Section 5: Spoking Wheels
An article on wheel cutting would not be complete without a discussion on wheel spoking. There is the traditional clockmaker method and then there is the JK method. I have only read about how arduous wheel spoking is to do by hand using the traditional clockmaker method that relies on a jeweler saw, specialty hand files and a lot of time. As you might have guessed, Jerry taught a technique that utilized the Sherline micro milling machine and which I will proceed to discuss next. After a bit of practice, a very nice result can be obtained with the micro mill.

Step 1: Scribe the spokes: overlay the original wheel onto the just cut wheel and scribe the spoke lines.

Step 2: Fit up the newly scribed wheel onto the 3 jaw chuck. The previously described milling machine setup should be in place with the CNC RT connected to the programmer controller that should be turned off at this stage.

Step 3: With a 3/16” collet fit up onto the mill spindle, fit up a 3/16” two flute end mill into the collet and secure. This would be a 2” double end mill to machine along the scribed lines.

Step 4: Machine the outer arcs: Align the end mill along the outer arc, positioning it in the middle of the arc and then lock the x & y axis. Snug up the z axis by moving the lock to the almost locked/closed position. This will take up the backlash while allowing you to progress the
Z axis. Then proceed to machine back and forth along the arc using the RT handwheel to revolve the wheel back and forth being careful to machine up to and including the scribed arc only. Progress the z axis .010” downward for each pass until the end mill passes thru to the other side. Proceed to machine all four outer arcs in the same manner.

![Machining the inner arcs has started on the practice wheel.](image)

Step 5: Machine the inner arcs: Align the end mill along the inner arc, positioning it in the middle of the arc, lock the axis and repeat above steps for all four inner arcs. Note that in the instance of cutting the outer and inner arcs one could leave the end mill down and machine thru from one arc to the other. In the instance of the left and right spoke sides, the end mill will need to be drawn up out of the wheel before traversing to the next cutting point.
Step 6: With the inner arcs complete, the right and left spoke sides must be machined. For this step, the programmer controller is utilized. The machining sequence is to do all the right sides first and all the left sides second or vice versa. Turn on the programmer controller as previously described. Position the end mill over the right spoke side and enter the number “4” into the controller. Proceed to machine up and back along the right side arc using the saddle hand wheel until the end mill passes thru the other side. Bring the end mill up, clear of the wheel and press “Next” on the controller. This will progress the end mill to the next spoke’s right side and proceed to machine. Repeat for the 3rd and 4th right sides. When the right side is complete, repeat the steps for the left side.
Conclusion:
This journey on modern day wheel cutting has been a significant learning experience for me and I trust has been enlightening to others. Many thanks to David LaBounty, Al Dodson and Werner Paul for their words of encouragement, insight and feedback. Special thanks to Jerry for his additional comments, pictures and many times taken to enlighten me. This article is much richer in content and perspective because of them. Thanks to the NAWCC Bulletin as well for deciding to publish this article on Jerry’s modern means and methods. Not so much for me, but for the benefit of others. I think from the perspectives of many, Jerry's teachings are viewed as a significant contribution to modern horology, however, they were not documented anywhere. So I am most pleased they will now be accessible to present and future students.

A couple of final notes...

Wheel cutting, for most of us, presents barriers not only in the form of learning curves but also in the choosing and obtaining of tools and, most importantly, in the ability to produce properly designed, sturdy cutters. Traditional methods place barriers to would be students. Jerry’s means and methods combined with modern tools breaks down those barriers and allow success to occur where it otherwise would not.

Admittedly, one way or the other, be it traditional or modern machine tools, there is an investment that must be made in tools to do wheel cutting. As you divine which path you will take, I strongly encourage you to come in to the 21st century and consider the modern, high quality tools that are available today. I trust this article properly extols the benefits to help you with that decision. Whichever means you choose, have fun making chips 😊.

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