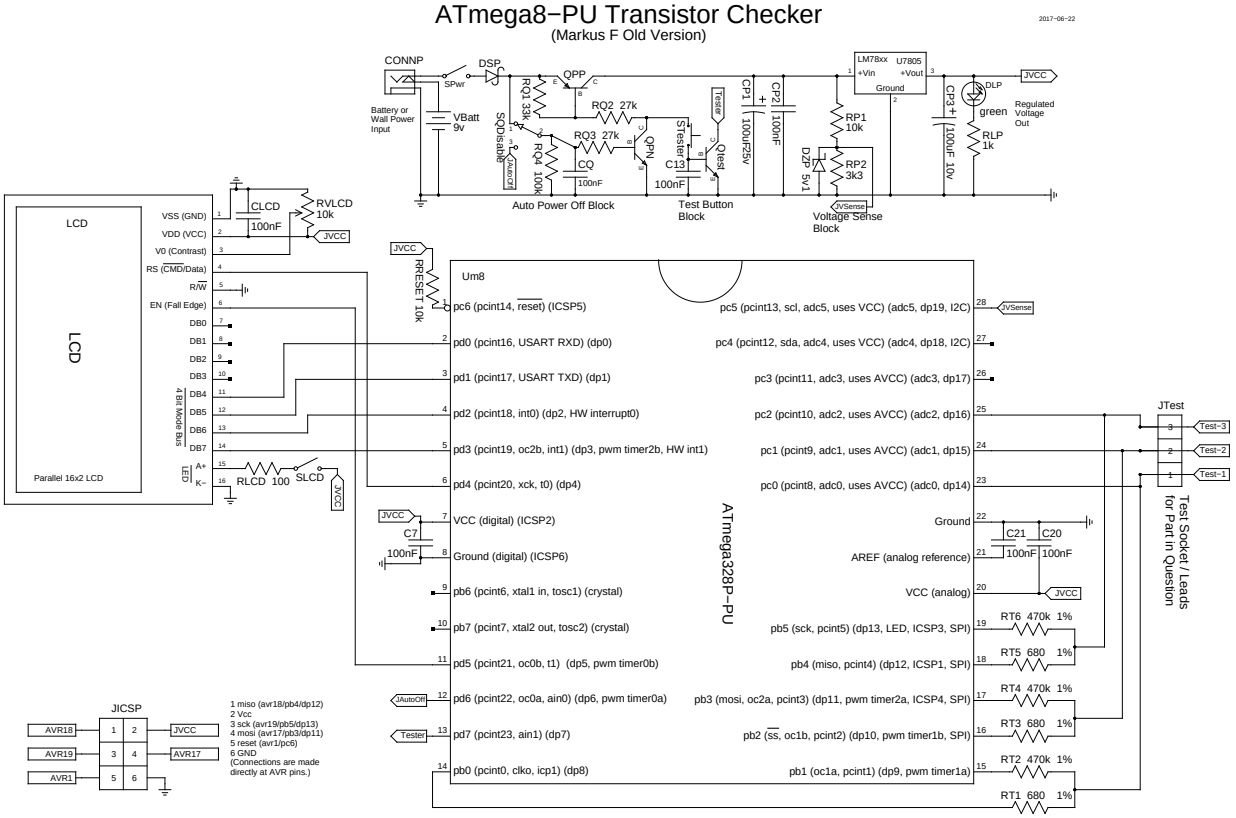

Markus F. Transistor Checker: Alternate Design
Project page: http://www.mikrocontroller.net/articles/AVR−Transistortester (use translate.google.com)
Forum post: http://www.mikrocontroller.net/topic/131804
Binaries: http://frickelpower.bplaced.net/ctest/
Updated page: https://www.mikrocontroller.net/articles/AVR−Transistortester
New version (different schematics than this): https://www.mikrocontroller.net/articles/AVR_Transistortester
Writing the EEPROM (parallel port ICSP method for ATmega8):
avrdude −p m8 −c dapa −e −U flash:w:TransistorTestNew.hex −U eeprom:w:TransistorTestNew.eep
(Note that copy/paste to a shell may make this command fail because of font differences.)

The source code can be recompiled for different AVR MCU's (ATmega8, ATmega168, ATmega328), but I used the precompiled ATmega8 code that is freely downloadable. The 3 AVR MCU's listed are all pin compatible in the DIP28 package.

This design is nearly identical to the Markus F. design, but has been split into 4 major sections and tweaked a little. It is recommended to wire up the circuit very similar to the schematic.

Power Section:
* The power supply section can use wall power or battery using the built in switch inside the wall power connector. One or the other can be left out for wall power only or battery only usage.
* Protection diode DSP will prevent plugging in something backwards and also act as a half wave rectifier if AC is plugged in. This should be enough for a low power circuit, but it can be replaced by a full diode bridge if needed.
* The auto power off section has been consolidated and can be omitted if it is not desired. A switch has been added to disable it if desired. The NPN and PNP transistors aren't overly critical, but BC547 and BC557 were used in the original. Both should have a C−E voltage rating of 45v, an E−B voltage rating of 5v, and a beta of 100+. The NPN can be 50−100mA rated. Since the PNP will be handling surge currents, 500mA or better is preferred. If high drain devices are attached in a design modification, increase the ampere rating accordingly.
* The voltage sense section has been consolidated and a zener protection diode added from another design.
* The power supply section as a whole can also be used in other AVR projects.

The ATmega8 block is wired nearly identical to the original design, but adds a debounce capacitor to the test switch.

I used to have Schottky diodes ESD protecting the 3 test lines, but Schottky reverse leakage was too much and they had to be removed. Signal diodes (1n4148) could be used since they behave much better.

The LCD section is wired according to the standard data sheet. It is a standard parallel 16x2 model. Some LCD's will already have and RLCD built in. Meter it to be sure.

The standard 6 pin ICSP header is shown but may be left off by those people using an external programmer.

The ICSP lines should be tapped directly at the AVR pins. Any protection resistors should be after the tap points. The ICSP cable should have protection resistors already in it. ICSP Vcc can provide power to the programmer or the programmer can provide power to the board (but never both). An ICSP header can service multiple AVR's if the clock signal is blocked for the AVR's that are not to be programmed (use jumpers or dip switches).

An ESD protecting diode from signal to Vcc is not provided on the reset pin because of the high voltage programming feature. Add one from reset to VCC if this feature will not be used (a 5v+ zener to ground could also be used). There is one from signal to ground, though. A 13v zener to ground could also be added for the best of both worlds.

If this is going in a portable tool box or bag, it is recommended to mount the circuit board on a shock mount and have some kind of cover to protect the LCD from scratches.