



HIGH ALTITUDE BALLOON TEAM

19 Feb 2010

Design Review

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Team Members: Jason Bailey
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Outline

- Project Goals
 - Russ Antenna
 - GPS Repeater, Paperwork, Miscellaneous Tasks
 - Single Balloon Antenna
- Where we stand and what we need to do
- What we have done so far...
- It's time for your questions....

Project Goals

Russ Antenna

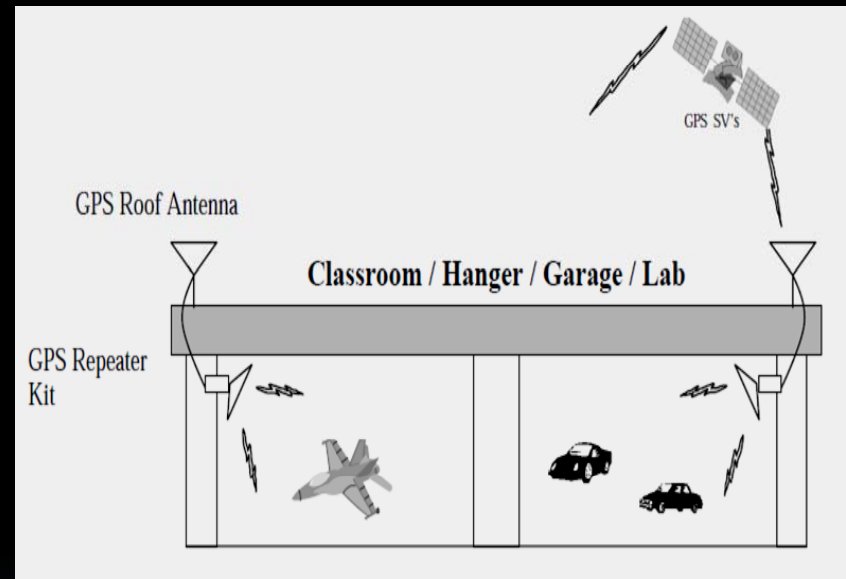
- Two Antennas on the Roof of Russ
 - 2m (~150MHz) Yagi
 - 440MHz Yagi
- Mounted on an Azimuth and Elevation Rotator
 - Yeasu G-5500
 - Yeasu GS-232B
 - PstRotator



Project Goals (cont'd)

GPS Repeater, Paperwork, Miscellaneous

- Allowing team to perform long term testing in the lab
- Manuals and wiring diagrams for all common components



Project Goals

Single Package Antenna

- Current Setup: Two Antennas
 - 900 MHz
 - 144 MHz
- Goal: To use one antenna for all communications
- Top: Microtrak 300
 - 144.39 MHz (APRS)
- Bottom: Freewave 900
 - 900 MHz



Where we stand and what to do..

Russ Antenna

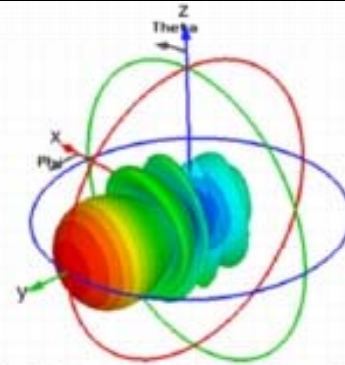
- What we have...
 - Yaesu GS-232B
 - Yaesu G-5500
 - 2M Polarizing Yagi
 - 144 MHz Polarizing Yagi
- What we need to do...
 - Put it all together
 - Order some cable
- Problems...
 - It's cold outside...
 - Testing



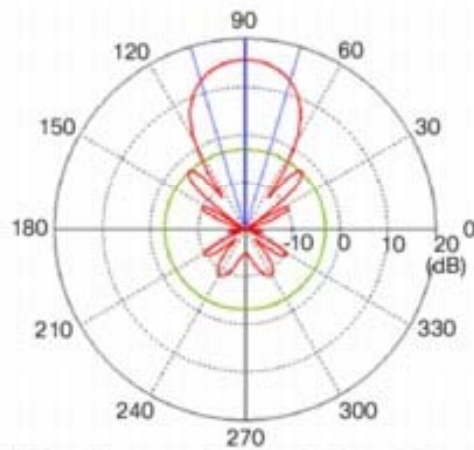
Yagi Antenna Basics



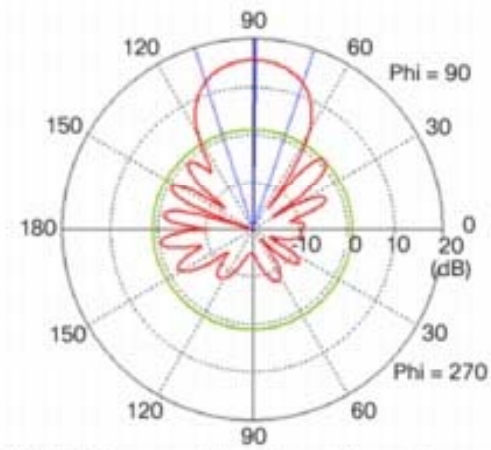
(a) Yagi Antenna Model



(b) Yagi Antenna 3D Radiation Pattern



(c) Yagi Antenna Azimuth Plane Pattern

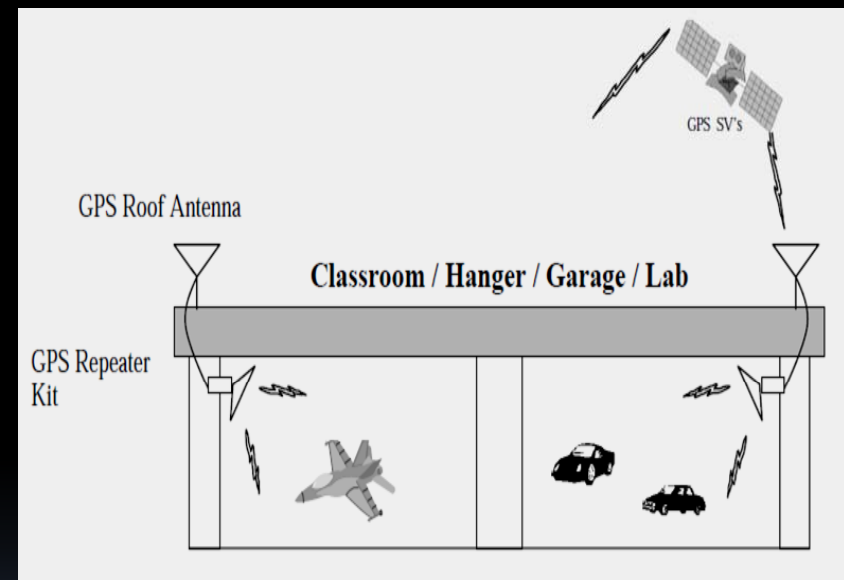


(d) Yagi Antenna Elevation Plane Pattern

Where we stand and what to do...(cont'd)

GPS Repeater, Paperwork, Miscellaneous

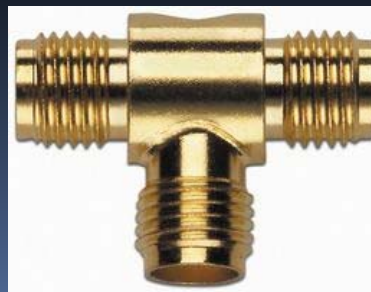
- What we have...
 - Design
- What we need to do...
 - Proof of concept
- Problems
 - Again...It's cold!!!



Where we stand and what to do...(cont'd)

Single Package Antenna

- Design:
 - 1. Physical "T" connection
 - 2. Diplexer
 - 3. DPDT Relay
 - 4. ???
- What we need to do...
 - Determine a good design
 - Scrap this idea
- Problems
 - Lots...



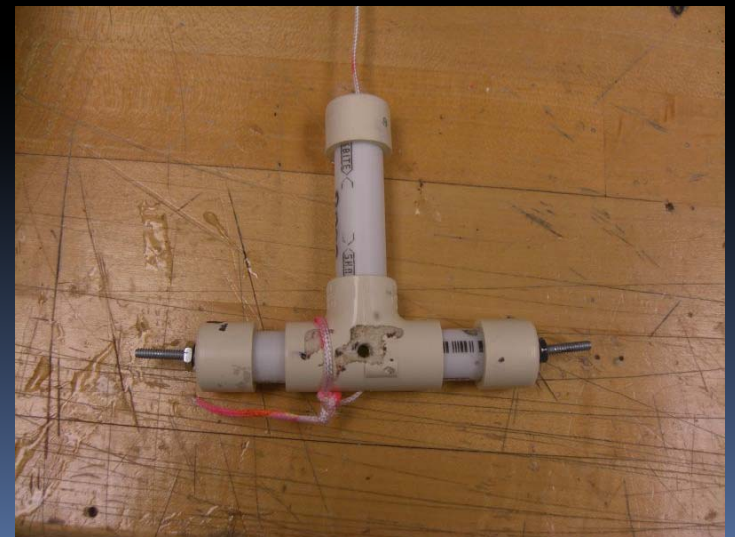
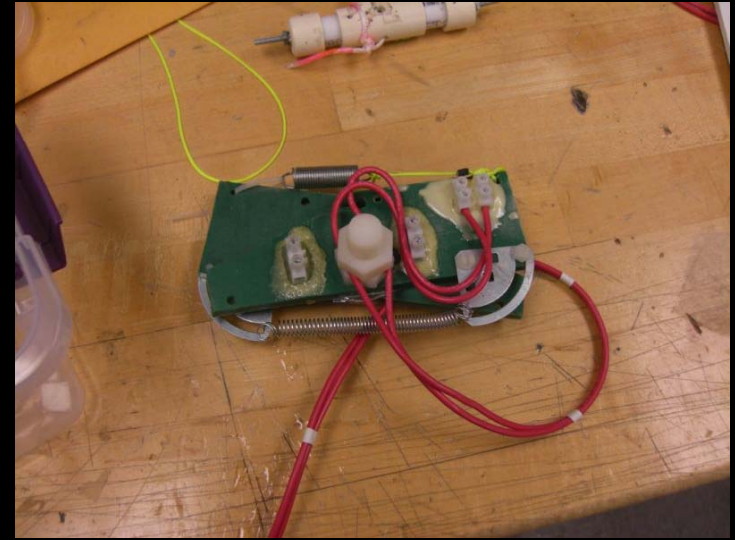
What we have done so far..

- Assisted ME team
 - Release mechanisms
 - Zero-G Release mechanism
 - “Iowa” cutdown device
- Circuit design
 - GPS Repeater
 - Russ Antenna Configuration
 - Single Package Antenna

What we have done so far.. (cont'd)

ME Team assistance

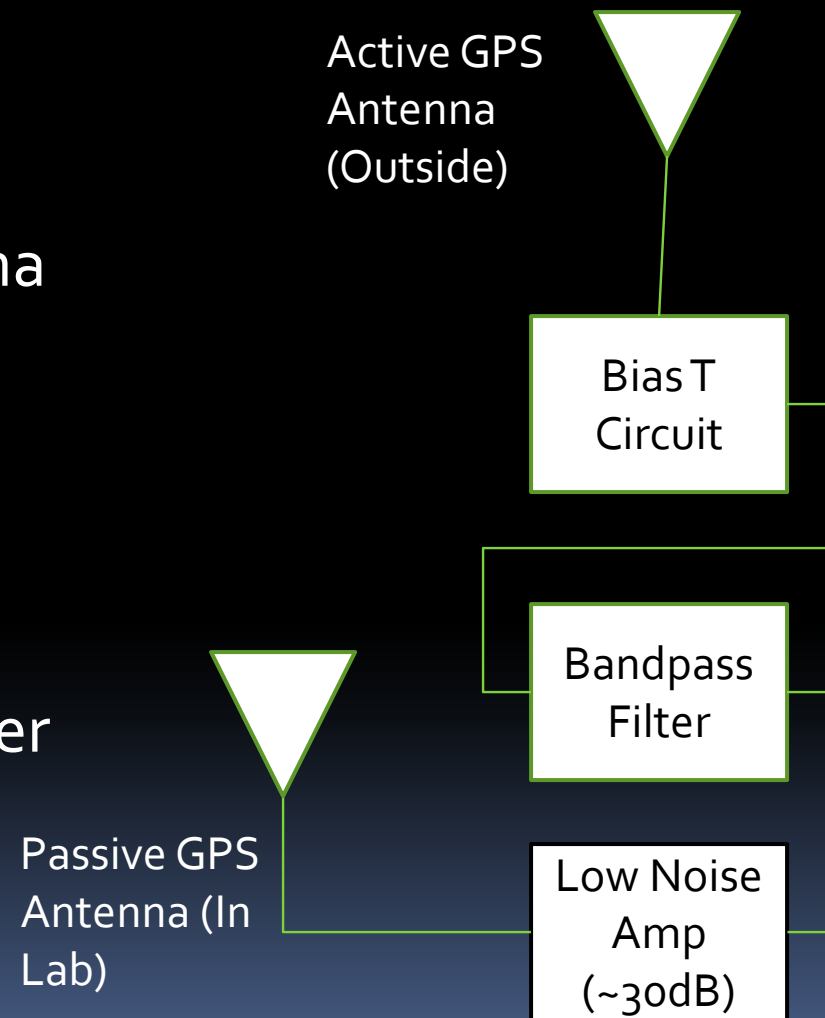
- Zero-G Release Mechanism
 - Improved safety release
 - Previous issues with NiChrome Wire
- “Iowa” Cut-down Device
 - Improved reliability
 - Again, Previous issues with NiChrome Wire



What we have done so far..(cont'd)

GPS Receiver

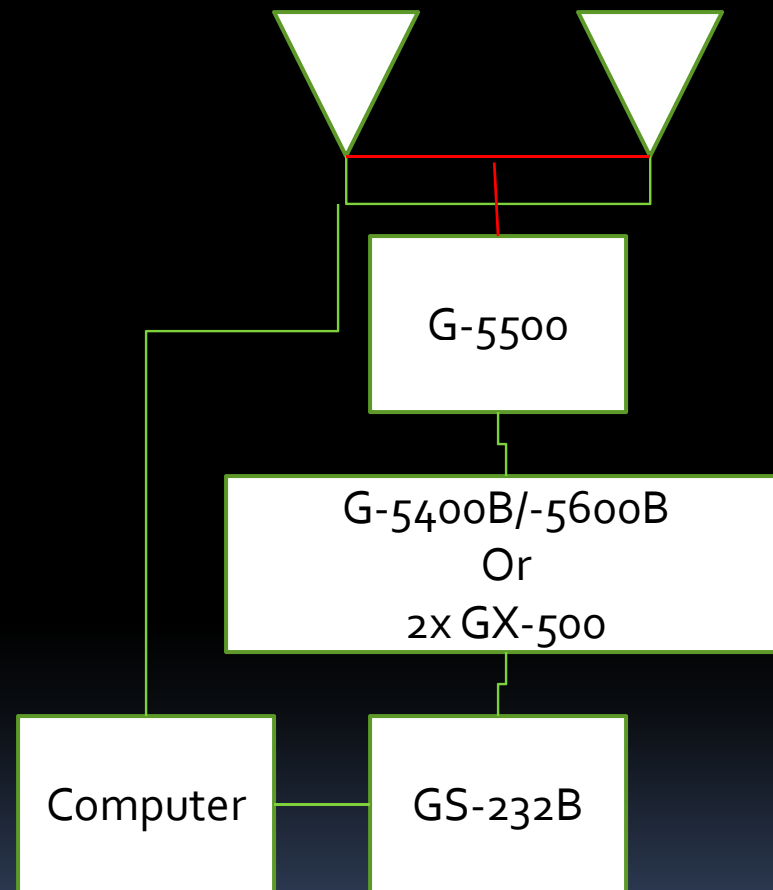
- Circuit Design
 - Active GPS Antenna (1.57542GHz)
 - Bias T Circuit
 - Bandpass filter (2 MHz BW)
 - Low Noise Amplifier
 - Passive GPS Antenna



What We have done so far...(cont'd)

Russ Antenna

- Circuit Design
 - 2M Polarizing Yagi
 - 144 MHz Polarizing Yagi
 - Yaesu G-5500
 - Yaesu GS-232B
 - Computer



Ask... And you shall receive
answers...

