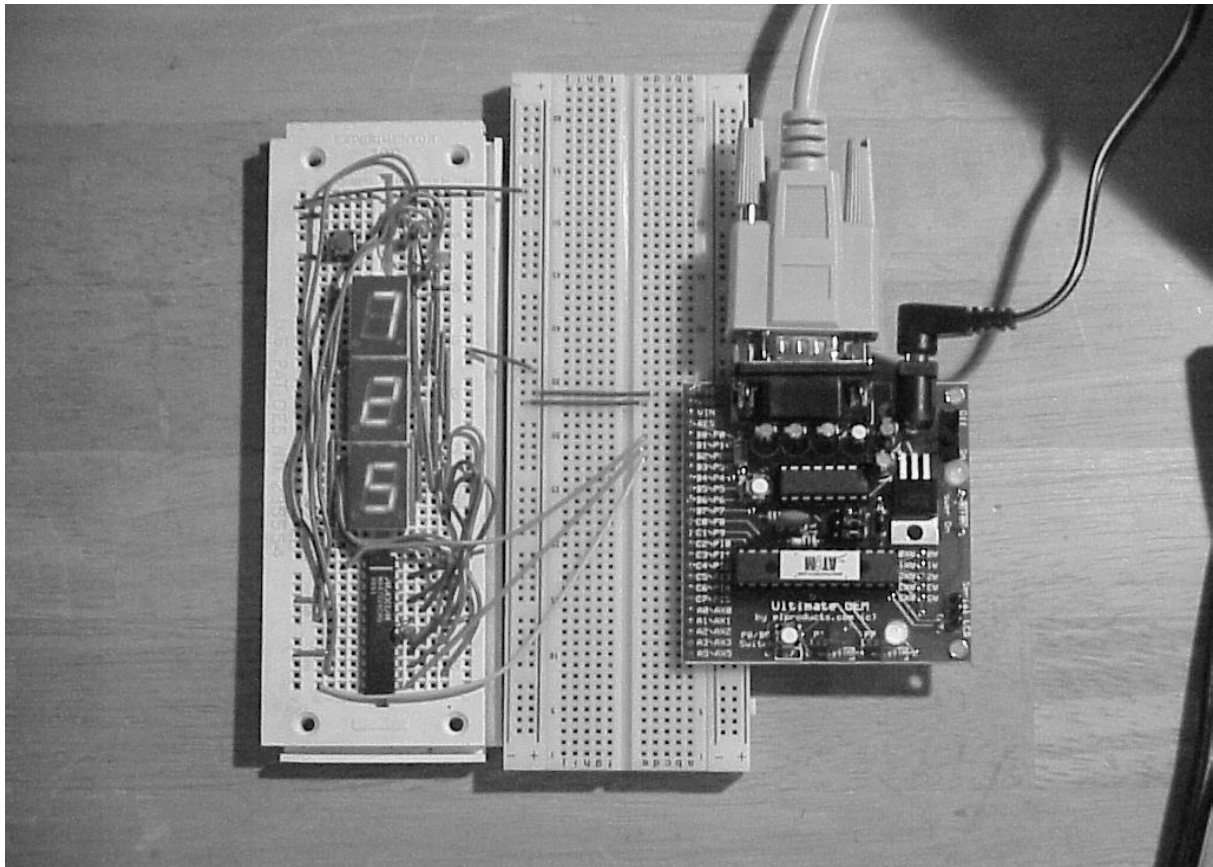


# Chapter 15 – Driving LEDs with Max7219

## Description

This project demonstrates how to control a Maxim Max7219 display driver using the Atom. The project is quite simple and I suggest you read the max7219 data sheet that is included on the book CD. It operates similar to a simple shift register but has many special features to make driving LED displays quite easy. The max7219 can drive up to eight displays but for this project I'll just drive three and have the project count up from 000 to 999.



## **Project Setup**

The max7219 and LED's are built on a separate breadboard. This is for two reasons; 1) it was easier to fit and it can easily be added to any project that I want to add the display to and 2) I had built this several years ago for a different project so I was too lazy to rewire it on the same board as the Atom.

This is one of the more complex schematics in this book but it's really not that tough to build. The max7219 drives common cathode displays which just means every individual LED in the display has their cathodes all connected at one pin. The LED's are multiplex driven by the max7219 which means the displays all share the same connections to their anodes and then each separate cathode is turned on or off by the max7219. Therefore, only one LED display is on at a time but the max7219 drives them in succession so fast the human eye picks them up as all lit together.

Now you could use LED's that mount horizontal on the breadboard rather than vertical like I did, but I wanted it to look like this in the previous application so I left those LED's in place. The Atom connections are quite easy. Just a clock, data and enable line are all that is needed. Using the SHIFTOUT command makes this setup easy to control. I supply power to the display board from the Ultimate OEM module Vdd output since this module has a larger 5-volt regulator. If you use a different Atom module, such as the Atom 24 pin, you might want to power the LED's via a separate power source since the Atom 24 regulator cannot handle nearly the amount of current that the Ultimate OEM can.

