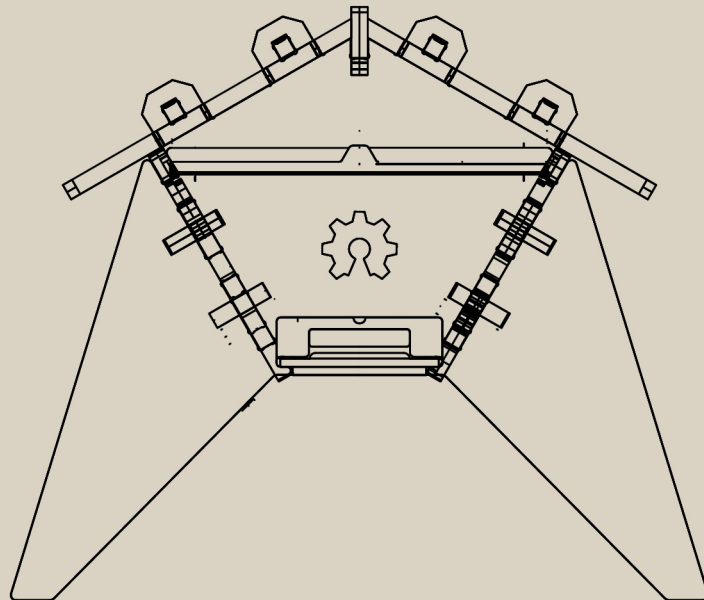




OPEN SOURCE BEEHIVES



**【 COLORADO TOP BAR HIVE
v5.4 】**



OPEN SOURCE BEEHIVES

www.opensourcebeehives.net

Project Overview



OPEN SOURCE BEEHIVES



OSBH - What is it?

The Open Source Beehives project is a collaboration between Fab Lab Barcelona and the Open Tech Collaborative. The project aims to build a global community of experienced and beginner beekeepers to share data and collectively study the disappearance of our bees. Around this data we hope to find evidence of the factors causing the problem, prove what they are, and adjust them.

This document contains the information you will need to purchase, fabricate, and assemble your new Colorado Top Bar hive.

Open Source + Citizen Science

We continue in a long tradition of open and shared Beehive designs. The **CC-BY-SA** license we have chosen gives anyone the rights to download, edit and remix their own versions of the OSBH designs. We think participation in design is something to be actively encouraged and by adapting, improving and creating new variations of these hives we hope to encourage innovation and a spirit of collaboration.

SHARE - copy and redistribute the material in any medium or format.

ADAPT - remix, transform and build upon the material for any purpose, even commercially.

COMMERCIALIZE - sell the beehives!

The licensor cannot revoke these freedoms as long as you follow the license terms.

Project Goals

1. Engage an active and diverse community to respond to the threats faced by bees everywhere.

- To encourage and facilitate responsible backyard beekeeping.
- To host regular community events to be held online and in distributed locations.
- Create a forum that democratically highlights best beekeeping practices
- Generate participatory actions and community awareness campaigns to promote bee health.

2. Bridge the information gap between beekeepers and maker communities.

- Encourage information sharing between people with differing backgrounds and expertise.
- Provide data tools to reference local contexts, traditional knowledge and regional environmental conditions
- Develop a range of communication tools to facilitate innovation in local beekeeping.

3. Develop open source hive meta designs that are suitable for local and digital manufacturing and that can be optimised for locality.

- Develop number of hive 'meta designs' that are used as a base for adaption.
- Provide an online parametric design systems for users to adapt their design online.

4. Employ embedded sensor technologies to monitor and study colony health.

- Design open source sensor board targeted for small scale Beekeepers and Citizen Science.
- Openly publish data on the Smart Citizen Platform.
- Develop alerts and remote monitoring systems to notify users of potential problems.

5. Enable radical and innovative forms of citizen science.

- Engage with and link to expert data analysis and modern scientific practises.
- Develop protocols and pathways for 'Cooperative Enquiry' and 'Citizen Science'.

Files Explained



Source Files: <https://github.com/opensourcebeehives>

CTB - v5.4 - 3DModel - 20mm.3dm

Rhinosauras software has been used to generate this 3D model. Here you can play and tinker with the original designs.



CTB - v5.4 - Nesting - 20mm.3dm

A nesting file is essentially a flat version of the design laid out to generate cutting strategies and tool paths. Adjust this file to calibrate it for different woods and machines.



CTB - v5.4 - 3DExport - 20mm.stl

The STL export file provides an easy way to load the model into web viewers. This is not a place to edit the design.



CTB - v5.4 - Cut Strategies - 20mm.dxf

This file contains the cutting strategies to load into your CAM software. Please look at the layers, they describe what tool paths to use.

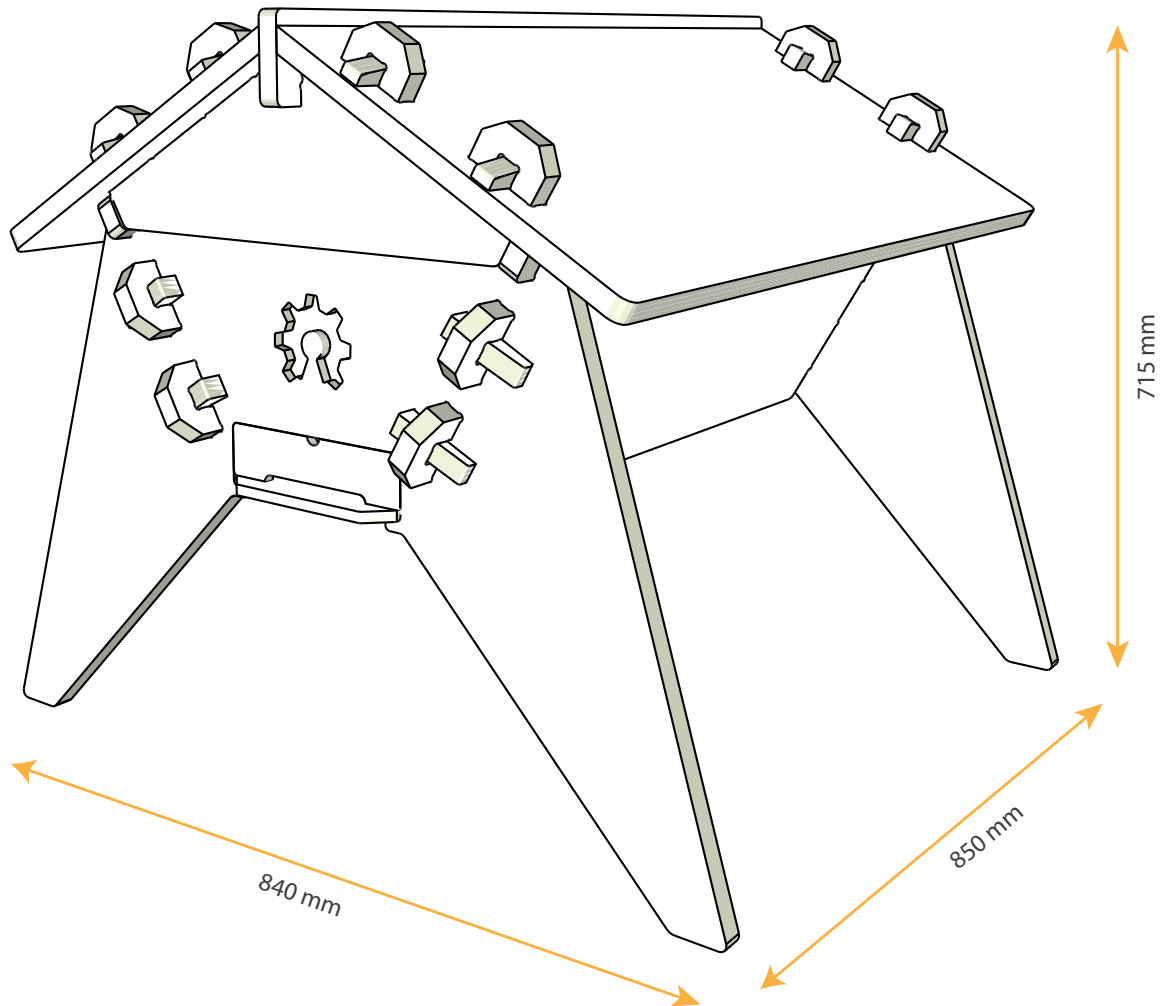


CTB - v5.4 - 3D Strategies - 20mm.stl

This STL file contains 3D information needed to cut an angle using your CAM software.

(Note: 20mm Metric / 19mm U.S.)

Projection



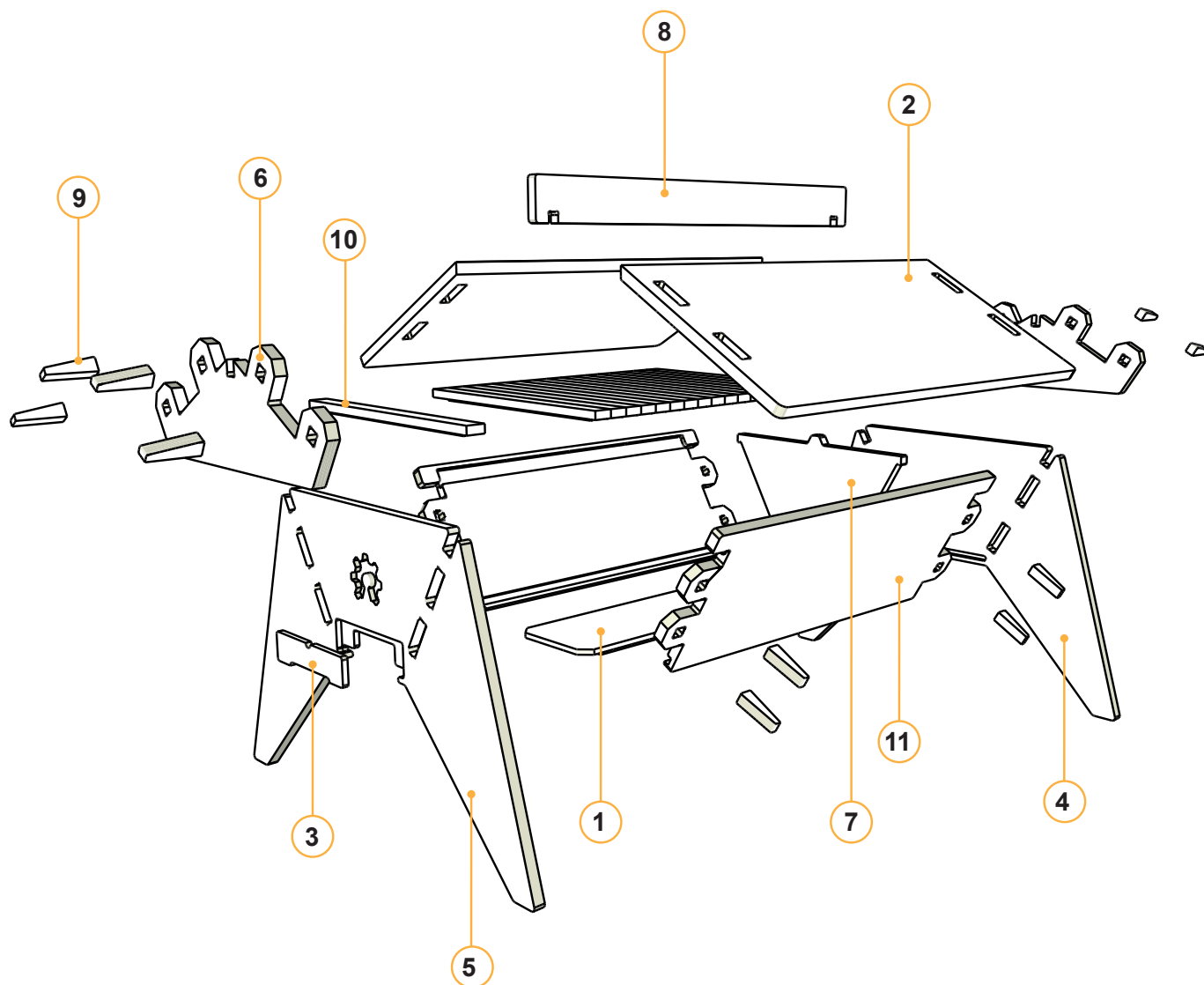
HIVE HISTORY

The Colorado Top bar hive was developed by the Open Tech Collaborative in Denver and has been adapted and tested at the Fab Lab Barcelona. It is a modern adaption of the Kenyan Top Bar Hive, this design increases the hive space by adding top bars in a horizontal direction and has been designed to follow in a tradition of natural bee keeping methods.

FEATURES

- Open Source Hardware = Open to adapt
- Locking system = no screws
- Fits one standard wood board
- Reversible Entrance for different seasons.
- Removable base tray.
- Removable lid

Exploded View



- | | | | |
|----|----------------|---|------|
| 1 | BASE PLATE | — | x 1 |
| 2 | ROOF PANEL | — | x 2 |
| 3 | ENTRANCE DOOR | — | x 1 |
| 4 | BACK LEGS | — | x 1 |
| 5 | FRONT LEGS | — | x 1 |
| 6 | GABEL | — | x 2 |
| 7 | FOLLOWER BOARD | — | x 1 |
| 8 | ROOF BEAM | — | x 1 |
| 9 | WEDGES | — | x 16 |
| 10 | TOP BARS | — | x 16 |
| 11 | SIDE PANEL | — | x 2 |

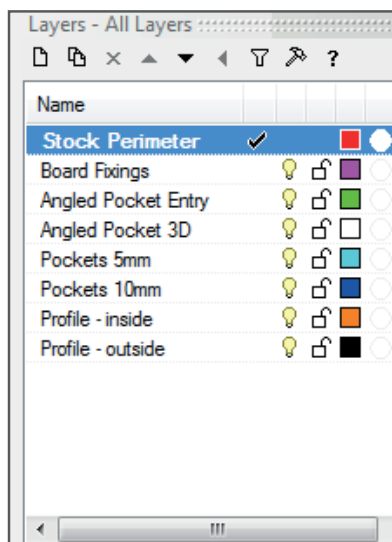
The 'CTB' design has gone through many iterations and prototypes to get to the current version 5.4. A key feature here is that it requires no screws to assemble. Here, wedges are used to create a tight fit between the pieces.

Milling

CNC MILLING*

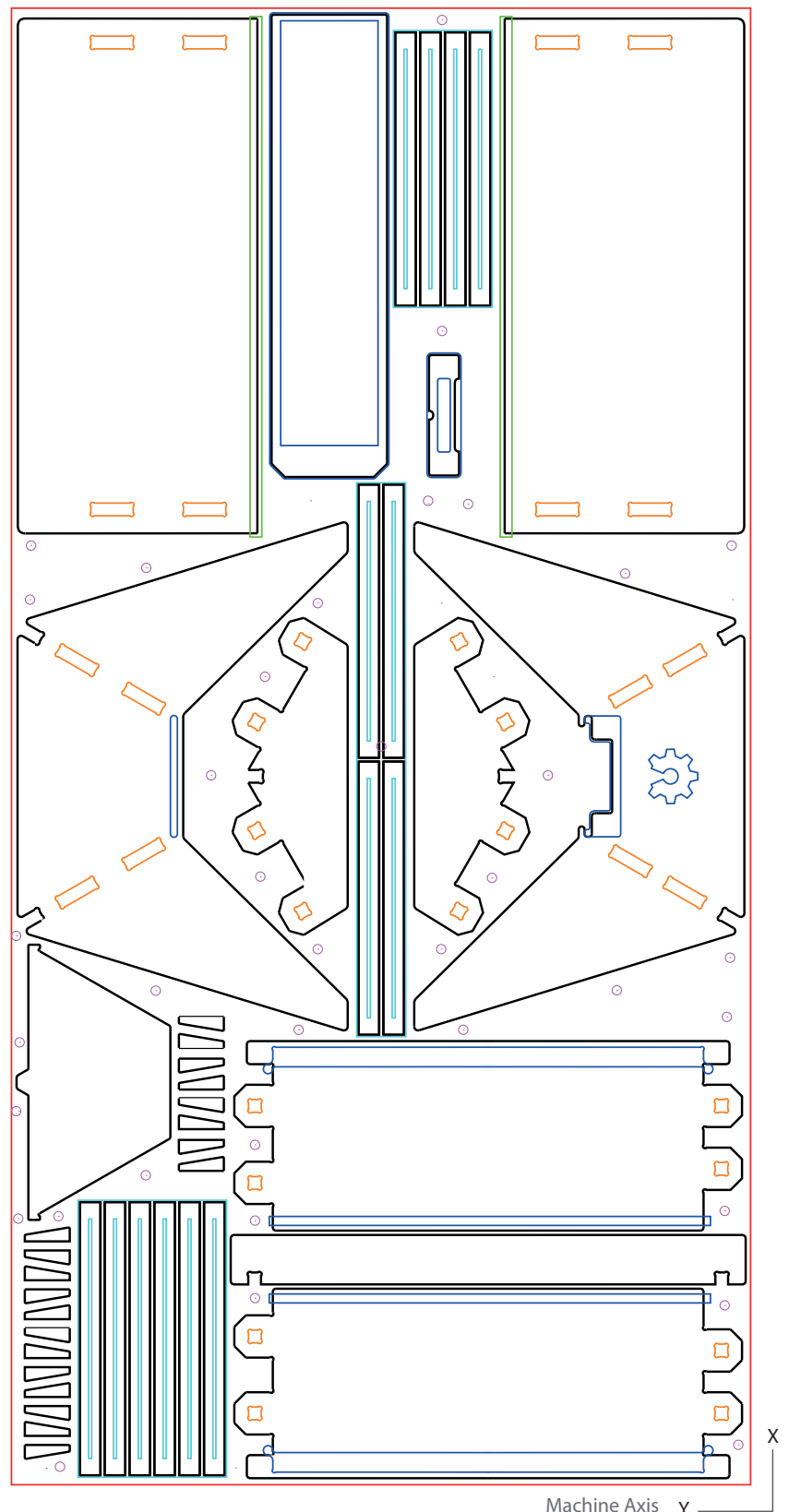
The hives have been designed to be cut using one standard size plywood board of 1220mm x 2440mm or 4 x 8 feet. This drawing shows the Cut Strategies that a machine operator will need to use with their own CAM software, (Computer Aided Manufacture). To help in the creation of the machine tool paths we have split the strategies into colour coded layers and named them according to the strategy required. See the 'Nesting' and 'Cut Strategy' files.

CUT STRATEGIES



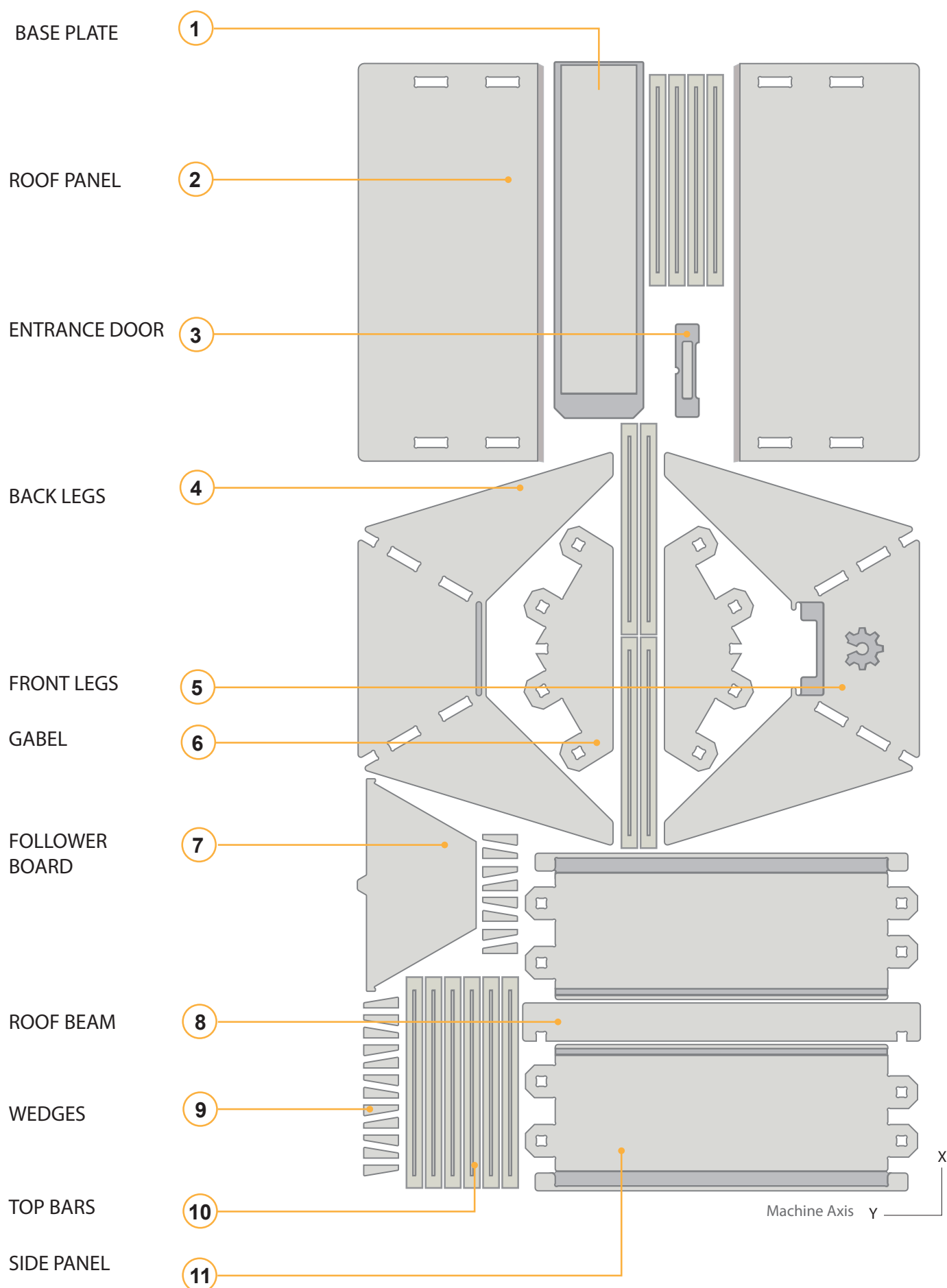
NOTE:

We have created two file types for 20mm and for 19mm (0.75 inch) thickness boards. It is common for wood boards to have slight variations, so be carefull to measure your wood before selecting the files. In these design every millimeter counts.



*A CNC router is a computer-controlled milling machine. They are often used to manufacture custom cabinetry and are available in most metropolitan areas. Check out the *Maker Map* to locate one in your city: <http://themakermap.com>

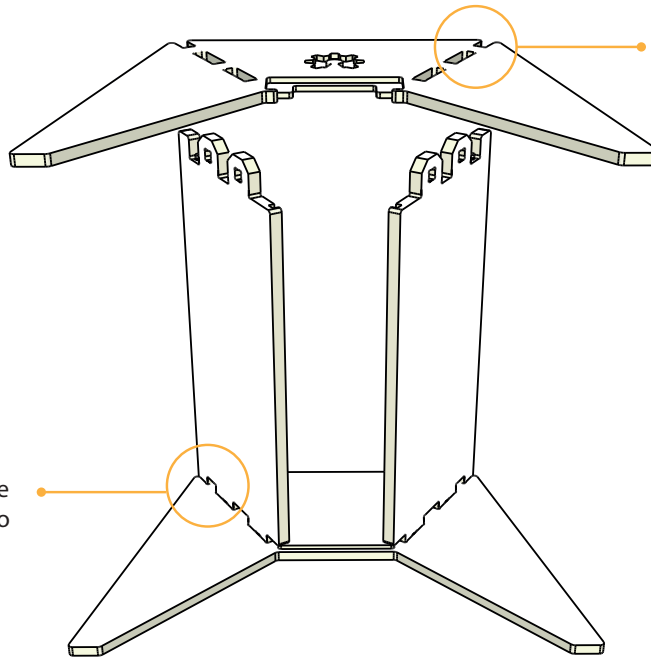
Components



Assembly 1

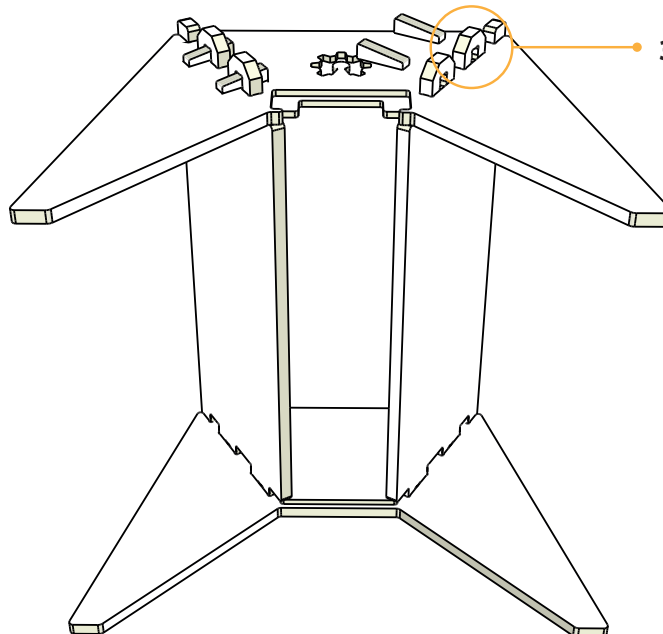
HIVE BODY

- 1** Lay the Back Legs flat on the floor and then place the two side panels into the corresponding slots.



- 2** Place the front legs into place

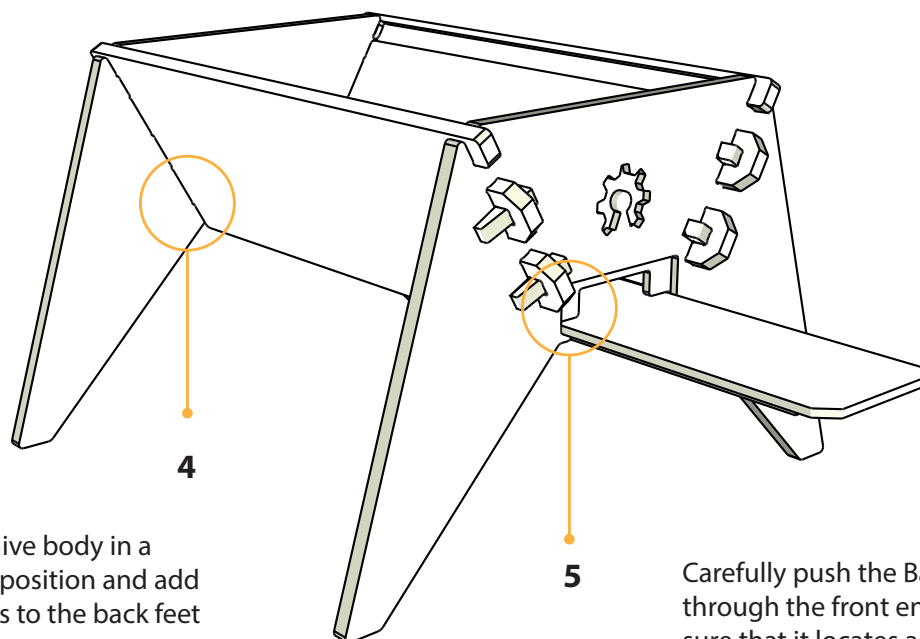
WEDGES



- 3** Whilst still resting on the floor add the wedges to the lock joints of side panels. Leave them loose for now.

Assembly 2

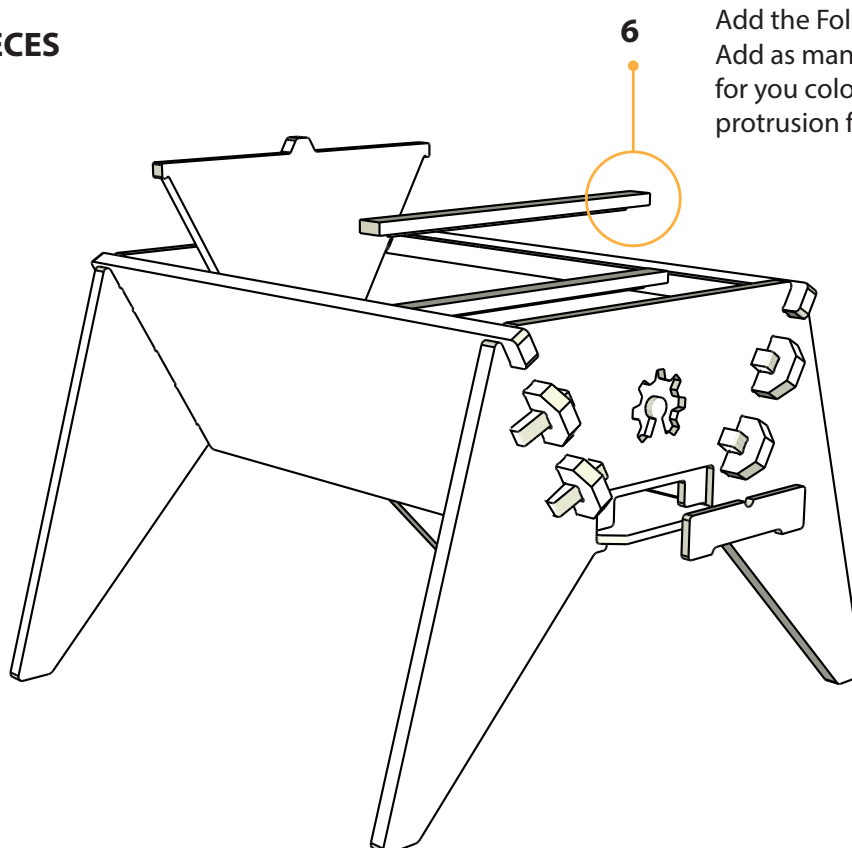
BASE PLATE



Place the hive body in a horizontal position and add the wedges to the back feet panel.

Carefully push the Base plate in through the front entrance and be sure that it locates along the groves and into the slot on the inside of the back feet panel.

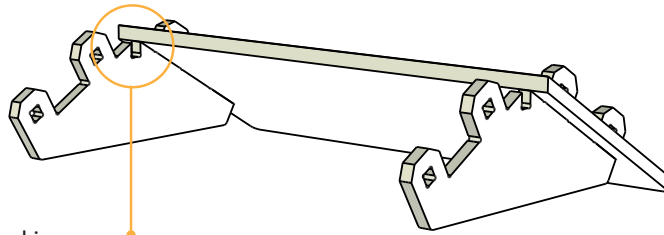
MOVEABLE PIECES



Add the Follower Board. Add as many top bars as needed for you colony size with the protrusion facing down.

Assembly 3

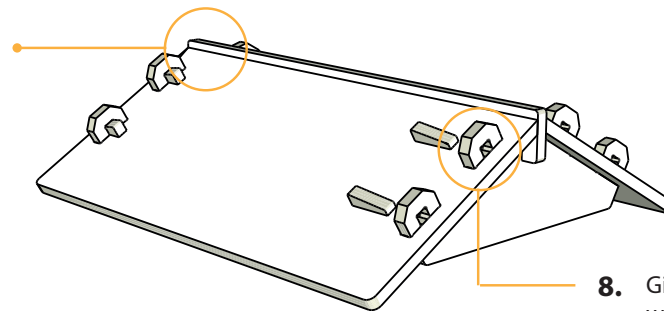
ROOF / GABLE ENDS



6. Add the roof Panels making sure the angled cuts are verticle.

ROOF BEAM

7. Add the Roof Beam.
Add the wedges.

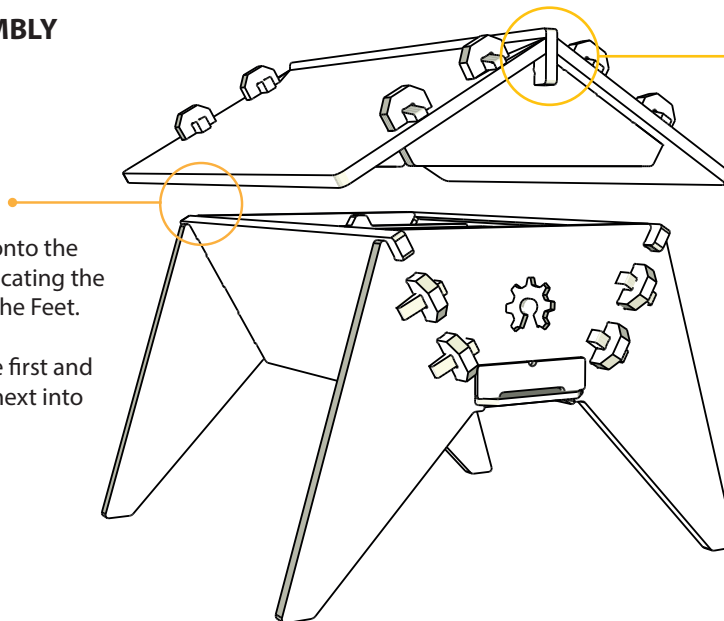


8. Give all the wedges a few taps with a hammer untill the Roof panels grip the Beam enough to create a compression fit.

ROOF ASSEMBLY

9. Place the roof onto the hive body by locating the Gable ends to the Feet.

Locate one side first and then drop the next into place.



10. Use a table saw to cut 30 degree angles in each roof panel where they intersect the roof beam (measure the angle to doublecheck before cutting).

Further Hive Preparation

Sustainable & Nontoxic Plywood

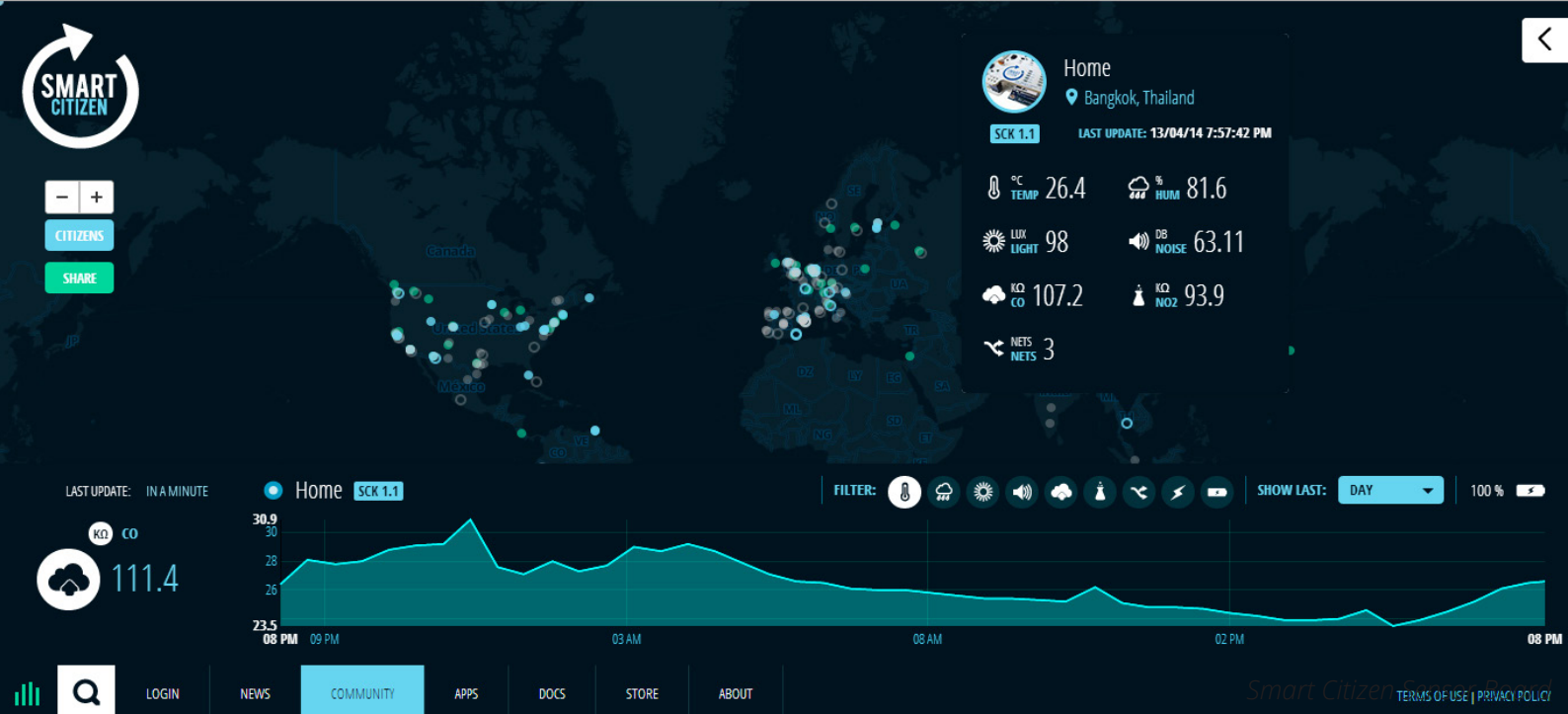
Source a plywood free from formaldehyde and harvested from responsibly managed forests. In the United States, look for wood that meets the CARB Phase 2 standard, which is the highest rating for nontoxic plywood in the nation.

Water leakage fix

Where the two roof panels meet the roof beam at the top of the hive, there is the potential for water leakage. This can be fixed by melting beeswax into the crack to seal it. This is strongly recommended, especially for any climates experiencing regular rain.

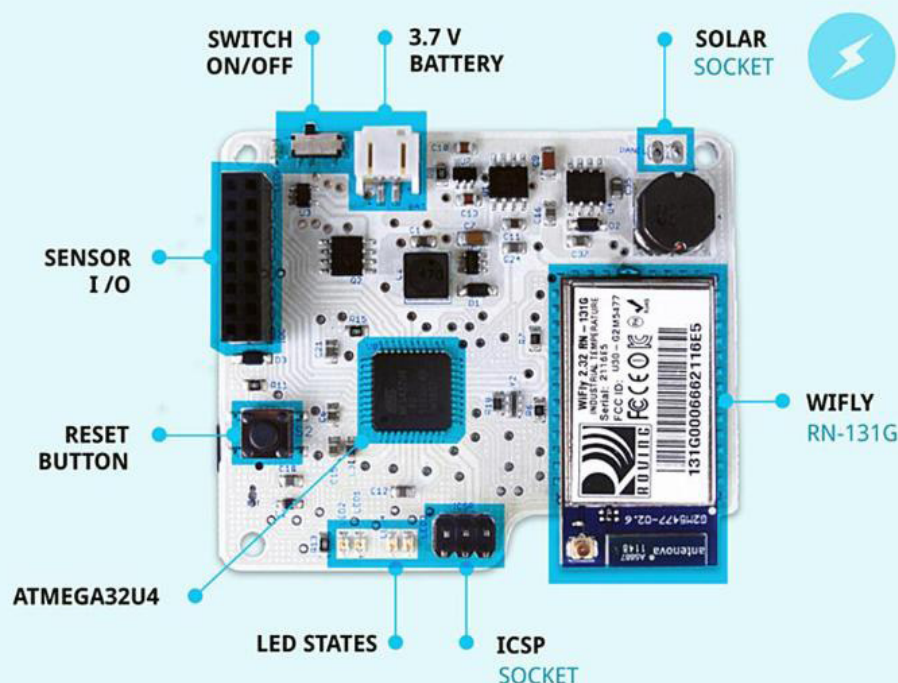
Varnishing

Plywood is not as weather resistant as hardwoods, so it is necessary to apply a non-toxic varnish that will protect the exterior of your hive without disrupting the bees. We have used Linseed oil with a good deal of success, but are open to any other suggestion.



The Smart Citizen Platform

Developed within Fab Lab Barcelona at the Institute for Advanced Architecture of Catalonia (laac), **Smart Citizen** is a hardware and software platform that empowers people to monitor the environmental conditions of their cities. The Smart Citizen project is based on geolocation, Internet and open hardware and software for data collection and sharing (Smart Citizen Kit - SCK , RESTful api, Mobile App and, the web community).



Beehive Sensor & Software Development

We are adapting the Smart Citizen platform for the Open Source Beehives project. Our vision is to develop a field-ready sensor package that can be integrated within hives without interfering with their natural habitat. Sensor data will be streamed to an online platform, where it will be openly available for public analysis.

Our data collection priorities include the following:

- hive population
- hive weight
- temperature
- humidity
- acoustics
- EMF fields

Functionality

The OSBH sensor kit will monitor hive conditions, stream data to an online software platform and mobile application, and will trigger SMS/email notifications to users based on patterns in the information.

We will develop a field-ready enclosure for the sensor package that also shields the bees from EMF fields by using a Faraday cage.

Get Involved

Email **sensors@opensourcebeehives.net** to help us develop open source hardware and software for the OSBH project.

PLANT THESE

HERBS



LAVENDER



CATMINT



SAGE



CILANTRO



THYME



FENNEL



BORAGE

PERENNIALS



CROCUS



BUTTERCUP



ASTER



HOLLYHOCKS



ANEMONE



SNOWDROPS



GERANIUM

ANNUALS



CALENDULA



SWEET ASYLUM



POPPY



SUNFLOWER



ZINNIA



CLEOME



HELIOTROPE

TO HELP SAVE BEES

Overview

This section will introduce you to the basics of Top Bar beekeeping. We will cover how to start a hive in your backyard, and some general introductory guidelines to keeping honeybees. There is so much to know, and we are only beginning to scratch the surface in this document. It is highly recommended that you investigate other resources in our Further Reading section below, find a mentor, or join a local beekeeping class to strengthen your beekeeping practice.

Your backyard or rooftop are great places to keep bees. Keeping bees connects us to a larger ecosystem even within urban areas. The experience is inspiring and humbling, as beekeepers often find themselves engulfed in the mysterious and magical world of bees.

Why Use a Top Bar hive?

Top Bar hives were designed in Kenya, where African honeybees tend to be more defensive than the gentle European breeds found in the United States and EU. The top bars (part of the hive that holds the comb) rest above the main colony chamber, touching on all sides to create a false lid. This allows gentle hive inspections, only disturbing a small portion of the hive at a time. Bees are known to be more calm and gentle in top bar hives.

Top bar hives also allow the bees to build “natural” or “free” comb. Other styles of hive such as the Langstroth hive typically use pre-made plastic foundations or commercially produced wax comb, whereas Top Bar hives allow the bees to build their own comb, limiting their exposure to foreign substances. It has also been argued that the bees build smaller cell sizes in free comb, allowing them to more easily manage Varroa Mites (common pathogen in honeybee colonies) reproducing inside the cells.

Last, top bar hives contain minimal parts and require little to no equipment to harvest honey and wax.

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Supplies

Below are a few pieces of equipment that will help you interact more confidently and effectively with your new colony. These are recommended, but not required:

Bee suit and gloves

This commonly used layer protects the wearer from bee stings, but lots of beekeepers do not use a full suit or gloves at all. The most important thing is to feel calm and confident. As a new beekeeper, it is wise to start with a suit and gloves until you are more comfortable.

Hive tool

The hive tool is a simple woodworking tool used to pull frames apart and remove them from the hive when the bees have stuck them together.

Smoker

Smokers are used to calm the bees by masking their alarm pheromones. Blowing smoke into the hive also makes the bees retreat into the hive to gorge themselves with honey.

Bee brush

The bee brush is used to gently remove bees from the comb when harvesting honey. The brush is also a helpful tool when catching swarms, or getting rid of bees left on top of the top bars before closing the lid.

Beeswax

Before installing bees into your hive it is smart to rub beeswax on bottom ridge of the top bars. This will encourage the bees build along the top bars, so they can be easily extracted.



Placing Your Hive

Beehives can be placed in a variety of different environments. It's important that you consider the needs of your bees when deciding the hive's location. Please read the considerations below carefully, as it is tricky to move the hive once the bees have been introduced.

Things to consider:

Heat management: In the cold the bees huddle together in a cluster shivering and metabolizing honey to stay warm. In the heat they fan the hive with their wings, but it is more difficult for them to manage intense heat than cold.

When placing a hive in your **backyard**, a good place is under a deciduous tree, where the hive gets cool shade in the hot summers, and warm sun during the cold winters. There are many variations if you do not have a shady tree in your backyard, depending on the light and heat within your own backyard. Sometimes a fence can offer shade for part of the day, .

When placing a hive on a **rooftop** a rug, carpet, or other insulative material should be placed under the hive to protect against hot tar paper or other roofing materials. Shade is a necessity when keeping bees on a rooftop. If no structural shade is available, it may be necessary to construct one yourself.

Accessibility: You will want to place your hive somewhere it will be easy to access and manipulate throughout the year. Keep in mind you will need to remove the roof to install bees, extract honey, and maintain the hive on a relatively regular basis.

Bee Traffic: Bee traffic will be limited to, but concentrated directly in front of the hive. The bees fly up and out quickly, so other than a few feet directly in front of the hive entrance, the bee traffic will hardly be noticed. It is not a good idea to place the hive facing any trafficked sidewalks, pathways or sitting areas. Some city ordinances require that hives are placed behind a 6 foot barrier so they fly over the barrier. This is a good way to keep bee traffic unnoticed.

Water Source: A bird bath or other water catchment area filled with rocks or a bucket with floating wood chips work best. It's important the bees have somewhere to perch near the waterline in order to drink. If a river or pond is nearby, these will also work nicely.

Top Bar Beekeeping Crash Course

Drainage: Because the Colorado Top Bar is made from plywood, it's important the legs do not soak in water for prolonged periods to avoid swelling. Choose a well drained space, and sit the four legs atop four bricks or similar. Remember to ensure the hive remains level and stable.

Moving the Hive: If you find the chosen hive location is inappropriate after installing your colony, unfortunately, moving your hive is a difficult process. You can move the hive 3 feet / 1 meter each day towards the new location, or move them 3 miles/ 5 kilometers or more at a time. Bees have a great internal GPS system. When moving the hive short distances the bees will try and return to the original entrance, and will get lost. Moving it slowly allows them to adjust. When you move them 3 miles/ 5 kilometers or more they are out of their orientent flight range. Upon noticing this the bees will reorient themselves. Move your bees only at early morning or dusk when all the bees are inside the hive. There is no need to tape up, or shut the bees in, just be gentle, and use smoke to chase them back inside if needed.

Populating Your Hive

There are three ways to populate your backyard or rooftop hive with bees. New colonies should be introduced in early Spring when temperatures are warmer and plants begin blooming.

Packaged Bees

The most common way for new beekeepers to start a hive is to purchase a package of bees. Packages are produced by commercial beekeepers who split their strong hives into boxes that contain a caged queen and usually 3 pounds of bees. This package can be collected or sent via the mail in early Spring. When purchasing a package you can most often count on ending up with a healthy, productive colony.

Installing bees from a Package

To install a package first remove the caged queen and hang her cage between two top bars. The screened part of the cage must be facing outwards so that the worker bees can feed and care for her. Make sure the cage is secure and will not fall into the hive. Next, contain the colony between the first 4-5 frames using the follower board as a false back. If you do not limit the bee's space it is likely they will abscond, or leave, finding their new home hard to heat and inhospitable.

The bees will also need to be fed with sugar syrup. Put 1 part hot water and 1 part sugar in a

Top Bar Beekeeping Crash Course

jar and shake until the sugar dissolves. You can use the jar as a feeder by poking small holes in the lid and turning it over on a stand (the bees must be able to access the drip) or you can use a store bought feeder. A general rule is to continue feeding your bees sugar syrup until they stop eating it. Refill your feeder as needed. You can also feed your bees with a pollen patty.

After the queen has been hanging in the hive for three days, you can return to release her. Remove the plug at the bottom of the cage using your hive tool while the opening is facing inside the hive. Watch your queen walk into the hive to insure she is inside and looks healthy.

Swarms

Catching a swarm is a great experience for all beekeepers, and is easy to do. Each spring, honeybee colonies that survive the winter with strong numbers swarm. This is how bee colonies reproduce. A third of the colony shoots out the front of the hive, and take to the sky in search of a new home. The swarm will land on a branch, park bench, fence etc. and wait while scout bees look for the perfect new home. Hanging in a large mass, these home hunting bees can be captured in a box and introduced to a beekeeper's backyard hive. Because they are already looking for a home, it is usually easy to convince them to stay.

Most of the time, swarms are a sample of the strongest colonies. For this reason, some beekeepers prefer to catch swarms, encouraging successful genetics, adapted to the local environment. The downside is swarms are a mixed bag, you don't know what you are going to get. Swarms can carry disease and mites with them, they might also have some undesirable behaviors - prone to swarming, aggressive etc. Many of these problems can be solved by re-queening the colony, others can be more serious.

Finding a swarm

The first step to acquiring a swarm is to get on a swarm list. The majority of people who end up with swarms in their backyards, on their fences etc. are unsure what to do with them. They usually call a beekeeping association, beekeeping supply store, or online swarm removal source to ask for help. These resources will connect citizens with swarms to beekeepers wanting to populate their hive/s. After being contacted through a swarm list, the beekeeper must act quickly, arriving at the swarm location before the home-hunting bees are gone. Sometimes it can take days for a swarm to find a home, other times it only takes a few hours. It is always a good idea to ask where the swarm is located, how high up it is, and how long it has been there to make sure you have the ability to catch it.

Capturing a swarm

You will need:

- 1 x bee suit
- 1 x bee brush
- 1 x ladder (if needed)
- 1 x large cardboard box.

To catch the swarm you must knock the swarm into your cardboard box. Place the box underneath the hanging bees and give the object they have landed on a good shake. If the bees have swarmed onto something like a wall or house, a gentle brush or sweep with your bee brush will do. In some cases if the object they have swarmed onto is small enough, like a tree branch, it is easiest to cut the branch into the box and take the whole thing with you. If you are successful in catching the majority of the swarm in the cardboard box, the bees will begin to send out pheromones, sticking their abdomens in the air and fanning their wings. This is a call to the rest of the colony. If you let the box sit on the ground, or near where the swarm originally hung, and wait 10-15 minutes, the majority of the swarm will join their colony in the box. If there is still a large mass of bees hanging, you may need to do an additional shake or brush into the box. It is impossible to get all of the bees in the box, and sadly some will be left behind, but the majority of bees will hopefully find your backyard hive the perfect place to live.

Installing a Swarm

To install a swarm into your hive make a small space in-between the top bars to dump the bees. In a top bar hive make sure to close down the space using your follower board to contain 4-5 frames. If you do not limit the bee's space it is likely they will abscond, or leave, finding their new home hard to heat and inhospitable.

The bees will also need to be fed with sugar syrup. Put 1 part hot water and 1 part sugar in a jar and shake until the sugar dissolves. You can use the jar as a feeder by poking small holes in the lid and turning it over on a stand (the bees must be able to access the drip) or you can use a store bought feeder. A general rule is to continue feeding your bees sugar syrup until they stop eating it. Refill your feeder as needed. You can also feed your bees with a pollen patty.

After a week or two, when the bees have built comb, return to the hive and look for eggs and

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larvae, insuring that the queen arrived safely with your swarm.

A Nuc

A Nuc is a small colony that comes with both bees and a few frames of brood (unborn bees) and food (honey). This is a major advantage, because these things take time for bees to create, and will give your new colony a large head start on the season. Using a nuc to populate your hive is expensive, but also the easiest way to introduce bees. However, it is difficult to find a nuc for Top Bar style hives. Most commonly they come on Langstroth frames that will not fit into a Top Bar hive.

Nuc's also have the greatest first year success rate, as the bees will not abandon the brood or leave the hive.. Like a package, Nuc's are produced by commercial beekeepers so you can trust that the bees will have a desirable genetic makeup, and arrive without disease.

Installing Bees From a Nuc

To install a Nuc, simply put the populated frames into your new hive. If there are bees left over they can be knocked into the hive, or left in front of the hive to follow their colony in on their own time. Reduce the space inside of the hive using the follower board to contain the new frames of bees and an a couple empty frames.

Interacting With Your Hive

Once your bees are installed, it's important to understand how to monitor their health and progress as a colony. Below is some advice on how to do this effectively.

Getting to Know Your Bees

As a new Beekeeper, the best thing you can do is spend time with your bees. This includes making routine hive inspections usually once a week in the spring and fall, and once a month in the summer. You can also spend time with your bees by watching them come in and out of the hive and observing them in your garden. The best skill a beekeeper can have is recognizing their bees: how they move, sound, smell, what they are bringing into the hive, what they are building, what they are storing. Once a beekeeper knows what their bees do, they have the ability to notice when something is different, allowing the beekeeper to seek instruction when something

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changes. In your first season, everything will be new, and it is helpful to find a mentor and some reliable resources on bees and beekeeping.

Who's In the Hive?



Worker Bee: Almost all of the bees in a colony are worker bees. These bees are all female, and they run the show. Throughout their lives, worker bees have a variety of jobs from feeding brood, cleaning house, building comb, caring for the queen, storing honey and pollen, guarding the front door, and finally foraging for pollen and nectar outside the hive. While it is easily mistaken that the queen is in charge, it is actually the worker bees who communally make all of decisions in the hive. They decide and prepare to swarm and raise new queens when necessary etc.



Queen Bee: There is only 1 queen in every colony. Her one and only job is to lay eggs. She can lay up to 2000 eggs a day at peak season! Unlike other bees, queen bees can live for up to 3 years. The worker bees take very good care of their queen, because without her the colony can struggle to survive. The mother of every member inside the colony, the queen also defines the genetic makeup of the colony. Their temperament, personalities, and behavioral qualities are all inherited from the queen.



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Drone Bee: Drone bees are the only males in the hive. Their only job is to mate. They wait around their whole lives to mate with a virgin queen. If they are lucky enough they will mate once after which they fall to their death because their sexual organs are barbed, similar to a worker bee's stinger, and pull out their insides upon copulation. A queen will mate with 5-15 drones once in her life, and spend the rest of her life inside the hive. Drones do no work inside the hive, they do not even have stingers to defend the hive with. The worker bees often care for them and feed them, but they are quick to kick the drones out in the fall once they are no longer necessary.

Brood: Brood is a term for baby bees in the hive. This includes eggs, larvae, and pupating bees inside the cells. Once they have emerged from their cell, they are adult bees.

Products from the Hive

Honey

The most popular product of honeybees, honey is produced using nectar collected from blooming plants. Traveling from plant to plant, the bees collect nectar and store it in their special honey stomachs where the nectar's sugar structure changes. It is then deposited into a wax cell where bees fan it to reduce the water content. Finally, the finished honey is capped in wax, like a lid on a jar. Honey is the bees carbohydrate and an important food inside the hive. When harvesting honey remember that bees need honey to survive.

Pollen

As honeybees move from flower to flower, they carry pollen on their back legs. Inside the hive pollen is the bees' main source of protein and other important nutrients, but outside the hive the unintentional transfer of pollen from flower to flower in the act of pollination makes blooming plants and bees perfect partners.

Wax

Bees build their homes out of wax. Inside the hive honeycomb is built to store honey and pollen. The comb is also where the queen lays eggs and brood is raised.

Propolis

Propolis is used by the bees to seal up any drafts and stick things together like glue. Bees make

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propolis by chewing up plant resins and tree saps.

Working in the Hive

The best time to inspect your colony is during the day when temperatures are above 60 degrees fahrenheit/15 degrees celsius, without wind or rain. Opening the hive at colder times (especially when misty) has been likened to ripping the bed covers off a sleeping person on a cold Winters morning. It will bother the bees and is not advised! The bees also maintain a temperature of up to 90 degrees within the brood cluster. If the brood gets too cold, it can die.

When working in your hive it is important to be calm and move intentionally. In a top bar hive the bees sometimes attach comb to the hive walls. Check before removing frames from the hive, and do so carefully.

What to Look For

When inspecting your colony, your main objective is to find evidence of a healthy queen. You can be sure your hive has a queen if you find her inside, or if there are eggs in the hive. After 24 hrs eggs hatch into larvae. Eggs are evidence that the queen was present within the last 24 hours, which is second best to finding the queen herself. Ideally you can find both to know the queen is present AND laying eggs. It takes practice to find the queen and recognize eggs. Eggs look like small grains of rice at the bottom of a cell, setting them apart from crescent moon-shaped larvae. If you wear glasses remember to bring them with you when inspecting the hive. Moving the frames into the sun sometimes makes it easier to see.

Other things to notice when inspecting your hive are pearly-white plump larvae in many stages of growth, convex cell cappings, calm worker bees, and plenty of food stores. If worker bees look deformed, larvae is brown and/or twisted, mites are observed on the backs of any bees, there is a lack of colony growth, brood is dead in the cells, or anything else unusual, consult additional resources to find out what is going on inside your hive. As mentioned before, the best way to monitor your bees health is to spend plenty of time with them so you will notice when something is different or wrong.

Watching for Swarming

In Spring months, if your colony is strong and healthy it is natural for them to swarm. If your bees swarm, your honey yields will suffer. You can manage your colony to prevent swarming by giving

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the bees more space, moving the follower board back in the hive as soon as cold days and nights are over. Be careful not to do this too soon or too fast, because the bees still need to heat the space, but giving them a few new top bars to fill up each week in the spring is a good idea.

If you find swarm cells - queen cells on the outer edges of the frames - this is a sign the bees are already getting ready to swarm. Once this happens it is hard to convince them otherwise.

Getting the Bees Ready for the Winter

When the last warm days of the season are coming near it is time to get your bees ready for Winter. Using the follower board or false wall, close down the hive to contain only the brood cluster and honey stores. It is best to feed your bees and insulate them with a breathable material. Burtap or tarpaper are sometimes used. Do not use plastic, this can cause molding. You can also use hay bales to block the hive from cold winds. Fall is also the time to administer any medications or mite treatments if you choose to do so. Be sure to wait until after honey harvest to treat your bees. Once you close the hive down for the Winter leave it shut until warm Spring days return. The bees will seal everything with propolis, and you do not want to break their seals during cold weather months.

Harvesting Honey

Harvesting honey from your top bar hive is easy to do. Simply use a bee brush to remove the bees from the comb that is full of honey, and cut the comb from the top bar. Smoke can also be used to chase bees from honeycomb. Hang a nylon paint strainer into a five gallon, food grade bucket. The cut comb can be placed or smashed inside the paint strainer. Honey is heavier than wax and will drain out of the strainer into the bottom of your bucket. This method works best if your honey bucket is kept in a warm place. Comb can also be cut and placed directly into jars. Cover the honey as soon as it is removed or it will be difficult to leave without lots of bees.

Honeybees make honey to sustain themselves through long cold Winters. Depending on how long and cold the Winter is, the bees will need a varying amount of honey to make it until Spring. Ideally, a beekeeper's job is to manipulate the colony into making excess stores so there is enough for us to take. Yet it is hard to guess how long and hard the Winter will be or how much honey the bees will need. Some beekeepers calculate how much honey to take by weight. Some hobbyist beekeepers wait until Spring and take whatever is left over.

You now know the basics of Top Bar beekeeping! Please check out the resource below to learn

more.

Further Reading

Native Pollinators

Attracting Native Pollinators: The Xerces Society Guide, Protecting North America's Bees and Butterflies

by The Xerces Society and Dr. Marla Spivak

Perhaps the best native bee reference available, this book offers information on native bee identification, habitat management, and community involvement. Because the book is written for the common backyard bee-enthusiast, its information is relevant to anyone who works with bees. Supporting bee minded people outside academia, this book aims to integrate native pollinators into human populated areas.

The Forgotten Pollinators

by Stephen L. Buchmann, Gary Paul Nabhan and Paul Mirocha

Authors Gary Paul Nabhan, a Ph.D. conservation scientist, and Stephen Buchmann, a research associate in ecology & evolutionary biology at Arizona State, are both pollinator enthusiasts. The majority of their research is done in the Sonoran Desert, a surprisingly robust ecosystem. The Forgotten Pollinators set the stage for pollinator conservation awareness within the United States. I highly recommend this book, as it navigates the social and environmental pressures on pollinators as essential ecological partners.

Keeping the Bees: Why All Bees Are at Risk and What We Can Do to Save Them

by Laurence Packer

Laurence Packer is a researcher and professor at York University. In his book he introduces his favorite bees and their roles in ecosystems and agriculture. The latter part of his book focuses on contemporary conservation concerns for the bees and the connected impact on human populations. Packer uses academic research of his own, but also that of many other contemporary melittologists (those whose academic study focuses on wild bees) throughout his book. It is one of the only full length contemporary publications on the topic of wild bees.

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Honeybees

The Beekeeper's Handbook, Third Edition

by Alphonse Avitabile, Diana Sammataro and Roger A. Morse

A good beekeeping book is hard to find. The Beekeeper's Handbook is a reliable text for beginning and advanced beekeepers. As your practice grows this book can stay with you, as there is always more detailed information to explore.

The Barefoot Beekeeper

by P. J. Chandler

Phil Chandler is an outspoken Top Bar beekeeper from the UK. His work challenges traditional beekeeping methods, seeking holistic approaches to keeping bees within today's economic and agricultural realities that tend to define apiculture. His book The Barefoot Beekeeper is written for beekeepers with a general knowledge about honeybees. It is one of the only beekeeping books that focuses on Top Bar beekeeping, teaching the beekeeper to draw upon a grounded knowledge of bees beyond a list of seasonal instructions.

Clan Apis

by Jay Hosler

This comic book depicts the evolution of bees and the daily life within a honeybee colony. This unique source offers an accessible account of the basics about honeybees. The visual characterization of honeybees explains often foreign and complex phenomenon within the hive, like swarming, in a joyful and accessible fashion.

Honeybee Democracy

by Thomas D. Seeley

Honeybee Democracy is an exciting report on Tom Seeley's in-depth research on swarming. His research details the process of swarming, how a swarm chooses and finds a new home, and how they get there. A window into the magic of honeybee colonies, this book will inspire and enlighten anyone who finds intrigue inside a honeybee hive.

Following the Bloom



Thank You!