

Andrew Hyduchak
Engineering Design VI – Homework 1
January 28, 2011

Low-Powered, Scalable Greenhouse Control System

The world's population increases every day. The infrastructures that support our food supplies is very delicate. Natural disasters/diseased crops/low yields/political instability/energy concerns can lead to food shortages on a large scale. Besides the logistical means of producing and consuming the food, the risk of inflation, especially today, where more people are financially strained, would put food out of reach of many people. A home greenhouse would be ideal to ensure that food is available to the end user of the system. A "green" system, when applying the terminology, generally refers to a system that produces efficiently with the least amount of input energy. Because energy can become a concern, the adaption of solar energy systems would provide year round, scalable growing opportunities for anyone using the system. A small microcomputer would be the heart of the system, controlling the other elements of the system that would be required to produce a certain crop. The reason I stress scalable is that the system should be relatively inexpensive and almost universally adaptable to size, crop, nutrients, available daylight and temperature. The system should rely solely on the electricity produced from a solar cell, but will take other compatible inputs to maintain the system operations. The system temperature, lighting schedules, nutrient supply and the crops own growing cycle would either be preprogrammed, or customizable. The microcomputer would be accessible through the user's computer network, which would in turn allow for remote access and monitoring.

This product would require a small investment, but should not cost more than a few trips to the grocery store. With the uncertainty we live every day, people are beginning to look for the security that food provides, so that they can still function in their daily lives. A person simply cannot move forward without steady supplies of food.

The product has a large market, seeking many of the consumers that have turned to “green” living standards. Not only would this take a person’s energy consumption off the global grid, it would reduce the reliance on large scale farming and the environmental damage SOMETIMES caused by it. In addition, many of those who desire organic, non-genetically modified foods would find this product appealing. The market is saturated with low-cost electronic components and development boards which could easily handle the tasks required, and do so with minimal energy requirements. The push for more efficient, safe energy storage will only drive the cost of batteries down, which will play a large part in how this system works. If a family could purchase a system that could be built and used relatively simply and quickly, with a small learning curve, costing no more than a couple weeks of groceries, the adaption could be widespread.

“I pledge my honor that I have abided by the Stevens Honor System.”