

This project is due at 1:59pm on Tuesday, April 1<sup>st</sup>, 2008.

This is the easiest of 3 projects that you must complete by May 6, 2008. If you do the math, that means that you have 3 weeks of school for two of the projects, and only 2 weeks for the third. By choosing to make this project a three week project, I am not doing you any favors. The wise students will approach this project as if it is really due on March 25, 2008, so that they can begin their next project(s) earlier.

## Instructions

The F-15E Strike Eagle is the top air-superiority fighter in the world, even though its design is 25 to 35 years old. It can carry up to eight AIM-120 AMRAM missiles at a time for use in dogfights.



You must design a circuit on the BASIC Stamp to set and monitor the onboard missile complement. The program must be demonstrated without being attached to the Board of Education. This project requires all 16 pins of the Stamp, as well as one D flip flop. You are free to use additional circuit components in your own design.

**Input Summary:** One potentiometer, generating numbers from 1 through 6  
One SPDT switch “mode”  
One momentary switch “load” or “fire” (depending on mode)

**Output Summary:** Three seven-segment displays:  
a. Number of missiles to load  
b. Number of missiles onboard  
c. Number of missiles to fire  
Two warning LEDs:  
a. Warning: you can't add more missiles!  
b. Warning: you don't have that many missiles!

The aircraft will be in one of two modes: *grounded* or *combat*, as set by an SPDT switch. While the aircraft is grounded, new missiles can be loaded onto the aircraft using a momentary switch. Each toggling of the switch loads some number of missiles onto the craft. The number of missiles loaded at one time can be varied from 1 to 6 by turning the potentiometer. This value is continually displayed/updated on the first display. While the F-15 is grounded, the third display is blank (not zero!). The total number of missiles onboard is indicated on the second display, but can never exceed 8. For example, if the plane already has 6 missiles, and the user attempts to load 3 more, then the first warning light comes on for exactly one second, and the total remains at 6. When multiple missiles are added, the second display increments towards its new total in steps lasting 0.5 seconds each, during which time, new “load” commands are ignored.

When the aircraft is in combat mode, the first display is blank, and the reading from the potentiometer is continually shown in the third display. When the “fire” button is used, this number is now subtracted from the total seen in the second display. Subtraction takes place in half-second intervals, as before. Also as before, there is a 1 second warning light if this quantity is not available.