Outline

- Introduction
- Real-Time Video Project
- Previous Research
- Goal
- Realistic Constraints
- Budget
- Summary
Introduction

- Wright State’s High Altitude Balloon
  - Team formed in 2005
  - Reaches altitudes of 100,000 feet
  - A multi-disciplinary project

- Large interest from government and industry

- Sponsors
  - Ohio Space Grant Consortium
  - The National Science Foundation
Real-Time Video Project

- Current Video Transmission System
  - Analog
  - Hardware-defined radios
  - Difficult modification
  - Low quality video

- Future Video Transmission System
  - Digital
  - Software-defined radios (SDR)
  - Easy modification
  - Higher quality video
  - Greater flexibility
Previous Research

- Team RadioHead
  - 2010-2011 EE senior design team
  - Initiated SDR research
  - Development on lab system
    - Laptop w/SDR to laptop w/SDR
    - Successful video transmission to 160 meters
  - Development on standalone system
    - Laptop w/SDR to computer-on-module w/SDR
    - Low quality video transmission at small distance
Goal

Achieve real-time video transmission from the balloon via a standalone software-defined radio
Realistic Constraints

- Federal Aviation Administration regulations
- Federal Communication Commission regulations
- Environmental: low temperature, physical stress
- Balloon limited to two 5 pound payloads
- Time: only two quarters for development and testing
Budget

- Majority of equipment already owned
- Purchase an E100 standalone SDR: $1,300
E100 SDR

- Runs a full distribution of Linux
- Can be deployed without a separate host computer
- 750 MHz Processor, 512 MB RAM

Challenges
- New development platform
- Must be programmed
- Must be set up to communicate with our SDRs
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Questions?

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