

Construction Notes (Stripboard)

It should be fairly easy to build the controller on a piece of veroboard (stripboard) slightly wider than the LCD and about 15mm deeper (around 100mm x 75mm). I've found the best type of stripboard for this purpose has the strips grouped into blocks of 3 connections.

Most components can be placed on the stripboard pretty much as per the PCB overlay.

Starting with the LCD hold it against the stripboard in the correct position and make a note of where the connections line up on the stripboard.

General.

To make life easy you may wish to fit the LCD using a plug and socket arrangement so it can be removed easily. I used a 16 pin IC socket cut in two to provide a 1 by 16 pin socket, this is soldered to the stripboard. The LCD can have a 16 pin SIL header fitted (or stiff wires), bolt the LCD to the stripboard before soldering up the SIL header so that the length of the 'pins' can be adjusted. The LCD can now be plugged in and out. Remove the LCD.

Referring to the circuit diagram and pcb layout.

- Fit IC1's socket and connect the six wires from IC1 to the LCD.
- Fit the voltage reg (if using) along with C5 and C4. (a small heatsink is a good idea for the voltage reg).
- Fit contrast pot (VR1) and connect the 3 wires to the LCD (and pin 5 to 0v)
- Connect the 5v line to IC1 (pins 1, 32, 11), 0v to pins 12, 31.
- Connect 5v and 0v lines to LCD.
- Fit and connect C3 as close to IC1 as possible.
- Fit and connect xtal to pins 13, 14 of IC1.
- Fit and connect C1, C2 (common wire between them to ground).

At this point you can test the circuit, apply power and check for 5v across pins 11 & 12 of IC1. If Ok plug in IC1 and the LCD, re-apply power and you should be greeted with the splash screen (you may need to adjust contrast to see this).

If this isn't the case check power to the LCD, the connections between the LCD and IC1 and the connections around the crystal.

- If your LCD has a backlight connect power to it as per your LCD datasheet. If it's an LED light then a 82 ohm resistor in series with the 5v power line gives a decent level of brightness.
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- Next fit a socket for the keypad (or decide where the wires will go) and place R1, R2, R3 & R4.
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- If you wish to add the beeper, place LS1 (this can be taken from an old computer motherboard), D2, R5 and Q3.
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- If you wish to use the sense/ack lines, place and connect R6, R7, R8, R9, R10, R11, D1, Q1 and Q2.
 - **Note:** If you don't place these components then you must connect pin 2 of IC1 to ground (0v) via a 10k resistor and place the two limit pull up resistors R10 and R11. These are important since allowed to float these lines could initiate commands or stop the table without warning.

That's it! Plug IC1 in, connect the LCD and connect the keyboard and read the manual for controller operation.