Lab 2, Memory size determination

Purpose

To determine the size of working memory on the Maple board. The documentation says 128k of flash, 20 kbytes of sram. Perhaps they are lying to us. Maybe some of the memory failed due to radiation exposure. We want to know what we have to work with.

Equipment Required

Maple board and IDE
Clever algorithm

Procedure

Write a program to determine the amount of memory addressable from the Maple cpu. If you read a memory location in the address space that doesn't actually have physical memory installed, you should get a value of 0FFh. But just because you read a value, doesn't mean there is memory there. It could be noise. Is it reproducible? We could write a value to a location and see if we read back that value, but we don't want to overwrite out program or the system code. Or send a value to an I/O device. What is the system memory map? Maybe we need two parts to the program. The first determines the boundary of use-able memory, and the second runs in the background to periodically check the memory. This second program should output what it finds But wait! What if the memory that holds the checker program is corrupt?

One caution. The bootloader is located in the front of Flash. It is difficult, but not impossible, to overwrite it, which bricks the board. It is possible, but not easy, to recover the bootloader (reload it). So, avoid this by understanding what addresses are where.