Using an Autonomous Ground Station to Aid in Community Outreach

Tyler Hughes
ChargerSat-1
University of Alabama Huntsville
Autonomous Ground Station
Do you like to sleep?
What do you do when you’re asleep at 3:00AM and your CubeSat is about to pass over?

- Run to the ground station and receive the transmission?
- By using timed queues you will be able to effectively make your ground station autonomous in the sense that it will know when to record the pass.
Current Hardware/Software Requirements

- Database to store information from beacon and downlink
- Relay Switch Controllers to automatically turn equipment on and off when needed.
• Advantages:
  – No one has to be there when the CubeSat passes overhead

• Disadvantages:
  – More prone to software glitches
    • Not permanent and can be overcome as more revisions to software is made.
Ground Station Database

- Can store subsystem status information
- Can store commands to be transmitted later
How convenient is using the app versus going to the ground control room?
How can I use my new ground station to my advantage?
CubeSat Android App

• Gets data from the database and displays it to the user
• Can be used for outreach
• Maintenance free
What information does it display?

• Anything that you have information for.
  – EPS status, voltage
  – Deployment statuses
Presenting at a high school? Want the students to be able to submit a request for the CubeSat to execute a command?
• The app will have the option for people to submit a command request to the CubeSat.
• The request will be put in the database for the CubeSat team to approve or deny later.
Acknowledgments

- University of Alabama in Huntsville
- Alabama Space Grant Consortium