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# The Hopper Spinning Wheel

*A User Guide by Amelia Garripoli*



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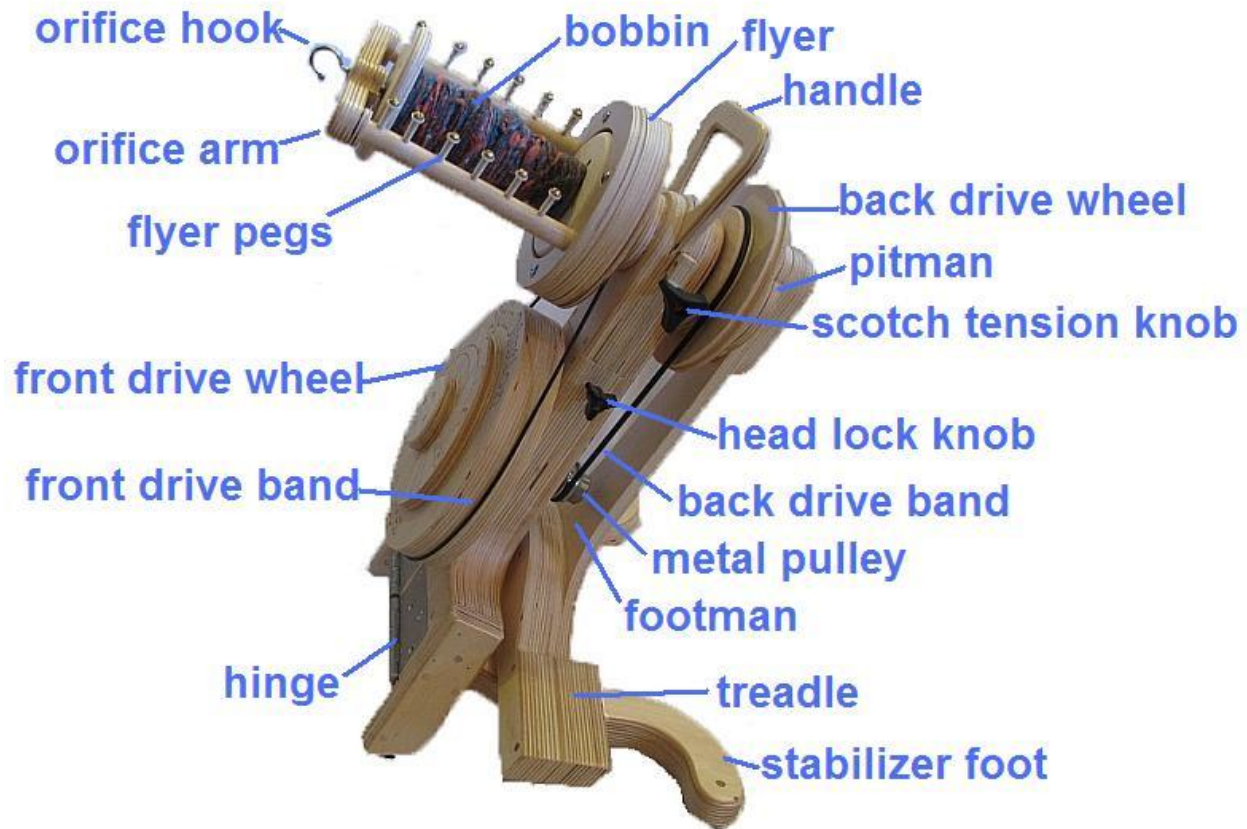
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Please use the information in this guide in a responsible manner. A spinning wheel is a complex machine, and needs to be treated with care and respect. Please contact your dealer or the makers if you have any questions or concerns about your SpinOlution Hopper Spinning Wheel.

## Your Hopper

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The Hopper Spinning Wheel by SpinOlution is a ready-to-go travelling Art Yarn wheel. Its unique raised double-treadle system uses the large muscle groups quads and glutes, instead of toes and calves.

I've used traditional names for traditional parts on this diagram. SpinOlution wheels use a pitman to drive the wheel. The Hopper's pitman bearing is located on the back wheel behind the flyer, with the pitman guide at the top of the footman.

Your Hopper has unique features in its orifice arm (usually part of the flyer assembly), orifice hook, flyer pegs (usually hooks), cordless scotch tension brake, and rocker-treadles. It also features a convenient built-in handle at the top of the wheel.

### Model Variations ...

- You can order your Hopper with an oversized art yarn flyer, as shown on the cover, which can hold up to 2 pounds of fiber. You can also order a new oversized flyer at a later date. If you plan to use both flyers regularly, an additional Hopper head is available so you can have a tool-less switch-out of flyers.
- The hinge is available in a variety of metals: nickel, brushed nickel, antique bronze, and bronze.
- The earliest Hopper wheels came with sharp-edged bobbins; now all Hopper bobbins have rounded edges on the bobbin ends. Most shown here are round-edged.
- The earliest Hopper wheels had two metal pulleys at the back rather than one; the update to a single pulley was done to make the treadling easier at the highest ratio.
- There are also orifice options, the art yarn hook shown here or a tubular orifice, which is useful for spinning autowrap yarns.

# The Hopper Spinning Wheel

## *A User Guide by Amelia Garripoli*

SpinOlution's goal is to provide the most advanced and easy to use spinning wheels that have ever been seen or used. The evolution of spinning wheels is finally here!

Your Hopper is a unique wheel – so even if you usually skip manuals, please take a look through this for an overview of its special features. Its scotch tension mechanism, orifice, bobbin, and treadling are unique to SpinOlution wheels.

If you are new to spinning on a wheel, I heartily recommend you hook up with a book, video, class, or local guild – check with the vendor you purchased your wheel from, they may teach, or be able to point you to a local teacher or guild. Maggie Casey's *Start Spinning* is an excellent book, and Patsy Zawistowski's video *Spinning Wool: Basics and Beyond* teaches spinning in a similar format to my own classes.

The Hopper invites you to spin art yarn with all its capabilities and large bobbin. For that, I recommend Lexi Boeger's book *Intertwined* or Jacey Bogg's DVD *Sit and Spin*.

I want to state clearly up front – this guide introduces the key features for success on your Hopper; however, it is not a complete book for learning to spin. Please see the recommended material above, for that.

Now, if you take a class, it's likely your teacher hasn't spun on a SpinOlution wheel before – unless she also owns one. So you might want to bring this guide along to help her understand the special features of your Hopper.

## Unpacking your Hopper

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If mailed, your Hopper arrives packed in a medium-large box. Lift out any covering pieces of packing material, then check carefully – the drive bands, scotch brake, bobbins, and any extra accessories may be tucked in amidst the packing material. Look through the packing material to be sure you have taken all of the items out of your box. Check for loose pieces that may have come off during shipping, to be safe.

The Hopper is shipped in its folded state, with a bobbin on the flyer.

If the scotch tension assembly is not shipped on your wheel, install it. On the side of the wheel is a square opening above the head lock knob. You should be able to see the flyer spindle through this opening. The wooden block is placed in it, with the leather-covered side toward the wheel and its lip pointing toward the bottom of the wheel. Next to this hole is a screw-shaft. Place the white nylon collar, flat side down, on this screw; part of the flat side will touch the block; if it does not, then rotate the block 180 degrees so that its lip will make contact with the nylon collar. Then place the spring on the screw – it should fit around the nylon collar, resting on the flat side, and extend above it, as shown in the picture above. The knob is then screwed onto the screw-shaft, just until it starts to push on the spring. You will want to adjust the Scotch tension once you are ready to spin, to suit the fiber and yarn you are spinning.



## Unfolding your Hopper

To prepare the Hopper, you need to rotate the flyer from the side to the front, fold the feet around from their stored position to hold the wheel up on the floor, and put the drive bands in position on the flyer and drive wheels.

To rotate the flyer, first loosen the head lock knob several turns so that the flyer head can be lifted easily. The head lock knob is the lower knob on the main body as shown in the diagram earlier. If the drive bands are on, check that they are not caught on the lower part of the Hopper anywhere. Then lift the flyer head up by the handle, and rotate it 90 degrees so that the orifice hook is on the same side of the wheel as the front drive wheel.

Now put the back drive band around the back drive wheel. This needs to be done before putting the head back on the Hopper. Then, align the pitman bearing on the back of the back drive wheel with the pitman guide at the top of the footman, and slide the flyer head back into the base. Tighten the head lock knob so that the flyer head cannot be removed from the wheel.

Put the back drive band around the back drive wheel and the metal pulley. Put the front drive band around a flyer whorl, located at the back of the flyer, and the front drive wheel. Before spinning, check that the drive bands are set up for the ratio you desire.

Your Hopper can stay in its ready-to-spin position when not in use if desired. I recommend removing your drive bands from the metal pulley and front drive wheel when not in use, so they do not become overstretched.

Should you lift your Hopper when it is prepared for spinning, the feet are not locked in place and will unfold. You can fold them to the front where the magnet will hold them, then unfold them back to sitting position when you put it down again.

## Folding your Hopper

If you are storing your Hopper and want to make it a bit more compact, you can fold the feet around to the front, and if desired, rotate the flyer and head 90 degrees as well.

To rotate the head, first remove the drive bands from the front drive wheel and the back metal pulley. They can be left on the top pulleys, or completely removed as you prefer. Loosen the head lock knob and then, with the wheel on the floor, lift the head out of the base.

Rotate the head 90 degrees so the flyer is on the left side of the wheel, put it back into the base, and tighten the head lock knob to hold the head tightly in that position. Check that the

The Hopper uses an accelerator wheel system –the treadles turn the back drive wheel, the back drive band drives the front drive wheel, and that wheel drives the flyer.





head is being held in place by the knob – if not, tighten the knob further until the head is locked in position.

There is an optional tote bag for the Hopper; your Hopper can be placed in this bag either completely folded, or with only the feet folded up. The front storage compartment for fiber and bobbins also has an opening that permits the non-rotated flyer to be there, as shown peeking through here, with the front compartment unzipped.



## Treadling

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The Hopper uses a unique large-muscle treadling system. It is a left-right treadling, with the heel or arch of each foot on each treadle. The treadles are raised, and the muscles of your thigh or backside (quadriceps and gluteus) are used to treadle. You will want to sit in a chair so that you move the treadles by lowering your leg, rather than raising it. I'm 5' 9" tall, and a standard 18" high spinning chair works for me.

Place the heel of each foot on each treadle. Depress one treadle fully, and then the other. If you try to push down a treadle with one foot before the other treadle has gone completely down, you will find the treadle difficult to push. With a little practice, you will soon find where each side is completely depressed and adapt your rhythm to the upswing of the other treadle.

Treadling moves both the back and front drive wheels, which turns the flyer when the drive bands are properly placed. If either of the wheels or the flyer are not moving, or it feels like you are pushing a refrigerator, check that the back drive band is in place, in one of the grooves on the back drive wheel and in the groove on the metal pulley; and check that the front drive band is in one of the grooves at the back of the flyer. In the front-most groove, the drive band rides on the small front part of the front drive wheel; in all of the other flyer grooves, the front drive band is on the outside rim of the front drive wheel.

The treadling is light on the lowest ratios; it will take only a light push to keep the wheel going. You may be able to keep the wheel spinning with only one foot treadling on one treadle. The amount of effort needed increases on the higher ratios, though still less than that used on traditional treadled wheels. If treadling feels heavy, adjust your position relative to the wheel – though you should feel the motion with your glutes and quads, it should not be a strain. You want to be pushing your leg down rather than lifting your knee above your hip, so if you are raising your knee to treadle, try a taller seat.

The Hopper drive wheel is stopped by holding your feet still on the treadles. If both feet exert slight downward pressure at the same time, then the drive wheel cannot rotate, so it halts, halting the flyer. The bobbin may continue to spin just briefly, as its braking system is separate from the treadling system.

*Please note* that as with all spinning wheels with drive bands, it is possible to trap things between drive band and wheel when the wheel is spinning – keep stray pets, audience members, and paper airplanes away from the wheel when it is in motion, to prevent accidents. Be sure to stop the wheel before walking away from it.

As you may have noticed from these pictures, I prefer to treadle in my socks (handspun for special occasions), as this keeps my treadles clean of anything my shoes may have picked up.

As with all wheels, practice treadling your wheel until you can start it going the direction you desire. Traditionally, spinners learn to spin singles clockwise and to ply counterclockwise, so start there. Or buck tradition, just make sure to ply in the opposite direction to that used to spin your singles.

The key to being able to start your wheel in the direction you desire is stopping the wheel at the right part of the treadle swing. Don't stop with either treadle completely depressed. If your first (slow) push down starts the wheel going the wrong direction, give a little push the other way to get the wheel started in the desired direction. Practice treadling until you can get the wheel turning slowly in the desired direction automatically.

Don't combine this direction-change trick with a fast start – the yarn is likely to jump off the flyer pegs and twist around the flyer spindle, requiring you to stop and fix things before you can continue.

It should not be necessary to start the wheel in the desired direction by touching the drive wheel with your hands. That said, beginners can struggle with learning this magic trick on any wheel – you may find a short push on the top of the front drive wheel in the desired direction gets you up and treadling in the direction you desire while you are still new to spinning. Practice until you no longer need this push to start.

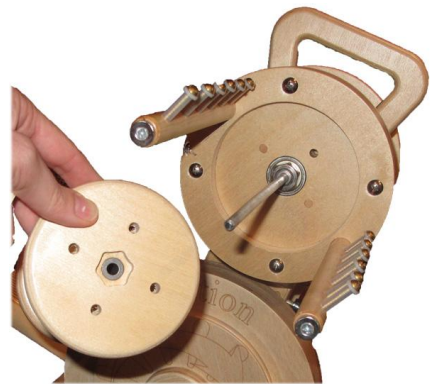
## Bobbins

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Remove the bobbin from the flyer spindle by pulling off the orifice arm. It is held in place by magnets. I usually push against the bobbin on the wheel with my fingers under the orifice arm and thumbs above, as shown here, to break the magnetic bond, pulling squarely at the middle of the orifice arm. The orifice arm comes off, and then you can take the bobbin off the flyer's spindle (rod).

To put a bobbin on the flyer spindle, make sure to match the hexagon cut-out at the back of the bobbin with the hexnut at the back of the flyer spindle. The bobbin is keyed onto the flyer spindle, as its rotation is braked by the tension knob on the top left of the folding arm. The inner face of the back whorl on the bobbin should sit almost flush to the back of the flyer. If the bobbin is not far enough back, the orifice arm will not fit back onto the flyer in the grooves that hold it in place.



Replace the orifice arm on the flyer arms by seating it squarely, matching both ends of the flyer arms at the same time. If one side seats but not the other, remove the orifice arm and place it more squarely so both sides seat at the same time. The flyer spindle also keys into a bearing in the orifice arm.



The Hopper's bobbins have four holes in the end pieces. These can be used to hold the leader. For a leader, make a large loop from about two yards of strong yarn – I use perle cotton, acrylic yarn, or a cabled wool yarn. Tie the loop with a simple overhand knot, and position the knot so it's not at either end of the loop. Push the string through one of the holes and back through another, so the ends of the loop are on the inside of the bobbin. Put one end of the loop through the other, and tighten this up as shown in the picture. This leader will stay secure and works for both clockwise and counter-clockwise spinning. Attach the leader to the front holes of the bobbin for smoothest spinning; if you put it on the back of the bobbin, it can rub against the back of the flyer.

Hopper and Mach II bobbins are interchangeable. Each bobbin can hold about 8 ounces of yarn, depending on the thickness and content of the yarn.

The oversized bobbins are changed on the oversized flyer in the same manner. The oversized bobbins can hold up to 2 pounds of yarn.

## Setting the Ratio

Your Hopper has eight ratios to choose from, from 2.75:1 to 19.25:1. But you are wondering – what's a ratio? The ratio is the number of times the orifice hook will rotate – the number of twists it will put into the fiber you are spinning – for each complete rotation of the drive wheel. The drive wheel makes a complete rotation with each complete trip of the treadles (both as a combination) up and down.

Ratios are set by choosing which grooves (pulleys) you place the drive bands in. The Hopper has two drive bands, the back drive band and the front drive band.

The back drive band controls which set of ratios you are using: the low set, or the high set. The wheel shown here shows the back drive band in position for the low set (left) and for the high set (right) – the front drive band has been completely removed from the wheel in these pictures.



For the low set of ratios, put the back drive band on the smaller groove of the back drive wheel, as shown to the left.



For the high set of ratios, put the back drive band on the larger groove of the back drive wheel, as shown to the right.

The Hopper **regular** ratios are 1:

Low set: 2.75, 4.25, 6.25, 7.5, 9.5

High set: 4.25, 6.5, 9.5, 12.25, 19.25

The Hopper **oversized** flyer's are 1:

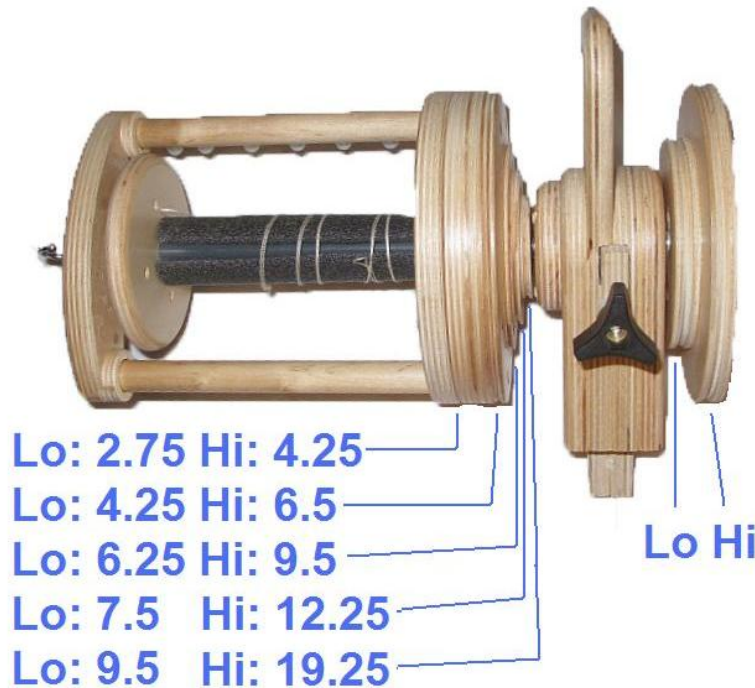
Low set: 2, 3.5, 5, 6, 8

High set: 3.5, 5, 7.5, 9, 13.5



Once you've chosen the low set or high set, you place the front drive band in a groove behind the flyer. For all but the lowest ratio, it rides on the outside rim of the front drive wheel, as shown on the cover. When the drive band is in the front-most large groove on the flyer, it rides on the small wheel at the front of the large drive wheel, to give the lowest ratio. The largest groove, closest to the bobbin, provides the lowest ratio; the smallest groove, furthest from the bobbin, provides the highest ratio.

The effort to treadle increases slightly with each ratio; but even at the highest ratio, it is lighter than traditional treadle wheels. Similarly, treadling for the "high set" is more effort than treadling for the "low set". For easiest treadling at the higher ratios, start treadling slowly, then gain speed. Once you get it started, it keeps going easily with regular treadling.



In the picture to the left, I've marked the front drive band location – note it has two positions on the outermost rim of the flyer, providing the two lowest ratios. After that, there are three grooves behind the flyer for three additional ratio options.

As you can see, the ratios 4.25 and 9.5 are found in both the low set and high set, and 6.25/6.5 are very close.

Most art yarns are spun at a fairly low ratio – the low set covers the spectrum most commonly used there. The high set contains ratios many traditional spinners will find useful, from thick yarns to fine yarns.



In these pictures you see the drive band position on the drive wheel for the lowest ratio positions (left) and for the second (and higher) pulleys (right).

When the front drive band is on the outside rim of the front drive wheel, it will position itself automatically as you treadle to line up with the selected pulley groove on the flyer.

How do you pick a ratio? Some spinners go by feel – they fiddle around until they find a ratio they like, and then they stick with it. Then, they take a technical spinning class and find out how their teacher recommends they adjust ratios, up or down,

for plying, spinning sock yarns, or whichever technical skill the teacher is presenting. I heartily recommend the book *The Intentional Spinner* by Judith MacKenzie McCuin, which provides several charts and diagrams showing when and why to apply ratio changes when spinning. A lower ratio is typically used to spin a thicker, lower twist yarn, while a higher ratio is used to spin a finer, higher twist yarn.

Generally, the higher the ratio, the more twists you put in your yarn for a complete treadle revolution, and the less drag there is on the flyer (draw-in tension is lower). The lower the ratio, the fewer twists you put in your yarn per treadle, and the more drag there is on the flyer. So, when you adjust the ratio, you may also then need to follow up by adjusting the tension – but honestly, this change is pretty subtle, so if you don't notice, you aren't alone. ☺

If you are just learning to spin, start at the lowest ratio and increase as your drafting speed increases. Your goal is to match a comfortable treading rate to your drafting rate, to produce the yarn you desire. Which ratio to use depends very much on the individual spinner.

I recommend moving the front drive band to the highest ratio and the back drive band to the low set at the end of each spinning session, so that the bands can “recover” from being stretched. Alternatively, you can remove them from the front drive wheel and the metal pulley at the back as recommended when folding the wheel. This maintains their stretchiness so it will be ready for you, when you are ready for spinning at the higher ratios.

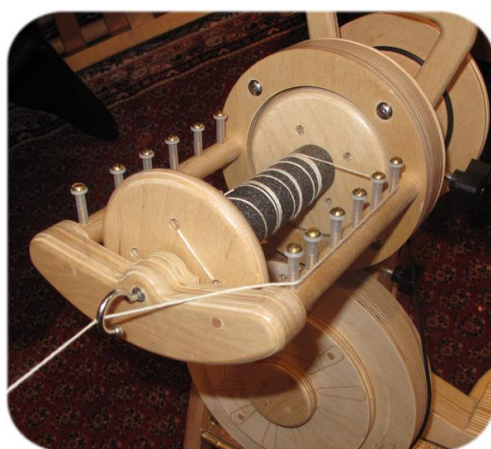
## Working with Open Threading

No doubt you noticed that your Hopper wheel has a unique open threading system. It uses pegs rather than traditional hooks – no more getting fibers or boucle loops caught on the tip of a hook as you spin! And it has an orifice hook rather than the traditional orifice tube – no need for an orifice threader!

For me, this is priceless – I can interrupt a plying job in mid-stride without breaking off the singles. I don't have an extra tool to keep track of (that orifice threader). And I can spin all the crazy yarns I want without getting hung up on the hooks.

The orifice peg has a smooth ball tip too, so it's not going to catch stray fibers either.

If you've used a delta orifice before, the theory is very similar. You bring the yarn or leader from the outermost point of the orifice hook horizontally toward you. At first, the yarn may slip out of the leader as you are learning to spin – work on keeping the angle of yarn from orifice to you horizontal, and work on keeping the wheel going in the same direction as you treadle. If you're just starting out, changing direction in treadling will cause the yarn on the bobbin to loosen and wind off the bobbin, leaping off the pegs and out of the hooks – stop, breathe in, breathe out, thread it back up, and start again. You're learning, give yourself a break. ☺



## Adjusting the Tension

Once you have assembled your Hopper and put a bobbin with a leader on your wheel, you will need to check the tension on the bobbin to ensure your yarn will take up onto the bobbin as you spin. Tension on the bobbin is controlled by adjusting the brake knob at the right side of the wheel – the top knob of the two shown here. Clockwise rotation of the knob (looking at the top of the knob) increases the brake pressure, and counterclockwise rotation decreases it. Very minor adjustments are needed to fine-tune the tension – less than 1/8 of a turn – so only use full rotations for the initial adjustment.



Let's explore the braking system briefly. The brake knob screws onto a threaded rod; it pushes on a spring, which pushes on a nylon flange, which in turn pushes on a wooden block. The wooden block goes into the flyer mounting; on its inside edge, it is curved, and has a piece of suede attached. The suede pushes on the rod (technically, the flyer spindle) that the bobbin rides on.

About once a year, or when you notice the brake not being as effective, undo the brake knob completely, and take the spring, flange, and wooden block off. Check the suede – over time its rough surface is smoothed; if needed, rough it up with a stiff-toothed comb, an emery board, your fingernail, or coarse sandpaper. There should be no oil or grease on this suede – if there is, clean it off thoroughly with paper towel, and check for residue on the flyer spindle accessible through the hole the brake block sits in.

The Hopper is a Scotch tension wheel. Adjusting the brake knob changes the brake pressure on the bobbin via the flyer spindle. The flyer spindle turns independently from the flyer arms, making this a true Scotch Tension, slowing the bobbin, not the flyer arms (Irish tension brakes the flyer arms).

To set the initial bobbin tension, start by twisting the knob until there is no pressure on the spring resting on it, so that any more clockwise twisting of the knob would cause the spring to start to compress.

Bring the leader to the orifice by taking it from the bobbin out to a peg directly to the side from it, then forward outside the remaining pegs to the front of the flyer arms, and from there under the orifice hook and toward you. Hold the leader straight from the orifice hook toward you, not at an angle. See the picture at the start of 'Working with Open Threading' on the previous page.

Always go along all the pegs from the first one you come to, to the front of the flyer arm. If you skip some pegs, your yarn will rub against the end of the bobbin. (Okay, except when lacing... what's that? See 'Twists and Turns - Tips to Make Spinning Easier' at the end of this guide.)

If your leader is short, you might add a yard or two of string to the end for this step... now treadle, and see if the bobbin will take up the leader or not. If not, twist the brake knob clockwise half a turn and try again. Once the leader does take up, you will want to fine-tune the tension with turns less than 1/8 of a rotation of the knob, clockwise to increase take-up or counter-clockwise to decrease take-up, until you can easily pull the leader off *while you are treadling* but still have the leader be taken up onto the bobbin if you are not resisting the take-up. If this testing takes a while, be sure to let the twist out of your leader from time to time – treadling with a corkscrewed leader is an exercise in not-fun.

*Note:* new wheels may have a strong initial pull until the first few bobbins of yarn have been spun on them. Try lacing the leader to perform the above exercise if you cannot overcome the pull even when the knob is not putting any pressure on the flyer spindle.

You might want to have a tighter tension than I've described setting above when you want to make a low twist yarn; when you're drafting quickly enough that you want faster take-up onto the bobbin; or for the stronger take-up needed for a thicker yarn, plying, or a fuller bobbin.

A great SpinOlution feature is that you will not have to adjust the tension when you change bobbins – most Scotch tension wheels put the brake band on a groove in the bobbin, so you have to remove the brake band, and then replace it, when you change bobbins. Not so with the Hopper. ☺

## While you are Spinning

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When spinning clockwise, it's usually best to start on the right-side pegs; counter-clockwise, start on the left-side pegs. That way, the yarn will want to stay against the pegs as you spin. You will need to stop and

change pegs from time to time so that the little hills of yarn that build up don't collapse into messes on the bobbin. Move regularly toward the back and then back toward the front, up and down. You can simply take the yarn off one peg, leaving it on the rest in the row, or add it around another peg in the row. Don't slalom the yarn around the pegs – it always goes to the outside, and then stays outside along the row of pegs until the last one, when you bring it to the orifice. The last peg before the orifice hook is important – it prevents the yarn from rubbing against the edge of the bobbin: be sure to be outside the final peg.

With experience, you'll find it won't matter too much which side of the flyer arm you are on – you can use the pegs on both arms to more completely and evenly fill the bobbins. Note that when you change which flyer arm you come along, you will need to unhook from the orifice hook to come from that side of the flyer arm to the orifice hook. Otherwise your yarn will wrap around the orifice hook and won't take up onto the bobbin (at all, or as easily... your experience may be either).

Hold the yarn you are making in a line from the center of the orifice hook to you. I keep my forward hand in a fairly neutral position in front of my body, so the yarn is coming in a horizontal line, from the hook to my hand. If you hold it at too extreme of an angle up, down or to the side, the yarn will thump as you spin it. Most spinners don't like that...

You may find you need to increase tension slightly – only a millimeter-sized nudge on the brake knob at a time – as the bobbin approaches full. The fuller the bobbin is, the more it can overcome the braking pressure. This is true of any Scotch tension based flyer system.

## Learning to Spin

If the Hopper is your first wheel, start with the lowest ratio – put the front drive band on the largest flyer whorl and the smaller part of the front drive wheel, and put the back drive band on the smaller groove of the back drive wheel.

For learning to spin, I highly recommend:

*Start Spinning* by Maggie Casey

*The Intentional Spinner* by  
Judith MacKenzie McCuin

## The First Steps...

With nothing on the bobbin, practice treadling as described earlier until you can start and stop the wheel going the direction you want.

Then put a leader on the bobbin and attach some yarn leftovers to your leader (acrylic's great for this!) – wrap the end of the practice yarn through and around the leader's loop a few times to catch it in place, or use a half-hitch so it stays attached. Treadle so the wheel spins clockwise, letting the acrylic be drawn onto the wheel. Be sure to adjust the tension as described before. Doesn't the feel of treadling change a lot when you add yarn to the mix? Hold this practice yarn so that it feeds onto the wheel easily, and then hang onto it, so that it gets a little clockwise twist before it draws onto the wheel. You'll be hanging onto your fiber like this while you are drafting it, so get used to that "holding back" feeling.

Once you've had enough of that, put the bobbin on a lazy kate and put an empty bobbin on the wheel. What's a lazy kate? It's a spinner's plying tool, usually a wooden base with metal rods to hold bobbins. SpinOlution makes a kate for the Mach II and Hopper bobbins. Stay tuned for product developments as they look into oversized-bobbin kates. I crafted a temporary kate for my oversized bobbin out of a plastic milk crate and a knitting needle.

Then do the exercise again with the yarn from the bobbin on the kate, but this time spin the wheel counterclockwise. Not only is this good practice, but you can put back in the twist you took out spinning clockwise.



## Adding Fiber

Whew! You're really going to learn to spin from these small notes? Remember what I said at the opening... this is really abbreviated! I recommend taking breaks – try these things in 15 minute increments, not more than 4 a day, so your brain has time to learn the muscle skills involved. It easily takes at least a month to develop basic spinning skills – and it takes practice, not just one concentrated session.

I recommend starting to spin with a Romney or Corriedale roving. Ask – roving is better than commercial top for this first lesson, as top is very compressed and harder to draft. Drafting is pulling the fiber along its length to make it thinner. Tear off a piece of fiber a foot long, and if needed, break it lengthwise into pieces about as wide as your thumb. Now hold one of these pieces with your hands 8 inches apart and tug gently. See how it gets longer, but doesn't separate? Do this along the length until your piece is twice its original length. You are pre-drafting the fiber. Eventually, you can skip this step and do all the drafting while you spin.

Now pull out just a bit of fibers at the tip, so you have a skinny piece at the tip of your length of pre-drafted roving that is about 6 inches long. Sit at your wheel with an empty bobbin and a leader on the bobbin. Put the leader on the pegs and orifice hook as described earlier in this guide, and then put 3 inches of the pre-drafted fiber through the loop at the end of your leader, pinching both ends about an inch from the leader with your primary hand (primary = right for right handers, left for left handers). With your other hand, hold the fiber about 8 inches back from your primary hand.

Treadle slowly, clockwise. Keep pinching that fiber! You'll very soon feel twist at your thumb. Slide your pinching, primary hand back about an inch (while treadling s.l.o.w.l.y). See how the twist follows it?

Now things get exciting... your other hand holds the fiber, while your primary hand pulls forward to both pull fiber out of the fiber mass, drafting it, and to feed the yarn you've made onto the bobbin. Every so often, your other hand will need to slide back to provide more fiber for drafting to your primary hand. That back hand should only be holding the fiber gently, as if it were a baby bird, not gripping it. A tight grip will matt the fiber and keep your primary hand from being able to draft from the whole mass.

Your drafted out, twisted fiber is yarn when it doesn't pull apart any longer. Stop, test a length by tugging on it, and adjust. Usually beginners have the opposite problem – their yarn is kinky-crazy with corkscrews. Treadle slower if that happens to you... your hands are learning a skill much more difficult than what your feet are learning!

How much twist, then? If you plan to ply, fold a length of singles back on itself to see what the 2-ply will look like, and adjust the amount of twist in the singles until you like the plyback test.

You've been taking breaks, right?

Sooner or later, you'll reach the end of your piece of roving; stop with 4 inches of it still unspun. To join a new pre-drafted length to it, overlay the last 4 inches of unspun end of your old piece with 4 inches of pre-drafted out end of your new piece. Draft them together just a bit, then hold at the start and start treadling again. Go back to drafting and sliding, and voila! They join! Do this as you need to.

Eventually, you'll fill a bobbin. Then another. Then, it's time to...

## Ply!

With two bobbins on a lazy kate and an empty bobbin on your wheel, you will be treadling so the wheel spins counter-clockwise now. Take both ends from the full bobbins, bring them together to the leader and loop them through it and around through it a second time to keep them on the leader. Tension the strands with your right hand, bringing them through two different pairs of fingers, and then pinch the two strands

together with your left hand. Start pinching near the leader so you have the ends folded back on the two strands. Treadle... twist enters and your yarn is plying! Slide your left hand back a bit as twist enters, then as needed feed it onto the bobbin and pull more yarn off the bobbins on the lazy kate.

The amount of twist you need when plying is set by the amount of twist in your singles – put plying twist in until the individual fibers in the plied yarn lie along the length of the yarn. This will give you balanced singles. Your plied yarn should look like the plyback tests you made when you spun your singles.

When the plying bobbin is full, wind the yarn off into a skein around your arm – under your elbow, up between thumb and palm, around and around. Tie the skein in 2-3 places with cotton, and soak the skein in a sink of warm water and wool wash to help set the twist. Repeat in a rinse bath the same temperature. Always fill the sink first, so the yarn isn't agitated, or it may felt. Squeeze the water out and hang your skein to dry.

## Refining your spinning

Try not to let the twist past your forward hand – in singles, this makes the fiber harder to draft, causing you to spin thicker yarn; in plying, it makes it harder to have an even plied yarn.

Your backward hand holds onto the fiber, but should not squeeze it – if it does, the fiber will bunch up and get matted. Treat it like a baby bird with your back hand.

Go backwards a step –go back to practicing treadling during idle moments and pre-draft a few lengths of fiber at a time, so you can separate out the skills in spinning and focus on individual tasks.

If the fiber is drawing on too quickly, decrease the brake pressure on the wheel, and treadle more slowly.

If the fiber isn't drawing in, first check – if the wheel is spinning the wrong way at first, the yarn may be jumping off the pegs and feeding off the wheel instead of on, wrapping the flyer spindle between the bobbin and the orifice, or wrapping around a peg or the orifice hook; check and fix those things, then after that, try increasing the brake pressure.

If you are having difficulties joining fiber, be sure both the old and new are completely unspun, and draft them together a bit before starting to spin. If your yarn has snapped at a thin spot, unwind yarn from the bobbin to find a thicker spot that can be unspun for a good join.

Thick and thin spots occur during spinning when different amounts of fiber are drafted – look at the thickness of the fiber between your two hands, and keep it consistent for a consistent yarn diameter. Give yourself time to improve at this, it's a very detailed task.

If your yarn is falling apart during plying, put more twist in when spinning the singles.

If your yarn is corkscrewing while spinning the singles, it needs less twist. Treadle slower, check that you are on the lowest ratio, predraft your fiber a bit more, and work on drafting more quickly. That last one will come with practice.

If a strand breaks during plying, overlap the broken ends by 1-2 inches and continue plying.

If one strand is wrapping around the other during plying, check that your right hand is tensioning the strands off the bobbin evenly.

## Twists and Turns - Tips to Make Spinning Easier

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**Yarn is not taking up on the bobbin...** increase the tension on the bobbin brake, turn the brake knob by ¼ turns clockwise until yarn takes up. As the bobbin fills, you will find draw-in decreases – this is standard behavior in scotch tension wheels; increase the brake tension and continue filling your bobbin. However, first check – if your yarn has jumped off the pegs, it could wrap around the flyer spindle between the bobbin and orifice arm. Remove the orifice arm, unwrap this yarn, and then restart spinning.

**Take up is too strong, yarn is pulling out of your hands too quickly...** decrease the tension on the bobbin brake. Turn the brake knob by miniscule increments counterclockwise once you have yarn taking onto the bobbin (1/8 turn or less). Very minor adjustments can have a large apparent effect.

For very fine spinning, start with a half full bobbin (of anything, even a piece of pipe insulation as shown here) and/or lace the yarn across the flyer arms like one shoe lace, to decrease the drag-in of the yarn. This is shown in the picture here. I find the half-full bobbin is the same as one lacing across the flyer arm, and that 2-3 lacings will reduce the draw in enough for very fine spinning.

You may find that lacing decreases draw in too much – if this occurs, give the bobbin a small nudge in the wind-on direction as you start to treadle – this is usually enough that yarn will continue to wind on as you spin.

**Yarn is thump-thumping as you spin...** be sure your yarn is coming from the center of the orifice hook toward your body in a fairly straight horizontal line. This minimizes any thumping. I have found that a slight angle is possible, but I definitely don't put the yarn at a 45 degree angle up, down, or sideways from the center of the orifice hook.

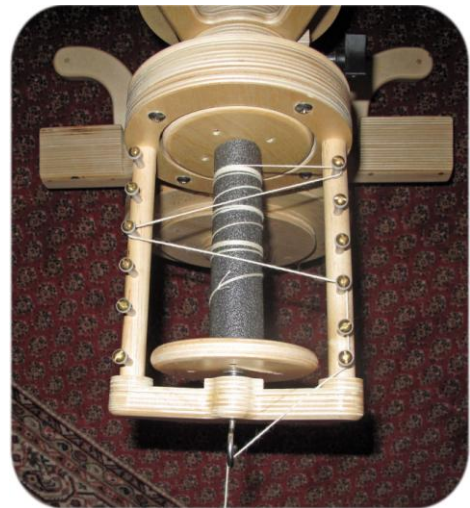
**Drive band is slipping...** increase speed slowly, over 5-10 treadlings, from nothing to the speed you want to spin, to minimize or avoid drive band slippage. Going from zero to top speed on the very first down stroke will almost always make the drive band slip.

The band may slip more in the highest ratio position if you often use it at the low ratio settings. Store your drive band in the highest ratio groove or even on the rod behind the grooves (only if the rod is oil free!) between spinning sessions to help it regain its high ratio size.

If you have overstretched the drive band, you may find it will recover elasticity by removing it and placing it in a warm room for a few days. As a last resort, consider cutting and re-gluing them shorter – but be sure to let them dry completely before using, or they will separate under the strain of being used on your wheel. New drive bands can be purchased from your dealer. In a pinch, try cotton carpet warp or string until your replacement bands arrive.

**Replacing a drive band...** if you need to replace the front drive band, it can be removed by taking it off the front drive wheel and then off the flyer. Reverse this to put the drive band on. The rear drive band is removed after taking the head off the base. When you put the head back on the base, be sure to have the drive band on the back drive wheel, and slide it so it will be able to go around the metal pulley.

**Flyer does not rotate as you treadle...** check that the drive bands are in one of the pulleys on the back of the flyer, back drive wheel, and metal pulley. If they are in place, check if the drive band is loose and slipping during treadling: see “Drive band is slipping”.



**Treadling is hard...** check if the brake band tension is set too strong; check if something's gotten under the treadles, jamming them; check if the drive band is out of the grooves on the flyer; try sitting closer to the wheel, or in a taller seat; if you are on the highest ratio, try switching to the lowest ratio for a few minutes to stretch the band just a bit, and then returning to the highest ratio; or if you are trying to start fast, start with a slower first few treadles, increasing speed gradually over the first few treadlings.

There is a SpinOlution group on Ravelry, if you have a spinning question about your wheel, you can often find an answer there:

<http://www.ravelry.com/groups/spinolution>

If treadling is still difficult, check for wear on the pitman guide or a loose pitman bearing. If you remove the Hopper's head and flyer assembly, you will see the pitman groove at the top of the footman. If the screw holding the pitman bearing has worked loose, remove it and put some white glue on the end of the screw before putting it back in (avoid getting any on the pitman bearing). Screw it in tight, but be sure the pitman bearing can still turn freely. If the walls of the pitman guide are worn, follow the advice in the next tip.

**A knocking sound when treadling...** the pitman guide, on the inside of the footman, can get worn, causing the pitman (a bearing) on the drive wheel to knock. You can reduce or remove the knocking sound by putting one coat of clear nail polish or light glue on the inside of the pitman guide. Let it dry completely before putting it back on the pitman bearing.

**Uneven or noisy treadling...** check for damage where the footman connects to the drive wheel – remove the Hopper head from its base, exposing the pitman bearing on the drive wheel. Make sure the pitman bearing's screw is completely screwed in, and that the pitman guide on the inside of the footman is not damaged – it is a regular flat-sided oval. You will need to contact SpinOlution for information on addressing any damage here.

## Maintaining your Hopper

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Your Hopper has a polyurethane finish, and so can be cleaned with a light dusting as needed.

Oiling: the Hopper in general does not need oiling, working on sealed bearings and its unique keyed bobbin system. You may find a light coating of oil on the flyer spindle and the bobbin pegs helps you slide the bobbins on and off more easily.

If a squeak develops on your wheel, locate the source. Metal-on-metal squeaks can usually be resolved with a small drop of oil.

Every 6 months (or as needed), check the suede on the inside end of the brake block as described in 'Adjusting the Tension'.

## Technical Specifications

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Furniture grade Birch plywood with a polyurethane finish.

Weight: 13 lbs.

Length: 18.5 in. (at the treadle)

Height 20.5 in.

Width: 16 in flyer ready; 7.5 in flyer stored



## Hopper Accessories

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(Prices and accessories subject to change, check with your dealer for current information.)

**Hopper with regular-sized art yarn flyer and 3 bobbins:** \$749

**Hopper with over-sized art yarn flyer and 1 bobbin:** \$925  
(\$1010 with 3 bobbins)

**Additional Hopper 8 oz. Bobbins:** \$35 each

**Black Canvas Tote Bag:** \$100 with wheel, \$125 after

**Lazy Kate:** holds up to 4 8-oz. bobbins, uses a dowel braking system to prevent bobbin backlash, \$97.

**Drive Bands** (replacement set): \$10

**Hopper head:** \$195 (useful to order with the oversized flyer for faster flyer swapping.)

**Over-sized Art Yarn Flyer (includes one bobbin):** \$250  
(does not include hopper head)

**Additional Oversized (2-lb.) Bobbins:** \$45 each



Hopper head with regular flyer (above)  
and with oversized flyer (below)

## About the Author

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Amelia Garripoli has been spinning and blogging since 2001, when she purchased a house that came with two llamas. She blogs as Ask The Bellwether (<http://www.askthebellwether.com/blog>) and is an active mentor in several online forums. You can find her as askthebellwether on Ravelry, thebellwether on YouTube, and [ask@thebellwether.com](mailto:ask@thebellwether.com) on email. She was thrilled to win Best Finished Item From Handspun Yarn at her county fair in 2009, a great follow-on to winning Best Handspun Skein in 2008. Amelia has written articles in Knitty, Spin-Off, and Yarn Magazine, knitting patterns for Fiber Trends, Crosspatch Creations and The Bellwether, and has published two books, Spindling: The Basics (2004) and Productive Spindling (2009). She teaches a wide variety of workshops on fiber preparation, spindling, spinning, dyeing, felting, weaving and more. Amelia loves exploring ways to turn fiber into textiles.

## Meet the Makers

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The Pauly family built their first spinning wheel in 1983. They started SpinOlution after 25 years of designing and building several wheels for personal use and experimentation. The company's goal is to provide the most advanced and easy to use spinning wheels that have ever been seen or used.

SpinOlution is pleased to offer the **Mach II** production wheel, the **Bee** travel wheel, the **Echo** entry level wheel, the **Hopper** art yarn/travel wheel, and an assortment of drop spindles and accessories.



SpinOlution wheels are guaranteed for 1 year from date of original purchase; in addition they offer customer support Monday through Friday, 10am – 5pm Pacific Time.

The Pauly's can be contacted via  
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**Echo**



**Bee**



**Mach II**

