

Weather Station technical paper

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Scope:

For most of our members the flying field is a good distance away from home. Therefore, it would be nice to have a way for our members to see what the weather conditions are at the field before venturing out there.

Access:

On the Tri-countybarnstormer.com website click the "Weather" button. This selection will take you to the "Weather" page. The page displays the latest weather and solar panel performance data.

Technical:

The weather station is a very inexpensive system called OurWeather and is available from "Switchdoc.com". The station consists of a board (based on an Arduino) that collects instantaneous data from five sensors (Wind speed, Wind direction, Temperature, Humidity and Rain gauge). This board connects via Wi-Fi to the local network allowing a web browser to be used to query any or all of its instantaneous readings using the REST protocol.

We use a Raspberry Pi (This is the same Pi used for collecting camera data) to collect weather data at specific intervals (every 60 seconds). The Pi sends a request using REST to the weather station. This request is for all data available. The information received from the weather station is saved on the Pi as a file (wthrddata.dat). This file is then sent to the webpage and stored in the "camphoto" directory on the website.

On the website there is a webpage that uses java script to extract the data from the file sent by the Pi and display it on a web page.

We designed the weather station to run off a single cell (3.7v) 4400mah LiPo battery. This battery is recharged during the day using three 6V 330ma solar panels connected in parallel to a SunAirPlus - Solar Controller / Charger (also from Switchdoc.com).

All of these boards are housed inside of a weatherproof box.

There is a Perl scripts that is used to manage the weather data going to the web site.

wthrdata.pl – is a Perl script that pulls data from the weather station (using REST) and places it (the data) into a file on the Pi (wthrdata.dat). The script then uses FTP to copy this file from the Pi to the tri-county web site. This script is executed using “cron” every 60 seconds.

Data Usage:

The file size of the data file sent to the website is 250 bytes. Because this file consists of only text it is very small. Sending this file once a minute only consumes 15KB worth of data in an hour. This is very low and will not impact our data usage goal of less than 2G per month.

Costs:

OurWeather Complete Weather Kit	\$156.99
Weather proof enclosure (9x8)	\$18.26
USB cable	\$2.63
GroveWeatherPi Solar bundle	\$95.57
Pole Mount Kit	\$10.34
2 U bolts	\$9.27
Silicone sealant	\$4.63
Total	\$297.69