Learning to Chase Threads by Hand: A Sequential Approach

Michael Mocho / Fine Woodworking

Albuquerque, New Mexico www.mmocho.com (505) 345-4674 e-mail: mmocho@mac.com

The following notes are an attempt to share some of what I have learned and discovered about chasing threads by hand. Threading is a very old technique- it has been done for hundreds if not thousands of years, and is a HUGE topic that has been well documented and yet often mis-understood. Entire books have been written on the topic, yet there are seemingly endless nuances, details, and opinions about how it is done. Please understand that this is only my subjective approach, and an attempt to share some of the strategies that have worked for me. Trust that you will find what works for you given patience and practice. My hope is that some of what is described here will help you develop your abilities with a little less frustration.

Stay Sharp, Safe Turning, & GOOD LUCK!

Threading myths:

Many people have stated that only certain woods are hard and consistent enough to be used for making threaded boxes. The belief that you must use ***only*** expensive woods like boxwood, blackwood, cocobolo, ebony, lignum vitae, etc. is HOGWASH. These woods certainly thread wonderfully, but are not essential. Any material with relatively consistent density will provide the even cutting resistance that prevents the tool from cutting too deeply into soft spots, thereby creating an irregular or "drunken" thread.
Here are several little tricks for cutting crisp threads on domestic woods without chipping or torn grain, and hopefully you will come to see that if you can learn to thread on hard maple, then exotic woods will be a real treat. (Exotic woods are becoming a depleted resource, so please be thoughtful about how you use them. A little practice on domestic hardwoods will make the exotic stuff go further).

Material selection:

I've had mixed results with attempting to thread softer woods -like big leaf maple, 'ambrosia' (southern) maple, or some species of walnut. I've found that the density of the annual rings seems to be a key factor, and some pieces just won't work, even with a very sharp chasing tool. Same thing with mahogany & cherry- the heavier, denser, tight grain pieces are your best bet.

I like to make boxes with the grain parallel to the axis of the lathe, I can get perfectly smooth threads on regular hard eastern maple using the methods described below, unless it is a particularly soft piece- with wide annual rings or 'punky' grain.

There are significant limitations to cross-grain threading- it creates at least 2 quadrants of every revolution that must be cut against the grain, plus the wood movement is across the axis of the threads, and results in a slightly oval diameter, which can lock a threaded wooden box closed when the humidity goes up.

Practice:

Thread chasing requires a little patience and practice, and most anyone can learn to do it by developing the right touch. A great material to practice hand-chasing on is a short section of PVC pipe- any diameter. Although it stinks a bit when cut, and caution must be used to avoid catching the long shavings in the spinning chuck, it has a very consistent density, unlike most woods. The smooth and even cutting action will help you develop a feel for the chasing process before you try threading on the irregular density of wood.

Finding the right combination of variables: **RPM**, **tool rest adjustment** (keep the cutting action at centerline or just a tiny bit above), **rate of tool advancement**, and the **number of teeth engaged** in the cut (determined by the angle of cutter tangency) are the elements of successful chasing. Perhaps one of the most critical is pressure, and where it is directed- that is the key element in developing the feel. A light touch and smooth movements with no hesitation is essential! Firm pressure on the tool rest to stabilize the tool, with minimal lateral pressure to advance the tool and engage the teeth is all that is required- heavy force will ruin the cut.

Learning to Chase Threads by Hand: A Sequential Approach

Sequential Practice Approach:

Learning to chase threads by hand really isn't all that difficult, but it requires moving the tool towards the headstock at the proper steady pace in relation to the RPM. In order to help you develop that pace, I recommend that you try this sequence of practice exercises- they will help you gradually develop the required rhythm:

1. With a piece of hard maple or PVC approximately 1" to 2" diameter and at least 6" long- turned to a smooth cylinder and rotating on the lathe at **around 350 to 450 RPM**, position the tool rest height at centerline, and parallel to the axis about 1/8" away from the surface of the material.
2. Starting on the right (tailstock) end, use a sharp pencil placed horizontally on the tool rest, strike a line on the rotating piece from right to left with a steady movement. Keep the pencil perpendicular to the axis, and imagine that the line you are drawing is cutting a thread. Try to keep the horizontal spacing of the lines even as you move. You may find it easiest to accomplish this if you first practice the movement from right to left several times before you actually touch the pencil to the spinning wood. Rather then move the pencil with your arms alone, simply shift your weight from right foot to left foot and move from your ankles, keeping your upper body and arms still. Try not to rotate your torso at the waist- move parallel to the bed of the lathe by shifting your weight from right foot to left foot. THIS IS MORE IMPORTANT THAN YOU THINK!
3. When you run out of length, return the pencil to the right end and try to strike the same line you just drew. Slow the lathe down a bit if it helps you to follow the steady spiraling line, and keep moving evenly- don't hesitate for even a second. The pencil- and the chasing tool- must already be moving to the left **before** it contacts the wood.
4. You can erase or sand off the pencil marks and repeat the above exercise as many times as it takes to establish a feel for the pace of movement in relation to the rotation of the test piece. Once you start to feel you are getting it, then try the following:
5. On a clean fresh surface, hold the pencil steady and at a point about an inch from the right end of the rotating piece so that a continuous line is drawn all the way around the turning cylinder. Draw several more lines spaced about 1" apart all the way down the rotating cylinder.
6. Using the pencil, strike a line in a steady motion up too but not past the mark. You will have to lift the pencil off the surface just as you approach the mark. With practice and a quick reaction time, you can learn to get your spiral close to the mark without going past it. Once you can do this consistently you will be ready to strike you first thread with the chaser.

Striking the Thread:

Before you use the chaser, adjust the tool rest height so that the **top cutting edge** of the chaser teeth are cutting ***exactly at centerline*** *when the chaser is held level- parallel to the floor****.*** When you try your first cut with the chaser, don't worry about stopping it at a shoulder or on a drawn line- just move steadily at the right pace so that the teeth engage into the cut. Notice that when the chaser engages into the cut, it doesn't require any force to move the chaser from right to left- it will automatically pull the teeth across the cut as long as your hand, arms, and upper body are **moving with it** at the same rate.

Once you have struck the thread with the chaser, practice dropping back into the cut, and play with the subtle adjustments with the height of the handle to control the cutting action: raising the handle will result in a more aggressive cut, dropping the handle will slow or stop the cutting action. Try to keep your movements steady without hesitation, and keep the tool perpendicular to the axis so that several teeth are engaged. **Don't let the first tooth on the left side of the chaser do all the cutting!**

You can use the pencil technique to practice the pace of movement on the interior (female) threads too. Drill or turn a hole and position the tool rest so that you can strike an evenly space line on the inside of the hole while it spins at about 350 to 450 RPM.

"Drunken" Threads:
The first strike of the chaser determines the thread. If the chaser moves into the cut at an irregular speed, it means the thread isn't even- often referred to as a "drunken" thread. Remember: **you can only deepen the first strike, so if it isn't right, don't waste time trying to correct a drunken thread-** cut it away and try again. This is why I don't make the undercut on a box until I have a good thread established. The drunken thread and the groove must be cut away- if there is no groove yet, I don't have to remove as much wood and the box won't loose as much height.

Interior threads:
After turning or drilling out an opening, carefully round over the corner of the opening, so that at the first contact of the chaser, the teeth don't get stopped by a hard corner. I start by deliberately striking the thread at a slight angle- the teeth of the cutting edge not quite parallel to the axis of rotation. The tool rest is set perpendicular to the axis, and the rest height is adjusted so that the cutting edge of the chaser is *very slightly* above the centerline at the 9 o'clock position. The handle is always kept horizontal (parallel to the floor). Start the thread cutting action with the tool not quite parallel to the axis of rotation, but no more than about 15 degrees off, and try to keep the tool level (parallel to the floor), with the cutting edge ever so slightly above center.

With the piece rotating at about 350 to 450 RPM, I practice the motion of the tool a few times before touching it to the wood. Practice will help you develop an instinct for this speed. The first actual contact of the teeth is very gentle- almost a "pretend" cut. By repeating this steady motion you will soon notice that the tips of the teeth will fall into the track without much force. I am careful not to push the chaser into the cut- it will simply be pulled by the screw action of the wood engaging the chaser. The more the cutting action is spread out over a larger surface area, the less aggressive the cut of each tooth, and the less tendency for the threads to chip out.

This is the moment where you need to determine if the established cut is even and not "drunken". The chaser should be pulled at a steady rate of motion, not slightly faster and then slower. If it is noticeably irregular- **STOP!** Don't bother to keep cutting- it is just a waste of time, because **you CANNOT correct a drunken thread.** Cut away all the grooves, round the corner again, and strike a new thread.

Most boxes do not need more than a full rotation or two to fully close the lid, but it makes more sense to thread a wider section and then cut some of it away. This allows the chaser to cut more smoothly because more teeth are engaged and it distributes the pressure of the cutting action over a larger surface. I usually thread about ½" section, but remove all but about 3/16" of it once I have tested the fit

Many turners make an undercut where they want the interior threads to stop, but I prefer to establish a good thread that is a bit deeper towards the opening then fades out, and only when I am certain it is an even thread do I undercut the interior diameter below the thread. If I get a bad start, I can trim the opening down past the bad thread before any undercut, so I won't have to remove any more wood than absolutely necessary. If I had already made the undercut slot down in the interior, I would have to cut all the way down past it before attempting another thread. I can always make the box a little shorter. (It is important to use the proper terminology, especially if someone is watching you. This is called a "design modification", not a screw up - at least for the first three attempts).

Once I know the interior thread is off to a good start, I can cut it to final depth – creating threads of even depth, and parallel to the axis of rotation. I will only make the final cuts on the interior thread after the inside of the box has been completely cut, sanded, and finished. This prevents problems of accidently sanding the finished thread. Avoid touching any sandpaper to the threads- it rounds over the crisp points, and can leave abrasive grit in the wood that wears the threads down over time.

You don't need to make an undercut groove on the female threads:
I tend to undercut the ***entire interior*** rather than cut a groove or slot below the threads. I use either Jack McDaniel's marvelous 'Eliminator' tools: www.jewelwood.com/products, the 10mm Hunter carbide tool, (www.hunterwoodturningtool.com/), or one of several home-made variations that all have the same super fine-grained, super hard carbide cutters with a raised cutting edge. I ALWAYS cut with these tools at a 45° angle- never flat- so that they shear cut rather than scrape, and if properly cut the resulting surface only requires 220 & finer grits to finish. The tools are not cheap, but are very effective, and much better than regular HSS scrapers. Once the box interior is smooth, the tapered thread can be chased to an even diameter- focus on keeping the handle of the chaser parallel with the axis of the lathe- sighting past the chaser to the bed of the lathe helps reference it when you are deepening the threads evenly.

Threading Boxes:
I have found that I get better results by threading the interior (female) side of the thread first before chasing the tenon (male) side to match it. Fitting interior threads to exterior will work too, but if you overcut the female threads, it makes the male threads obsolete. Overcutting the male threads only requires cutting them off and re-chasing a new section. This shortens the piece, but saves wood.
To try and clarify the sequence: it goes something like this:

1. Mount what will become the female thread onto the lathe chuck, and turn or drill the interior to the desired diameter and depth. If this will become the bottom of the box, I will go to full depth in stages, being sure not to let the Forstner bit choke in the bore by jammed shavings. The heat from the drilling process makes any moisture in the wood expand the shavings, and they tend to prevent a Forstner bit from backing out if the hole is drill in one plunge. If the shavings are not flowing out of the hole behind the bit, it is time to retract it so they will clear. ***Be sure to hold on to the drill chuck as you crank it out so it does not pull out of the Morse taper in the tailstock!***
2. Slightly round the corner if the hole edge to allow the chaser to enter without catching.
3. Slow the lathe down and apply just a few drops of threading lubricant to the area I am going to thread, waiting at least 30 seconds for it to soak in. **(more detailed information about the lubricant below**).
4. Set the RPM to the proper threading speed relative to the diameter- this is approximately 350 to 450 RPM, and a bit slower for anything over 3" diameter. Practice the movement of the chaser several times before it actually touches the wood. The first strike should be done with a smooth determined stroke- light pressure and towards the center of the bottom of the hole- with as many teeth engaged as possible. Deepen the thread gradually, applying more lubricant if the cutting action seems to indicate that the wood is tearing. Cut the thread about ½" or so, until it is well established.
5. If the first (or second, or third, or tenth) threading attempt doesn't work, I consider the beauty of a proportionally shorter box, and remove the drunken thread, adjust the RPM, and try again. Since I have only ruined the first few threads of the box, I can usually start over by removing less that 1/8" of wood. (Can't do that if you have already made the undercut).
6. Although the threads are still tapered, undercut them with the undercutting slot tool or shear scraper- enlarging the interior diameter of the bore below the section of threads. Often I cut almost all the way to the bottom of the bore, trying to move the cutter at a steady rate to cut a smooth interior for less sanding. The deeper the interior, the more challenging this can get. This must be done at higher RPM- the speed used for chasing will be too slow for a clean cut, so remember to adjust the RPM.
7. I use a pair of locking surgical forceps that hold a piece of cloth-backed abrasive wrapped over a small wad of steel wool for padding to sand the interior smooth, avoiding the threaded section. **DO NOT use your finger to sand in an openings smaller than about 1 ½"- many people have broken fingers this way.**
8. I cut the interior threads to final depth- gradually moving the chaser handle so it is parallel to the axis of rotation. Clean off the ways of the lathe bed so you can use them as a visual reference –sighting over the handle of the chaser- to see that your final cuts are done with the **chaser handle parallel to the lathe bed.**

Cutting the tenon threads:

1. Prepare the tenon by sizing it about 3/32" larger then the hole you just threaded, and it is OK if it is *slightly* tapered towards the tailstock. Do not attempt to chase threads on any tenon shorter than the length of the first 4 teeth on the chaser. Round off the corner of the tenon- about a 1/16 radius- but DO NOT sand it. Even a little grit that gets caught in the grain of the tenon will gradually dull the chaser.
2. Don't make the relief cut where the tenon meets the shoulder- not just yet. The reason is that if the thread should get ruined on the first try, you only need to remove a little wood (moving the shoulder to the left) and try again, rather then having to cut off the entire tenon at the shoulder.
3. The first critical strike of the chaser should be at an angle rather then perpendicular to the axis of the lathe. This means that you DO NOT cut with the first tooth of the chaser (the first tooth on the left side of the male chaser). The rounded corner, a light touch, and a little lubrication will help to keep the chaser from stopping and running the thread.
4. Once the thread is established, use the previously threaded female part and see if the thread will start to engage when you screw it on. *Be careful not to over tighten the thread if the tenon is still tapered- it can split the female part, or lock the pieces together!*
5. Make note of how far the female piece screws on to the tapered tenon, remove it from the tenon, then bring the RPM back up in order to *slightly* reduce the tenon diameter with a skew or bedan- cut clean, yet leaving some of the first strike of the thread.
6. Apply more lubricant and re-strike the thread. Gradually reduce the diameter of the tenon until the female part screws on, but don't try to screw it on all the way to the shoulder until the relief cut is made.
7. Once the thread has been properly struck, and you are certain it is running true, then make the relief cut so the parts will screw together all the way to the shoulder stop. The relief cut can be made with a thin parting tool, but I prefer to cut a clean "V" cut into the corner where the shoulder meets the tenon. I think it looks cleaner than the square cut made by the parting tool, and terminates the threaded section with a little more grace. (the V cut looks more like the threads than a parting tool slot) A parting tool also tends to tear or fold the end-grain fibers of the shoulder, so cutting the end grain surface with a small sharp skew (used long point down) makes a cleaner surface. Make the cut no deeper than the deepest part of the thread.
8. The wider the relief cut, the more milliseconds you will have to pull the chaser out of the cut before it touches the shoulder. It will be come obvious that letting the chaser hit the shoulder will immediately ruin the threads unless you withdraw the tool. Stay alert, and don't hesitate! Pull the chaser out without touching the shoulder.
9. If the threads are well established, if often helps to slow the lathe down a bit so you can make the final cuts with the chaser all the way to the relief cut and have a few more milliseconds to pull the tool out before it ruins the threads. The slower speed can compromise the quality of the cut and surface smoothness, so there is always a trade off.
10. Once the relief cut is made, be careful not to over-cut the threads, which will l result in a loose fit. This means that the threads may not fully engage and over-tightening can break the tips off the threads. The only solution to correcting over-cut threads is to remove the entire tenon and re-establish the thread.
11. It is possible to match the gain exactly by trimming the shoulder until the lid stops where the grain matches. (This is more likely when the amount of wood removed when parting the two pieces and the length of the tenon are kept to a minimum). Thin parting tools can help, as well as the use of pre-sized thread starters. Caution is required so that the shoulder is not over-cut, which will require the removal of more wood - the distance of one full tooth width- so that the female thread screws on almost one full rotation more. The resulting tenon goes deeper into the recess, and sometimes doesn't look so good with the wider relief cut, and it also reduces the amount of engaged thread, creating a weaker connection of the parts.
12. There is certainly no rule that the two parts being threading together have to match grain, or even be made of the same wood. I find it useful to deliberately emphasize the interface with a bevel, step, cove, or some other detail rather than attempting a perfect grain match. It may look great for a while- especially on smooth cylinder or egg shaped boxes, but the delicate edge tends to become more obvious eventually, so I think it is better to deliberately ease the seam to make it look more intentional, rather that attempt to conceal it.

Important factors:

Tool rest height:
The cut should occur at the 9 o'clock position- this is where the wood is moving vertically, and the cutting forces travel directly into the tool rest. Cutting higher or lower results in the tool being slight pulled into or forced away from the surface of the spinning wood. Keep in mind that just like every other turning tool, chasers have a bevel that functions as the control surface for the cut. The tool rest height determines how much of that control surface rubs on the wood and thereby how much resistance prevents the teeth from cutting too aggressively.

RPM:
Finding the proper RPM for a given diameter is a matter of experimenting. Too fast and the chaser jumps out of the cut -or in the case of cutting the male thread with a shoulder- rips off the threads when the tool hits the shoulder and stops advancing. Too slow and the chaser cuts deeper across the flat-sawn areas and less deep across the quarter-saw surfaces of the grain. Softer materials and smaller diameters require slightly higher RPM.

Once I have found the proper RPM of a given diameter, I simply put a mark on my lathe's speed dial so I can remember the speed in the future. The RPM range tends to be between 350 to 500 on most diameters under 4". Fine-tuning the RPM for a given material and diameter will come with time and experience. (Experience is what you tend to get when you proceed without it).

Pressure:
As stated earlier, the more the cutting action is distributed over a given surface, the less each individual tooth sinks in. This is why I always make the tenon (male thread) about twice as long as I need, especially on softer woods and smaller diameters. The extra length allows the chaser to 'float' more and I can gradually thread up close to the shoulder without destroying the threads, and the teeth are less likely to cut a drunken thread. The longer tenon length also means a few more milliseconds to engage the chaser in the cut before having to remove it. It is easier to remove the excess tenon length rather than attempt to perfectly engage fewer teeth on a shorter tenon. This can be especially difficult on a larger diameter tenon where the delay is longer between the moment the first tooth cuts and the next tooth engages in that cut. Dull chasers make you think more pressure is required - sharp chasers cut clean with less resistance.

One way to reduce the risk of ruining the tenon is to use pre-threaded thread starters (see below).

Lubrication:
The reason many exotics like boxwood and blackwood are so desirable for thread chasing is that in addition to very even density, they tend to have a high resin content, which has a lubricating effect on the cutting action. Applying just a few drops of a lubricant to the surface of hard maple can create a similar smooth cutting action, and prevent the grain from crumbling. The chips tend to come off the cutting edge more like 'slurry' than as dust, and it seems to make the fibers a bit less brittle. The mix I use is just regular 'Dawn' dishwashing liquid, thinned about 10% with denatured alcohol or glycerin- anything to make it thin enough to penetrate just a bit, but still viscous enough to remain on the surface. I use a small squeeze bottle with a thin tip, and slow the lathe down as far at it will go so a few drops will soak the surface of the area to be threaded and gradually sink in. Waiting at least 30 seconds before bringing up the rpm to start cutting allows the juice to sink in a bit and soften the wood. Because I tend to finish box interiors with shellac and wax, I haven't had any issues with the lubricant interfering with the finish, as very little remains on the wood. Don't apply so much that the stuff splatters the box interior, and once the threads are cut I like to rub wax into them and remove the excess with a rag and a toothbrush. The lubricant makes the chaser gum up, but my theory is that the crud in the teeth also makes the chip compress as it comes off the cutting edge, so it doesn't rip out the soft grain as it crosses over the hard grain. I have also tried using wax as the threading lubricant, and it seems to work fine, though the thread chaser can scrape it away more quickly than the liquid soap that tends to sink into the wood fibers a bit more.

Matching diameters:
If the threaded tenon (male) starts into the threaded hole but seems too tight, **don't attempt to reduce the diameter with the chaser**- it almost always causes the threads to crumble as the wood hits the bottom of the tooth groove. It is better to **slightly** reduce the diameter- taking off just the points of the cut thread- with a light cut from another tool (parting tool, bedan, scraper, or skew) and then deepen the remaining thread with the chaser to get the proper fit. I have found that coloring in the areas to be threaded with a soft red pencil can help you to see when the chaser has cut deep enough to make a strong thread, yet still leaves a bit of the original surface on the points of the thread to assure that you haven't bottomed out the chaser. Once the thread is fit, the remaining red marks are easily removed with steel wool.

Using threading starters:
One useful trick that I have discovered makes it possible to thread even a short tenon by using a thread starter. A short pre-threaded section of wood that matches the diameter of the piece to be threaded can be pressed up to the end of the blank in the chuck by using the tailstock live center. The chaser can be engaged on the existing threads of the starter, and once the chaser is allowed to move onto the uncut blank, it will already be moving at the proper rate driven off the pre-threaded piece. This makes it much easier to prevent drunken threads on the tenon (male thread), and is also the best method for cutting threads on a short tenon that would otherwise be unlikely to have enough surface area to allow for accurate threading.

Making thread starters that are matched to nominal sized (preferably carbide) Forstner drill bits can provide a level of certainty that reduces much of the risk involved with chasing male (tenon) threads boxes.

I believe it would also be possible to make a pre-threaded started ring for striking interior threads, though I have not bothered to try it. It would be essential to temporarily attach the interior thread starter ring in front of the hole to be threaded so that it is secure, yet could be removed after the interior thread has been successfully struck. (Chances are it may not be worth the effort, but if you try it, please contact me and let me know how it works).

The "Arm Brace":
Although I have used the arm brace that Allan Batty and many others employ when cutting interior threads, I have come to find it unnecessary- as long as the cutter is sharp, and light cuts gradually deepen a properly struck thread. The one advantage it provides is that it can be used to restrict the lateral movement of interior chaser so it will cut at constant depth- regardless of the consistency of the rotating wood. The hook on the tip of the arm brace prevents the chaser from moving away from the surface you are threading, though only if the arm brace does not move towards the axis of rotation. The circular motion of the chaser that is described in the Batty video- in which the vertical position of the chaser is slightly varied by the use of the arm brace as the interior thread is struck- seems to be one method by which the cutting action is regulated. The aggressiveness of the cutting action is controlled by adjusting the presentation angle of the chasing tool, and thereby the proportion of bevel contacting the wood. Tilting the top of the chaser downward has the same effect as a negative rake grind, except that it reduces the proportional contact of the bevel and thereby the beneficial resistance. **If the chaser is not held precisely horizontal- that is, if the handle is dropped or raised as it travels inward- then the resulting thread may not be accurate and the lid will not contact the shoulder evenly when it is screwed on.**

Other threading strategies:
Making prepared inserts- both male and female threads can be turned out of a suitable material (i.e. hard maple or boxwood) and then glued into a prepared hole in any wood. In this way, much less expensive material is used, and woods that are not suitable for chasing can still be used for the body of the container. For large diameter threads- such as cremation urns- pre-threaded inserts can be cut off of existing PVC, ABS, brass or other metal plumbing fittings or components and epoxied in place, though it is essential to compensate for hygroscopic movement.

Buying and preparing the chasers:
Whichever chaser you purchase, it will most likely require a little tune-up before it is ready to use. Take a good look at the first tooth on the left corner of both the male and female chasers- - it should be a FULL TOOTH, not a half tooth. If there is less that a full tooth on the left side, then grind it away until the next tooth becomes a full tooth.

I have used many brands of chasers- Sorby, Crown, Ashley Isles, etc., but I prefer the chasers that Mark St. Leger sells. They are double-ended and retract into the spiffy wooden handle to protect the teeth from damage. They work great, cost about $75, Same price as a set of other chasers) and are available in 20 or 16 TPI from Mark at: www.markstleger.com Although they are not listed on his website, just call or write him to find out if he has any left, or when the next batch will be ready.

I use 20 TPI up to about 2“, and 16 TPI for anything bigger. The finer the thread chaser, the easier it is to use, but the shallower the engagement of the parts, and the tighter the diameter tolerances have to be for the two parts being screwed together

Make sure that the tips of all the teeth are in a straight line, and it helps to slightly soften all the shape edges of the tool shank so it slides easily on the tool rest. Make sure your tool rest is also smooth and free of nicks. The angle of the teeth should match the pitch of the threads. Some chasers are made with the notches that form the teeth cut perpendicular to the top surface of the chaser. Good chasers will have the grooves of the teeth *slanted* to match the pitch of the thread so the wood can flow through them with less friction. Perpendicular chasers can be corrected by grinding the underside of the tool until the teeth are properly angled as it sits on the tool rest- remove just a little metal on the left underside of the chaser to make it lean towards the direction it cuts- a minor detail, but it makes a little difference in the quality of the cut because the teeth won’t drag against the side of the threads as much.

Sharpening thread chasers:
I have found most chasers as you buy them are much too aggressive to use on softer woods- they are usually ground to a less than 90 degree cutting angle, and I have had much better success by grinding a short negative rake bevel on the top of the teeth- just 5 to 10 degrees can make a big difference. Even just honing the tops of the teeth at a 5 to 10 degree slope will slow down the cut enough to force the chip back into the cut and thereby compress the fibers a bit where the cutting edge is breaking them off. This slower cutting action combined with the lubrication prevents the fibers from crumbling like a dry cracker, and seems to actually compress and burnish the threads.

Acknowledgements:

Any success I have had with hand-chasing is due to the instruction, feedback, encouragement, and support I have received from the following people. I am very grateful for their help and generosity in sharing what they have learned:

Alan Batty	Bill Jones	Mike Mahoney	Chris Stott
Stuart Batty	Bonnie Klein	Stuart Mortimer	Richard Raffan
Mike Darlow	Dale Larsen	Mark St. Leger	

PASS IT ON! Once you learn this (or any other) technique, I encourage you share it freely with anyone who is interested in learning it. Chasing is a great technique to add to your work, and with enough practice, it isn’t as hard as you may think.

-Michael Mocho
www.mmocho.com