

6.111 Final Project Checklist

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Check off Items:

- Demonstrate working display controller block with DDR2 frame buffer and HDMI output; the data processing block must be able to draw the at least the graticule onto the screen.
- Demonstrate functional data processing block that draws the graticule, as well as user-input settings on the screen and at least a single-shot set of traces on the screen. The traces should be vertically movable on the screen for the check off, but vertical scaling and horizontal scaling and moving are stretch goals. If the capture and storage module is not working, a static set of example values will be written to the BRAM and drawn on the screen.
- Demonstrate single-shot capture and storage module that triggers once after the user presses a button. If the trace is successfully drawn, this also demonstrates the basic functionality of the analog front end board.

Stretch Goals:

- Demonstrate fully-functional analog front end with AC/DC coupling and vertical scaling (the minimum requirement of the analog front end for the check off is that the ADCs work).
- Add horizontal scaling by downsampling and interpolating using a FIR $\sin(x)/x$ filter (the minimum requirement for the check off is to sample at the full rate of the ADCs, and then display the first 1366 samples as pixels across the screen without an interpolating filter).
- Add horizontal scrolling in single-shot mode; the user will be able to scroll left and right through all the samples that were captured, not just the first N samples that fit on the screen after the trigger event.
- Add a front panel controller board that uses rotary encoders to emulate the knobs on an analog oscilloscope instead of pushbutton controls.
- Add measurements such as peak-to-peak and RMS voltage and frequency that are drawn on the screen.