One of the design issues that we encountered was the robustness of our voltage regulator. The voltage regulator is built on a soldered protoboard which means that all of the pieces of the voltage regulator must be soldered on. The chip which the voltage regulator was placed on must be very small because that is the only way to build the outer shell such that all of the ambient light will pass through the polarizers. This creates a problem because that means all of the pieces are squeezed together.

More specifically, the wall jack is connected to the diode at node 1 by a long piece of wire, but the wire must be bent underneath the chip such that none of the wire is outside of the boundaries of the chip otherwise the the chip will not fit inside the outer shell. This creates a problem because bending the wire can cause the wire to unattach from the rest of the board and the rest of the circuit would not have any current going through it.

There are two ways to fix this problem. First to get larger polarizers, this way the dimensions of the outershell would be larger which means that the entire circuit and chip would be larger. This would solve the problem because with a larger circuit chip the wires would not have to be bent to the degree such that the wires could come off. Another solution is to use a stronger soldering technique so this way the wire is more stable.

The small chip size also creates problems for the wall jack itself. To plug the circuit into the wallwart, it requires some force which could unattach the wallwart to the circuit board. This happens because the soldering on the board is not strong and the reason why it is not strong is because we cannot add too much solder on to it otherwise it will short circuit other parts of the circuit.

To solve this, the method above of larger polarizers making the entire design larger would suffice. A larger circuit would mean that the dimensions of the outer shell would be increased. This way more solder could be added on in which case it is harder to forcefully unattach the jack.

Another problem that arises from a small chip is that many of the components are close together when soldered and it is easy to short circuit certain components. This happened several times and some of the components got really hot. Again the same way to solve this would be use larger polarizers so that there is more space to add more solder. Figure 1 shows the back side of the voltage regulator.
Another issue with the design of the circuit is that the LED lights must be placed directly in the middle in order for the camera to capture the diamond image. The LED lights are attached to the circuit through very thin and long wires as if the LED lights hang above the circuit which makes it difficult to pin the LED lights in the middle. To solve this problem, tape was used to hold down the wires so that the LED lights are in the center. Figure 2 shows a picture of that. Even though there is no functional hinderance, it looks not as nice.