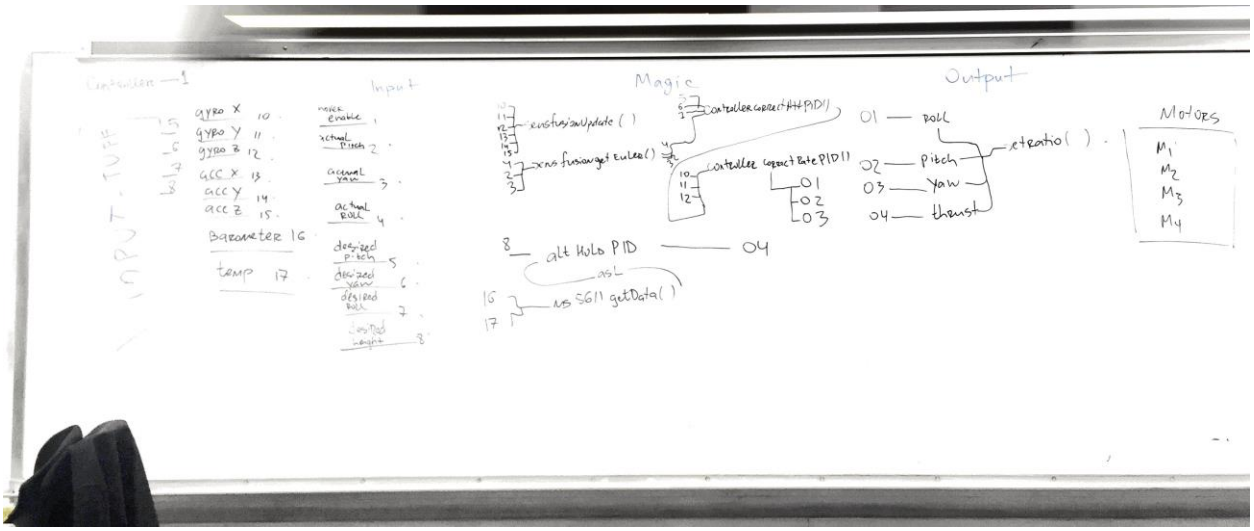
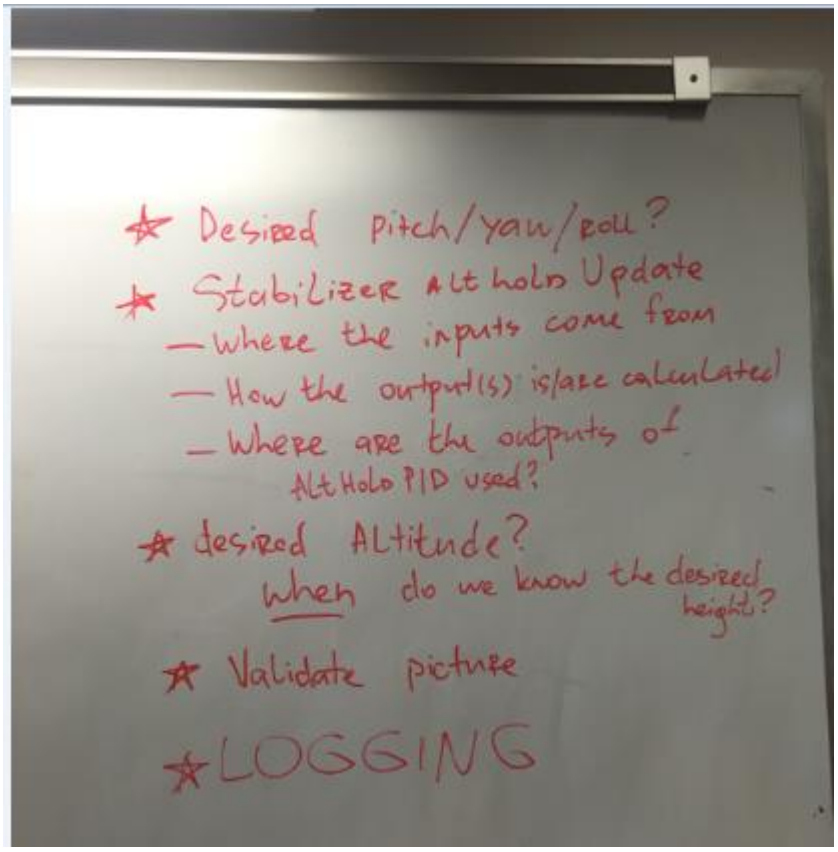
Quad Research Notes

- **ControllerCorrectRatePID** (arguments…)
  - initialized in QuadCSource-master > modules > src > controller.c
  - Arguments
    - Takes in values of actual and desired roll, pitch, and yaw rates
  - pidSetDesired
    - Sets PID set points equal to the desired roll, pitch, and yaw rate values
  - TRUNCATE_SINT16
    - Takes in 2 arguments: the roll, pitch, or yaw output (or current roll, pitch and yaw) and compares the pidRollRate (desired roll rate or set point) with the actual roll rate. Same for pitch and yaw.
  - Also used in stabilizer.c
    - Used to subtract gyro drift?
    - **gyroscope**: determines orientation, can be used to provide stability
- **ControllerGetActuatorOutput** (int16_t* roll, int16_t* pitch, int16_t* yaw)
  - initialized in QuadCSource-master > modules > src > controller.c
  - makes pointer values for roll, pitch, and yaw outputs? Not really sure what it's doing overall
  - also used in stabilizer.c
    - Gets actuator output?
    - **actuator**: a type of motor that is responsible for moving or controlling a mechanism.
- **commanderWatchdog** (void)
  - initialized in QuadCSource-master > modules > src > commander.c
  - used in stabilizer.c
    - "// Added so thrust can be set to 0 while in altitude hold mode after disconnect"
- **stabilizerAltHoldUpdate**
  - initialized in QuadCSource-master > modules > src > stabilizer.c
- **senfusion6**
  - Part of IMU and AHRS sensor fusion algorithms that provide a real-time measurement of orientation relative to the Earth. https://www.youtube.com/watch?v=BXsGWoOMtmU

stabilizer.c notes

- stabilizerInit()
  - initializes stabilizer struct
  - calls motorsInit(), imu6Init(), sensfusion6Init(), and controllerInit()
  - sets desired rollRate, pitchRate, and yawRate to 0
  - imu.c
    - inertial measurement unit
    - combines the info from the accelerometer(measures non-gravitational acceleration) and gyroscope(determines orientation) to figure out the current angular position of the quad.
  - motors.c
    - motor driver
    - motorsInit() – initializes motors?
  - sensfusion6.c
    - Part of IMU and AHRS sensor fusion algorithms that provide a real-time measurement of orientation relative to the Earth. https://www.youtube.com/watch?v=BXsGWoOMtmU
    - 'DCM filter' in quaternion form – Don't know what this means
  - controller.c
    - controllerInit() – initializes PIDs, sets PID limits, etc.
- stabilizerTest()
  - Checks if all the tests pass and if everything works (motorsTest(), imu6Test(), sensfusion6Test(), controllerTest())
- stabilizerTask()
  - calls controllerCorrect, AltitudePID, sensfusion6
  - subtracts gyro drift




★ Desired pitch/yaw/roll?
★ Stabilizer Alt hold Update
— where the inputs come from
— How the output(s) is/are calculated
— Where are the outputs of Alt Hold PID used?
★ desired ALtitude?
When do we know the desired height?
★ Validate picture
★LOGGING