Week 5

PID Pitch
PID Roll
PID Roll+pitch
Yaw

Milestones (overview)

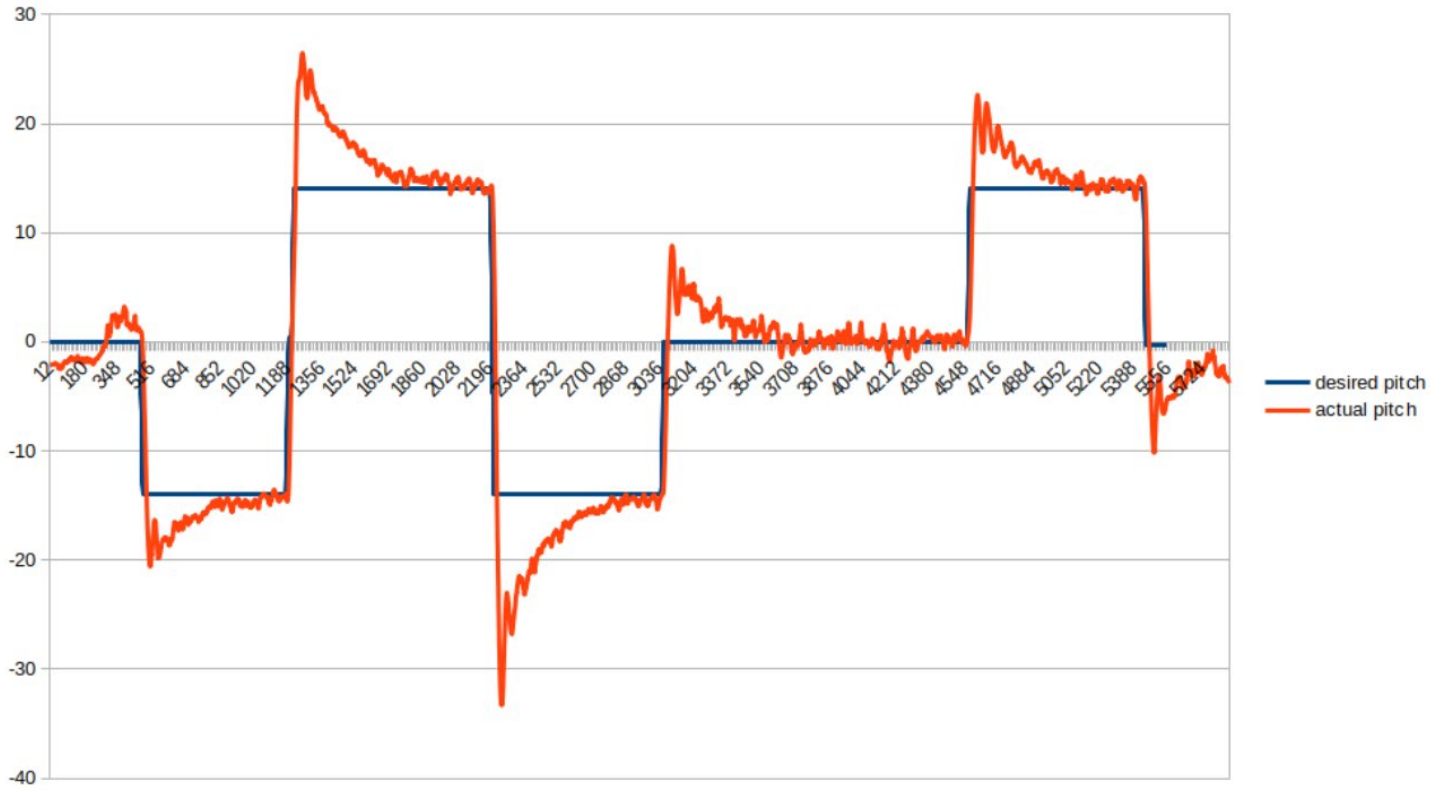
1. PID controller for Pitch in rig
2. PID controller for Roll in rig
3. Roll and Pitch together
4. Yaw

Milestone 1

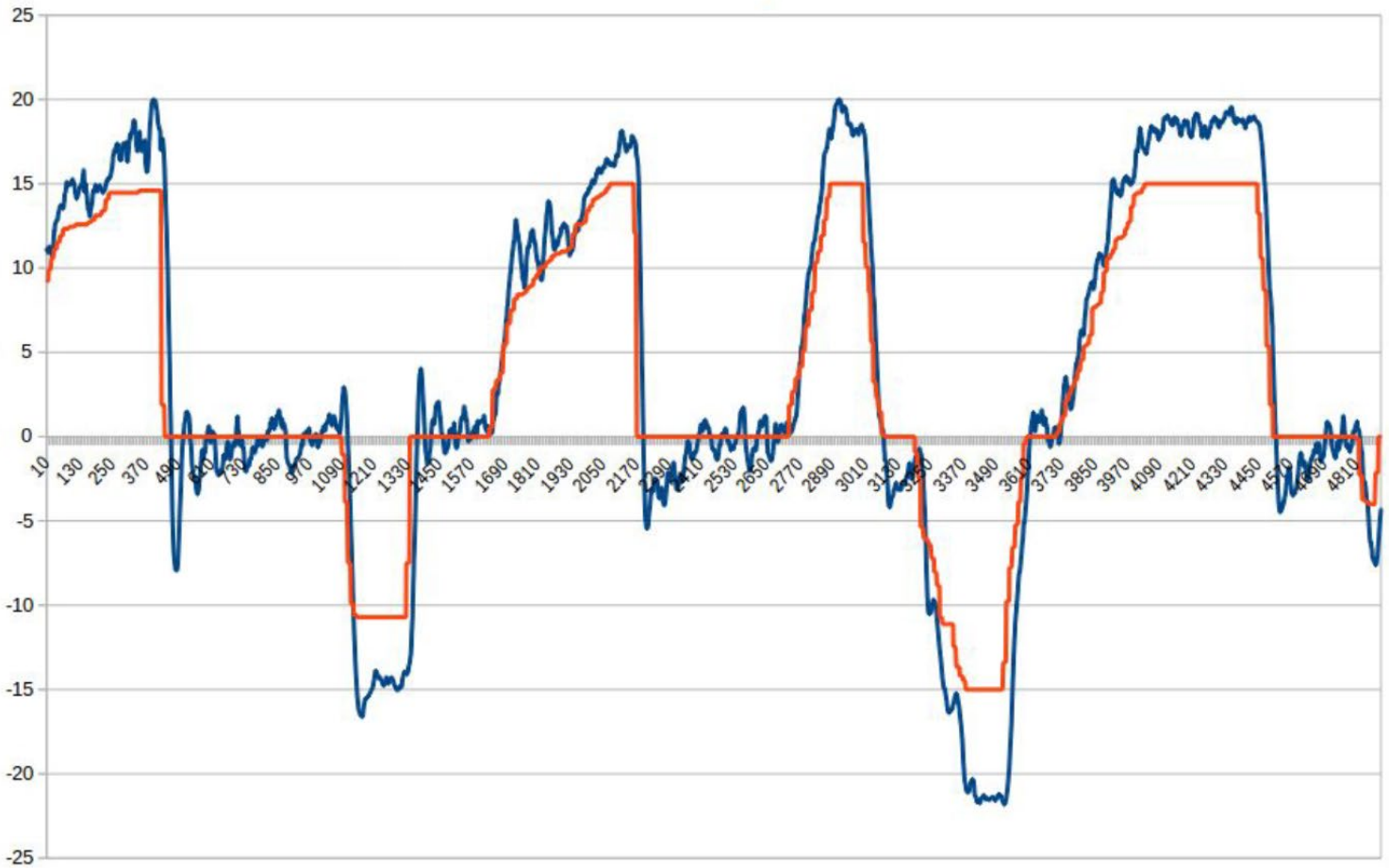
- Pitch PID controller is apparent, no lag
- Safety limits still work
- Graph showing 4 motor pwm values, Pitch value (from filter), Desired pitch, vs time.

Milestone 1

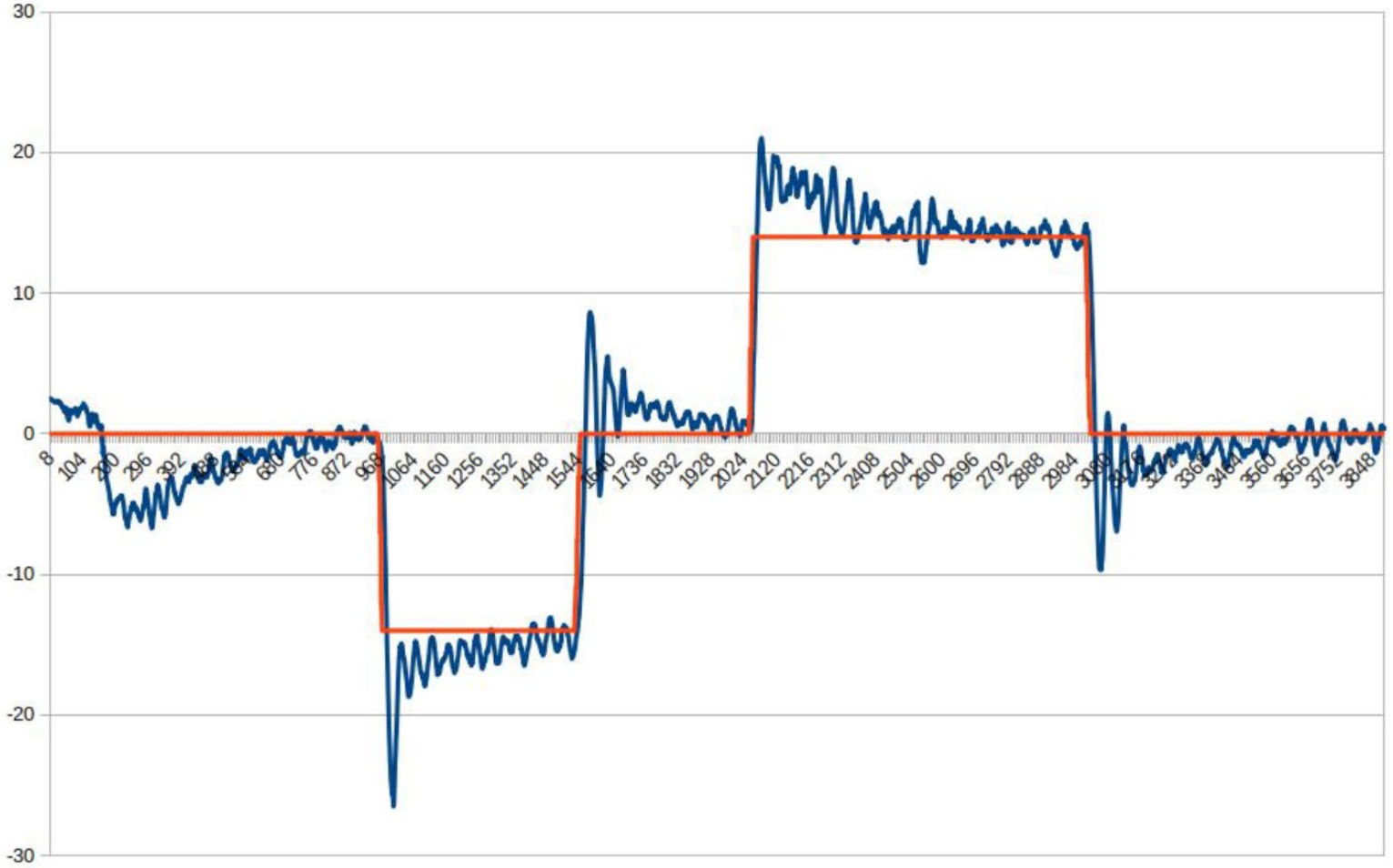
What is wrong here?



What is wrong here?



What is wrong here?



Roll

-Switch test rig to test roll DOF

-add roll control to pitch control

  – to test roll, set all pitch gains to 0 (but remember what they are!!)

Motor pwm= Thrust_neutral+Thrust_amplitude +

+-pitch_velocity*d+-pitch_error*p+-pitch_I_term

+-roll_velocity*d+-roll_error*p+-roll_I_term

Milestone 2

- Demonstrate Joystick control of Roll angle and thrust
- Show graph of good tracking, showing roll and desired roll
- Safeties still work

Milestone 3

-Add motor pause (A) and un-pause(y) from joystick

-Hand held (no free flight yet!) test of combined roll pitch, thrust

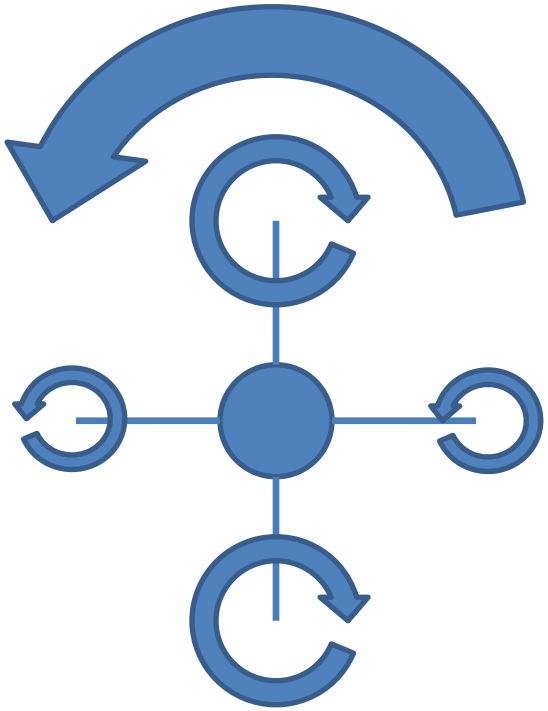
- Max speed 1200

-Turn on both roll and pitch gains

-show/feel joystick control, (RPt, pause, calibrate, run, kill)

-check all safeties

Yaw control



- Turn off pitch and roll (keep thrust)
- Command desired yaw velocity with left joystick
- Try to match desired yaw velocity using only P control.
- Hand testing, no free flight yet! (should be able to feel it (barely), and see it with low thrust values)

Milestone 4

- Hand held (no free flight yet!) test of just yaw control (turn off Pitch and roll)
- Show graph of yaw rate, desired yaw rate, and motor speeds.
- Should be able to feel yaw control.

Get ahead milestone for next week

- Add roll, pitch, thrust, yaw together, try controlled flight in ground effect only!