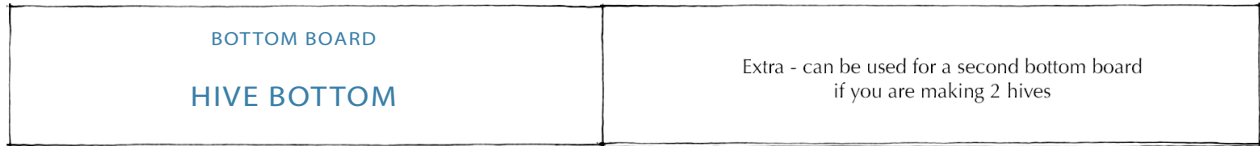
You will want to ask someone to help you with the next step.

- Push one hive side through the saw. Have someone stand on the opposite side to receive both pieces. Set aside the side rail.
- Flip the hive side over. Run it back through the saw to cut the outer edge at a 22 1/2° angle.

Note: Unlike the opposing angles on the edges of the top bars, the two angles on the edges of the hive sides will be slanted in the *same* direction.

- Repeat the two angled table saw cuts with the second hive side.





Step 7. Cut the Hive Bottom

From the third board, cut both ends off the hive bottom using your circular saw.

Step 8. Cut the Legs and Leg Braces

Check your circular saw to make sure that your saw blade depth is set just a little below the thickness of the 2 x 4.

- Cut out the leg and brace pieces, cutting along your marked lines.

Step 9. Trim the Metal Roofing

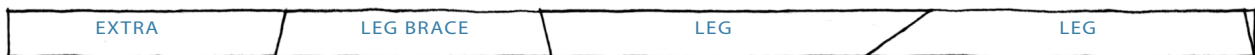
- Check the dimensions of the roofing. If it has not been cut to fit or has been cut unevenly, trim it to 48" long with a jig saw or tin snips.

Step 10. Cut the Foam Sheathing

- Measure the styrofoam sheathing. Mark it 46" x 20 3/8" with a black marker.
- Cut to size using the razor knife and the long framing square.

You are now ready to assemble your new Top Bar Hive!

2 X 4 LEG ASSEMBLY



Questions about Beekeeping?

Submit any questions for Jacob in the Q&A section on the course homepage or post it to our blog at www.sustainlife.org/blog/category/beekeeping/

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Beekeeping Suppliers

Beekeeping Tools and Supplies

Texas Hives

This company is owned and operated by Jacob and his family. You can buy a complete Top Bar Hive or an unassembled Top Bar Hive Kit as well as other tools and supplies you'll need for beekeeping from Texas Hives.

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beekeeping.glorybee.com

Bee Weaver Apiaries – Bee Seller

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www.beeweaver.com

Recommended Bee Books & Journals

ABC and XYZ of Bee Culture

by Amos Ives Root

First Lessons in Beekeeping

by C.P. Dadant

Starting Right with Bees

by Henry G. Rowe
A.I. Root Co.
623 W. Liberty Street, Medina, OH 44256

The Bee Keeper's Handbook

by Diana Sammataro & Alphonse Avitabile

The Hive and the Honey Bee

by Joe M. Graham

American Bee Journal

51 S. 2nd Street, Hamilton, IL 62341
1-800-637-7468

Bee Culture

The Magazine of American Bee Keeping

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