Outline

- Goal
- Progress
  - Block Diagram
  - Video Test
- Plans
- Conclusions
Goal

- Design a standalone software defined radio to be used for communication with Wright State University’s High Altitude Balloon.
- Be able to transmit streaming video data and GPS data.
Block Diagram – Gstreamer

- **Input**

```bash
gst-launch -e -v v4l2src device="/dev/video1" ! video/x-raw-yuv, ! \ timeoverlay halign=right valign=bottom shaded-background=true ! \ textoverlay text="Test Video 640x360 25fps" halign=left valign=bottom shaded-background=true ! \ x264enc bitrate=498 ! mpegtsmux ! filesink location=videol.ts
```

- **Output**

```bash
mkfifo rxfifo.ts
mplayer rxfifo.ts
```
Block Diagram – GNU Radio
Block Diagram – GNU Radio

- Packet Encoder
- Modulation – GMSK
- Packet Decoder
- Demodulation
Block Diagram: USRP

- Send

```plaintext
USRPSink
Unit Number: 0
Interpolation: 128
Frequency (Hz): 2.56G
Gain (dB): 0
Side: B
Transmit: Auto T/R
```

- Receive

```plaintext
USRPSource
Unit Number: 0
Decimation: 64
Frequency (Hz): 2.56G
Gain (dB): 28
Side: B
RX Antenna: TX/RX
Halfband Filters: Disable
```
Demonstration
Plans

- FPGA implementation
  - Inputs
  - Signal processing
  - Outputs
High Altitude Balloon

- AVMap Operation – Paul Cary – 2/14/11
- APRS and CW Beacon Subsystems – Paul Cary – 2/14/11
- Power Subsystem – Chad Morris – 2/23/11
- Cut Down Subsystems – Chad Morris – 2/23/11
- Flight Video Subsystems (camera & DVR) – Adam Baker – 2/28/11
- 900MHz Experimental C^3 Subsystem – Adam Baker – 2/28/11
High Altitude Balloon

- Balloon Launch: Tentative date April 9\textsuperscript{th}
- Collaborate with Mechanical Engineering Team
Questions?

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