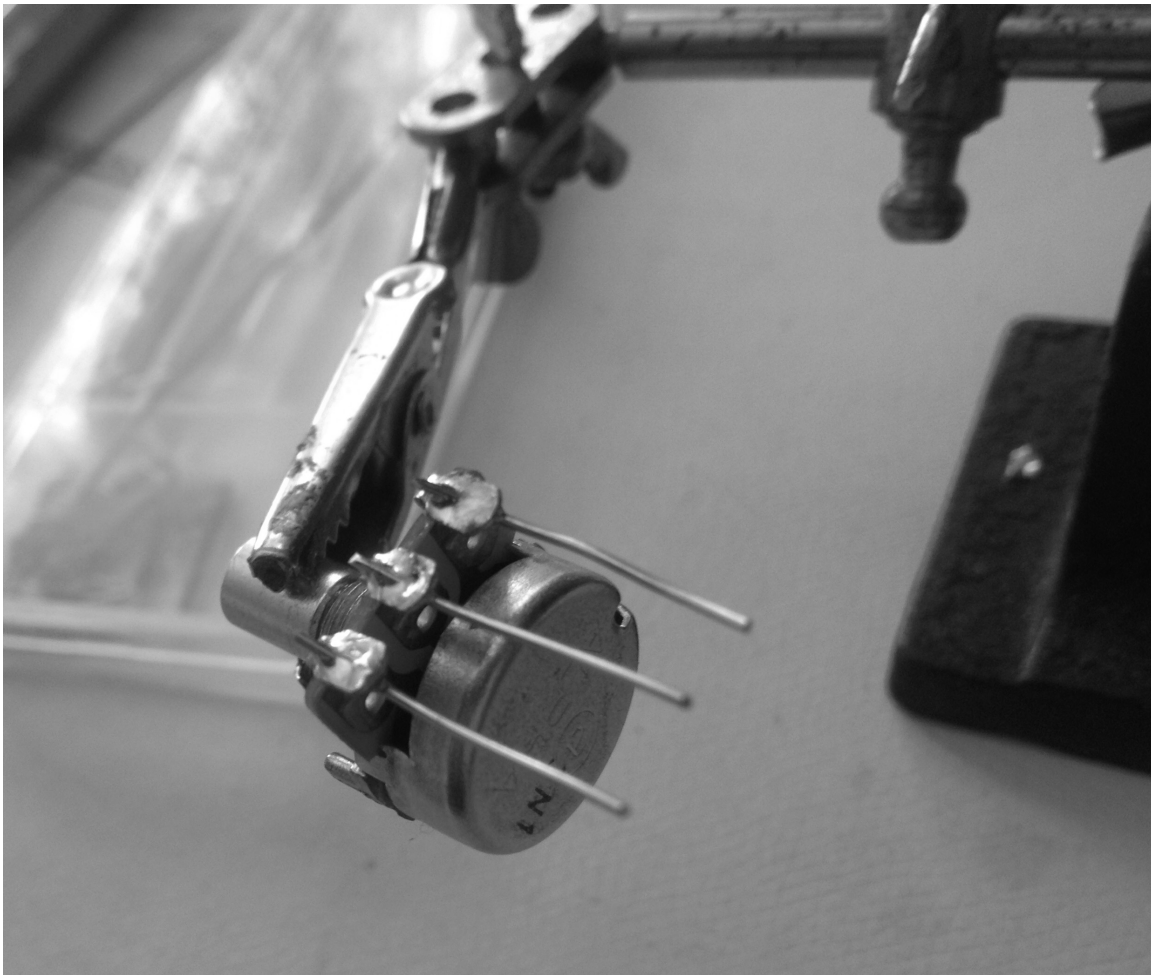


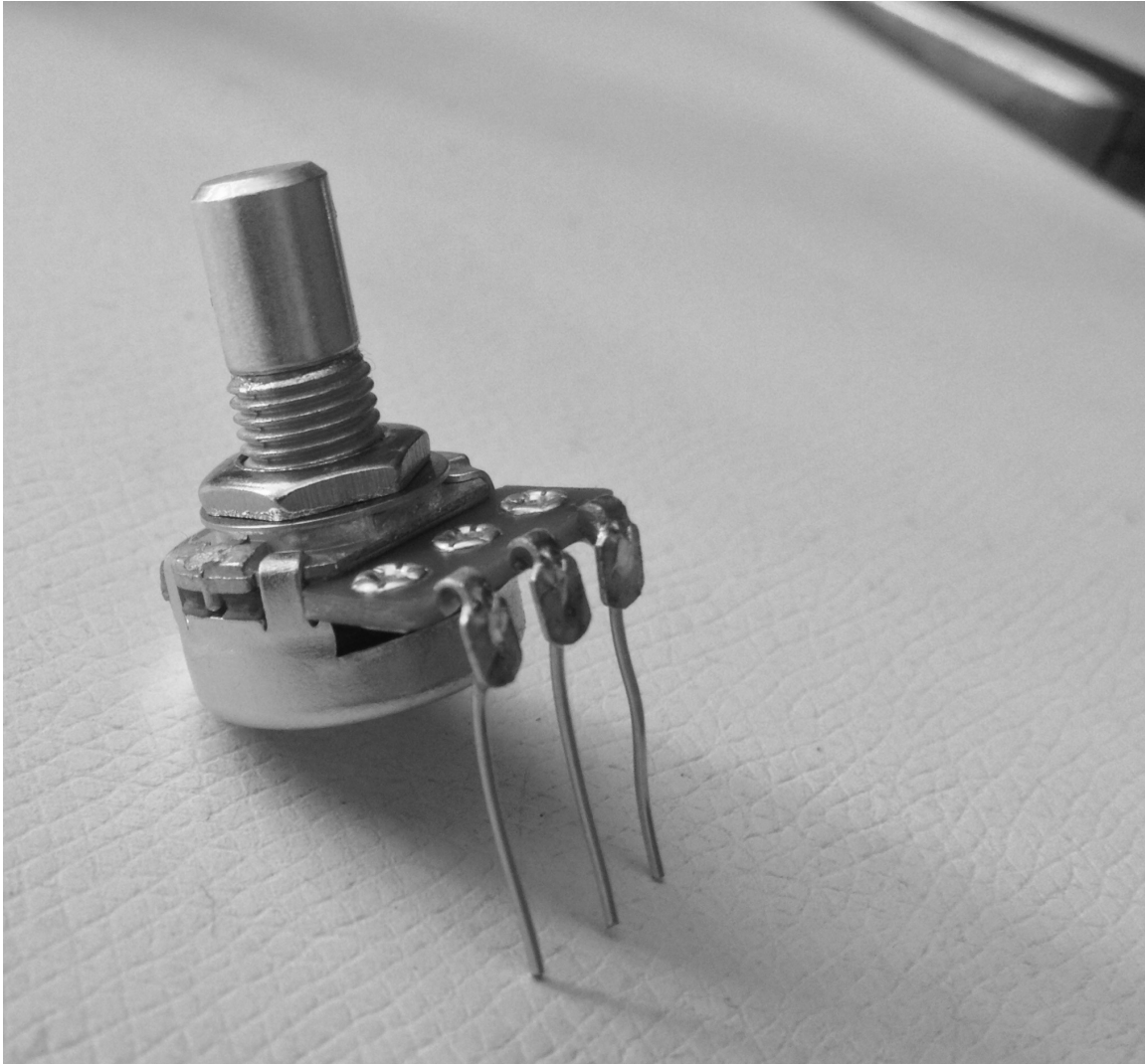
Preparing the pots

All pots must have their legs extended using bus bar wire in order to connect to the Hardware PCB. The amount of bus bar needed is approximately 0.5" per leg. An effort should be made to keep the bus bar at a 90-degree angle, centered on each leg, but precise alignment is not necessary since the bus bar has a lot of play when mounting the pots to the PCB. The most important thing is to "trim" the bus bar where it meets the solder lug, so that it sits flush with the lugs (see photos). Finally, the anti-rotation tab must be clipped or snapped off.

Partially completed pot. Note the unclipped excess bus bar above the solder lugs:



A fully prepared pot. Bus bar has been clipped close to the lugs, and the anti-rotation tab has been removed:



Mating the Hardware and Motherboard PCBs

The Hardware and Motherboard PCBs connect in a standard “PCB sandwich” style design, electrically connected via IDC headers and secured with metal spacers. The two boards should face “away” from each other —i.e., component sides should face outwards, with the headers and spacers in the middle of the sandwich connecting the PCBs by their solder sides.

We recommend that the Female / Male IDC headers be soldered first, before soldering anything else on the PCBs. It doesn’t matter which board gets the female headers and which gets the male. To make sure alignment is correct, install and screw down the spacers before soldering. Once the headers are soldered, the

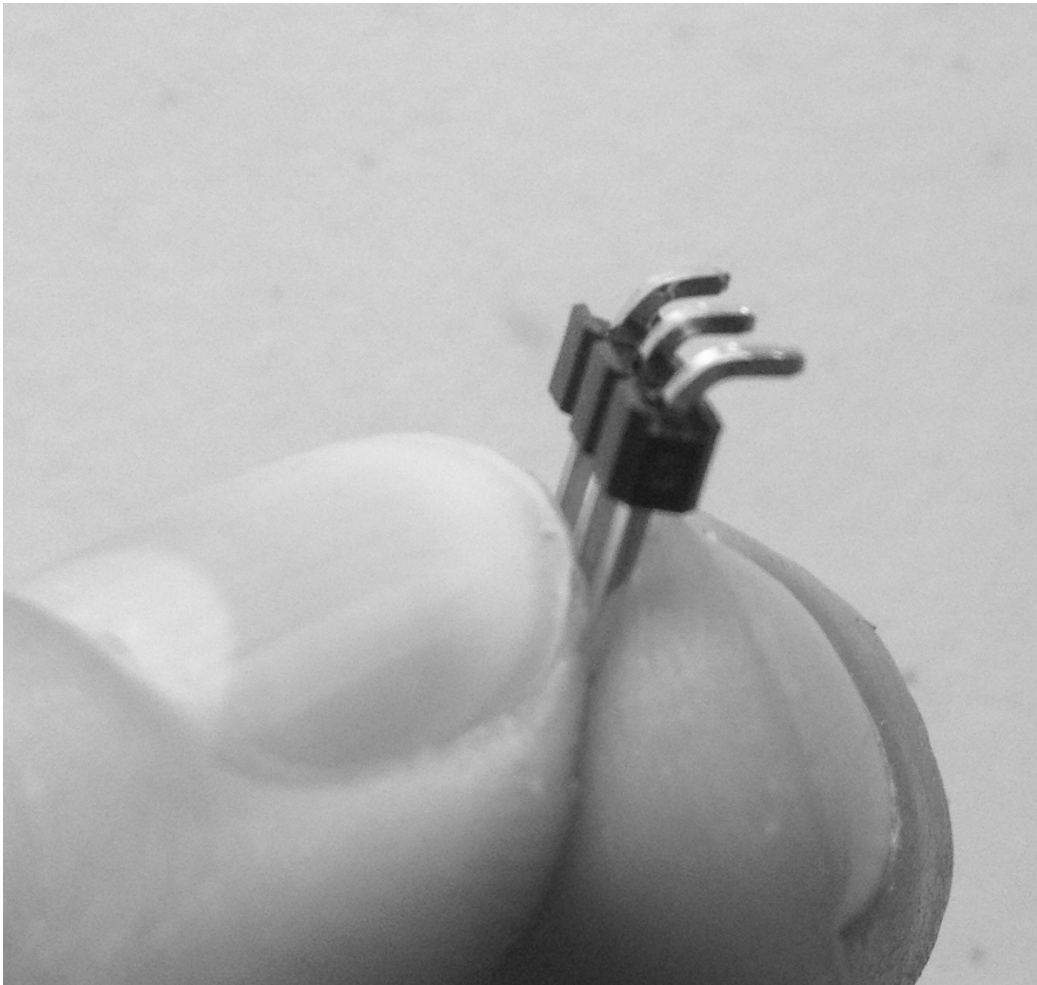
spacers can be removed and the sandwich separated to begin soldering the rest of the boards.

Building the NES PCB

The NES PCB houses the NES Controller socket as well as some additional active circuitry. Pay attention to the top and bottom sides of the PCB. The top side (which ultimately faces the panel) contains the NES Socket itself and a 10uF electrolytic capacitor. The bottom side contains a schmitt trigger IC, resistor, 100nF ceramic capacitor, and headers for connecting the NES PCB to the Motherboard PCB.

The NES PCB headers should be bent to form right angle headers, so that the 3 Pin Header cables sit parallel with the PCB. Standard headers can be easily bent by mounting them in the PCB (no solder yet), and applying a downward force with your hands or a tool. Alternatively, standard pre-made right-angle headers can also be used

Standard header formed into a right angle using needle nose pliers:



Connecting the NES PCB to the Motherboard PCB

The NES and Motherboard PCBs are connected using two 3-pin header cables. The first cable connects NES PCB header J3B to Motherboard PCB header J3A. The second cable connects NES PCB header J4B to Motherboard PCB header J4A. Make sure the polarity of the cables is correct, taking care to align pin 1 on each side.

A square cutout is provided on the Motherboard PCB to thread the cables when assembling the module.

Building the Hardware PCB and Panel Assembly

Before building the Hardware PCB, prepare the front panel by snapping in the plastic LED covers (these may require some force to snap in). Then mount the NES PCB to the front panel using the 15mm spacers.

Now place all the panel hardware (jacks, pots, switches, and LEDs) on the Hardware PCB, but don't solder anything yet.

Before soldering anything, fit the front panel over the Hardware PCB and guide the hardware through the panel holes. All panel hardware should be secured with their appropriate nuts/washers prior to soldering.

About the jacks:

Since JK3, JK4, and JK5 are so close together, they're mounted using only 3 legs. The fourth leg should be clipped off prior to installation.

About the NKK toggles:

The 90945A760 washer replaces the stock washer that comes with the NKK switches. The larger washer is needed to cover the large mounting hole.

About the Alpha pots:

The pots should be pulled up through the mounting hole so that they sit flush against the panel. The included washer and nut should then be tightened, but only by hand (no pliers). Over-tightening prior to soldering can twist the pots and bend the bus bar connection to the hardware PCB.

After the pots have been soldered in place (thus stiffening the bus bar connections), their nuts can be tightened fully using a pair of needle nose pliers.

Programming the Firmware

Firmware is programmed using a Microchip PICkit 3.

An in-circuit programming header is **not** provided; the PIC must be programmed externally. Refer to official Microchip documentation for the breadboard circuit.