

Laboratory Assignment #0
“Start Thinking About Your Project”

Due: Discuss project ideas with TA or Instructor by Friday, October 18, 2002

EE 281 is a design laboratory project course. There will be several weeks of exercises to help get you familiar with the development and diagnostic tools, but the majority of the course is dedicated to building a project of your own creation. There are links on the class WWW page (<http://www.stanford.edu/class/ee281/>) to various projects to give you ideas. The TA and the instructor can also help generate ideas. If you are working in a team, discuss the project with your teammate. You should set up a meeting with the TA or instructor by Friday, October 18, and you should have at least preliminary answers to the following questions:

- *What do you want to build?* It is important that you decide soon what you want to build, so you can start planning the design and getting parts. If you are working in a team, you will also need to decide how to partition the project. Your project should be something that inspires you, but is also reasonable for the scope of the course – **see the warning below**.
- *What will your user interface look like?* In addition to the core functionality of your embedded system, it will need some way to interact with its users. This can be individual buttons, keypads, keyboards, LEDs, LCD displays, terminals, or other mechanisms. We will discuss these in later lectures, but you should start thinking about how you envision your project interacting with people.
- *How do you want to develop your software?* There are a variety of libraries available for the AVR, or you can do it all yourself. You can write entirely in assembly language, or you can implement some of your code in a high level language, such as C. Later lectures will present some of the implications of these decisions, but you should start considering how to most efficiently get your project to function.
- *How do you want to build your hardware?* Quick test circuits can be wired up on a breadboard, like the EE 183 geek-box, and wired to the AVR development boards. But for your final project, you will want something more permanent, with a truly embedded AVR processor surrounded by your own electronics. Wire-wrapping is an excellent prototyping tool. Soldered proto-boards are even more compact and professional looking. Building a full-custom printed circuit board is beyond the scope of the class, but if you have the resources and time, we can assist you. **Your final project must be built using a method more permanent and sturdy than breadboarding.**

Warning: The classic EE 281 mistake is to attempt a project that is too ambitious. We would rather see a well-built, completed project of reasonable scope than a superlative project that never actually works. Assume that some of your design will not work when you first wire it together. If it does work, then great, you can add more features. But plan for a significant debugging phase on a basic functional system. And remember—it’s never too early to start working on your project.