**Parrot Drone**

* Flying indoors is limited to relative movement due to weak/no GPS signal
* Battery life is ~25min, less in cold weather
* Be sure to save all flight logs (stored in the SD card)!
  + In case of a crash or unexpected behavior, this will help identify the issue
* SkyControllers are paired with specific drone, should use same pairings each time
* SkyController USB cables are sensitive
  + If they become ‘unplugged’ while software is running, network interface mapping will be lost (very bad!)
* Video stream needs to be accessed over RTSP
  + Example: rtsp://192.168.54.1/live
  + Can be opened in VLC or similar tools
  + Compatible with OpenCV VideoCapture (only tested with gstreamer implementation)
* Recordings (mp4) need to have sound stripped to be processed by OpenCV
  + ffmpeg -i video.mp4 -an -c copy video\_no\_sound.mp4

**Testing**

Sphinx (simulator): <https://developer.parrot.com/docs/sphinx/index.html>

* Have a phone with FreeFlight ready when the drone is being software-controlled
  + Permits quick emergency takeover if something goes wrong
  + The SkyController also has buttons for returning home and landing that can be used without FreeFlight.
* Simulator only works on Ubuntu and Debian, is *very* resource intensive
  + Disable drone camera simulation (if not needed) to reduce footprint
  + Primarily useful for quick tests, verifying SDK commands/events
* Be sure to sign up and use all of the following services:
  + B4UFLY
    - Tells you where you can and cannot fly
  + Kittyhawk
    - If you have to fly near an airport, this lets you get authorization
  + FreeFlight
    - Mobile app for drone control, calibration
      * Calibration should be done before each test!

**SDK**

Olympe: <https://developer.parrot.com/docs/olympe/index.html>

Olympe Examples: <https://github.com/Parrot-Developers/olympe/tree/master/src/olympe/doc/examples>

* Supports only Ubuntu 18.04, Debian 9+
  + Runs fine in a VM
    - If using a WiFi connection, network adapter should be bridged
    - If using a USB (SkyController) connection, should be connected *directly* to the VM (VMWare will prompt when the device is connected)
      * Otherwise, with a WIndows host, the device must be installed as a network adapter and bridged: <https://web.archive.org/web/20200924055927/https://www.mathworks.com/help/supportpkg/parrot/ug/intro.html>
* Python implementation only
* Can connect to the drone directly over WiFi (range ~400ft) or through the SkyController (range ~4km LOS)
  + WiFi IP: 192.168.42.1
  + SkyController IP: 192.168.53.1
* If controlling multiple drones from one computer, need to use a different network interface for each drone (automatic for SkyController) and generate a unique IP for each one
  + <https://forum.developer.parrot.com/t/multiple-parrot-anafi-controlled-via-olympe-on-linux-configure-ip/9590/2>
* If doing GPS movement, float tolerance should be relaxed unless very precise points needed
  + If default is used, drone will spend a lot of time hovering trying to position to an overly precise point
  + Example: [\_float\_tol parameter in moveTo](https://developer.parrot.com/docs/olympe/arsdkng_ardrone3_piloting.html?highlight=moveto#olympe.messages.ardrone3.Piloting.moveTo)
* Supports raw piloting commands: <https://developer.parrot.com/docs/olympe/arsdkng_ardrone3_piloting.html#olympe.messages.ardrone3.Piloting.PCMD>
* Default timeout on commands (\_timeout parameter) is only 20 seconds - should be increased for movement commands when needed
* If doing relative movement, note the movement axes (y is NOT vertical!): <https://developer.parrot.com/docs/olympe/arsdkng_ardrone3_piloting.html#olympe.messages.ardrone3.Piloting.moveBy>
* The drone will only accept one connection at a time - additional connection attempts will be refused
* Events aren’t sent at a high frequency (only 1-2 per second). If needed, real-time position, speed data can instead be extracted from the RTSP metadata stream
  + <https://developer.parrot.com/docs/pdraw/metadata.html>

**Regulations**

* Part 107 certification required for *outdoor* non-recreational flight
  + Be sure to identify a pilot early on
  + Studying can take up to 25 hours
    - Be sure that you are watching the newest Part 107 exam material. All drone regulations changed in December 2020 and the new Part 107 exam started in April 2020
    - <https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/phak/media/pilot_handbook.pdf> (Everything in this book, and Part 107 regulations are fair game)