



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Joshua R. Fournier	Project Number J0910
Project Title HF Backpack Station	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My engineering problem was to develop a backpack that would be able to supply emergency support and communications for an indefinite period of time, as well as supply shelter, and other necessities.</p> <p>This project was designed for emergency relief and emergency communications during a natural disaster and would be able to run independent of an outside power source and other telecommunication devices using a solar panel, battery, and QRP (low power) radio for use on the amateur radio bands. As a result of some research and debate, I designed my first prototype and tested it. This emergency communications device proved itself out in the field as a viable QRP emergency communications device that would run independently of an outside power source.</p> <p>Methods/Materials Steps for construction of the solar panel mounting apparatus: 1.First, I found my power budget. 2.I next found out how to construct a solar panel mounting system. 3.I determined what type of battery I needed. 4.Next, I got a suitable solar panel and a suitable battery. 5.Then, I found materials I needed online and locally. 6.Finally, I built the mounting frame.</p> <p>Steps for determining the solar panel/battery combo would work: 1.I discharged my 12.6v and 12 amp hour battery into the QRP radio (low power radio). 2.After mounting the solar panel onto the backpack, I charged the battery from the solar panel. 3.I then tested it in the field. All tests were recorded accurately and can be answered for if you have questions.</p> <p>Results I successfully transmitted emergency communications from my prototype. I successfully ran my station for 20 hours off of the battery.</p> <p>Conclusions/Discussion With the information that I recorded from that trip, I determined that more of the weight should be put lower on my back so that I could balance out my pack. I may try some of the other mounting techniques. I'll definitely try new radios and different equipment.</p>	
Summary Statement My engineering problem was to develop a backpack that would be able to supply emergency support and communications for an indefinite period of time, as well as supply shelter, and other necessities.	
Help Received Grandpa helped build solar mounting device. Science teacher helped with designs. Dale helped with antennas and morse code.	