

WOODTURNING

FUNdamentals

Publication of the American Association of Woodturners
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AAW
EDUCATION

**SPECIAL
EDITION**

TURNERS ARE TOPS!

PROJECTS FOR MAKING A VARIETY OF
SPINNING TOPS

AAW | AMERICAN ASSOCIATION
OF WOODTURNERS

Woodturning FUNdamentals

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Cover photo: Bonne Klein

INTRODUCTION

Note from Phil McDonald, Executive Director

The AAW staff and board are pleased to present you with this complimentary special edition of our Woodturning FUNDamentals: Turners are TOPS, which offers practical project information, as well as inspiration on making a variety of spinning tops. I would like to quote from Brigitte Hinrichs' article that addresses the question, "What exactly do you do with a top?" The answer is as surprising as it is obvious: "You *play* with it." Great gifts for children, spinning tops may even help you to rediscover your inner child! Nearly everybody is a kid at heart. We hope you have fun making, learning, and playing with your spinning tops.

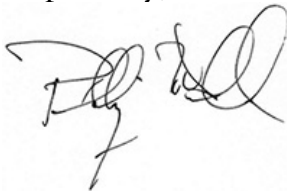
Every other month, the AAW is presents Woodturning FUNDamentals, a digital publication which features information, projects, tips, and videos to help members build foundational woodturning skills and techniques. This publication ties directly into AAW's education mission, and is one of the many publications and services offered with an AAW membership.

For as little as \$45 per year (the price of an online membership), AAW members have access to publications including, *American Woodturner* journal, Woodturning FUNDamentals, Safety for Woodturners, and several mentoring publications, as well as a variety of complimentary services, website tools, grant opportunities, and specialty programming. You can learn more about AAW membership at <https://aaw.site-ym.com/?page=MemberBenefits>.

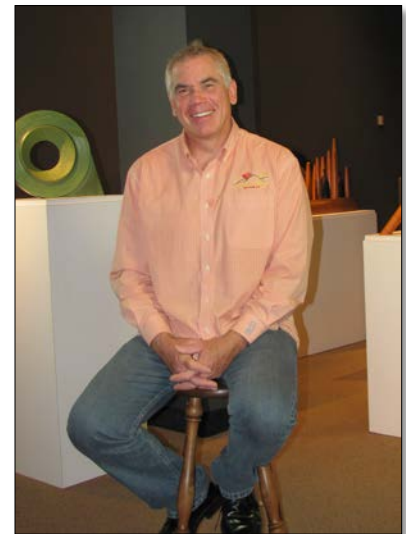
As always, Woodturning FUNDamentals invites you to submit your questions, tips, projects, and problems with us. Every turner develops tips and techniques that work, and also runs into frustrating obstacles from time to time. You're not alone. Please send your submissions to us at linda@woodturner.org.

I welcome your suggestions and concerns.

Respectfully,



Phil McDonald
Executive Director
phil@woodturner.org



Dancing ballerina top made by Janice Levi.
Photo by Tib Shaw.

ARTIFACTS OF ENCHANTMENT

Brigitte Hinrichs

About 20 years ago German woodturner Armin Kolb began developing his craft with the usual repertoire of bowls, boxes, and pens. He already had a preference for spinning tops; however, over time they gravitated to the center of his work. Traditionally, tops were trinkets in the broad product range of the typical woodturner and were often given away with the sale of other items. Armin approached this class of objects with a new perspective. He felt it was important to dispel the notion of the spinning top as a simple children's toy and, instead, to understand it as an artifact.

Years of experimentation led Armin to combine various hardwoods with natural materials such as amber, coral, and bone and occasionally to embellish the ensemble with gold, silver, or gemstones. He investigated which shapes and material combinations were possible and necessary to highlight the aesthetics of a spinning top without robbing it of essential functionality—its rotation. In the process, he built a rose engine lathe and explored eccentric turning and inlay techniques to produce formerly unimagined designs.

The results span a fascinating range of tops evoking timeless architecture, heirloom jewelry, and delicate celestial models. Pierced interiors and zigzag stems on some may initially hold the viewer back because they suggest works too

fragile or eccentric to handle. But the fine workmanship and detail usually prompt closer inspection and first-hand discovery that all his tops really do spin.

Play

“What exactly do you do with such a top?” many still ask. The answer is as surprising as it is obvious: “You *play* with it.” But what is the meaning of play in this context? Or more precisely: What does it mean when adults play? It's about forgetting oneself, as when children become absorbed in their game and lose track of all the distractions around them. Armin's spinning tops invite people to set aside the purpose-orientation of our society and to pause for a few moments, focusing on their own center. In Japan, the name for top—*koma*—literally translates as “happy alone.” The top places the spinner under its spell as the world falls away and nothing further needs to be satisfied.

Movement and stillness

The attraction of tops lies partly in their quirky behavior. Some of them prefer their cozy circles, while others sway drunkenly. Perhaps the most startling display occurs when the top embodies



Armin Kolb, Germany, *Amma*, 2003,
Pink ivory, ebony, black Palmira, amaranth,
3½" × 2⅓" (9 cm × 6 cm)

Photo: Roland Schmidt

motion at a “standstill,” running silently in perfect rectitude. Movement, as a symbol of external action, has become one with stillness, the inner reflection.

For Armin, then, the top offers the user not only the amusement of a familiar children's toy but also the visual and kinetic experience of centering and absorption in the present. Its powers of engagement and nuanced aesthetics provide enough inspiration for him to commit all his energies to its continuing development and enrichment.

Armin Kolb, Germany

Fernambuk, 2003, Bone, fernambuk, betelnut, ebony, 4" x 2 1/8" (10 cm x 6 cm) partially turned with a rose engine

Photo: Roland Schmidt



Eugn, 2003, African blackwood, amboyna, bone, antler, blue pigment, 3" x 2" (8 cm x 5.5 cm)

Photo: Roland Schmidt



Coral Tops, 2001, Bone, coral, silver, gold, ruby, ebony, 4" x 1 1/2" (10 cm x 4 cm)

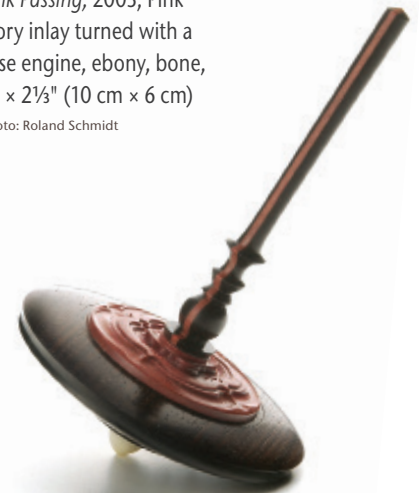


Without, 2003, (left) bone turned with rose engine, silver, betelnut, amber, mammoth ivory, emerald, (right) bone turned with a rose engine, coral, amber, mammoth ivory, ruby, 3" x 1 1/8" (8 cm x 3 cm)



Pink Passing, 2003, Pink ivory inlay turned with a rose engine, ebony, bone, 4" x 2 1/8" (10 cm x 6 cm)

Photo: Roland Schmidt



Without, 2003, (left) Bone, antler, silver, African blackwood, ruby; (right) bone inlay turned with a rose engine, antler, silver, sapphire 2 1/8" x 1 1/2" (6 cm x 4 cm)

Photo: Roland Schmidt



Untitled, 2001, Boxwood, 4" x 1 1/8" (10 cm x 3 cm)



Axe de Rotation, 2001, Tulipwood, ebony, 3 1/2" x 1 1/2" (9 cm x 4 cm)

Photo: Roland Schmidt



SPINNING TOP

Old German Design Spinning Top

Tom Pearson introduced his demonstration of making a spinning top with the comments that the design was probably hundreds of years old and was an old German design.



The parts needed to make the spinning top.

To make this Old German design spinning top you will have a handle, wheel, shaft and toggle. We have included a dimensional drawing to illustrate with creation and assembly.

Three pieces of wood will be required:
Handle, 33mmx33mmx170mm,
Shaft 2mm x20mm x100mm, Wheel
80mm dia. x 20mm thick.

You will also need Nylon Cord 1.6mm x 300 and a small round-head nail.



The Handle

Tom had mounted a piece of wood 33mm x33mm x170mm on the lathe, with a predrilled hole 20mm through one face and a 12mm hole drilled through the other direction. It is important to ensure that the 12mm hole is located in the centre of the 20mm hole; otherwise, when the string is wound around the shaft of the spinning top, it will bind on the sides.

- Turn to round.
- Mark the end for the head of the handle.
- Shape and sand to finish.

The Wheel

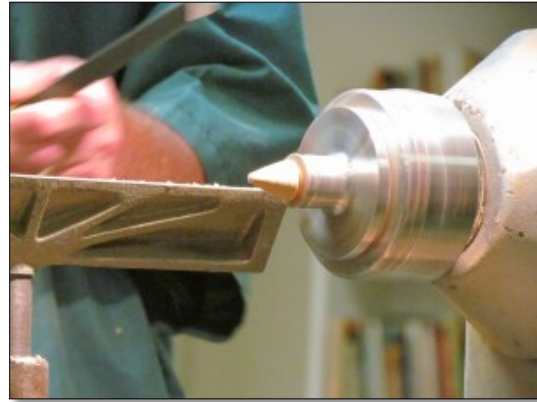
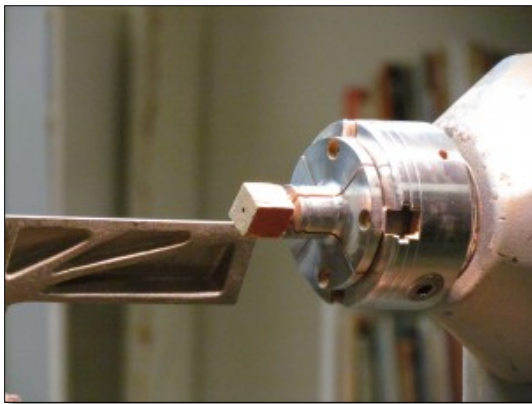
Tom had made a jam chuck to hold the wheel, which had been predrilled with a 12mm hole. Tom's tip--Use hard wood for your jam chuck. It holds better and lasts longer.

Shape the first side, sand, and texture if you wish. Remove the wheel and refit into the jam chuck and shape the second side. Sand and texture if you wish.

The Shaft

Mount the shaft (20mm x20mm x100mm) in pin jaws. One end of the shaft becomes the toggle. Tom then drilled holes for the string.

- Mark the length of the toggle.
- Mark the wheel position and turn to an exact 12mm.
- Reduce the remainder of the shaft to smaller than 12mm so that it will spin easily in the handle.
- Remove the toggle and reposition the shaft in the jaws so that you are able to shape the spinning end. At this stage Tom suggests that if you are going to use a rivet, put that in now and then shape the end.



Remove from the chuck and assemble.

As the instructions on the SAWG website suggest, a piece of string 300mm long is about right, but in good New Zealand fashion, surely if 300mm works well, a longer piece of string will work even better. Not so! It gets jammed in the head of the handle! Tom suggests that a smear of super glue on the free end of the string will make it last better.

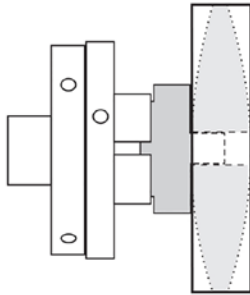
~ Demo by Tom Pearson
Report by Earl Culham
South Auckland Woodturners Guild

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A SPINNING TOP

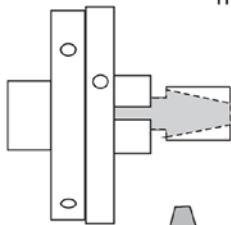
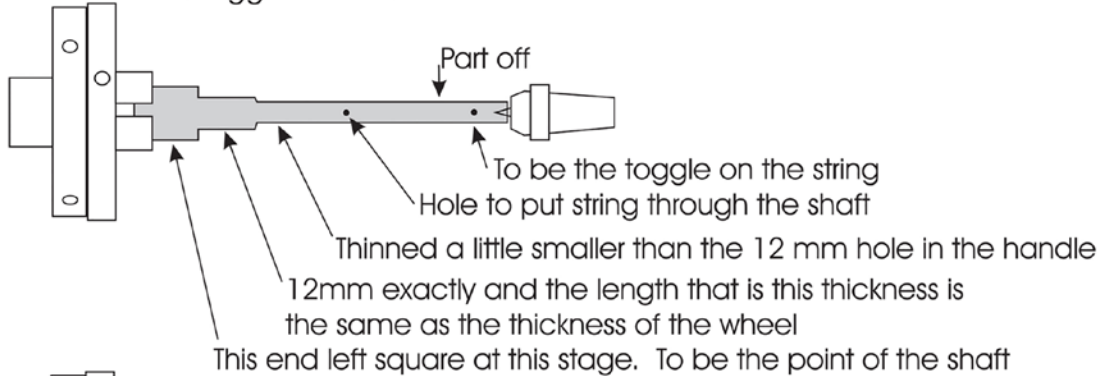
Parts List:
 Shaft & Toggle 20 x 20 x 100
 Handle 33 x 33 x 170
 Wheel 80 dia x 20 thick
 Nylon Cord 1.6mm x 300
 Small round-head nail

The wheel has a 12mm centre hole.
 A jam chuck is the best way to mount the wheel for accurate results.
 The handle is prepared by drilling 1 x 20mm hole and 1 x 12mm hole as shown in the drawing below.

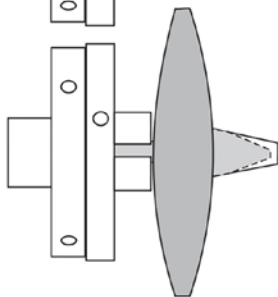


The wheel is firmly fitted onto the jam chuck by its centre hole.
 One side is shaped and then the wheel is turned around and the other side is shaped.
 Lines, spirals, and other decorations can be added.

The shaft and toggle wood is mounted between chuck and tail.

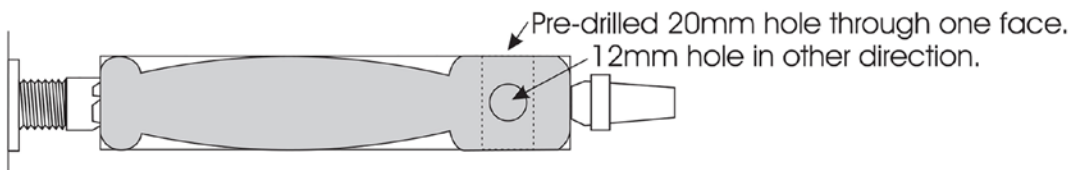


Reverse the wood and remount with most of the length inside the lathe head.
 Start to shape the point, particularly the part that will be close to the wheel. Do not complete the point.



Glue the shaft into the wheel and remount.
 Give the point of the shaft a final cut down to size.
 Drill a small pilot hole into the exact centre of the end of the shaft.
 Knock the round-head nail into this hole.

Mount the handle wood between centres.



Turn to shape and sand. Dismount and sand ends.

Keep ‘Em Turning

Peg Tops

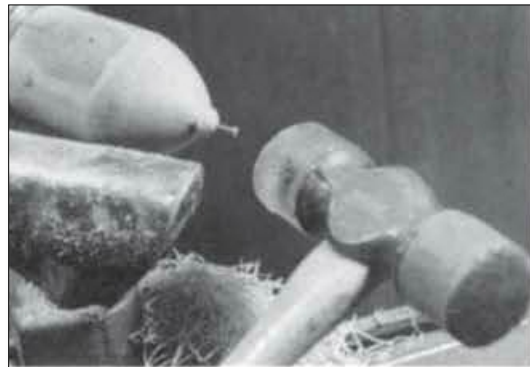
Al Rumpf is a member of the Seattle Chapter of AAW, and he showed members over three hundred tops from twenty-nine countries. His largest is from Malay and weighs nine pounds, and his smallest is a ½” spinner.

“Tops can be made on anything. I have ones made of bone, glass, gourds, brass, nuts, and, of course, plastic. But most tops are made of wood. It’s the preferred material. Being a turner, that’s all I use.”

“Tops are fascinating,” Al said. “It’s hard to trace their origin; they seem to be known all over the world. Every climate and culture has some history of top spinning: the ancient ceramic top found in Egypt, the crude coconut shell-on-a-stick of jungle tribes, the spinning ‘dreidel’ of Jewish celebrations, the art form of the elaborate Japanese top, and the relatively modern tippe top.”

Spinners are small tops spun using just a snap of the fingers. They come in all sizes and shapes. The only requirement is that they have a rod of some sort sticking up on them so they can be spun. A variation is the supported top. The rod is supported in a handle and the string wrapped around it. After pulling the string, the handle is removed leaving the top free.

Hummers are tops of any kind that make noise when they spin. Wind-up spring devices, twisted metal rods, and all manner of levers and rods are used to make different tops spin.



The secret of making any top according to Al, is to use wood of uniform density. “If it isn’t uniform, the top will be off balance and wobble. This applies to all tops – spinners, peg tops, and tippe tops. You can use almost any wood and laminated woods are beautiful. Just be sure your laminate is in balance, that is, don’t glue a light-weight wood next to a heavy wood.”

Tops for kids take an awful beating, so use a common hardwood, like maple, oak, or ash, and don’t bother with a slick finish- it will get knocked off it a short time. For display tops, the sky’s the limit.

TURNING A PEG TOP

This is the typical throwing top, about 3” high and 2” in diameter. Spindle turn it using a jamb chuck or collet chuck. Turn the sloping part with a gentle convex curve, using about 2/3 to ¾ of the total length of the top, leaving a little ledge about 3/8” up from the point to wind the string against. Cut several grooves on the slope to hold the string. Round over the top of the top and add a little cap at least ¼” high on that end for a string anchor. Before you part it off, drill a 1/16” hole in the point, then drive a small brass escutcheon nail into the hole for a wear point. File the nail fair with wood, if necessary. Use any finish.

~ Bob Brown
Kirkland, WA

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TOP

O' THE MORNIN'

Making the Finger-Snap Top

Roger Zimmermann



I used to start my day by turning a finger-snap top before going off to my job. A salesperson at work—who was 110 percent Irish—heard about, then saw, my tops and dubbed them Top o' the Mornin.' She ordered 200 to pass out to the Big Brothers Big Sisters organization in her area.

Handmade tops are a great item to give to kids (and adults) or sell at craft fairs at low cost. They also represent a good exercise in product engineering and design. In this article I delve a little into the mechanics of tops and offer some tips to make your tops better. The focus will be one-piece finger-spin tops, but many of the principles provided are applicable to other types of tops as well.

Scale and ease of use

Finger-snap (or spin) tops are small tops that are propelled by a sharp twist of the thumb and first or middle fingers. Kids ages five and up already have the motor skills to spin these, unlike larger tops that are spun with a string or a whip. The tops described here are made from small

scraps of wood and can be turned from start to finish in minutes.

For demonstrations at shows, they are ideal.

Snap tops generally measure about 1" to 2" (25 to 50 mm) tall and 1" to 2" in diameter at the widest point, although larger tops are not uncommon. Wood is the traditional medium, but they can also be made from many readily available materials, such as plastic, aluminum, or brass, with ordinary woodturning tools. They can be painted, colored, grooved, or otherwise decorated from simple to very ornate, as in the collaborations of Bonnie Klein and Jacques Vesery.

Stem

The shaft or stem that drives the top is typically about $\frac{3}{16}$ " (5 mm) in diameter. If the diameter is thicker or thinner than that, the top may become difficult to spin well. Thinner stems impart a faster spin, but the torque required to generate high speed with quick snapping of the fingers will also be higher. This is particularly noticeable for

tops with heavy or large-diameter bodies.

Making the stem taller increases the probability of introducing wobble into the top. Shorter stems are easier to spin, with better performance. Make the stem no longer than half the overall length of the top. Good balancing also requires attention to the moisture content of the material. If your top was turned from green or semi-dry wood, there is a very good chance the stem will warp and make the top wobble.

I find that ornate features on the stem can often contribute to the beauty of tops. Plain shafts tend to look unimaginative if used for every design, whereas those with beads and graceful curves can greatly enhance the value of a top.

Top Body

The larger the diameter of the body, the harder it will be to spin the top. Reducing the weight of a large-bodied top, however, can help. Use lighter wood for larger tops and denser wood for smaller tops. Heavy tops will generally spin longer but are harder to



An ultrasharp tip may actually be worse than one that is a bit rounded over. A sharp point may embed itself in the bearing surface and cause too much friction. It may also not allow the top to orient itself and stand straight up. While making the top, you can insert a round-headed brad into the wood point and then machine it to dead center. A metal tip will last longer than a wooden one, but a wooden tip that is not too pointed will hold up quite well.

Decoration, finish, and presentation

The surface of the top can be grooved with rings or textured, but don't create an imbalance in the process. Kids love to paint the tops and watch the colors change and meld as the top is spinning. If a natural finish is desired, coat with a simple product like Tung oil or buffing wax. Put finished tops in little velvet bags. They make perfect gifts to cherish forever. Consider making platters with slightly concave surfaces to spin the tops on.

Spinning technique

Finger-snap tops are spun by the rapid twisting of the stem between thumb and forefinger (middle finger works as well for some). Hold the top in a vertical position with the arm and hand held steady. The stem is allowed to roll between the two fingers as the snap progresses. Don't try for high speeds initially; that will come with a little practice. If snapped well, a good top in excellent balance should spin between 3,000 to 4,000 rpm and continue for about a minute or more, depending on the physical characteristics of the top, supporting surface, and initial snap speed. If the bearing

get up to full speed because of greater starting inertia. The top must accelerate to high speed in the brief time that finger snapping imparts its force—less than a second! Keep the mass of the body (center of gravity) to the outer edge when possible for lighter tops to achieve longer spinning capability.

The choice of material for tops can be critical. For maximum performance, choose straight-grained wood free of knots and imperfections with an even density. Be cautious about using wood from branches or small trees. The ideal site for good top wood is about halfway from the center to the sapwood in a tree at least 8" (20 cm) in diameter. A large difference in the spacing of the growth rings will probably lead to instability of the top. Check that the grain lines are evenly spaced across the diameter of the body. Heartwood on one side of the top with sapwood on the other may

ing

create imbalance such that the top may not even spin. The grain should run the length of the top and not perpendicular to it. Make sure the outer edge of the body is perfectly smooth for better balance.

For easier spinning, locate the body somewhere in the lower half of the top. The higher the body on the spinning axis, the greater the chance of inducing a wobble in the top. For little kids, a shorter body that is low to the ground is easier to spin and is much more stable than one that rises halfway up the full height. Once you get a better feeling for the center of gravity and its effect on motion, you can experiment and make tops that prove harder to spin but have very interesting behaviors.

Tip of the top

The tip of the top requires a lot of attention. It needs to be in the very center of the bottom and smooth.



Spalted maple, 1¾" x 1½" (44 mm x 38 mm), 45 second spin time, easy to spin with low center of gravity



Maple, 1½" x 1¾" (38 mm x 44 mm), maple, 65 second spin time, very easy to spin because of low center of gravity; tight sleeper, wakes up slowly

surface is rough, friction will slow the top down sooner. If accelerated to speeds that it cannot handle, the top will wobble out of control.

An alternative method is to spin the top on the end of the stem rather than the tip. Just above a suitable surface, hold the inverted top vertically, body and tip up, between the first finger and thumb. Snap as before, but afterward quickly pull your hand away, allowing the top to fall free to the surface below. This requires a bit of practice. The top may hesitate a bit before righting itself on the end of the stem. Some tops spin better on the end of the stem than on the tip as designed. Go figure!

Troubleshooting structural problems with spin

If practice does not overcome spinning difficulties, the top itself may need tuning. First, make sure the tip is smooth. If you feel a burr, use very fine sandpaper to sand the tip perpendicular to the top's axis, but do so very lightly. If the point is off center, you may have to carefully remount the top in a jam or vacuum chuck to true the tip. You can also try to balance a wobbly top, but it takes a bit of an effort. It is obviously better to use uniform wood initially. My brother, a mechanical engineer, floats his tops in water. The heavy side will roll to the bottom. You can remove or add weight as you please to stop or retard the rolling. (A drop of dish soap will break down the water's surface tension.) With some persistence you can balance the top to very tight tolerances and make it spin a very long time, as well as go into a deep "sleep."



Various tops (top left clockwise): apple, bubinga, white oak, white oak, white oak, cocobolo

Experimentation with performance and design

Most of the rules of thumb offered up to this point apply to making basic tops that spin easily. Once you master these, you may sense that high performance isn't everything. For most people, attractive form and surface also matter. Such considerations, however, may conflict with optimum spin. You have to use your best judgment about which rules to break. For example, you may find it worthwhile to risk slight imbalance or shorter spin time by turning an urnlike silhouette or incorporating some striking sapwood. If the resulting top spins poorly, only a little time and very little material have been lost.

Strive to make your tops as elegant as possible. They will sell better and be much more interesting to look at. Also keep in mind the age and ability of your potential client or audience, including the more sophisticated top lover. Experiment with different grains, densities, stem lengths, diameters, tip sharpness, and placement of the center of gravity. Surprisingly, you can make good spinning tops by doing everything "wrong." You never know until you try. I even keep many of my top "failures," since they are still lovely to look at. Some of the tops shown here have broken the rules in various ways. One of my very best spinners was cut from a 2"- (50 mm-) diameter maple branch with pith. On the other hand, if you want only a consistently good spinner, stick to the basics.

Top jargon

Along with tops comes a set of terms that you may want to use with your audiences. During spinning, a well-balanced top will come to a position where it appears to be actually standing still. This is called *going to sleep*

or the top is *asleep*. At other times the top may have a secondary spinning axis called precession. This occurs when the axis of the top wobbles in a slow circle around the tip (just as the earth wobbles on its own axis, though much more gradually). As the top slows down, it will progressively tilt, which is called *waking up* (technically distinct from wobbling). Each top has its own sleeping and waking up pattern, which gives it a unique signature.



Ebony, redheart, 2" x ¾" (50 mm x 19 mm), 20 second spin time, average spinner, less spin time because of its small size

Games to play with the tops

Hold a contest to see which tops can spin the longest. Note that tops spun in a slightly concave dish will bang into each other; find out whose top is left standing at the end. Try spinning your tops on unusual surfaces such as the back or palm of your hand. Try to spin the top on the base of the stem instead of the pointed tip, as described earlier. Above all, have fun! ■

Roger Zimmermann is the president of the Wisconsin Valley Woodturners. You can email Roger at latheybum@aol.com.



Cocobolo, 2" x 1" (50 mm x 25 mm), 15 second spin time, difficult spinner because of its high center of gravity and narrow diameter

The light conversation dies down and nerves kick in. The tension in the darkened basement builds. Everyone finds a place—the start time draws near. A hush falls over the room. A blinding glare erupts as spotlights hung from the ceiling are suddenly turned on. The ring of light illuminates...the *Battle Top Arena*!

Annually, members of the Keystone Wood Turners (KWT) from eastern Pennsylvania gather in a darkened basement shop around this Battle Top Arena. It has a gleaming 30"- (76cm-) wide piece of maple turned into a stepped, slightly concaved dish. The sides are 2¾"- (7cm-) high Plexiglas and four starting blocks are fitted into openings in the Plexiglas. The arena sits atop a 40"- (100cm-) high base (*Photo 1*).

It is the start of our annual Battle Top Event. Turners who have not yet participated question why all the fuss—there are no motors involved nor any drinking. Why would adults gather so excitedly to play with what could be considered a kid's toy? Once it's explained, most quickly understand.

It is a big event with plenty of good-natured competition, and it's more than that. This competition helps build group camaraderie while we play with what we have turned. Entrants make a top just like everyone else's and the same length string is wrapped around it. Hold onto the knob on the string, give it a yank, and the competition begins. Tops careen erratically around the arena banging together, sending some flying. Things settle down a bit and tops start to dance and circle each other. Some look like prizefighters as they drop in now and then to take a shot and circle out of the way. Other tops careen toward them and at the last second, they deftly spin out of the way.

In the end, only two tops are still spinning. With little momentum left, they become wobbly and look punch drunk. The crowd pushes closer to see whose top topples first. It's at that



Photo 1. The battle top arena is ready for action.

BATTLE TOPS

Robert
Shafer

point the two competitors wonder out loud if they did enough. The crowd joins the speculation: Was the shape correct? The weight evenly spaced? Was the string wound the correct way? In the end, one top falls over; the other is gloriously spinning alone. In that instance, you have your answers. Whether or not the differing opinion has anything to do with the winner's top, he or she can forever say, *Yeah, but my top beat your top!*

Running the event

We run the event like most bracket-type eliminations. Early testing showed how important it was to limit weight and design options, so there is a pre-race weights and measure phase. We want to have a long battle with as much action as possible—everybody remembers those early-phase, thirty-second

knockout prizefights. They were exciting...for about thirty seconds. We now restrict weight and contact areas to ensure all entries have a fair chance to bang around a bit.

Each combatant is given a number and his or her top is placed in a holding block so no one is tempted to fine-tune their top during heats—although everyone just holds their top between heats anyway. Our holding block is a stand with numbers on it.

We use software designed for running Cub Scout pinewood derby races to determine heats and scoring. An alternative method is to number each entry, then number tongue depressors similarly and place them, numbers down, in a container. Before each heat, draw four sticks at random: The first stick drawn starts at gate #1 and so on. The tops are placed in the gates with 30"-long strings

wound around them, and on *ready, set, go!* strings are pulled and they're off! A club member removes the fallen tops from the rink until two are left. Last top spinning wins the round.

The points awarded are: 1 point for first, 2 for second, 3 for third, 4 for fourth. We track scores on a separate sheet as hash marks and a total of 9 points or more means elimination. New sticks are drawn for the next heat. An odd number in the last heat means a lucky break for someone.

For the next heat, the sticks are placed back in the container. Heats are run until there are only four players left. The slate is wiped clean and those

four battle through new heats until eliminated by points. The winners receive a gift certificate and the top finisher is awarded a first-place trophy.

I designed the trophy quickly in a late-night, pre-race-day frenzy. The design has become something of an issue: Consensus is that it looks like a fancy toilet plunger with a glass globe on top. But, it's my game and my rules, so I added a new rule, "The winner *must* accept the trophy from the previous winner." This rule has ensured that last year's winner doesn't try too hard for fear of having to display the trophy for



2 The top is mounted onto rails, which are inset from the edge. The Plexiglas is screwed to the edge of the arena.

another year. For some strange reason, though, the trophy has disappeared. No kidding—it really cannot be found. I can only assume somewhere out there somebody is truly appreciating its beauty...or their house has bad plumbing. ▶

Battle top rules

The last top closest to the center of the arena and still vertically spinning wins!

The battle

At the start, place your top, wound with string, in a starting block and hold it against the cradle with a finger while your thumb supports the start gate. With your free hand, pull the string and release the top. The first and second tops to stop spinning will be removed from the arena. The remaining two battle to the end.

Points are scored based on order of finish—too many points will eliminate you. Elimination rounds will be held and the finishing position of the four tops scored until there are only four tops left to compete in the final round.

Top design

Tops must be hand turned, newly made, and pass a weight and measures process before being allowed to compete. All surfaces that will contact the arena and other tops must be made of wood. Non-wood materials may be used to add weight, but must be firmly glued in place. No metals are allowed as protrusions—metal could dent the surface of the arena.

The shaft of the top needs to be straight and also stick out below the bottom of the body $\frac{5}{8}$ " to clear the bottom of the cradle. In order for the top wrapped with string to fit within the cradle, the top of the body can be no higher than $1\frac{1}{8}$ " from the arena surface.

The bottom of the shaft must also be flat or it will not travel down (or up) the concave surfaces. The requirement is a minimum diameter of $\frac{1}{8}$ " and maximum diameter $\frac{1}{4}$ ". If a top fails to end up in the center or spends too much time hugging the wall, it will be disqualified; however, the participant may blow the top back into action.

The widest point of the top's body must have texture or small indents to cause other tops to bounce off it—this is a *battle*, after all! Indented edges should be smooth; otherwise the starting blocks could cause tops with sharp or square-edged indents to slow drastically.

Top dimensions

- Weight: $1\frac{1}{2}$ oz maximum
- Length: $2\frac{1}{2}$ " minimum, $3\frac{1}{4}$ " maximum
- Widest diameter: $2\frac{1}{4}$ " minimum, $2\frac{3}{4}$ " maximum
- Widest point thickness: $\frac{1}{8}$ " minimum, $\frac{1}{4}$ " maximum
- Widest point center height from bottom: $1\frac{1}{8}$ " minimum, $1\frac{1}{4}$ " maximum
- Widest point must have indents or texture: $\frac{1}{16}$ " maximum depth, $\frac{1}{8}$ " maximum width

Knob for string

Tops are spun by wrapping a 30"-long string around them. The end of the string is attached to a knob. That knob is your design but should have an eyelet or hole to attach the string to and be able to pass through the $\frac{3}{4}$ " by $1\frac{1}{2}$ " hole of the starting gate. String will be provided.

Hints

A shaft that is too thin can break—there is a lot of torque applied when the string is pulled. Leave enough room above the top of the body to wrap the string around the shaft and still fit under cradle of the starting block.

The last top spinning in the center wins. Ideally, that means the winning top will spin faster and longer and knock other tops off balance and end up in the center. In a perfect world, this might all be possible, but in the battle arena, there is strategy to consider: Do you want your top to bang others? Or stay spinning and out of trouble all together?

Other rules

All rulings by check-in and heat judge(s) are final. You may use a back-up top in case of non-repairable breakage, but it must also be weighed in ahead of time and placed in holding blocks.

Substitutions, repairs, or adjustments can be made only for broken tops. After the start of the event, fine-tuning is not allowed. Tops must be returned to holding block between rounds.

To ensure new tops are made each year, competing tops will be collected at the end of event and returned at the end of next year's event.

Another game

We also hold a longest-spin contest. The same rules apply, except that spin tops do not have to have a flat bottom or be textured.

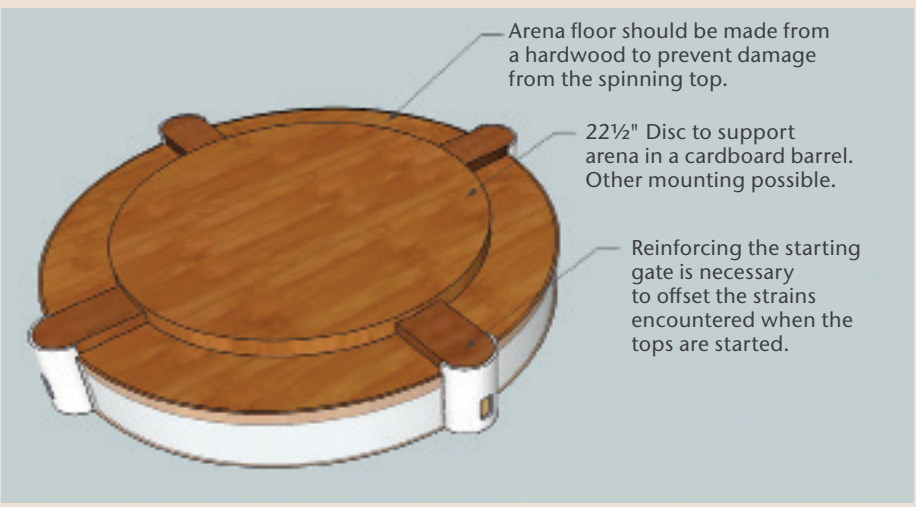


Figure 1. Battle top arena, bottom view

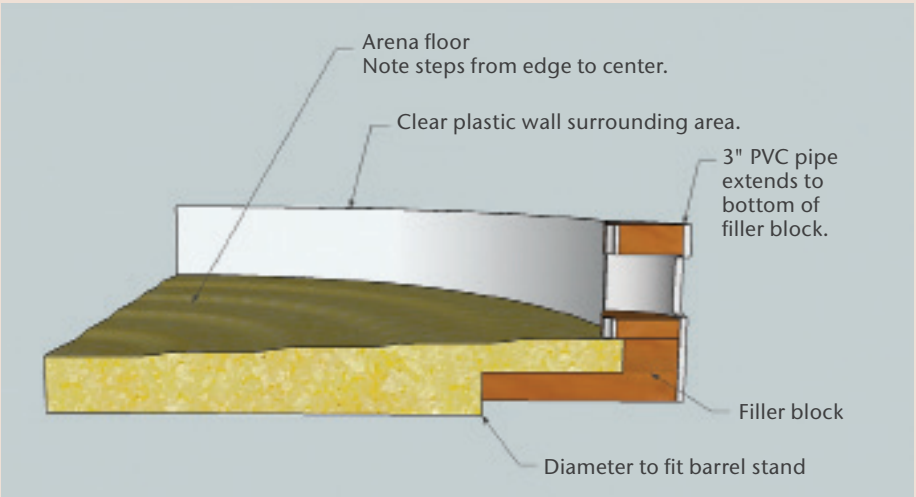


Figure 2. Cutaway of the arena

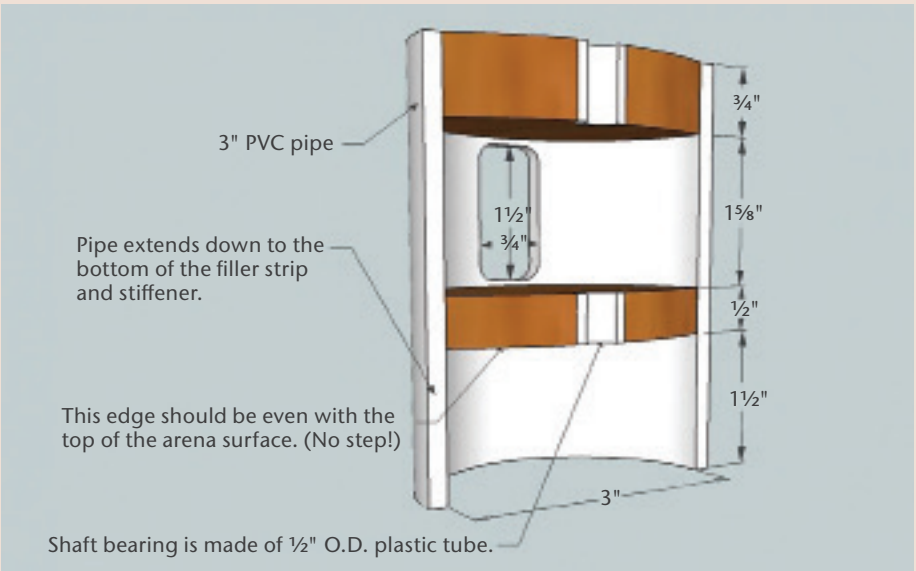


Figure 3. Starting gate

Arena top

I made the arena from glued-up 2"- (5cm-) wide maple boards about 7/8" thick. I used an already-glued up board, which ended up being fairly thin in the middle after turning. To its underside, I had to mount hardwood rails, 2 1/2" (6.4cm) wide by 3/4" (2cm) thick, (which were glued and screwed at the ends where the top was thickest) at 90 degrees to the glue joints in the top to help keep the thin top from warping. To allow the top to be placed on the base with the rails inside the base, the rails were inset from the edge (Photo 2).

For your arena top, I suggest you use thicker boards to begin with and turn the top and insert all as one piece (Figure 1). This removes the need for rails. The insert for the drum could be made in a variety of ways, perhaps from one wide board.

In order to turn the top of the arena, I had to mount the insert to the rails, but did not glue it. To that board, I attached a faceplate and mounted the assembly onto the lathe. I turned the arena top round, then made it concave slightly toward the center in rings about 4" (10cm) to 6" (15cm) wide (Figure 2). The idea is that the incline is slight enough for the tops to be knocked back up to even the highest level. The slight incline of each ring allows the tops to spin on different levels (rings) and not just gravitate to the center all the time.

To create the mounts for the starting gates to attach to the arena, I had to remove the insert and temporarily mount three, 1/2"-thick by 3"-wide boards to the underside of the top. One runs parallel between the supports and is positioned so that it runs through the very center of the top. The board will also stick out past the edges of the top at least 2" on both sides. Add two more (shorter) boards at 90 degrees to this board, also centered, and each one also sticking out 2" past the edge.

There will be four, 2" lengths sticking out of the top, onto which the four starting gates will be mounted.

There are also grooved or dished areas (channels) starting right in front of the starting gates about 4" wide that run straight across the rings, narrowing to 1" or so as they reach the edge of the 6" center. I had to use a pad sander to create these channels, but don't add the channels until after mounting the starting gates. There is no finish on the surface other than occasionally adding mineral oil. Once round, the starting gates can be added as well as the disc that will fit into the drum.

The base is a cardboard 55-gallon drum with fabric around the outside to dress it up. We add sandbags (or logs) for weight during the event. Angle irons attach the top to the base.

Starting gates

The starting gates are 3" PVC (75mm) pipe $2\frac{7}{8}$ " (7cm) high, cut lengthwise (Figure 3). Our starting gates look like they have veneer added, but because I refinish furniture, I made the plastic look like wood by drawing and shading with my touch-up stuff for furniture repair (Photo 3a, 3b, 3c).

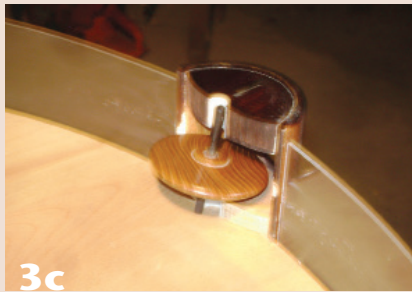
For the $\frac{3}{4}$ " by $1\frac{1}{2}$ " hole for the string to pass through, after the PVC is cut to length, drill two $\frac{3}{4}$ " holes in the back, one at the top of the opening, the other at the bottom. Make straight cuts with a small saw to connect the holes. Sand the sides of the holes smooth; otherwise, the string will rub and fray.

The starting gates are at the point where they need to be positioned onto the top. Place each cut PVC on top of a board and up against the edge of the arena surface. Trace the curved inside edge onto the board. Keep track of which pipe is used for each of the four boards to ensure that the pipe fits its respective board.

Detach the boards and cut the curved ends using a bandsaw. Remount the boards and glue and



3a The starting gate has an opening in the back for the string.



3c A top leaves the starting gate, spinning at top speed.



4 Each spin top needs a 30" string wound around its stem. Competitors design the knobs.

screw them in place. Ideally, they will be equally spaced around the outside of the arena. The vertical channels can now be sanded into the top surface so that the channels will line up with the positions of each starting gate.

The PVC-pipe starting gates need two half-round rests each—one glued into the top and another into the bottom. (I used liquid-nail construction adhesive, but since some of the rests have come off, it's probably best to also screw them to the PVC pipes.) Cut eight 3" - (8cm-) diameter discs, four will be $\frac{3}{4}$ " (19mm) thick and four are $\frac{1}{2}$ " (13cm) thick. Drill a $\frac{1}{2}$ " hole off-center in each of them (for the stem of the spin tops). Glue into each hole a length of $\frac{1}{2}$ " plastic tubing. Cut about one-third of the each disc off in an arc to open up the drilled hole (see Figure 3).

The bottom also needs a filler block that is as thick as the arena top. Use a small length of 3" PVC to draw the circles. One side will be rounded to fit into the starting block and the

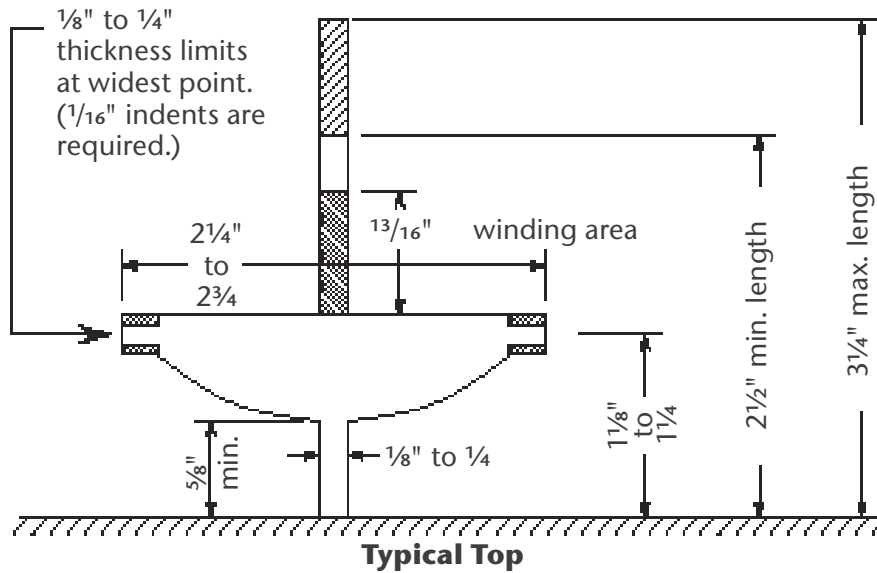
other curved to match the curve of the arena. Glue one disc to the bottom of each of the starting gates (or to the supports sticking out of the bottom of the arena top).

Glue and screw the starting blocks onto their respective rests. It's important for the contestants to brace the starting block with their thumb while they pull the string to release the top ▶



Harry Pye with the trophy he won in 2010.

Measuring tops

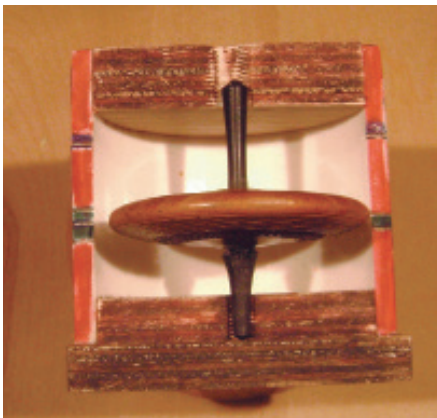


Keystone Woodturners Battle Tops
 Maximum Weight: 1.5 ounces
 (Tip touching the arena surface must be flat, not pointed.)

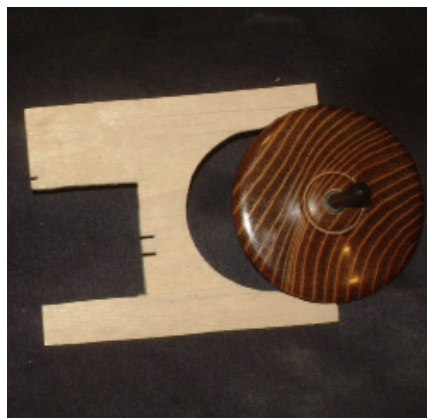
Gauges for spin-top construction



An official diameter gauge can easily measure each contestant's spin top.



A gate gauge helps contestants visualize the specifications for tops.



We supply mini handout gauges for contestants to take home.

into the arena. The starting blocks can come loose.

Measure for the Plexiglas sides. Use a flexible measuring tape or string to measure the distances between starting gates and transfer those distances to the Plexiglas. Cut four lengths. Drill holes in the Plexiglas for the mounting screws. The holes should be slightly larger than the shank of the screws, and the screws need to have wide flat heads. Start on one end and work toward the other end using the holes in the Plexiglas as a guide. Drill each hole in the wood and screw the Plexiglas in place as you go. I made a numbered pattern from Masonite for the sides. The Plexiglas occasionally needs replacing.

Spin tops

Every year, each participant makes a new spin top (or two) for the competition, which is an excellent way to ensure active turning participation with club members (Photo 4). The specifications for designing the tops are given in the sidebar and we have developed a number of gadgets to verify that tops meet specifications (see *Measuring Tops*).

The Battle Tops Competition is a simple idea that through testing quickly became not so simple. It is a lot of fun, though, and worth the work involved. ■

Rob Shafer, president of the Keystone Wood Turners, has been a woodworker all his life and has been turning for eight years. He is president of a furniture-repair service that repairs new furniture for retail stores. Battle Tops is Rob's brainchild. Contact Rob at thegpw@comcast.net for questions.

Harry Pye created the drafting pictures. David Souza, who opens his shop every year for this and other special club events, helped keep me on the right (safe) track turning the arena top.

Battle Tops Joe Larese

Jay Hockenberry, a fellow member of the Nutmeg Woodturners, was looking for a turning project that would interest the kids involved with the Waterbury Youth Services. I remembered how much fun my kids had with string-propelled tops and realized calling them “battle tops” would add some competitive fun. The construction is relatively easy with adult supervision. Be sure to make at least two handles and two tops so you can have a spin-off!

The handle

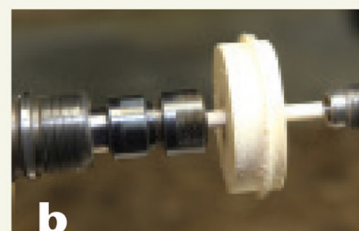
1. Start with a ¾"- (19mm-) thick board, 2¾" wide × 7½" long (70mm × 191mm).
2. Using a drill press and a 1½" (38mm) hole saw, drill a hole centered to the width and 1½" in from one end.
3. Draw on the handle shape and cut out with a jigsaw or band saw.
4. Turn the handle on edge and drill a ⅝" hole 2⅜" deep, being sure to intersect the 1½" inch hole at the center. Drill through one edge of the handle, but only part way into the opposite edge (*Photo a*).
5. Sand to round the edges and make the handle comfortable to hold.

The top

1. Use a 2½" (64mm) hole saw with a ¼" (6mm) pilot drill to create a disk from a ¾"-thick pine or poplar board.
2. Cut a ¼"-diameter wooden dowel 5" (127mm) long.
3. Glue the dowel into the disk with 1¼" (32mm) protruding from one end.
4. To turn, sand, and paint the disk, you can mount the longer end of the dowel in a pen mandrel whose ¼"-diameter shaft has been removed. You can also hold the top in a Jacobs chuck mounted in the headstock spindle of your lathe. With either method, bring up the tailstock for support (*Photo b*).
5. Turn, sand, and paint the top (*Photos c, d*).
6. Drill a ⅞"- (3mm-) diameter hole in the shaft of the top (*photo e*).
7. Attach a 2" (51mm) length of dowel to a piece of string about 24" (61cm) long.

Wind and go!

Slip the shaft of the finished top into the handle and thread the string through the small hole. Grip the top and turn, winding the string around the shaft. Pulling the string quickly allows these tops to spin much faster than finger-spun tops. Create a battle top arena by cordoning off a section of a table (better yet, turn a large platter with a rim) and challenge a friend to see who has the top top.



BALLERINA SPINNING TOP

Turn a Dancing Top



The ballerina spinning top offers a change of pace for top-makers.

With the addition of tiny arms, this top creates the illusion of a graceful ballerina dancing across the floor.

Turning the Body



Photo 1

To make the top, select a hardwood such as maple. Begin with a blank that measures about 4" × 2" × 2" (10cm × 5cm × 5cm). If the blank is square, I mount it straight into a four-jaw scroll chuck. No need to turn a tenon.

Using a roughing gouge or a spindle gouge, turn the blank into a cylinder (Photo 1). Then using a pencil, mark the cylinder with lines corresponding to the bottom of the ballerina's dress, her waist, her shoulders, neck, and head (Photo 2). After turning my first two tops, I discovered that it is easy to make the dancer too top-heavy and she won't spin satisfactorily. On my third design try, I opted to keep more weight in the bottom of the dancer.



Photo 1



Photo 3

You don't need a sharp point, but rather, a slightly rounded point for her to "dance" on.

Use a spindle gouge to shape the legs of the ballerina. You don't need a sharp point, but rather, a slightly rounded point for her to "dance" on (Photo 3). Next, shape the dancer's tutu. Here is where I first went wrong. I removed wood from beneath her skirt, thus making the dancer top-heavy. Instead, turn a slightly concave curve at the bottom of the skirt toward her legs, then curve the top of the skirt toward the waistline. To reduce weight from the top portion, use the spindle gouge to give the dancer a small and delicate waist with a slight curve up to the shoulders (Photo 4).

To create the dancer's neck, I use a parting tool, then switch back to a spindle gouge to turn a round bead for her head (Photos 5 and 6). Feel free to create little hats that can be used as handles to spin the top, but be careful not to add too much weight up top. My ballerina is set to dancing by a twist of her little round head.



Photo 4



Photo 5



Photo 6

**Photo 7**

Turning the Arms

Turning the two tiny arms can be challenging as both arms must be the same size. Begin with a blank that measures $1/2" \times 1/2" \times 3"$ ($12\text{mm} \times 12\text{mm} \times 7.5\text{cm}$). Insert the square blank into small jaws, pushing it in so that only about $1\ 1/2"$ (4cm) is exposed. This will help prevent vibration. Use a spindle gouge to turn the blank into a cylinder. Depending on the height of your finished top, the arm length will vary from about $3/4"$ to $1"$ (2cm to 2.5cm). Use a ruler and pencil to mark the overall arm length and the hand position (Photo 7).

**Photo 8****Photo 9**

Tiny holes must be drilled for the eye screws that will fasten the arms to the body. A skew can be used to create a small divot in the end of the arm blank. Then using a small drill bit that approximates the size of the eye screw, drill a hole the length of that eye screw (Photo 8). You are now ready to turn the arm using a spindle gouge. When you are satisfied with the shape, sand it and part it off with a skew (Photo 9).

Loosen the small jaws and extend the blank so that another $1\ 1/2"$ is exposed and proceed as with the first arm. Use calipers to make sure that the diameters of the two arms are equal.

Assembling the Parts

You are now ready to attach the arms to the body. Begin by placing a small pencil mark on each shoulder where the eye screws/arms will be attached (Photo 10). I usually just eyeball this. If you have a Dremel and Dremel drill press, it is quick work to use a tiny drill bit and drill the two holes (Photo 11). Otherwise, you can use a full-sized drill press. Next, use two pairs of needle-nosed pliers and

open the eyes on two eye screws. Dip each end of the eye screws into wood glue, medium cyanoacrylate (CA) glue, or epoxy, then screw them into the top end of the arms and into the body (Photo 12). Slip each of the two open eyes into the eye screws that have not been opened. Use the pliers to close the eyes (Photo 13).



Photo 10



Photo 11



Photo 12



Photo 13



Photo 14

Your ballerina top is now completed, although you may choose to paint the top with acrylics, dyes, markers, or colored pencils (Photo 14). These are wonderful birthday and Christmas gifts for children. Have fun spinning!



Photo 15

~ Janice Levi
Groesbeck, Texas

I began turning wood about 14 years ago and like most new turners, I turned every type of wood and every type of shape that I could imagine. I then began to decorate those turnings. During the past three years, I have concentrated on turning wearable art—jewelry and purses. These tiny bits of wood provide endless opportunities for shape and style and enhancement. And the best part is, I can wear them!

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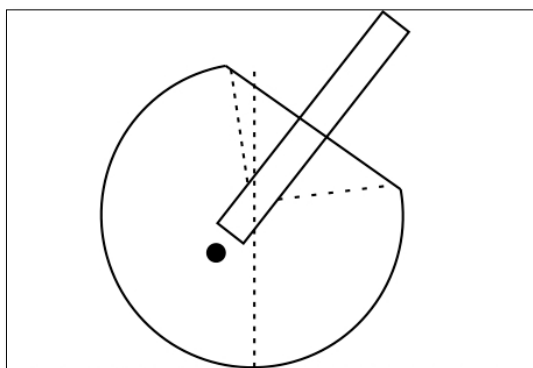
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TURNING A TIPPE TOP

Giving tippe tops to kids of all ages is FUN!

A tippe top has the curious property that when it is given a good spin, it will, on its own, flip upside down and spin on its stem. Tippe tops became somewhat popular in the 1950's and 1960's, but now most people have never heard of them. It is not difficult to make a top that looks like a tippe top, but to make it work properly takes some care. Here we reveal the secrets we discovered, mostly by trial and error, that make a tippe top work.

In order for a tippe top to work, the center of mass should be low in the top, as shown in the diagram below where the center of mass is marked with a dot.



Keeping the center of mass low can be accomplished in a variety of ways. First, the top can be hollowed fairly deeply to get rid of a lot of the mass that is high in the top. Second, one could place a weight (we use a ¼ inch ball bearing) low inside the top. Third, the blank could be made by gluing a dense wood on the bottom and a light wood on top.



Photo 1: Shows tops made using these three methods.

Another issue is that the top requires a good spin to have enough energy to flip. If the top is too large, then it is too difficult to spin fast enough. The ideal diameter seems to be between ¾ inch and 1 ½ inch.

Here is an outline of how to turn a tippe top. We are assuming that the blank will be mounted for a spindle turn, that is, the grain runs parallel to the axis of the lathe. You can also turn it cross-grained by making the appropriate modifications. Most importantly, DON'T use a spindle roughing gouge or a skew for cross-grain turning! Photo 2 shows the outcome of the steps below. We refer to the various stages below by counting from the left.

1. Start with a blank that is ¾ to 1 ½ inches square and at least 2 inches long. Maple is a great choice if you plan to decorate the top, but any wood works. Mount between centers and make a tenon as the first turning

in photo 2. Then mount the blank on a chuck and turn it round (typically with a spindle roughing gouge or a bowl gouge) as in the second turning of photo 2.



Photo 2

2. Next start turning the body of the top and hollow it as in the third and fourth turnings in photo 2. You can use a spindle gouge, detail gouge, gouge, or even a bowl gouge. Be sure to leave enough support material that the body can be hollowed. Hollowing can be accomplished by pushing a gouge into the center of the body about 1/8 of an inch with the bevel at approximately 45 degrees and then pulling the gouge toward you. If you intend to insert a weight, do not hollow very deeply. If you do not plan to insert a weight, then hollow to at least the widest part of the body. (That is, if it were a whole sphere, hollow to at least the center.) Drill a 1/4 inch-diameter hole for the stem as in photo 3 and the fifth turning in photo 2. Make the hole 1/4 inch deep if you are not adding a weight and 1/2 inch deep if you are.

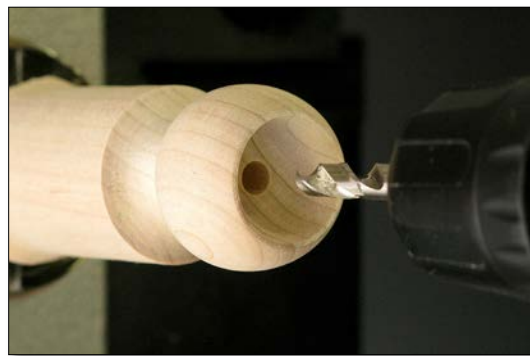


Photo 3

3. Now is the time to sand and finish the inside of the top. Finish by rubbing a small stick of carnauba wax on the surface and then polishing with a paper towel or rag while the lathe is turning fast. Repeat this process two or three times. If you wish, you can texture with your favorite texturing tool and add color with a paint marker before waxing.
4. Turn the outside of the top to be approximately round and part it off with a parting tool.



Photo 4

- There are several methods of mounting the body of the top. For example, use a ¼ inch collet or a drill chuck that allows you to mount a ¼ inch steel rod approximately 1 ½ inches long or steel dowel pin. Another method is to make a jam chuck. Photo 4 shows all three options. Use the drilled ¼ inch hole to mount the top as in photo 5. One advantage of the jam chuck, photo 6, is that its size is adjustable.

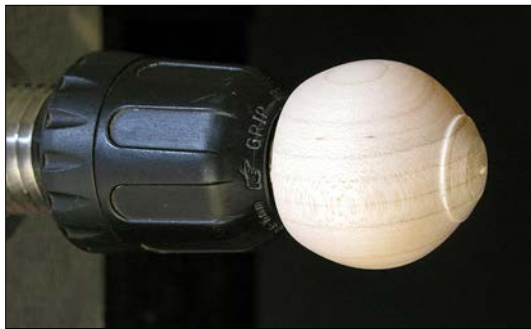


Photo 5



Photo 6

- Finish turning the outside of the top, making sure that the shape is approximately round as in photo 6. The top seems to work better if it is a little shorter than a perfect sphere.

- Sand and finish with carnauba wax as before. Again, you can use a texturing tool and paint pens to decorate the top before finishing.
- If you planned to use a weight to lower the center of mass, insert a ball bearing into the ¼ inch diameter hole and push it to the bottom. A drop of CA glue will secure the ball bearing, if it fits loosely.
- Plan to have the stem extend approximately ½ inch above the body and measure the length needed for the stem.

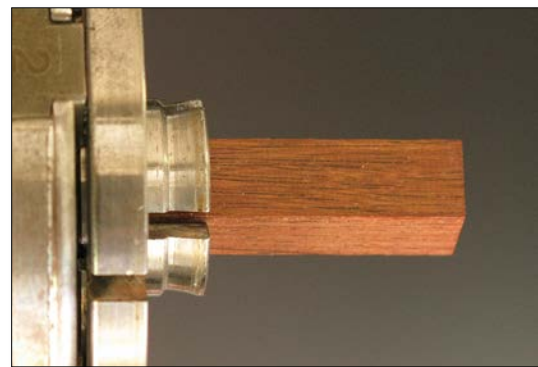


Photo 7

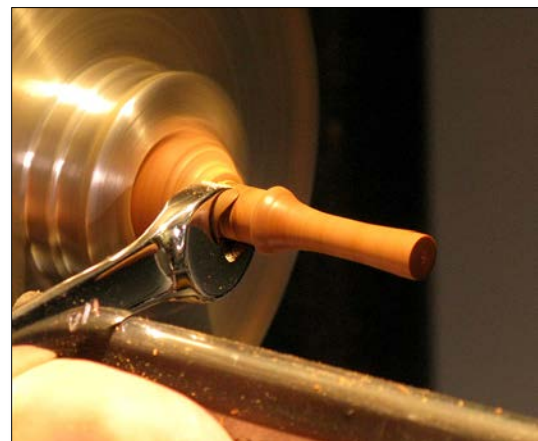


Photo 8

10. Use a blank approximately ½ inch square by at least 1.5 inches long for the stem. Mount in a chuck as in photo 7 and turn the stem. Make the stem ¼ inch in diameter or less. Give the stem a nice shape. Make the tenon 1/4 inch diameter to fit snugly in the hole drilled earlier. A sharpened ¼ inch wrench can be used to size the tenon, assuming the hole is not oversized. See photo 8. Be careful about the shape of the top of the stem. It can be flat, concave or slightly convex. The stem in photo 2 has a flat top. If it is too convex, when the top flips up, it will not catch, but just fall.



11. Now is the time to wax and polish the stem. You can texture and paint the stem, if desired.

12. Insert the stem into the top and test it. If it works well, glue it, and you have finished, but if not, the top may still be salvageable by reshaping the body, or if it almost works, by using a longer or shorter stem.



With some practice you can make a very attractive and working tippe top in less than 30 minutes. Have fun making, playing with, and giving kids (of all ages) tippe tops!

~Neal Brand and John Solberg
Both of Denton, Texas

Neal Brand and John Solberg are members of Golden Triangle Woodturners in Denton, Texas, where they each have served as president. They are also members of Dallas Area Woodturners and Woodturners of North Texas. They each joined AAW soon after they started turning wood approximately 10 years ago.

I enjoy making spinning tops and look for ways to decorate them without interfering with their spin quality. Here is a simple technique I recently found while searching for more intensely colored felt-tip pens. Similar to children's spin art, this method involves adding color to a spinning canvas—your workpiece—making use of centrifugal force to spread the paint.

Turn and prepare the top

Turn a top to your design. It is best to use a straight-grained, defect-free, dense, light-colored wood, such as maple, birch, pear, or madrone. Leave enough holding wood at the handle end to resist pressure from the splash pen later. If your cutting tool is sharp and producing a good surface, you may be able to sand with only 500-grit abrasive. I like to polish the wood further with high-grit, diamond-coated, pen-buffing pads and then burnish it with wood shavings and buff with a paper towel. Slow the lathe and apply a shellac-type sealer/finish, which acts as a base on which to add color.

Apply color

When the sealer has dried, apply a series of colors using felt-tip pens (I use Permapaque® brand). Run the lathe slowly, as before, and touch the pen to the spinning wood to create circular lines (Photo 1). You can also add spiral lines by pulling the pen across the turning surface at a consistent pace. You can do this with a variety of colors prior to adding the “splash” effect.

To achieve the spin-art look, where the color is spread onto the wood by the forces of the spinning wood, use a high-flow acrylic paint pen or marker (some brands include Molotow, Montana, and Golden). I have used 15mm broad-tip markers in black and white. They are also available in yellow, red, blue, green, and pink, as well as with narrower tips. The tips take a beating from this application,

SPLASH TOPS

Phil Cottell



but they are reversible and exchangeable. The markers can be refilled.

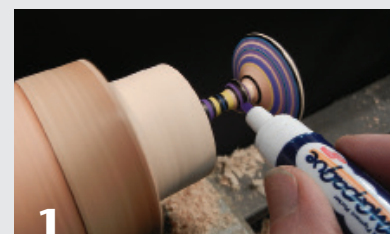
When the high-flow paint is applied to a spinning workpiece, it readily sprays outward from centrifugal force, creating the radiating lines, or “splash” effect. Ensure the paint is flowing well by plunging the tip of the acrylic pen/marker against a paper towel; keep the tip pointed downward. With the lathe speed at about 3000 rpm, press the tip of the marker onto the spinning top, near its center. Stop the lathe and examine the result (Photos 2, 3). Touch up at slow speed with felt-tip pens if needed.

Allow the paint to dry (this does not take long), then apply a compatible wax, such as the microcrystalline variety made by Renaissance, buff, and part off. Hand-sand the tip of the handle, apply wax, and *voilà!* The combinations of top design, color, and splash patterns are limitless.

Other uses

A bit of useable wood will remain on the chuck after parting off the top. This can be used to make a splash button, pendant, brooch, or scarf keeper using the same technique and without having to do a separate glue-up. ■

Phil Cottell is a founding member of the Island Woodturners Guild, an AAW chapter. He turned his first bowl in 1998, after a career in forestry research and teaching. He studied forestry at the University of British Columbia and at Yale and is a life member of the Association of BC Forest Professionals. Phil lives near Victoria, BC, with his wife of 50 years, Donna, and their found dog Flower. He can be reached at plcottell41@gmail.com.



1 Add circular lines with felt-tip pens.



2 Use high-flow paint in a pen or marker to add the “splash” effect.



3 Centrifugal force will “throw” the paint outward from its point of application.



This method also works well on other small turnings, such as pendants, buttons, or Christmas ornaments.

Put a Spin on Spindle Work

A Colorful Top for Summer Fun



The students in my beginning classes always seem to enjoy turning tops. Tops are fun to make, as well as to use, and they offer a great spindle gouge and skill building practice.

And, if you like colorful things, you can do to any art supply or hobby store and outfit yourself with markers that will transform your turning into any color combination you can imagine.

I start by gluing a 2" x 2" Eastern hard maple block to a scrap attached to my faceplate. Maple is a good turning wood and its fine texture and light color make it ideal for playing with various combinations of colors.

As with any turning project, sharp tools are important. The sharper the edge, the easier and cleaner the cut. A little time spent sharpening now will reduce the sanding work later. In fact, I encourage people to improve their cuts so only minimal sanding is required. A cleanly cut surface also takes color better.

STEPS

1. Turn the cylinder true, using your favorite spindle gouge. As soon as I have a cylinder, I begin shaping the end farthest from the faceplate. This will become the bottom of the top, so make the bevel smooth and gentle.



2. Decoration begins immediately. First I use a colored marker, then texture some of the colored areas with a chatter tool. To do this, pull a chatter tool along a line to 7:30, pressing hard enough to create chatter. Experiment to get the feel of how lathe speed and pressure affect chatter.

Contrasting smooth bands of color with textured ones is very interesting, although you could use just smooth bands, if you prefer. Any combination of colors you like is OK.

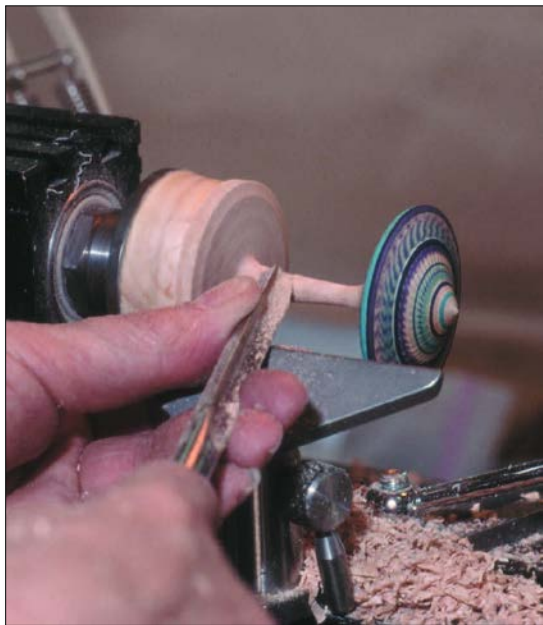
3. Begin to shape the top end of the top. Always work downhill, riding the bevel for the cleanest possible cut. You don't want to make the body of the top too thin, but you do have a lot of room for your own design interpretation. Avoid flat areas on the top and bottom. Work with gentle curves to blend the body into a stem about $3/16$ " in diameter. The secret to a good spinning top is a thin handle. The main disc is about $1/4$ " thick at the rim. I like to shape the rim too. The top should be user friendly, so avoid making really sharp edges on the disc.



4. Continue to refine the handle. Aim for a diameter of about $3/16$ ". Work from the body to the thinner end to prevent breakage. You might like to bring up the tail stock for extra support.



5. As you refine the handle, it's fun to continue to decorate the domed area connecting the flat part of the top and the stem. Again, markers make it easy to apply colors to the top while it is spinning on the lathe. I like Tombow and Staedtler markers.



6. When you are satisfied with the stem, carefully part it off with the long tip of a skew.

Cut carefully to avoid tear out and leave a smooth-to-the-touch end on the stem. Cradle the top in your hand as you cut, so you can catch it as it comes free. Then apply Carnuba wax with a buffing wheel to seal in the color.

~ Bonnie Klein
Renton, WA

WHERE TO TURN FOR WOODTURNING

Selected readings from *American Woodturner*, journal of the American Association of Woodturners

Getting Started in Woodturning

1. Safety for Woodturners
2. Lathes and Turning Tools
3. Learning at the Lathe
4. Practical Woodturning Projects

Elements of Woodturning

1. Turning Holiday Ornaments
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Tops Tops Tops

Simple Projects for Fun, Thanks to Dave Hardy

I don't care whose shop or studio you visit, you can always learn something new – a new technique, a method of working or just a new idea.

I visited Dave Hardy's shop in Pennsylvania while assisting on the next "Masters of Woodturning" video and a new sharpening video. We ended up in Dave's display room where I noticed two tops. One was a "CD" top and the other was a Dreidel. One ancient, the other about as modern as you can get. Dave kindly gave me his permission to "steal" his two tops and present them to the AAW membership.

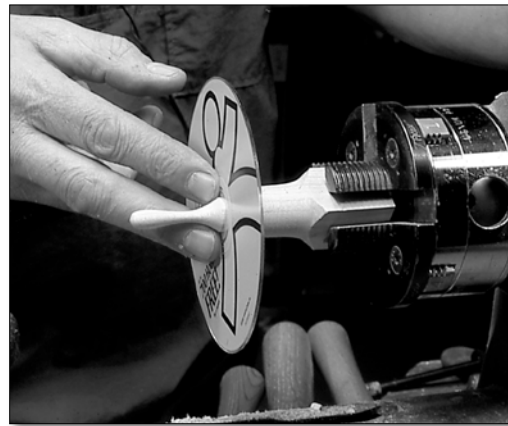
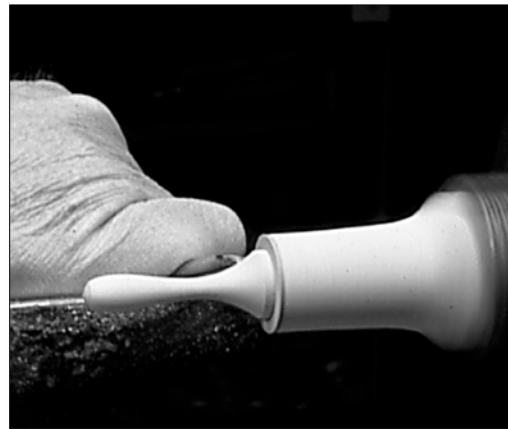
THE "CD" TOP

The CD top is probably one of the simplest projects that you can come up with, but it answers the age old questions. "What do you do with all those CDs?" The answer for some creative woodturners is simple – turn them into spinning tops. At the very least, this is the type of project that will (may) entertain your family and friends. It would be a very basic project for beginners or perhaps a good demonstration project at your local elementary school.

All you need to get started is a few old CDs. If you don't already have enough, you might try the supermarket or bookstore. The last time I was there, they had a box full of them. At first I felt a little guilty about grabbing one, but the lady at the cash register told me to help myself. I did; I have enough CDs for a while.

Next you need a chunk of hardwood. Maple, oak, walnut, cherry will do just fine. The turning stock should be about 1" square and about 4" to 4 ½" long.

I support the piece in my OneWay Talon chuck with spigot jaws, which is available from many turning supply houses. That way I don't have to worry about using the tail center as I turn. No fancy chuck? Fasten a waste block to a small faceplate, drill a 5/8" hole in it. Turn a 5/8" tenon on your top stock and glue it into place. Turn and sell enough tops and you can probably afford that fancy chuck.



Use a roughing out gouge to turn your stock to a cylinder and then switch to a spindle gouge to refine the shape. Dave Hardy and I both agreed that the top of the top should be toward the tailstock.

This allows you to turn a shoulder and make sure the stem fits the CD opening, without removing the stock from the jaws of the lathe. Once the handle of the top and the shoulder are finished, you can work on the point or the business end of the top. Once I have the shape where I want it, I use the long point of the skew to part the piece from the lathe and create a sharp point for the top to spin on.

Prior to parting the stem from the lathe, you might consider adding a little decoration with marking pens. Odd pieces of colorwood also work great for tops. A little 5-min. epoxy fixes the CD to your turning, and you're off and running (Uhhh, spinning).

THE DREIDELTOP

My first comment upon trying the Dreidel top was that it did not spin for very long. After a little bit of research on the Internet, I discovered that the Dreidel was not supposed to spin very long. The markings on the sides are part of a game of chance the side that ends up after the piece stops spinning and falls down determines the winner.

The Dreidel is not only a game, but in ancient times the four-sided spinning top was a way for children to defiantly study the Torah in a time when doing so was punishable by death or imprisonment. Using the Dreidel, children could study in public. When enemy patrols were nearby, they could pretend to be playing the game of Dreidel.

Today this traditional top is more often part of a spirited Chanukah game. On each side is a Hebrew letter: "Nun," "Gimel," "Hay" and "Shin." These letters collectively stand for the phrase "a great miracle happened here." Players place raisins, nuts or candies into a kitty. Each player takes turns spinning the Dreidel. If "Nun" turns up, you win

nothing and lose nothing. "Gimel" means that you win the whole pot. "Shin" means that you must put more into the kitty. And "Hay" means that you win half of what is in the kitty. When a pot is won, a new round begins until a Dreidel champion is crowned. (If you don't know a Hebrew scholar, use other lettering or a photo on each side. You can also find the Hebrew letter information on the Internet through a quick Google search.)



The Dreidel I received from Dave was about 1 ¼" square, but I understand that they can range from about 5/8" square to about 2" square and the characters can be carved or hand lettered. If you turn one 1 ¼" square, start with stock that is about 4 ½" long and secure it in your chuck. Actually, you use the same turning procedure used with the CD top, except that the orientation is just the opposite. The spinning tip is facing the tailstock. And, on the body the goal is to round the long edges – leave the flats to write on.

I generally use the long point of the skew to make a nice sharp point on the Dreidel, but a spindle gouge will work just fine. Then turn a handle and carefully part it from the lathe. The handle can be as simple or as ornate as you choose.

As always, have fun.
~ Bob Rosand
Bloomsburg, PA

TIMELESS SPINNING TOPS

“Whip Top” or “Parish Top” made for games and contests



Photo: Tib Shaw

As a woodturner, I make all sorts of objects, both decorative and functional, but by far my favorite is turning tops. Not only because spinning tops delight and entertain children; their appeal appears to be universal, appealing to all ages, across every culture, rekindling the child in all of us. Tops may be even more timeless and universal than we thought - historical research shows that clay and terra cotta spinning tops have been around for at least 5,500 years! Tops may have been one of the first non-essential objects turned on primitive lathes, though we may never know for sure.

Tops come in a wide variety of forms from tiny finger twirlers to enormous Chinese tops up to 120 pounds. Spinning tops appear to have arisen in multiple places around the globe. When Europeans came to North America, they brought their tops with them, but were probably surprised to learn that the Native Americans they encountered already had tops of their own.

One sort of top that was very well known in colonial America has fallen out of favor, and is only rarely seen these days.

These are tops that are started by hand - usually both hands - and can be kept spinning indefinitely by swatting them with a sort of whip, thus they are generally known as "whip tops." The whip is usually a wooden stick with a few long strips of rawhide or eel skin attached at one end. In practice, a right-handed person would reach down and spin the top very quickly clockwise with both hands, then keep it spinning with repeated whippings.

Whipping the top can impart both spin as well as direction, so with practice you can direct the top to go across the floor or yard in a desired direction, making them a natural focus of many games and contests. These tops were in common use in Europe as well as America 200 years ago, so common that a larger top was often kept in the school yard and parish hall (nowadays town hall or city hall in most areas), so they became known as "Parish Tops." Parish top contests were often mentioned in colonial writings as a form of entertainment, and some schoolmasters considered them a way to allow children recreation and even a way to keep warm during the winter months. Native American versions were often a short section of a log sharpened to a point on one end with a hatchet.

Whip tops may be conical in shape or more cylindrical, with a pointed end that touches the ground. Both shapes were in use as far back as ancient Greece by both children and adults, and can be seen depicted on pottery of the time.

In northern regions of Europe and North America, frozen ponds and waterways made an excellent surface for spinning tops, and larger tops - as much as 10 pounds or more - were used on ice for sport and recreation. Similar to adult softball leagues today, parish top teams competed between villages and even between Native American tribes.

Making a whip top is an easy turning project. Just turn a cylinder about 2-1/2" to 3" in diameter with a blunt point on one end, a 45-degree cut to center will do fine. Make the top no taller than about 3" to 4" total, taller forms are too top heavy, and much harder to spin by hand. For use on hard surfaces like concrete, it may help to insert a metal tip of some sort; I've drilled a tiny hole and inserted a large upholstery tack that has worked just fine. A whip can be fashioned from an old broomstick, and a pair of long rawhide boot laces will do well for the lash material. With whip and top completed, all you have to do is go outside and get the thing spinning, and get some practice whipping it to keep it spinning upright. Don't be surprised if you attract a crowd of on-lookers who will want to give it a try. This is a great opportunity to ask them if they'd like to make one of their own, and you can recruit another to the ~~addiction~~ - er, hobby, that is - of woodturning!

~ Brad Vietje
South Ryegate, Vermont

Photos:

Tops of ancient Greece:



[Weblink to this image, click here.](#)

Another ancient Greek form (the basis for my copy):



[Web link to this image, click here.](#)

References:

Culin, Stewart: *Games of the North American Indians: Games of skill, Volume 2.*
[On-line version with diagrams, click here.](#)

Oliver, Valerie: *History of the Top.*
Spintastics Skill Toys, Inc. 2002; revised October, 2003.

SAFETY TIPS

Woodturning safety is YOUR responsibility

Safe, effective use of a wood lathe requires study and knowledge of procedures for using this tool. Read, thoroughly understand, and follow the label warnings on the lathe and in the owner-operator's manual. Safety guidelines from an experienced instructor, video, or book are good sources of important safety procedures. Please work safely.

ENVIRONMENT

- Don't use a lathe in damp or wet locations or in the presence of flammable liquids, vapors, or gases. Always keep a fully-charged fire extinguisher close at hand.
- Guard against electric shock. Inspect electric cords for damage. Avoid using extension cords.
- Frequently remove shavings from the floor while turning. Eliminate all slipping or tripping hazards from the floor around the lathe and work area.
- Keep your work area well lit and well ventilated. Use anti-fatigue floor matting at the lathe workstation.
- Use a powered dust-extraction system to remove wood dust and other air-suspended particles while sanding or generating any form of dust.
- Do not be distracted. Keep pets out of the shop. Ask family members to enter the shop carefully if the lathe is running, so you aren't startled, and to wait until you turn off the lathe before trying to get your attention.



EQUIPMENT

- Keep lathe in good repair. Check for damaged parts, misalignment, binding of moving parts, and other conditions that may negatively affect its operation.
- Ensure that all guards, belt covers, and other safety features are in place.
- Keep the lathe bed, toolrest holder (banjo), and tailstock mating surfaces clean and operating smoothly. Remove rust or debris that would cause binding.
- Keep turning tools sharp and clean for better and safer performance. Inspect frequently for cracks or defects. Don't force a dull tool. Never use a tool for a purpose for which it was not designed or intended.

PERSONAL PROTECTION EQUIPMENT

- Using a full face shield is recommended for all woodturning operations, but especially for bowl, vessel, or any medium to large turned pieces involving chucks and faceplates. At a minimum, use safety goggles or safety glasses that have side protectors when turning small items.
- Fine particles from a grinder and wood dust are harmful to your respiratory system. Use a dust mask, filtering respirator, or a powered air filtration respirator (PAFR), in conjunction with a dust-collection system and proper ventilation. Be especially mindful of dust from many exotic woods, spalted woods, or any wood that might give you a skin or respiratory reaction.
- Wear hearing protection during extended periods of turning, grinding, or power carving.

BLANKS & TURNING MATERIALS

- Turning stock should be physically sound and carefully inspected for cracks, splits, checking, ring shake, and other defects that compromise the integrity of the wood. Always be aware that defects may be present but undetectable through visual inspection.
- Exercise extra caution when using stock with any known defects, bark inclusions, knots, irregular shapes, or protuberances. Beginners should avoid these types of stock until they have greater knowledge of working such wood.
- Frequently stop the lathe and inspect the blank to determine if defects are

being developed or exposed as material is removed. Discard blanks that have significant defects. Adding adhesives to attempt to “fix” defects in the blank is not advised. Do not rely on glue to keep a defective blank together.

TECHNIQUE

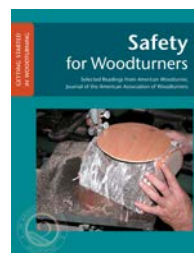
- Tie back long hair, bangs, and beards. Do not wear gloves. Avoid loose clothing, jewelry, or any dangling objects that may catch on rotating parts or accessories.
- When using a faceplate, be certain the workpiece is solidly mounted with stout screws (#10 or #12 sheet metal screws as a minimum). Do not use drywall or deck screws. When turning between centers, be certain the workpiece is mounted firmly between the headstock drive center and tailstock center.
- Before starting the lathe, rotate your workpiece completely by hand to make sure it clears the toolrest, banjo, and lathe bed. Be certain that the workpiece turns freely. Ensure the blank is held securely by the drive center, faceplate, or chuck.
- Always check the speed of the lathe before turning it on. Use slower speeds for larger diameters or rough pieces and higher speeds for smaller diameters and pieces that are balanced. Always start a piece at a slower speed until the workpiece is balanced. If the lathe is shaking or vibrating, lower the speed. If the workpiece vibrates, always stop the machine to verify why. Ensure the lathe speed is compatible with the size of the blank.

- Be aware of what turners call the “red zone” or “firing zone.” This is the area directly behind and in front of the workpiece, the areas most likely for a piece to travel into as it comes off the lathe. A good safety habit is to step out of this zone when turning on the lathe, keeping your hand on the switch in case you need to turn the machine off. When observing someone else turn, stay out of this zone.
- Hold turning tools securely on the toolrest, holding the tool in a controlled but comfortable manner. Always contact the toolrest with the tool first before contacting the wood.
- Turn the lathe off before adjusting the toolrest or repositioning the banjo. Following these adjustments, again rotate the piece by hand to confirm that all parts of the piece will not encounter an obstruction.
- Always remove the toolrest before sanding, finishing, or polishing operations.
- Do not use cloth to apply finishing or polishing materials if you intend to contact a rotating object on the lathe. Never wrap polishing materials around fingers or hands.
- When a lathe is running in reverse, it is possible for a chuck or faceplate to unscrew if it is not securely tightened or locked on the lathe spindle. Use spindle-locking screws in the faceplate or chuck if turning in reverse.

ROUTINE

- Check that all locking devices on the tailstock and toolrest assembly (rest and base) are tight before operating the lathe. Frequently check the tightness of chuck jaws throughout the woodturning session.
- Remove chuck keys, adjusting wrenches, and knockout bars. Form a habit of checking for these before turning on the lathe.
- Know your capabilities and limitations. An experienced woodturner is capable of using lathe speeds, techniques, and procedures not recommended for beginning turners.
- Don’t overreach, keep proper footing, and keep your balance at all times.
- Never leave the lathe running unattended. Don’t leave lathe until it comes to a complete stop.
- Stay alert and watch what you are doing. Pay close attention to unusual sounds or vibrations. Stop the lathe to investigate the cause. Don’t operate machines when you are tired or under the influence of drugs or alcohol.

~ Rob Wallace
Ames, Iowa
AAW Safety Committee Chair



Members: [Click here to download a free digital copy of AAW’s 66-page Safety for Woodturners book.](#)

GALLERY OF TOPS



Robert Sakauye

BEYOND THE SIMPLE TOP

Since the flowering of artistic woodturning in the 1980s, the humble spinning top has evolved into a vehicle of creative expression for many. Long known for her chatterworked and vibrantly colored tops, for example, Bonnie Klein recently created *Fire and Ice*, reminiscent of fine-cut crystal. It illustrates just how far her continuing explorations have ranged with the use of alternative materials, rose engine detailing, and detachable parts (note the offspring and internal flame). Her crisply foliated collaborations with Jacques Vesery further celebrate the lavish top. Magical intricacy also infuses Robert Sakauye's tops, with their kaleidoscopic surfaces and mating receptacles. The meticulous work of Randy Rhine suggests a similar penchant for labor-intensive assembly and calculated pattern exposure, graphically documented on his website. Comparable precision is evident in the starburst layups of Eli Avisera's blockless dreidels, which rest on lettered containers for Chanukah presents. In contrast, Judy Ditmer's executive models and

mini-spinny earrings rely on festive bangles to set them apart from traditional tops and make an imaginative leap to the jewelry department.

With little ornamentation, the other tops here take a radically different approach to complexity. John Lucas's microtop series achieves its drama through visualization of a mathematical progression toward the infinitesimal. With a length one-half the width of a parting tool, the smallest member hints at even tinier, invisible tops receding toward the spin of quarks. The trio of tops from high-end furniture manufacturer Herman Miller also envisions relationships—in this case, the interactions of a dance ensemble twirled en pointe. These tops do not need to be stationary to be fully appreciated. They pay tribute to the modernist aesthetic and playfulness of designers Charles and Ray Eames, whose seven-minute film *Spin Tops* (viewable on YouTube) remains a classic for top enthusiasts.

—David Fry

Randy Rhine,
Yellowheart, pink
ivory, boxwood,
blackwood, brass



Randy Rhine, Blackwood,
pink ivory, boxwood,
Colorwood, segmented and
ornamental turning, inlay

See more of Randy's work at
randyrhine.com.



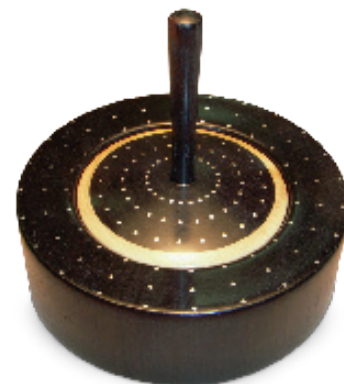


Judy Ditmer, assorted tops (clockwise from lower left), tiny executive tops with beads, ½" (13 mm) dia; regular tops 1½" (38 mm) dia; executive top with beads; tiny tops ½" dia, mini-spinnies (earrings with removable earwires become functioning tops)



Robert Sakaue, peg top box, African blackwood, boxwood, bloodwood, 3" x 2¾" (76 mm x 60 mm)

See more of Robert's work at gallerym.net.



John Lucas, microtops, African blackwood, ½" to ¼" (13 mm to 1.6 mm) high



Robert Sakaue, *Starry Night* top, African blackwood, boxwood, silver; 2¼ x 2" (60 mm x 50 mm)



Geoff Whaling, 2010-2012, small collection of square- and radial-laminated spinning tops, various timbers and veneers. Typically 3" x 1¾" (75 mm x 45 mm)

My initial foray into making tops was a deliberate plan to develop spindle-turning skills. Lamination of timber became more pronounced through seeing Jack Wooderson create simple yet effective patterns in tops using concentric rings with laminated veneers as dowel inserts. Exposure to many influences from turners such as Jim McPhail, Randy Rhine, Randy Knapp, Jon Sauer, and later Eli Avisera lead me on a journey to hone my skills in spindle turning and joinery so I could develop and refine a simpler style of spinning top.

At the 2009 Turnfest symposium in Australia, I met Bonnie Klein. She encouraged me to look up Eli's Avisera's work, which led to further refinement of laminated timbers. I am currently working with linear laminated blocks, developing Tunbridge style laminations.

—Geoff Whaling, Australia

Herman Miller, 2009 Special Edition Tops, Eames tribute, Walnut, 4½" x 2½" to 3" (114 mm x 63 mm to 76 mm)

Photo courtesy of Herman Miller, Inc., hermanmiller.com



Eli Avisera, *Round Dreidel Box*, 2010, Maple, ebony, silver; 3¾" x 2" (95 mm x 10 mm)

See more of Eli's work at avisera.co.il.



Bonnie Klein, *Fire & Ice*, 2011, Cast acrylic, 6" x 2½" (152 mm x 64 mm)

See more of Bonnie's work at bonnieklein.com.

Photo: Tib Shaw

COLLABORATIVE TOPS

JACQUES VESERY AND BONNIE KLEIN



As the World Turns & the Seasons Spin, 2009, Swiss pear, white oak, fossil mammoth ivory, acrylic paint, metal leaf, 6" x 5" x 21" (15 cm x 13 cm x 53 cm)

This collaborative set was featured in "Boxes and Their Makers," a traveling exhibition based on the book *New Masters of the Wooden Box*.



As the World Turns Green With Envy of the Sun and Moon, 2007, Cherry, pear, koa, glass, acrylic paint, 6" x 4" (15 cm x 10 cm)

Collection of Gene Colley

See more of Jacques' work at jacquesvesery.com.



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