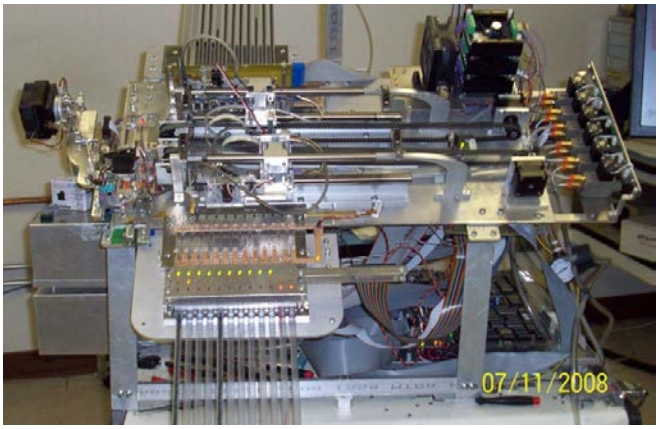
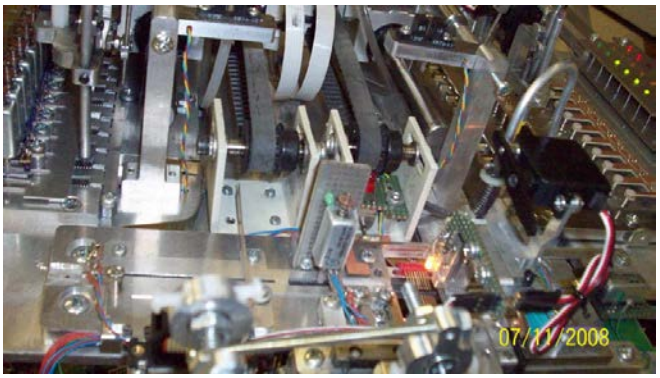
# General Project 26—Circuit Testing Machine/Stephen Nelson

Stephen Nelson had the design of a particular machine in mind when he bought his first Sherline mill. He has completed the design shown below and it is now in use in his company automatically handles I.C.'s in an 8 pin SOIC package. Following is what he has to say about the project. Machines like this typically start at $60,000.00 and up, so Steven is off to a good start by making his own.

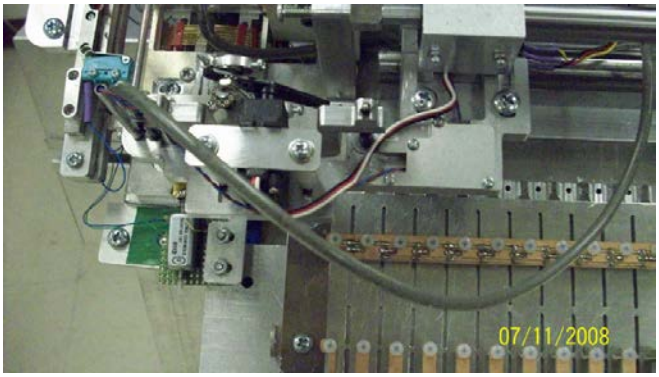


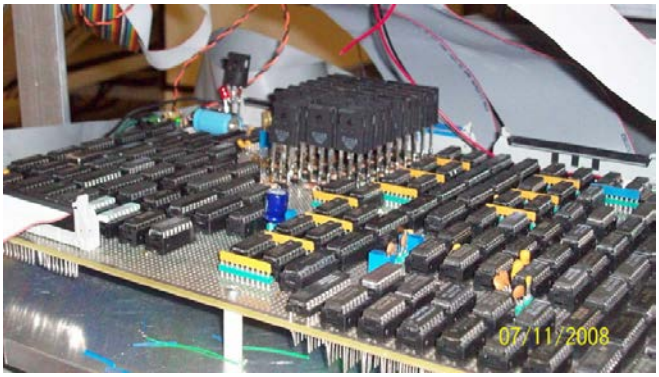




*Components of Stephen's highly sophisticated IC testing machineÃ³three years in the design and building.*

I attached a few pictures of my first project on a Sherline Mill (Model 2000). I don't know if it is the largest project made with one of your machines but it was definitely a major undertaking for a novice. The entire machine (Except the Thomson rods) were made using my Sherline mill. I haven't counted the number of components that were made to build it.

It is about 3 feet wide and 2 feet high. I spent over 2 years building it. I could only work on it when I had time. It was designed to handle 8-pin SOIC I.C.'s so that they could be tested. Although handlers for this part can be bought, I have always been disappointed with all the problems they have. The 8-pin part is especially a problem because it is square and even a small amount of rotation will cause a problem.




*Some of the machined components are seen in the machine at left and some of the many parts that need handling on the right. This is quite a job to take on for a first project.*

This machine has proven to work very well. The key has been to pick the part up and place on the next section rather than letting it slide across the two surfaces with gravity. I have a business that tests these parts and it has proven to be a tremendous help. I have written a program in Pascal (DOS) that handles all of the programming overhead. I then write the cutting program inside

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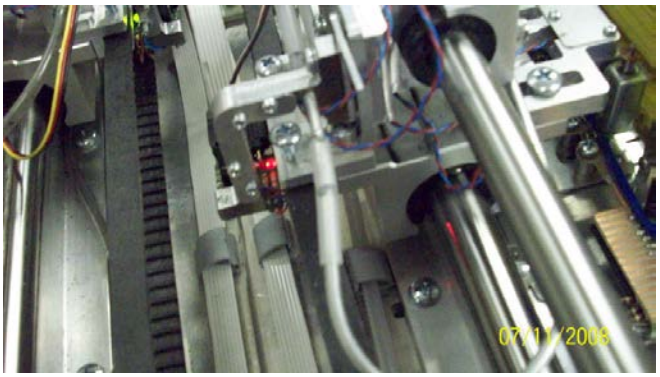
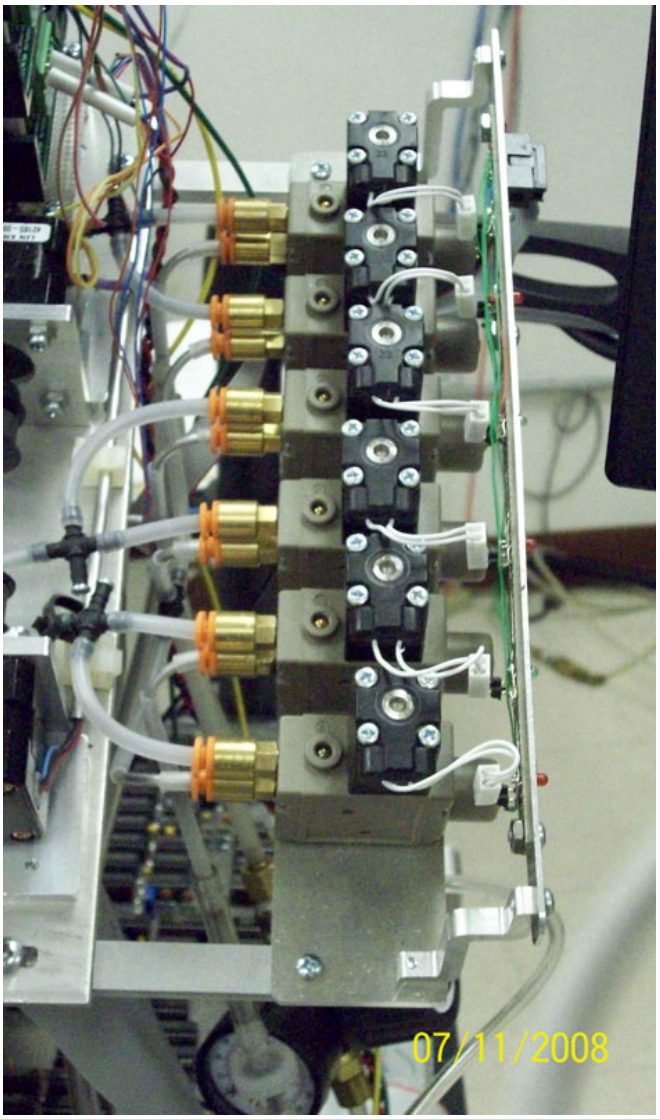
of this shell and it outputs the G-Code. My G-code would not be interesting to your audience. Because of the quantity of different components that I had to make, the amount of G-code was enormous.




*More photos of the completed machine. Though probably not something any viewers would wish to duplicate, it does demonstrate the kind of project that makes it worthwhile having your own in-house machining capability. Can you imagine what this would cost if you contracted it out?*

By the way, even the circuit boards were cut with the mill. I started with blank copper clad board. There are about 6 boards total that were made to custom fit the different sections. The main control electronics was wire wrapped. It was far too complex to cut using the mill. I use the mill for many things at my company. I am always in need of something being cut or I require a complex shape. I looked for a mill for a long time before I stumbled across your web site. Your machine was exactly what I was looking for, and the price was very reasonable. (Don't tell anyone but I would have paid more.)

*—Stephen Nelson*

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