

## Lessons Learned — GreenCube 5 “Dave-Bob”, launched 19 May 2013

1. The predictor code may have a sign error; during the flight, the recovery team noticed the predictor always suggested the payload would move north, when previous predictions (run by the EOSS software) indicated a trajectory in the opposite direction.
2. The hard plastic case for the GoPro camera was vacuum-sealed shut when the recovery team found it. It has been suggested that the case leaked air at high altitude, but did not allow air back in during descent.
3. Yagi antenna orientation was problematic for both ground teams. The launch team’s antenna had lost its protractor, and compass apps for smartphones disagreed during the launch.
4. Regular DNT dropouts were observed by both ground teams, possibly due to the Arduino resetting.
5. The ham radio data transmission on 144.440 MHz interfered with planned amateur radio activity on 144.450 MHz. Further, the callsign of the Dartmouth Amateur Radio Club (W1ET) was used as an identifier in the ham transmission. This callsign should be changed to a student callsign if possible (see personnel list for callsigns), and Prof. Eric Hansen should be contacted regarding any future use of the W1ET callsign.
6. DNT data may be more robust in binary format. As it is, the DNT transmits a page of data at a time; if the entire page is not filled when a dropout occurs, the page may be lost. Additionally, DNT data is not being parsed effectively at the groundstations.
7. The recovery team was able to make a quick and easy recovery in part because they waited until LOS to pack up, then used the last GPS fix as a starting point for the search. This was much easier than the old method of trying to drive to the predicted landing location while running a groundstation in a vehicle.
8. The data files from the launch team groundstation were not immediately backed up on thumb drives. Data backup must be emphasized on the checklist.
9. Several items were missing from the equipment checklist, notably latex gloves and a second nine-pin splitter. These should be added.