Using linux throughout the complete UAV stack
something about dronecode.org announcement
Basics of RC planes

This is a short tutorial with pictures that shows you the basics of how a Remote Control airplane works. I go over the theory of how the whole set up operates including a look at the actual mechanics of the airplane and the use of the hand-held controller. There are lots of different controls and controllers and they will vary but in this tutorial I take a look at a pretty standard set up and it will give you a good understanding of how RC airplanes work.

And here is a video I made showing this airplane coming out of the box and some short footage of me launching it off.

The controls on an RC airplane are pretty much the same as on a real airplane. This makes sense because you have the same thing (An aircraft), it is just the size that is changed. There are four major controls in an RC airplane:

1. Throttle
2. Elevator
3. Ailerons
4. Rudder.

An explanation of the Controls

1. The Throttle: This affects the speed of the airplane. The more throttle you apply the faster the airplane will go. This also
Receivers

Show http://orangerx.com/2014/01/25/r400-spektrumjr-dsm2-compatible-4ch-2-4ghz-receiver/ in browser
R400 Spektrum/JR DSM2 Compatible 4Ch 2.4Ghz Receiver

posted by OrangeRX on January 25, 2014

A perfect foamie or parkflyer receiver. Very small and very light!
The OrangeRx R400 now offers true signal reception diversity! This results in an even more robust signal link than the original R400, while providing the same quality, range and value. Taking it one step further, we've negotiated a lower component cost on these units so that we can offer you an even better price than before!

1) OrangeRx receivers are built using original components, MCU’s and with state of the art SMT automation to ensure a quality product each and every time.
2) All OrangeRx receivers are QC tested before leaving the factory.
3) The OrangeRx will work with ANY Aircraft ORX/Spektrum/JR DSM2 2.4Ghz transmitter.
4) The OrangeRx R400 is only 2.7g in weight and 35x15x9mm in size.

Tip: Extension Wires

Improve signal strength and create a more robust link. Available at HobbyKing.com

Search
Remote controls

Show http://www.open-tx.org/radios.html in browser
Radios

Improving your Tx

The following radios and radio boards are compatible with OpenTX.

- **FrSky Taranis+**
  - New version of Taranis with:
    - Haptic vibration
    - Multi colored LCD background light
    - Improved LCD display
    - Improved audio circuits

- **FrSky Taranis**
  - ARM Cortex M3 32-bit 120MHz
  - 212x64 LCD with gray scales
  - 60 models + infinite on SD
  - 9 flight modes
  - Telemetry
  - Advanced audio functions (voice files from SD, vario, ...)
  - SD data logger

- **Turnigy 9XR PRO**
  - ARM Cortex M3 32-bit 36MHz
  - 60 models + infinite on SD
  - 9 flight modes
  - Telemetry Interface through Futaba trainer jack
  - Advanced audio functions (voice files from SD, vario, ...)
  - SD data logger

- **Turnigy 9XR**
Telemetry

- Battery state
- Radio link state
- Raw sensor data
- Position
- Processed sensor data
Atmega based flightcontrollers

- Needed for multirotors
- Have I²C, SPI and UARTs
- Different firmwares
  - multiwii
  - ardupilot
- ~50Hz control loop
- “multi core” solutions for GPS support
Config tools
Cortex-M based flightcontrollers

- 32 bit
- single precision floating point
- >40MHz clock speed
- More IO options
- ~400Hz control loop
- Multiple firmwares
  - baseflight (multiwii port)
  - taulabs
  - ardupilot
Hybrids

- Taulabs freedom
  - gumstix overo COM
  - cortex-M on baseboard
  - [http://buildandcrash.blogspot.nl/2014/03/vertical-control.html](http://buildandcrash.blogspot.nl/2014/03/vertical-control.html)

- Flexbot + Arietta G25
  - AT91 ARM9 on COM
  - AT32u4 on flightcontroller
  - didn’t make it to ELC-E :(
Hybrids

- Quadcopter at the Intel booth
Hybrids

- Linux and FC communicate over (USB) serial
- Mainly for telemetry logging
- Computer Vision
Running linux on the flightcontroller

- ‘hard’ realtime
- userspace drivers
- Only one real effort:
  - ardupilot
Groundstations

- qgroundcontrol (mavlink)
- taulabs ground (taulabs)
- Other, closed sourced ones
Middleware

- Mavconn
- Mavproxy
Mavlink example

Flexbot + arietta G25

minnowboard + webcam

FRI2 running mavproxy

arduino + sama5d3-xplained

Laptop running QGC
QGC demo