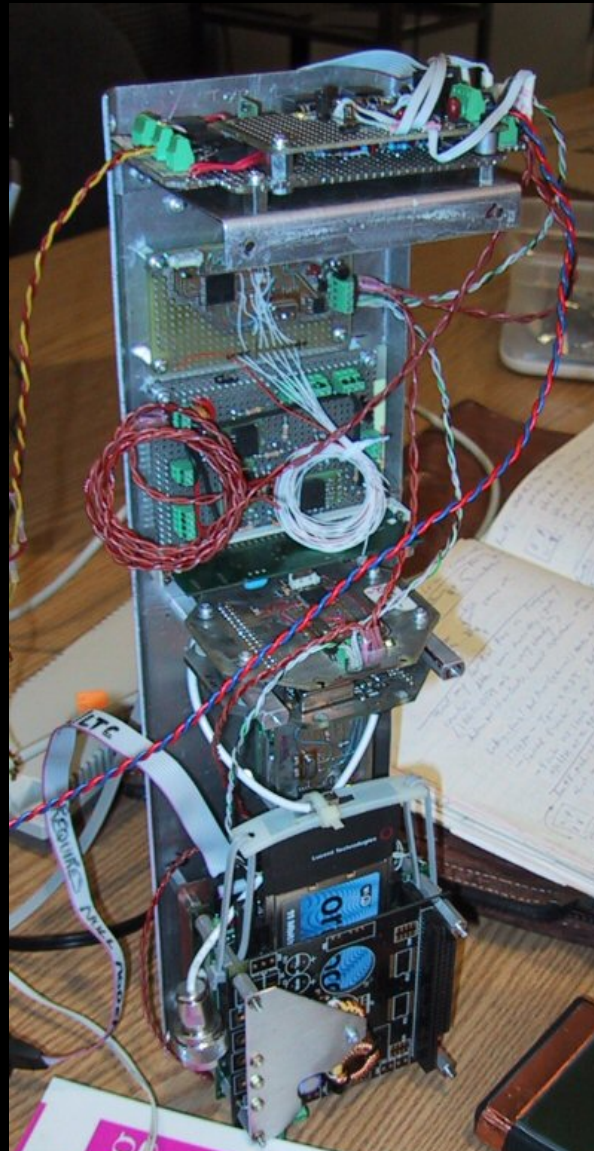
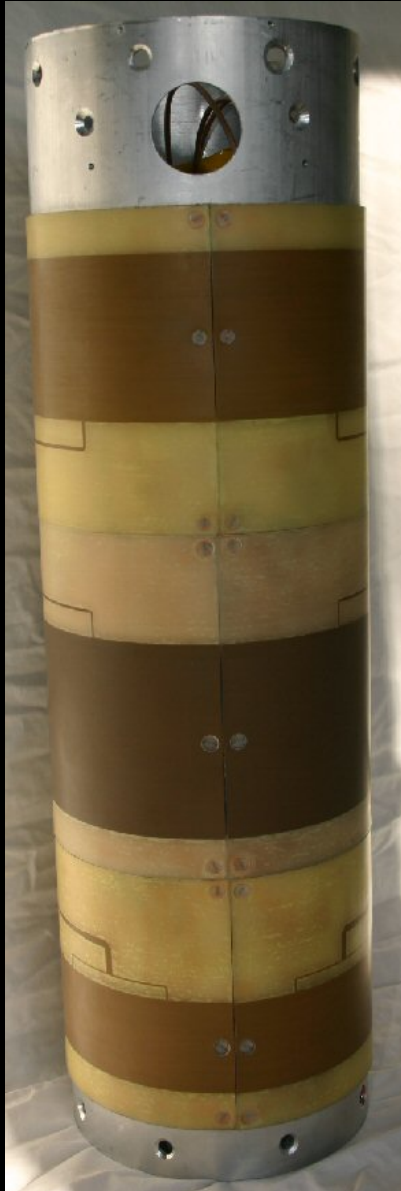


Portland State Aerospace Society Rocket Avionics



Avionics Jargon

- **Avionics** - any electronics on the rocket
- **ARM** - a 32-bit RISC microcontroller
- **LPC2148** - the ARM chip used on sensor nodes



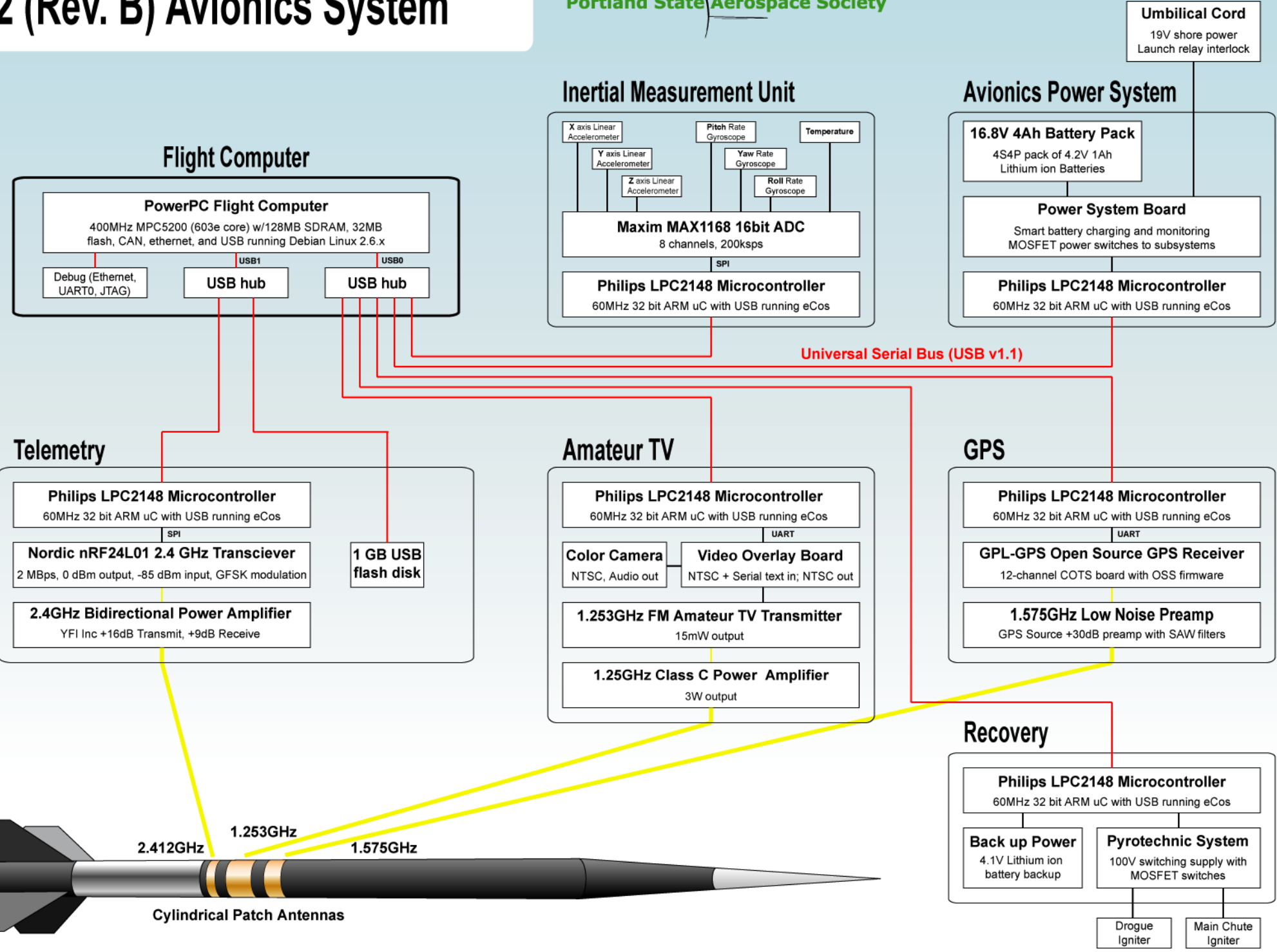
Avionics Jargon

- **Firmware** - software that interacts with a microcontroller and hardware
- **RTOS** - real-time operating system
- **eCos** - an open source RTOS

Avionics Jargon

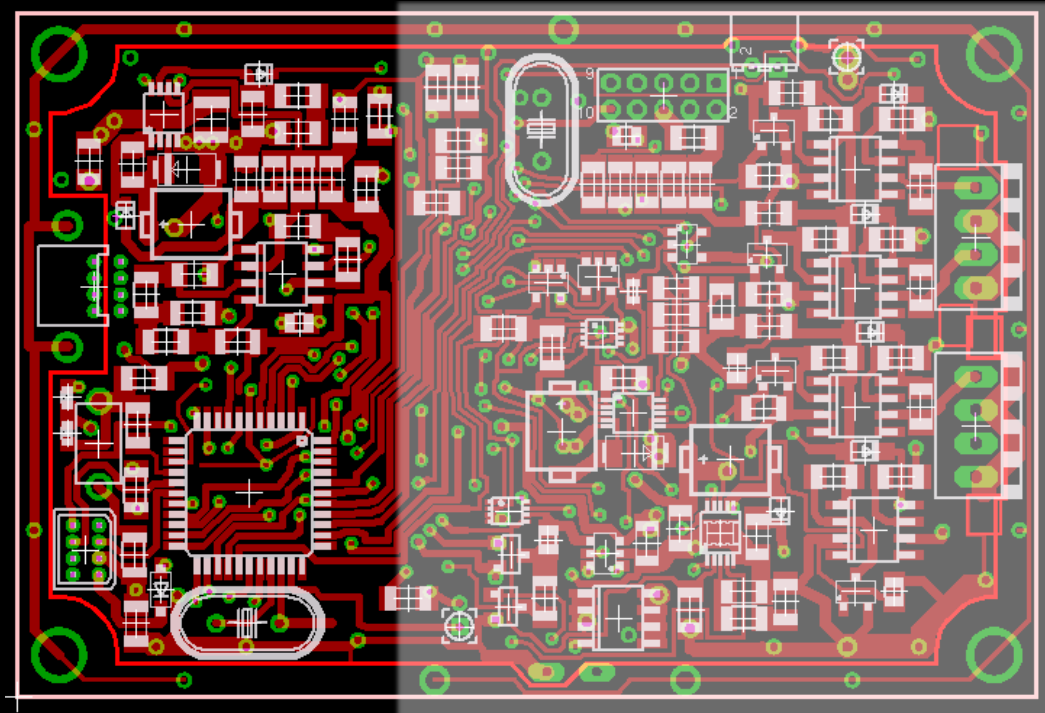
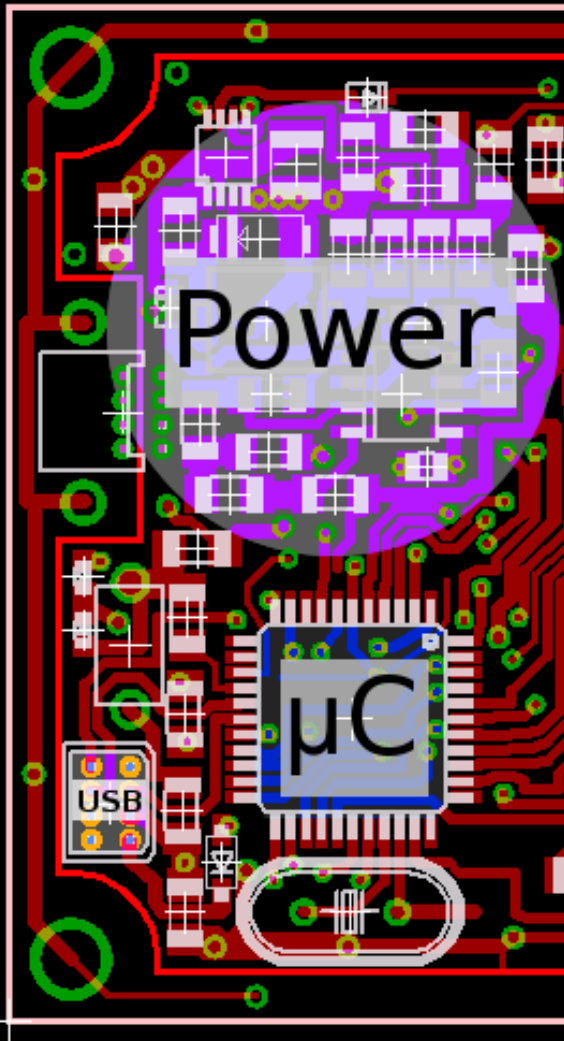
- **Node** - a group of sensors

LV2 (Rev. B) Avionics System



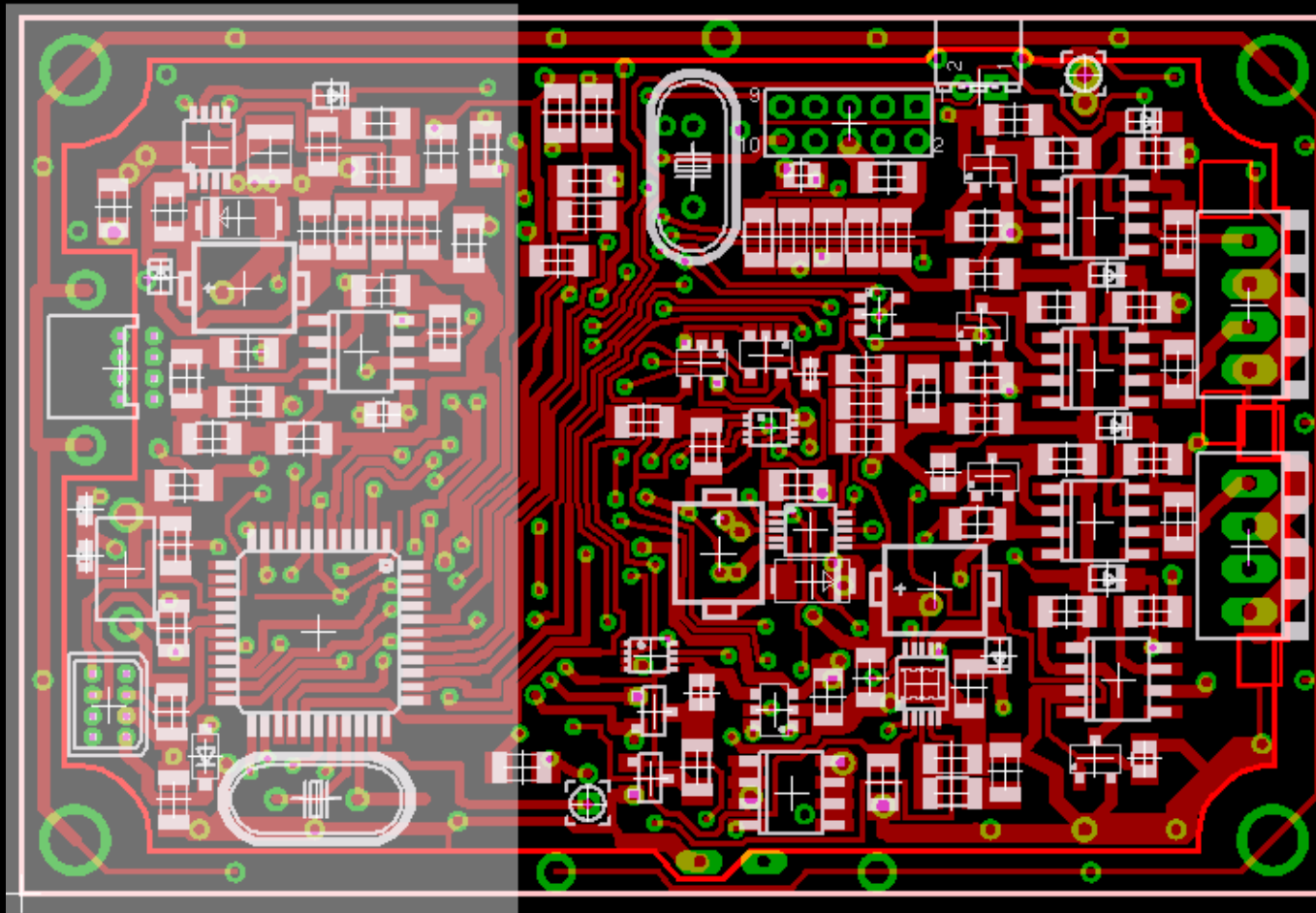
Avionics Jargon

- **Front end** - generic electronics for all nodes



Avionics Jargon

- **Application Specific Electronics** - everything else



Current Avionics Projects

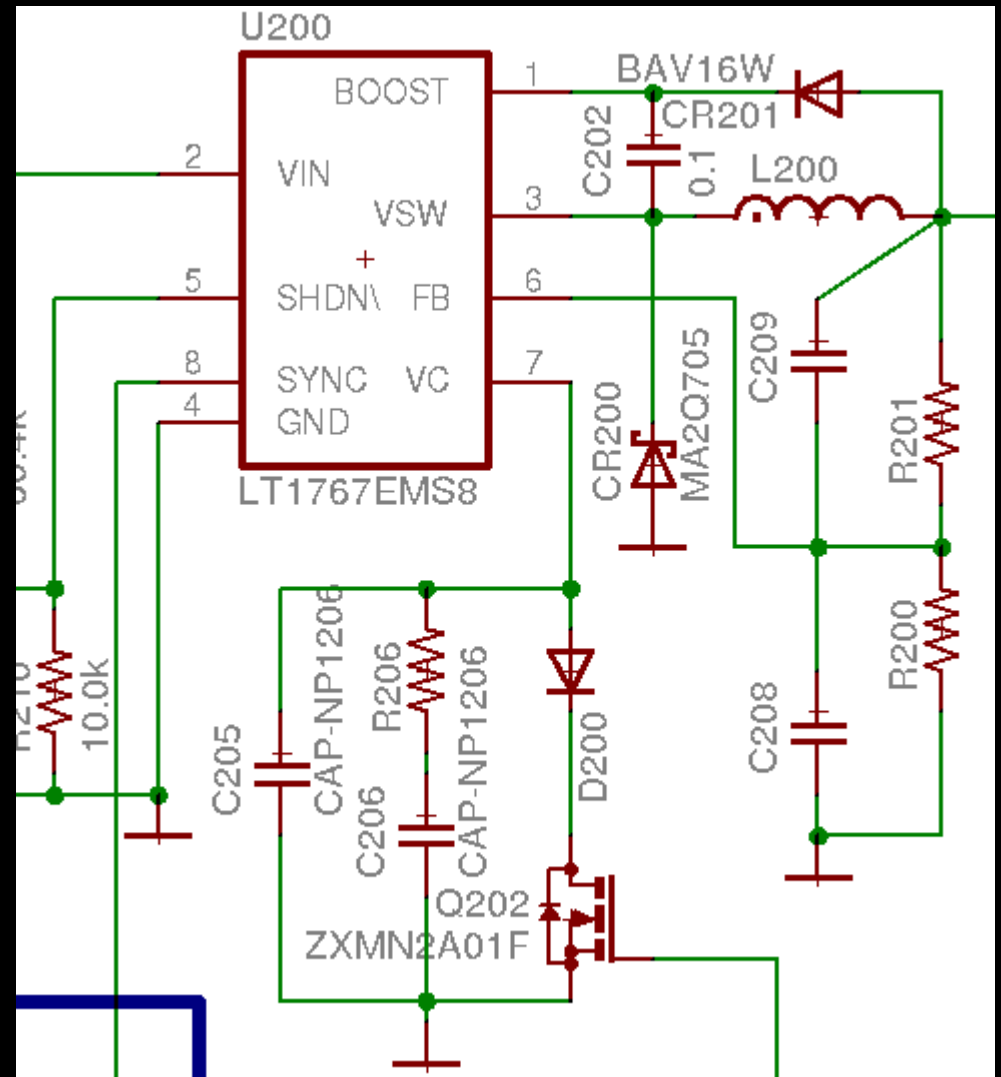
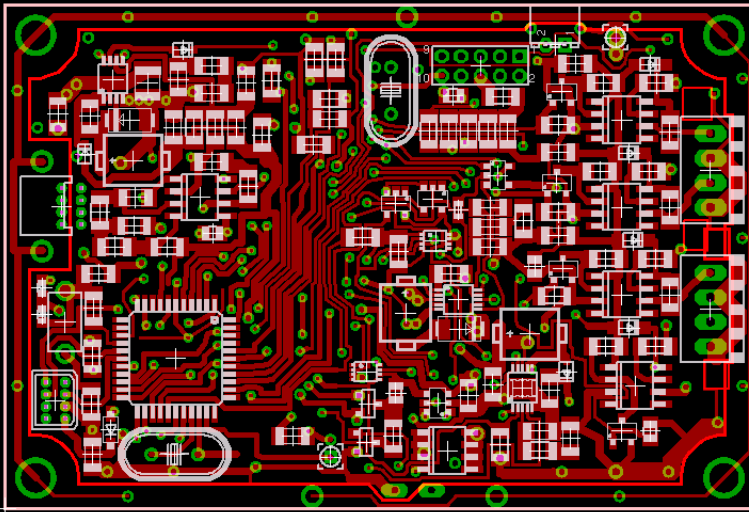
- Layout of application specific nodes
- USB firmware for nodes
- GPL-GPS
- Design of camera node

Node Layout

Each sensor node must have:

- a schematic --->
- a board layout

==
v

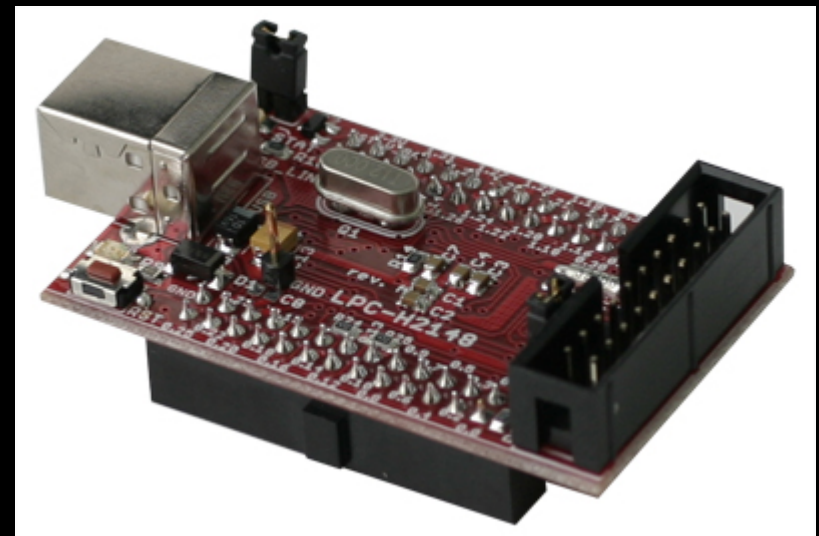


Node Layout

- Skills needed:
 - Basic circuitry knowledge (ECE221)
 - Ability to read data sheets (ECE171)
 - Familiarity with transistors (ECE321)
- Tools needed:
 - EagleCad
 - Subversion
- Who to talk to:
 - Timm, Andrew, Glenn, or Sarah

USB Firmware

- Node Firmware
 - sets up the microcontroller
 - gathers sensor data
 - communicates over USB
- Must fit in 32KB RAM
- Real time response

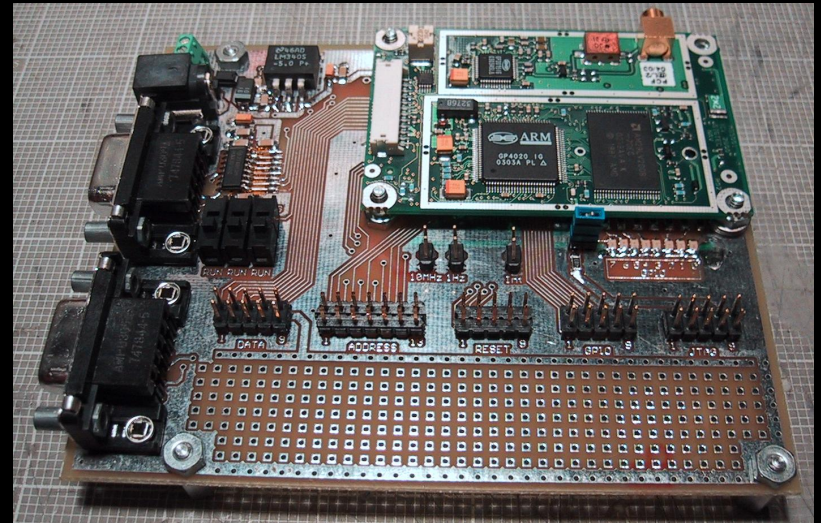


USB Firmware

- Skills needed:
 - Familiarity with Microprocessors (ECE371)
 - Experience with C (CS163)
- Tools:
 - GIT, CVS
 - eCos
 - access to a Linux system
- Who to talk to
 - Sarah, Andrew, Jamey

GPL-GPS

- GPL - GNU Public License
- Provides open source firmware for GPS receivers
 - no speed or altitude limitations



GPL-GPS

- Skills needed:
 - Familiarity with Microprocessors (ECE372)
 - Experience with C (CS202)
 - Willing to learn about GPS systems
- Tools:
 - CVS
 - eCos
 - access to a Linux system
- Who to talk to
 - Andrew

Camera Node

- Replace old camera node with something cooler
 - USB camera?
 - VGA out to flight computer?
 - built in overlay?



Camera Node

- Skills needed:
 - Good internet research skills
- Tools:
 - internet access
- Who to talk to
 - Andrew, Timm, Keith P

How to get involved

- Avionics meetings every Wednesday
- Avionics mailing list
 - <http://lists.psas.pdx.edu/mailman/listinfo/psas-avionics>
- Talk to
 - Andrew
 - Timm
 - Sarah
 - Glenn