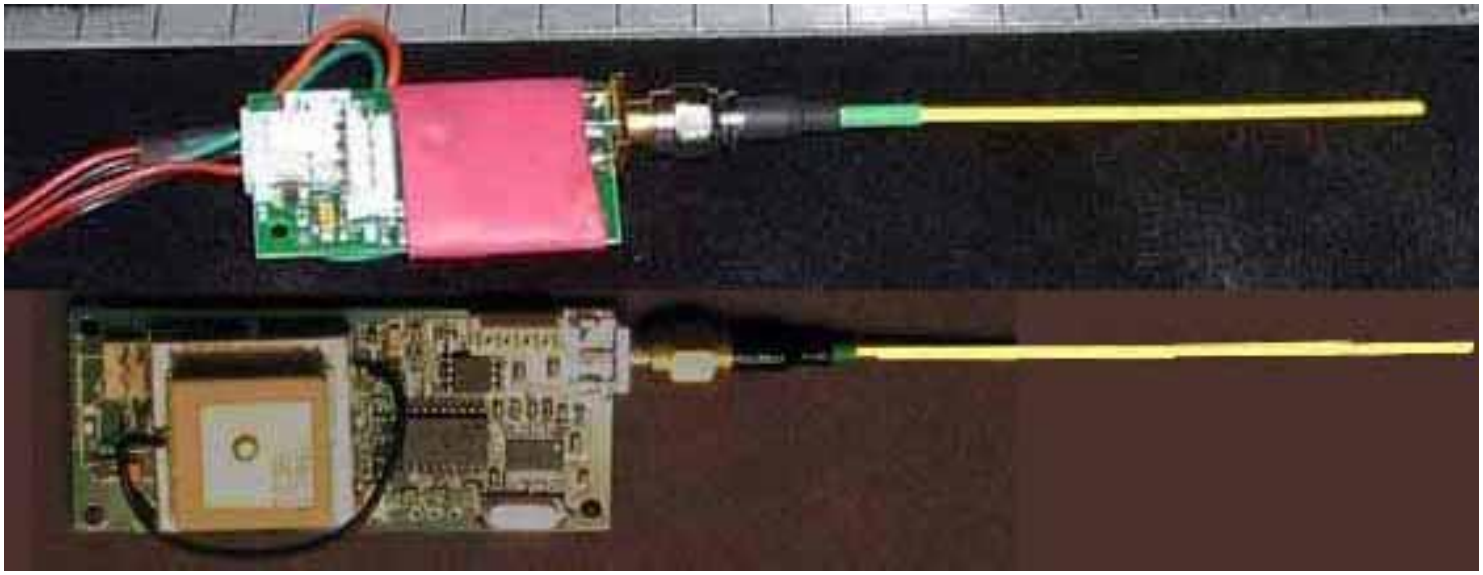
Doppler-Trek Needs a Boost



We are looking for a ride on one or more rockets at the Austin Area Rocketry Group's October 2 launch. These flights will be used to test our rocket tracking system described below. Our payload is pictured above (full size, cm ruler) and consists of two small radio transmitters having a mass of about 30 and 60 grams.

If you have an interest in participating in our project, please contact Ron Parsons at w5rkn@w5rkn.com. I'll also be at the AARGs September 4 launch in Hutto. I'm the one riding an electric scooter.

Doppler-Trek is an all-volunteer group dedicated to creating an open-source software program for computing the position of a rocket in three-space as a function of time. The methodology is to use a small, inexpensive radio transmitter in the rocket and to analyze the Doppler shift of the radio signal to measure the velocity of the rocket and then to derive the position of the rocket throughout its flight.

This methodology has two advantages over a GPS tracking system – the payload is much cheaper and the GPS receiver loses lock during the boost phase of the flight whereas the Doppler method is fully functional during this phase. This permits better analysis of the performance of the rocket during the most interesting part of the trajectory.

We do this by having five (or more) radio receivers around the launch point and recording these Doppler-shifted signals at a central point. The Doppler shift can be used to determine the distance of the rocket from each of the receivers and, using the mathematics of Trilateration (this is the mathematics behind the GPS system), determine to location of the rocket as a function of time in either x,y,z coordinates or in Latitude, Longitude and Altitude.

Our test flights will have a GPS tracking transmitter in addition to our small transmitter for comparison purposes.

We are working with the IGNITE foundation (http://www.igniteeducation.org), a 501(c)(3) organization, in Fredericksburg that provides education and rocket launch opportunities to high school students in Texas.