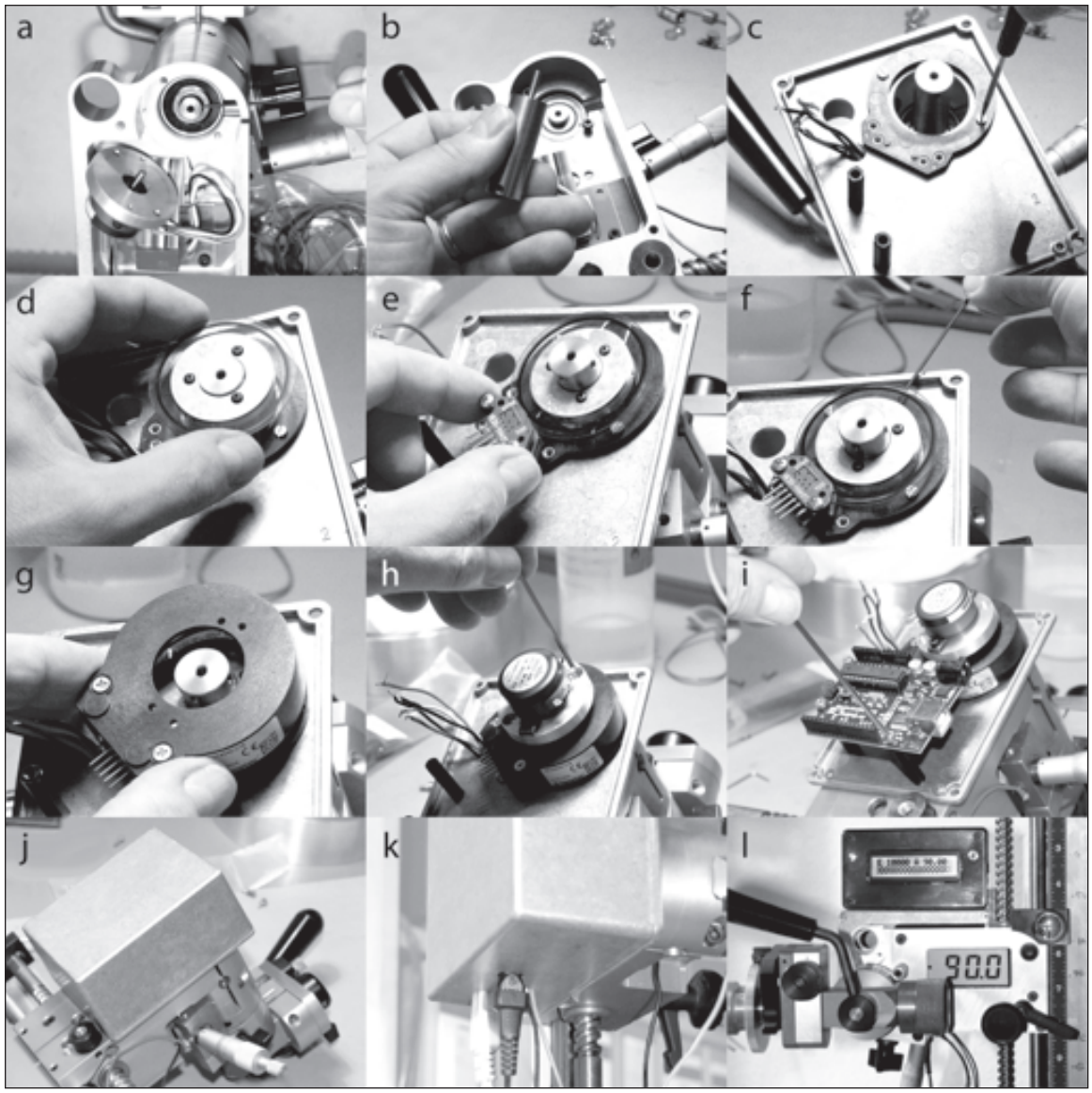

Figure 20-29 Assembling the encoder mechanics on a Poly-Metric Scintillator. a. Removing the original potentiometer. b. The shaft extender. c. The extender has been locked in place and protrudes through the top plate of the hobby electronics box, which is in turn bolted to the back of the Scintillator. The base plate of the encoder is next. d. Carefully mounting the encoder wheel. e. Bolting the sensor block in place. f. Locking the encoder wheel. NOTE: The orientation of the wheel sets the location of the index pulse. I chose to place the pulse so that it triggers each time the quill is raised above horizontal (at approximately 100° cutting angle). g. The cover encloses the optical encoder. h. Installing the original potentiometer at its new, more distant location on the top cover of the encoder (see Figure 20-28). i. Bolting the Arduino microcontroller in place. j. The hobby box protects all of the encoder hardware. k. Wiring emerging from the bottom of the encoder box. l. The 16 character x 2 line LCD display mounted atop the original, variable-resistor angle readout.

20.8.4 The Electronics

The mechanical parts are presumably under control, and they will produce a series of electrical pulses as the quill moves up and down. Unless you plan to follow these pulses with an oscilloscope or flashing LEDs, however, you are going to need some support electronics. Specifically, you must count and keep track of encoder steps, calculate the facet angle, and present the result in a usable form to the operator (this is you).