1. **Testing your board:** Each computer has a program called `gxstest` installed with the `XSTOOLs`, which will test your board to make sure it is functioning. In order to run this test, you simply select the board type (XSA-100), plug in the power and the programming cable, and click test. Note that the tests would not work if you have any external components connected to the board.

2. **Hooking up the board:** To use your board, simply plug in the power supply (between 6 and 9V, please) and the parallel cable for programming.

3. **Hooking up external components/signals:** When attaching external signals it is **critical** that all components share the same ground and that all signals into the board be between 0 and 5V. (The FPGA operates and outputs at 3.3V, but will accept 5V signals.) You would destroy your board if you put in a signal below 0V. You can expect to get strange behavior out of external components by having different grounds. **Conclusion:** ALWAYS test every input to make sure it is within the range 0-5V before attaching it to the board.

4. **Clocks:** External clocks, if any, should be connected to pin 73 on the XSA board. This is listed as "SPARTAN-CCLK" in the documentation. Please verify that all external clocks are between 0-5V as the function generators will default to -2.5 to 2.5V which is **not good** for the boards. The XSA boards also have a CPLD (Configurable Programmable Logic Device) which can generate various clock frequencies by itself. There is a `XSTOOL` program `gxsetclk` for configuring the
on-board clock. You can configure this clock for a speed between 100MHz and 48kHz. Refer to pages 22-23 of the *XSA Board User Manual* for more information.

5. **Pinouts & Schematics:** The pinouts and schematics of the XSA-100 board are provided in *Appendix-A* (pages 32-34) and *Appendix-B* (pages 35-44) respectively of the *XSA Board User Manual*.

6. **General Board Care:** Make sure that any external signals that you put into the board are limited to 0 to 3.3V and that you don't draw too much current (external) from any output. Insert a 470 Ohm current limiting resistor in series with your output if you're not sure, or just ask. Also, please try not to damage the FPGA boards by dropping them or spilling drinks on them.

**Acknowledgements:** This handout was adapted from the website of the class for Stanford EE 183 <http://www.stanford.edu/class/ee183/tao.shtml>.