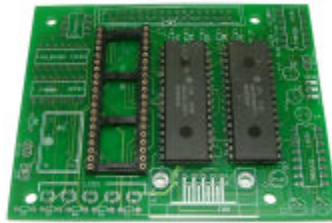


PCB Construction

Mount the PIC socket (SOCKET).
There is no need to insert the PIC into the socket at this time, however.

Mount the two memory chips (IC1-2).
Be sure to observe the proper orientation of the chips.



Mount the MAX 232 (IC3)

Mount the 74393 (IC5)

Mount the 7400 (IC9)

Mount the 7433 (IC4)

Mount the 75452 (IC7)

Mount the oscillator (QG1)

Mount the 34-pin connector

Mount the RS232 DB-9



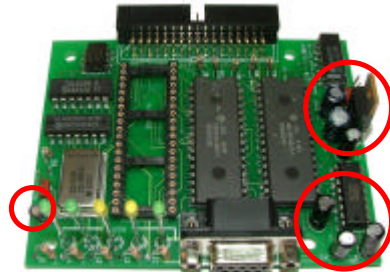
Note that the 75452 is shown as a 75453 on the silk-screen. Ignore this misprint! □

Mount the power regulator 7805 (IC6).
Observe the appropriate orientation of the 7805 with the "all flat side" facing the edge of the PCB.

Mount the two 47 uF power capacitors (C5-6) next to the 7805. Be careful to observe the appropriate polarity of the capacitors as marked on the silk-screen.

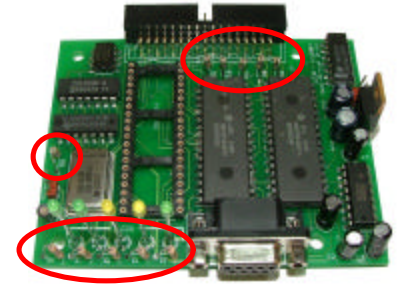
Mount the four 10 uF capacitors (C1-4) around the MAX232, observing polarity.

Mount the 1 uF filter capacitor (C7)



Mount the top six 10k (or 11k) pull-up resistors (R1-2, 8-11). Five are mounted above the memories and one to the left of the oscillator.

Mount the five 470 ohm resistors (R3-7) at the lower left of the board, next to where the LEDs will be mounted.

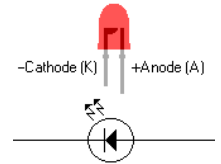


TIP

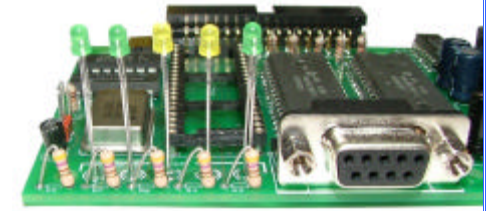
When mounting the LEDs, you must pay attention to two important things: their orientation and the height that they rise above the PCB.

Orientation – They should be mounted "pointing down" to the bottom of the PCB (with the RS232 jack at the bottom of the PCB). This is easily recognized by finding the **long lead** of the LED and putting it in the **top hole**. Or, if the leads are the same length, look inside the LED to identify the Anode, which should have the longer lead

Height – the LEDs need to "show through" the holes that will be drilled in the case. With the supplied case, the base of the LED should $\frac{3}{4}$ " above the top of the PCB. The easiest way I have found to do this is to make a bend in the long lead of the LED $\frac{7}{8}$ " from the base of the LED. Mostly straighten the bend, and insert the LED into the PCB. Re-bend the lead so that the LED will "hang" upside down. Solder the other lead in place. Then return to the top side of the PCB, ensure that the LED is oriented straight up, then straighten and solder the previously bent lead.



Mount the six LEDs as shown.
See the above TIP for information about the best way to mount them.



Things NOT included...that you'll need...

Wire – you will need standard wire to connect the power switch, power jack, and reset switch to the headers for connection to the PCB.

Soldering iron and solder – kinda' goes without saying...

Drill – for LED, power, and switch holes.

Dremel (or like) cutting tool – to machine the plastic case

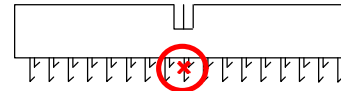


IMPORTANT

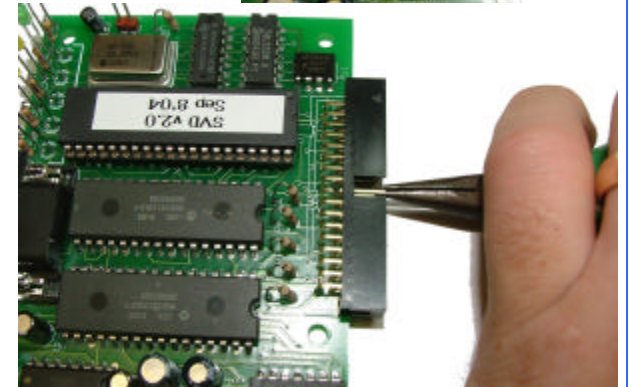
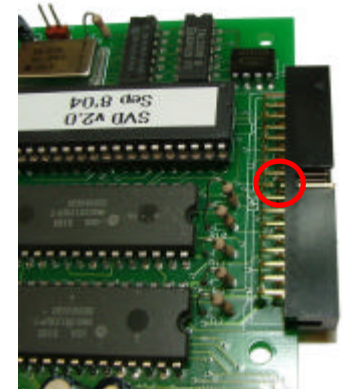
The following instructions describe how to remove a pin from the 34-pin connector. This pin must be removed to allow the edge-card adapters to fit into the connector. If you don't remove this pin, the connectors won't fit!

This was done because +5V is supplied to the edge card connectors to allow for termination as well as adapters such as that needed for the Apple II. The missing pin ensures that the edge-card adapters can be inserted in only one way.

Snip the middle pin at the top of the 34-pin connector.



Pull the snipped pin out of the connector.



"Big" ICs

IC8 – (1) PIC with label – this is a pre-programmed PIC 16C65b or 16C74b of either the one-time programmable (OTP) or windowed CERDIP

IC1-2 – (2) 128kx8 SRAM – this can be of many different brands and part numbers, though they are all compatible with TC551001CP

SOCKET – (1) this 40-pin socket should be used to mount the PIC, allowing future firmware upgrades.

"Big" Hardware

X1 – (1) Female DB9 right angle

SV1 – (1) 34-pin box header, right angle

"Small" Hardware

SW1 – (1) momentary pushbutton (for reset)

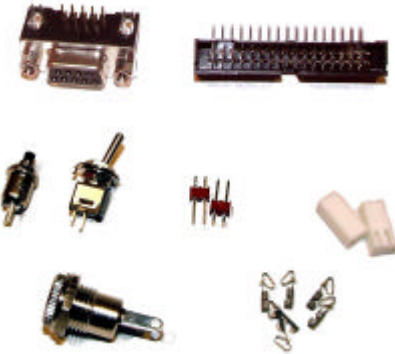
SW2 – (1) SPST toggle (for power)

POW – (1) Power jack – 2.5mm X 2.1mm

JMP1,3 – (2) .1" 2-pin Molex-style headers

HDR – (2) .1" 2-pin Molex-style connectors

CLP – (6) clips for mounting in headers (4 needed, 2 extra)



Cut the indicated notches out of the SVD label.

Mount the label on the smooth top side of the case.



Working on the top half of the case:

Drill 5 holes for the LEDs using a 1/8" bit. Try to keep them straight – as in this example :-).

Drill a hole for the Reset button and for the Power switch. Use a 3/16" bit. Note that this bit is just a tad small. I'd use a 13/64" if I had one.

Drill a large hole for the power jack about 3/4" from the side below the "9 – 12V" part of the label. I don't have a drill bit big enough, so I will "ream" it out as needed. The hole should be centered from between the top and bottom of the side of the case.



Final Assembly

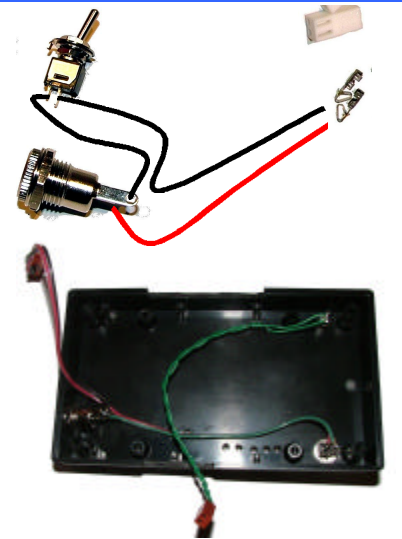
Mount the Reset switch.

Mount the Power Switch. Note that since this is a SPST switch, there is only one set of contacts. The contacts go toward the bottom of the case – that is, they are opposite of the direction of “on” for the switch.

Mount the Power jack.

Wire the Power switch and jack together, crimping clips on the ends and attaching a connector. *Note that the power adapter supplied is “center positive”. So wire the red/positive lead to the center of the jack.*

Attach wires to the Reset switch, crimping clips on the ends and attaching a connector.



Install the PCB into the bottom of the case. Note that the case only comes with 4 screws, so use two to attach the PCB, and keep 2 for securing the two halves of the case.

Attach the power connector to the power header. **IMPORTANT** – make sure the red wire (attached to the center pin of the power jack) goes to the positive + side of the header.

Attach the reset connector to the reset header. The direction of this connector doesn't matter.

