The primary goal of this research program is to test and validate this method in a flight environment using realistically seen stressing of solder joints based upon environmental loading. Future research items are still in the formulation stage. Ideas include investigating if this technology will work with Columbia Space Shuttle flight hardware, and developing a package to use solder joint health monitoring for commercial use. The master FPGA design is responsible for accepting the board data stream and calculating the voltage levels required by FPGA and other circuitry. The voltage levels required on the board are measured using a 3.3V, 1.8V, and 1.2V. The board will run on 28VDC power which is stepped down to 5V through a DC converter. The 5V power will be provided to separate regulators to produce the voltage levels required by FPGA and other circuitry. 3.3V, 1.8V, and 1.2V.

The slave FPGA design is responsible for monitoring its own solder joint health, and collecting low level data from all of the sensors on the board. The slave FPGA is a Spartan 3A DSP FPGA in a 676 pin package. The slave FPGA is designed to be easily integrated into research aircraft and to use existing instrumentation infrastructure, such as time and data recorders to produce the voltage levels required by FPGA and other circuitry. The voltage levels required on the board are measured using a 3.3V, 1.8V, and 1.2V.

Future work includes extending the research to include other types of solder joints, and to investigate if this technology will work with Columbia Space Shuttle flight hardware.