Lathe Practice Piece I

1. With a hacksaw cut a length of 3/4" diameter aluminum rod 3.5 to 4 inches long.
2. Mount the piece in the lathe with about 1.5 to 2 inch projecting from the chuck.
3. Clean up the saw cut on the end.
4. Cut the 1/8" dia as shown on the right side of the drawing above.
   a. Attempt to cut the diameter to 0.001" with a good surface.
   b. Use cutting oil.
   c. Note the depth of cut indicator on the cross slide is calibrated in 0.001" of motion of
      the cutter so advancing it 0.005" decreases the diameter by 0.010", Note there is backlash
      in the motion so all positions should be measured with the bit moving inward.
   d. Although one can easily advance the bit 0.03" into the material each pass smaller cuts
      are needed to produce a good finish and accurate control of the diameter.
   e. When removing the last 0.05" from the diameter use cut of less than 0.01" the next to
      final cuts should be only a few thousands deep and usually repeating a pass without
      advancing the bit will remove 0.001".
   f. You may which to practice getting a good finish and controlled diameter by first cutting
      an 0.600" diameter.
5. Mount the piece further out and clean up the center of the piece.
6. Turn the piece around in the chuck with about 1.5 inches projecting.
7. Turn the end down to 0.500±0.01" for a length of 1.25"
8. Cut a 0.35" dia section. (cutoff or parting tool)
9. Cut the threads
   a. Install the thread cutting tool, position the top slide to 27.5° from the motion of the
cross slide, Set the zero of the cross slide, switch to the slowest speed possible, and setup
the gearing for 13 threads per inch.
   b. Position the tool just beyond the end of the piece, engage the feed and turn on the
motor, when the tool reaches the 0.35" gap turn off the motor.
   c. retract the tool 0.05" (on revolution on the handle) with the cross slide, run the
motor backwards until the tool free of the part. Then return the cross slide to the original
position.
   d. Advance the topslide 0.005" inch and repeat steps b-d until the threads are cut.

10. The above arrangement is required because this lathe does not have the screw cutting indicator
many lathes have. Normally on disengages the feed and backs up the saddle by hand and then re-
engages the feed at the point in the rotation as indicated by the screw cutting indicator. Without this
indicator it is quite possible to start the next thread a half of a thread width from the first cut, thus
destroying the work.

For a detail description of lathe use please see:
http://me.mit.edu/lectures/machine/outline.html
http://155.217.58.58/cgi-bin/atdl.dll/tc/9-524/toc.htm