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Builders' Logbook

CNC In the Home Shop – Part 1

by Kevin Kinney

While I'm still a novice, I may know enough to introduce the idea of Computer Numerical Control, or CNC, which is computer control of a mill. While this usually means huge industrial mills, it also includes small hobby mills such as the one in my garage.

This article will be in three parts. The first part will introduce mills in general and parts of a CNC mill setup. The second part will expand on this and describe homebuilder uses for CNC. The final installment will document a CNC project from concept to cut.

As a newcomer to the machining world, I first had to learn about mills. Mills without computer control have been a staple of metalworking shops for a century or more. Until the 80's & 90's, they were multi-ton machines that only professional shops could afford. A company named Sherline introduced a small vertical mill for hobby use. Later they offered a CNC retrofit for their mills.

At a minimum, a vertical mill is a machine with 3 axes of movement that removes material using a cutter. It has a horizontal bed that moves left & right (the X axis), forwards & back (the Y axis) and a cutting head that moves up & down (the Z axis). By adding computer control to a mill, it's possible to create many parts with very little error. For those that went on the Hartzell flyout, you saw CNC machines that took a 6 foot aluminum billet and rough cut a propeller. Finishing is by hand; a tribute to the human eye.

Regardless of the size of a CNC machine, most setups have elements in common. CNC begins with a computer program, often written in a language called "Gcode." Knowing Gcode helps, but isn't necessary as software is available to convert computer drawings directly into Gcode. An example of Gcode is – G02 X1.0 Y1.0 This means cut a circle at 1,1. Using this and other codes, it's possible to create complex projects.



