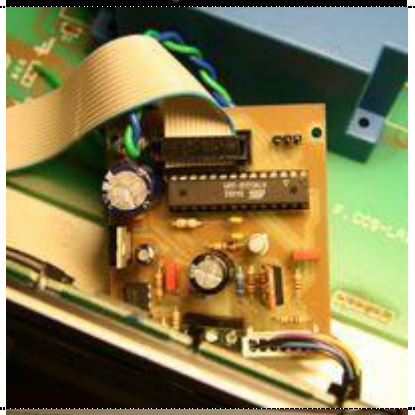
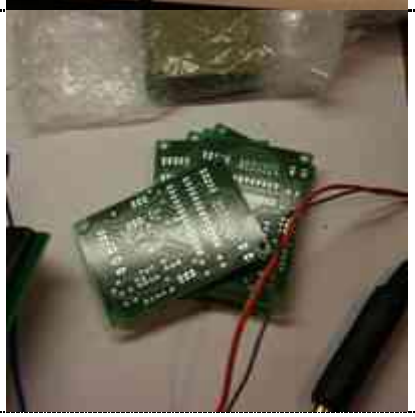
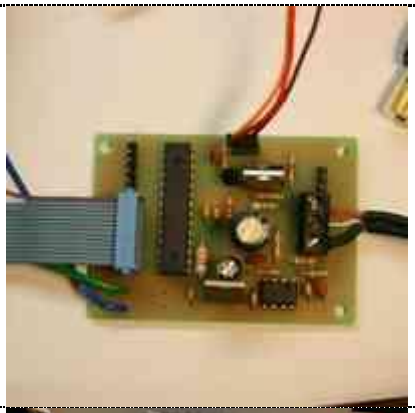
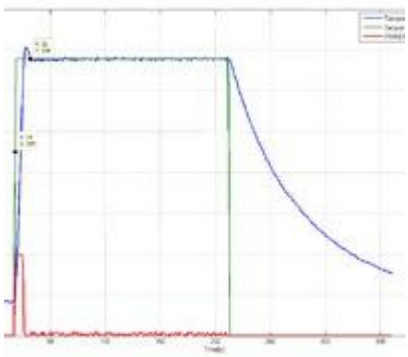
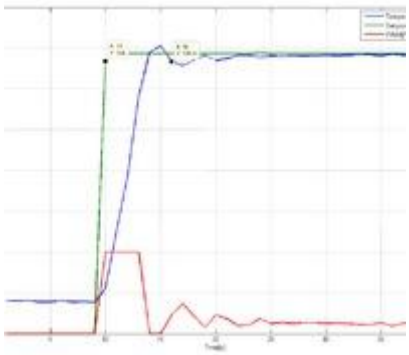
Soldering Station for Weller Soldering Tips

This project is based on the work of Martin Kumm.

	I made it simpler and cheaper. Instead of using an Arduino I use a ATmega8. This design doesn't use SMD and one single Layer PCB for easy assembly and cheap PCB production and the PCB is only 70x50mm. Instead of using two Buttons to adjust the temperature I use a potentiometer and optionally you can use a standard HD44780 compatible LCD.
	The PCB I designed is very easy to assemble and can also be home made. It has an optional LCD interface to display temperatures. The serial port can be used for monitoring, logging and firmware update.
	These are the two tips I use for this project. They can be switched very easily and also heat up very fast. I could not find a good and flexible cable for connecting the 3.5mm plug to the soldering station. You will need at least 3 wires and not too thin because the peak current is around 5A
	I had some PCBs made and if someone wants some then please send me an e-mail.

	This is one of the ordered PCB assembled and tested. While testing I wound a bug in my firmware and now it works better than before. I also made a video during the assembly.
	The inside of the first prototype before installing the LCD. The transformer is from the battery charger that was in this enclosure before. It has a rated voltage of 12V at 5A. When using a smaller power supply and no LCD you can use a much smaller enclosure. Bu I had that laying around for more then 10 years and finally I found a new use for it.
	This is the first prototype I made. The enclosure and the power supply I had laying around. On top you can see my old Ersa TE50 soldering station that I used to build the new one.
	Front view of the prototype with LCD and the knob to adjust the temperature. I used a CNC mill to make the holes and to engrave the scale for the temperature adjustment knob. The temperature can be adjusted from 200°C to 400°C. If you turn the nob below the 200 mark the heater is turned off.

	This is a plot of the soldering iron heating up. Here for the big 50W tip. It only takes 14 seconds to heat up and here the heating current was limited to about 50%.
	This is the response for the small tip and here it only needs 6 seconds to heat from room temperature to 340°C. It has a small overshoot when heating up from room temperature but I think it's the controller is tuned good enough. Maybe I could implement a estimator for the temperature but that would be overkill.