UP: REAL-TIME VIDEO TRANSMISSION
MIDTERM PRESENTATION

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Overview

- Antenna Design
- Package Assembly
- Experiments
- Launch
- Video
- Results
- Conclusion
- Questions
Antenna Design

- “Little Wheel” antenna showed poor performance
- SWR was measured and calculated for both antennas
  
  \[
  \text{SWR} = \frac{1 + \sqrt{P_{\text{REV}}}}{1 - \sqrt{P_{\text{REV}}}} \frac{P_{\text{FWD}}}{P_{\text{REV}}}
  \]

- \(P_{\text{FWD}} = 5\) W

- SWR(ground plane) = 1.923:1
- SWR(little wheel) = 3.422:1
Antenna Design

- Ground Plane Antenna selected due to the performance and SWR
- Tuned to correct frequency
- Used LMR-400 coax to help keep losses minimal
- Tested on spectrum analyzer to see power coming out of transmitter through antenna
Assembly of package took about a week.

Block Diagram:
Package Assembly
Experiments

- RTrak APRS
- Downconverter
- Ground plane antenna
- Mobile receiving station
- 600 TVL color camera
- 6600 mAh battery for transmitter
Launch

- Launch June 7
- Used 1600 gram balloon
- Launched from soccer field in Beavercreek
- Predicted to land in Greenfield/Washington Court House area
- Landed outside Wilmington in a woods
Launch
Video
Results

- Video transmitted up to 115,476 feet
- 600TVL was upgrade but could be improved
- RTrak sent accurate data above 60,000 feet
- Last transmitted altitude was 115,476 feet
- Ranks 31st in HAB record book
- CW beacon aided recovery
- Battery on APRS became unhooked
- Transmitter battery lasted over half of flight
Conclusion

- ATV was a success
- Bigger battery for transmitter
- Receiving station exceeded expectations
- RTrak reliable for future launches
- Future ATV teams will implement Russ antenna with CEG help on code
Questions?

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