This is the prelab assignment for the final project. The objective is to design, test, and demonstrate operation of a complete solar power system. The system may include components such as:

- Battery charge controller, to charge a battery from the solar panel, with substantial functionality beyond the system of Exp. 3.
- Step-up dc-dc converter, with performance beyond the flyback converter of Exp. 4.
- Inverter, with performance beyond the modified sine wave inverter of Exp. 4.
- Battery charger, that connects to the ac power line and charges the 12 V battery. This converter should function as a low-harmonic rectifier and should include isolation.
- Auxiliary power converters for other loads supplied from the battery, such as a high-frequency resonant fluorescent lamp ballast or a dc motor speed controller.
- Solar panel positioning system.

Each group will work on one system component, and each of these components must include a PWM converter and a feedback loop. Multiple components will be combined into a single power system on a single PV cart for the Expo.

The prelab assignment is to:

1. Choose a project topic and research the topic (use library, internet, textbook, consult the instructors, etc.)
2. Prepare a preliminary design proposal that includes:
   a. A one-paragraph description of the proposed project, including input/output specifications and project objectives
   b. A preliminary circuit design that includes a circuit diagram, component types and values, and a brief description of how the circuit is supposed to work and how you chose the element values
   c. Design of magnetic components: select core size, number of turns, wire gauge, air gap length as appropriate

One prelab assignment is due from each team at the beginning of lecture on March 11, 2008.