Date: 4/6/15 12pm
Location: ASU SSDFC - field, Tempe
Weather: Warm and moderate breezes (on the verge of not being flyable)
Pilot: Marc Leatham
Co-Pilot: Mason Denney
Vehicle: Flame Wheel F450

Objective:
1) Perform a signal stability test with the drone hovering
2) Determine flight stability of drone

Equipment:
- flame wheel quadcopter + DX8 controller
- Mission Planner on the ECHO lab Linux laptop
- Valon Transmitter
- Signal Hound
- Ground antenna
- Rolling measuring wheel

Pre Planned Flight Path:
1) Hover 2 meters over a fixed point 100 ft from the ground antenna.
2) See how well the drone holds this position in "Loiter" mode

Checklist:

Ground Station	Laptop On	x
	Laptop Battery	x
	Mission Planner	x
	Telemetry module attached	x
	Orient telemetry antenna vertically	x
	Connect COM Settings 57600 (Direct USB=115200)	0
Aircraft		
Preflight	Inspect frame and legs	x
	inspect props	x
	inspect motor	x
	inspect ESCs	x
	GPS receiver and cables plugged in and oriented front (red)	x

	RC transmitter plugged in, (all switches forward = STABILIZED)	x	
	telemetry plugged in	x	
	APM connections	x	
	Velcro battery	x	
	check Valon secured	x	
Flight	RC transmitter sticks at minimum throttle	x	
	transmitter power on	x	
	transmitter battery voltage check	x	
	transmitter model check (flamewheel)	x	
	transmitter mode switch to STABILIZE	x	
	aircraft placed at home location	x	
	battery connected	x	
	connect drone to mission planner	0	
	secure battery cables	x	
	transmitter antennas straight and vertical	x	
	telemetry antenna straight and vertical	x	
	confirm telemetry strength greater than 75%(Mission Planner)	0	
	Check RC receiver is glowing orange	x	
	pitch and roll vehicle ensure correct response by hand	0	
	airspeed confirm 0 +- 3	0	
	set home altitude	0	
	verify alt=0 +-3	0	
	battery voltage fully charged	0	
	confirm gps has 3d fix	0	
	check valon is working	x	
	flight plan verification	0	

Summary

        After failing to get the C and Python scripts working with the Signal Hound in the field, we decided to troubleshoot the issue back at the lab and focus on a practice flight. We flew despite also having trouble connecting the quadcopter to the 'APM Planner 2.0' software which would have provided us with telemetry from the quadcopter's sensors.

Actual Flight Path:
1. Hovered over a fixed point 100 ft from the ground antenna ~4 meters in the air. The breeze pushed the drone north-east, but since the breeze was moderate and did not vary, pilot input kept the drone steady over the fixed point on the ground.
2. Once switched into "Loiter" flight mode, the drone corrected for the wind and stayed directly over the fixed point on the ground. However, this would only last for 5 seconds, until the drone would start to drift in the wind again, albeit not as fast as the drone had been before it had swapped over to "Loiter". As for normal flying in "stabilize" mode, the Valon is a noticeable addition of weight and the performance of the drone is more deliberate and sluggish with it attached. The drone still performs very well with the Valon on and will have no troubles performing as we need it to. Further testing will reveal what the additional weight does to flight time.

Flight Data:
        https://www.google.com/maps/d/edit?mid=zJ18TpaIngR8.kBeeBqdJQYt0

Software Issues Resolution:
        Telemetry issues with the quadcopter were a result of general inexperience with the new Linux-based 'APM Planner 2.0' software. Despite the program being very similar in appearance to the Windows-based 'Mission Planner', we couldn't troubleshoot the issue in a timely manner. We will practice using the laptop in the lab and become more familiar with the 'APM Planner 2.0' software.

        After discussing the script issues with colleagues, the error was traced back to not using 'sudo' to start the scripts. The detailed field test checklist we are creating will resolve these types of errors in the future.

Future flight objectives:
        We will retry this experiment after becoming more comfortable with APM Planner and updating the test checklist with 'sudo' commands. Later, we will test slow lateral movement as well as higher altitudes.

Update:
        The quadcopter and 'APM Planner 2.0' software on the Linux Laptop are now connecting easily.