

Alexander Valys  
6.111 Final Project  
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## **CHECKLIST**

### **MOBILE DATA LOGGER**

1. The mobile data logger will not be able to receive a GPS signal from within the 6.111 lab, and even if it could, would not produce meaningful visual output, but the availability of a serial flash module with plausible data logged on it should prove that it is working.

### **VISUALIZATION SYSTEM**

#### **VGA Module**

Reads active video memory and drives a VGA display.

1. Check for output of any sort on the monitor.

#### **VRAM Module**

Manages double-buffering of video RAM, and conversion of 20-bit 1024x768 pixel locations to 19-bit physical memory addresses.

2. Check for 'active' signal on oscilloscope, indicating which video RAM is driving the display. Signal should oscillate when display is being refreshed.

3. Check that screen resolution is 1024x768, and color is 18-bit.

#### **Pixel Fill**

Handles coloring of pixels in the video RAM directly. If time permits, supports alpha transparency.

4. Check for colored pixels on the screen (not just random data).

5. Check for regions of transparency on the screen (TIME PERMITTING)

#### **Line/Rectangle/Text Draw**

Draws lines between arbitrary coordinates, fills rectangles, and draws text on the screen, by issuing commands to the pixel fill module. If time permits, the lines may be anti-aliased.

6. Check for lines drawn on the screen, of multiple angles and lengths. TIME PERMITTING: check for line anti-aliasing.

7. Check for filled rectangles on the screen.

8. Check for text drawn on the screen.

#### **2D/3D Transform**

Transforms points in two- or three-dimensional geographic coordinates into screen coordinates. If time permits, the 3D transform will take the Earth's sphericity into account.

9. Check visualizations to verify that 2D transformations appear to have been performed accurately.

10. Check visualizations to verify that 3D transformations appear to have been performed accurately.

11. Check that Earth's curvature is visible in 3D visualizations (TIME PERMITTING, and possibly not noticeable even if implemented).

#### **Visualization Modules**

Selects data from sequence of positions logged on serial flash, and renders visualizations of various subsets of it.

12. Check for presence of 2D visualizations: altitude vs. time, velocity vs. time, position, and more if time permits.
13. Check for presence of 3D visualizations: position vs. velocity, position vs. altitude, and more if time permits.
14. Check for presence of labeled axes in all visualizations.
15. Check that all visualizations support scrolling, zooming, and (for 3D) rotation in arbitrary directions.

#### **IMPS/2 Module**

Decodes mouse movements and provides them to the visualization modules as control signals.

16. Check that the visualizations' views can be controlled by an attached PS/2 mouse, with support for zooming using the mouse-wheel.