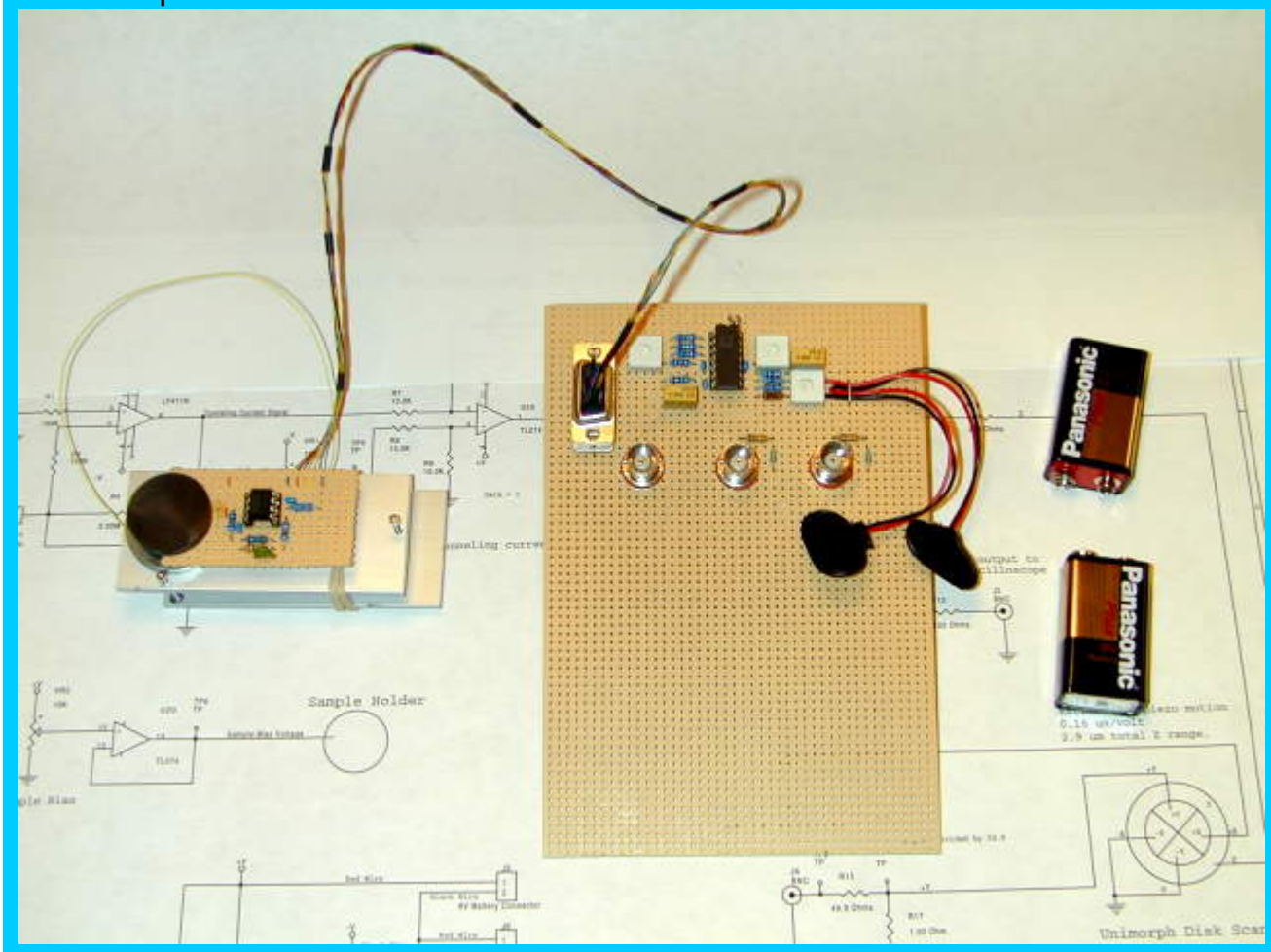
Project

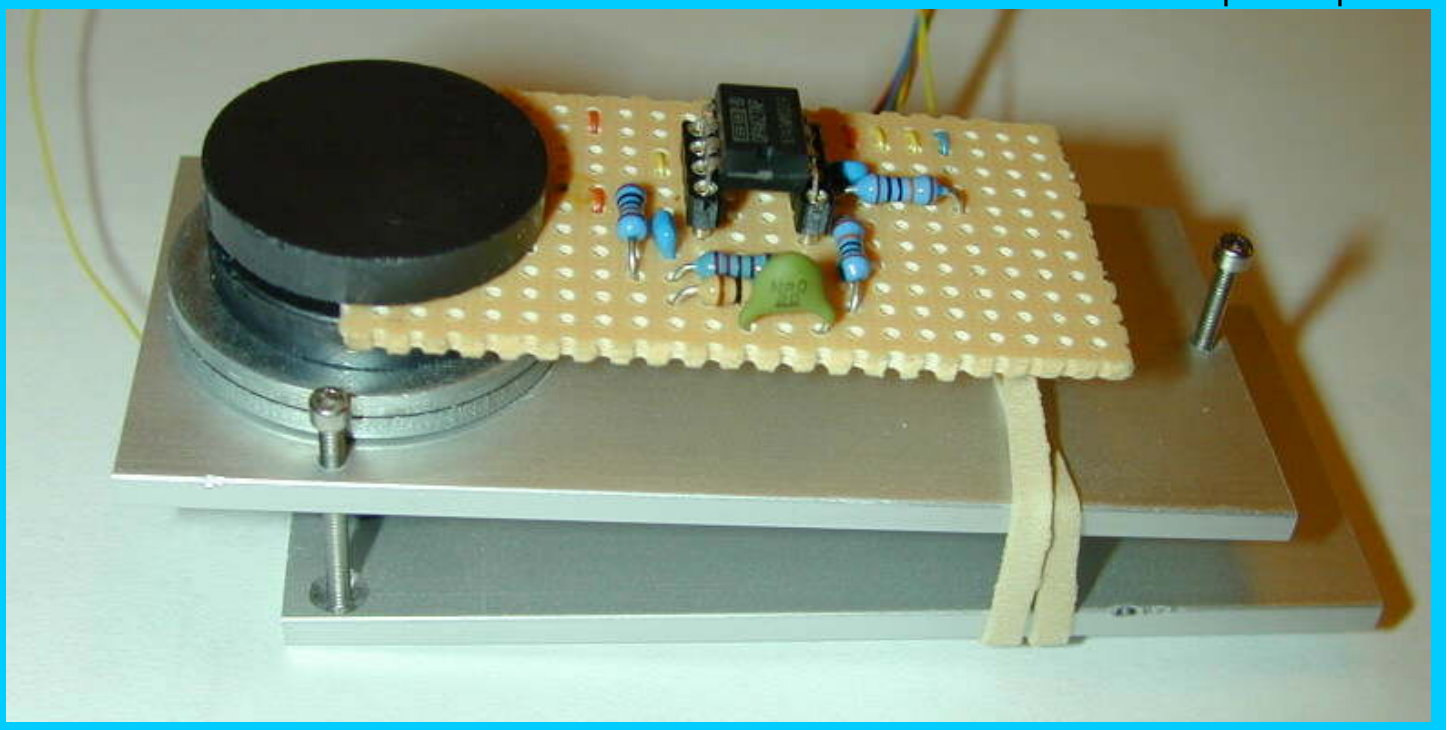
A Simple Scanning Tunneling Microscope (STM).

The goal of this project is to build a simple STM that can resolve atoms, with a cost of materials less than $100.00 excluding oscilloscope. My real goal here is to provide a base of information so experimenters and students could build a simple STM. Typical piezo tubes used in tube scanners of commercial scanning probe microscopes cost in the range of $200 - $800 and operate with several hundred volts applied to the scanner. This design uses a unimorph disk scanner to reduce the cost and avoid using any high voltage. The Piezo element is commonly available and this particular one costs $1.80. The control voltages are so low that two 9-volt batteries can power the control electronics.

Microscope and control electronics

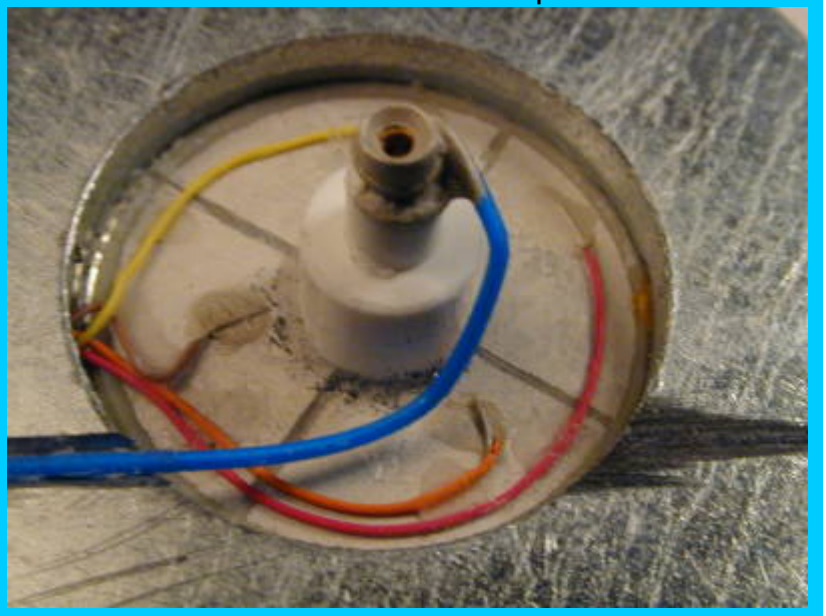


STM with pre-amplifier



The microscope mechanical assembly

Unimorph Disk Scanner



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