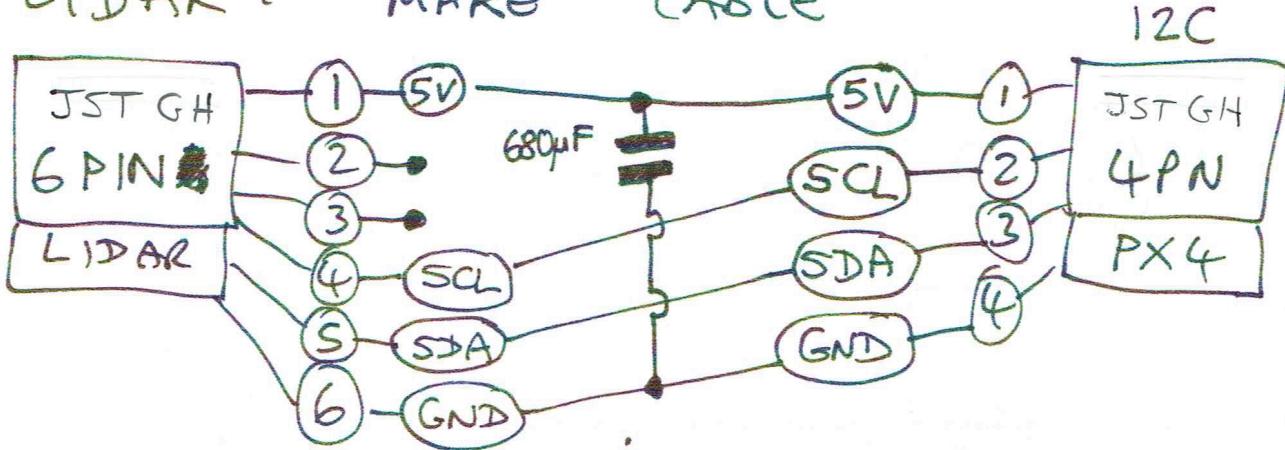


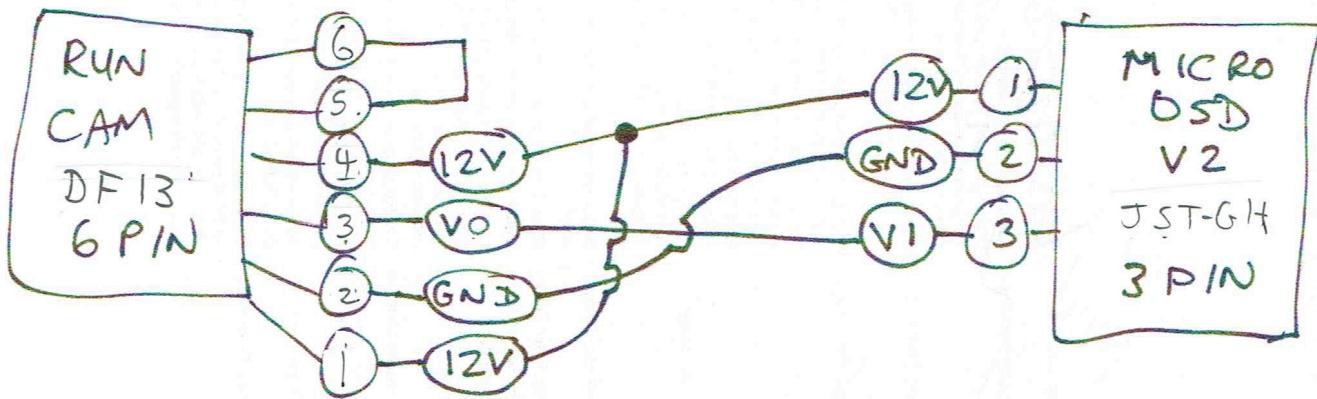
GYROSCOPE
ACCELEROMETER
MAGNETOMETER
LIDAR
OPTICAL FLOW
HD VIDEO BROADCAST
TELEMETRY
ULTRASOUND
REMOTE CONTROL
AUTO PILOT
GPS

TO DO

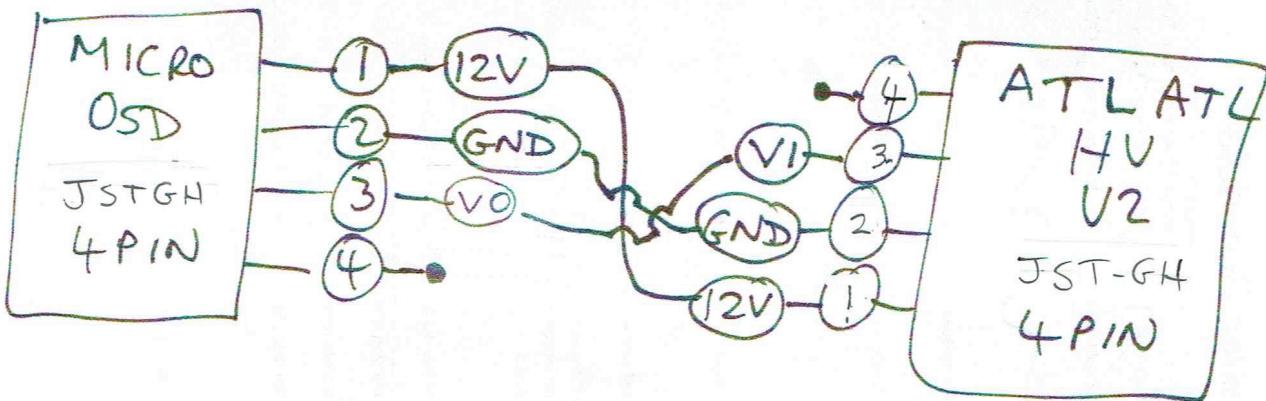
① LIDAR : MAKE CABLE



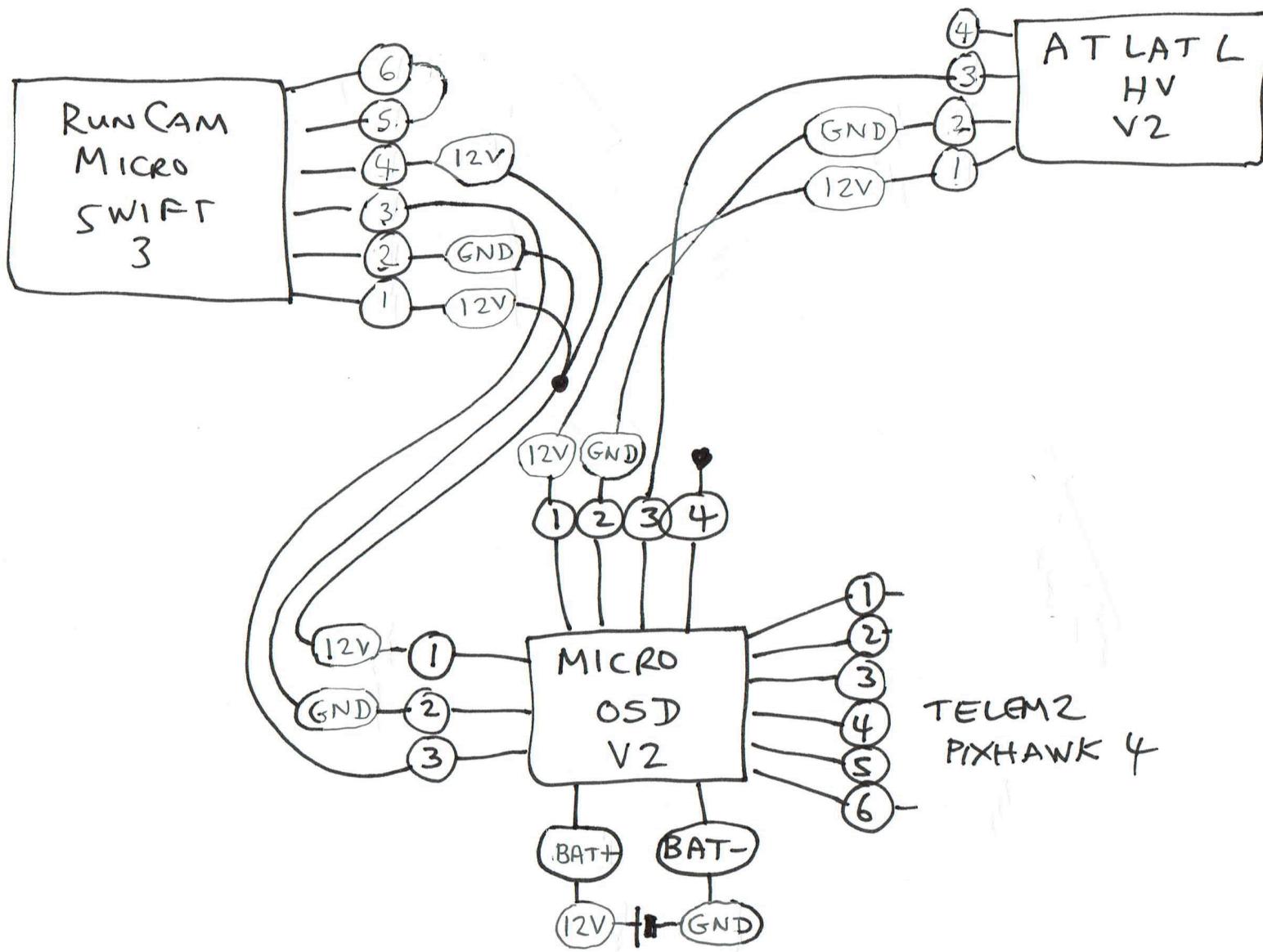
② RUN CAM : MAKE CABLE



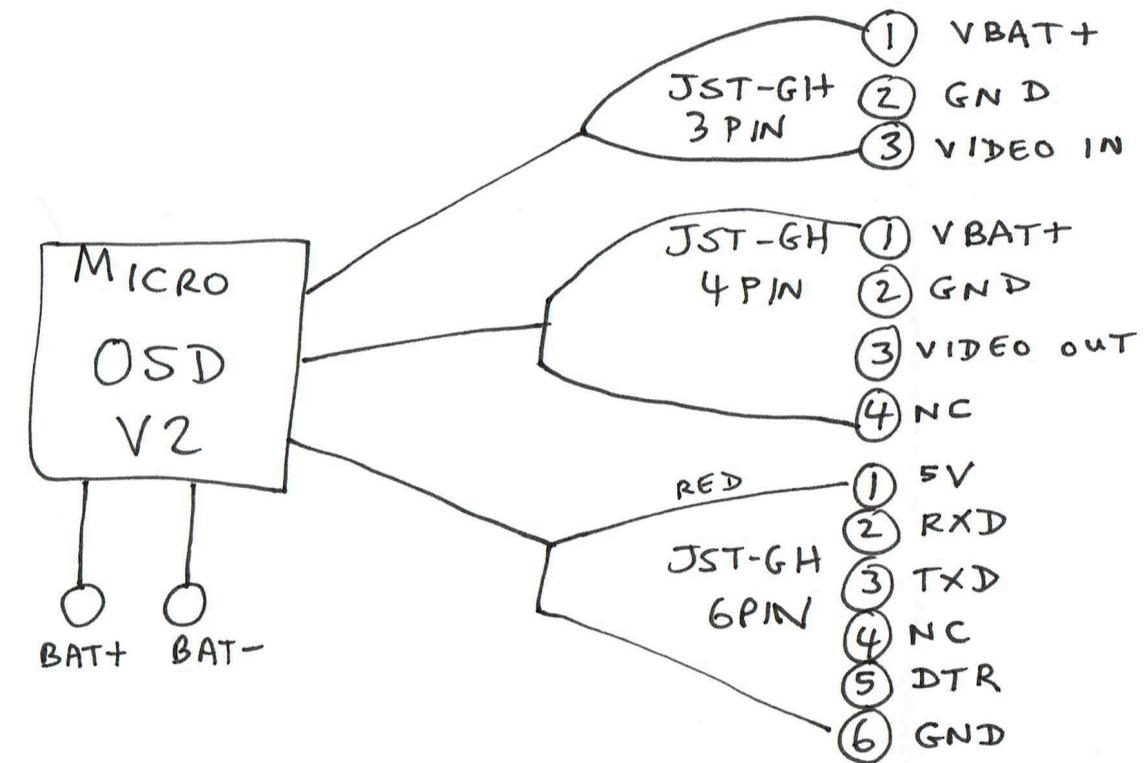
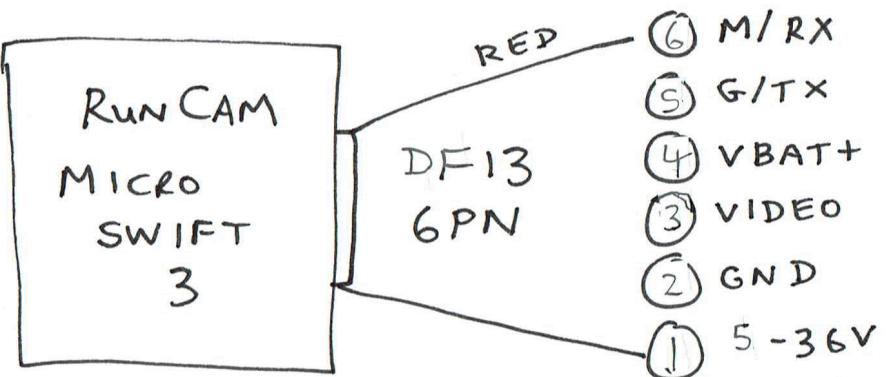
③ ATL ATL HV V2. : MAKE CABLE



COMPLEX
VIDEO
TX

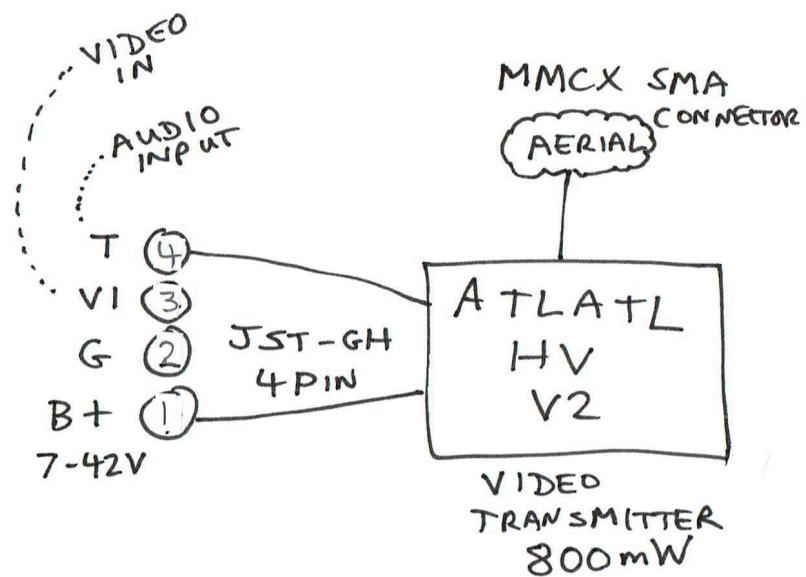


VIDEO

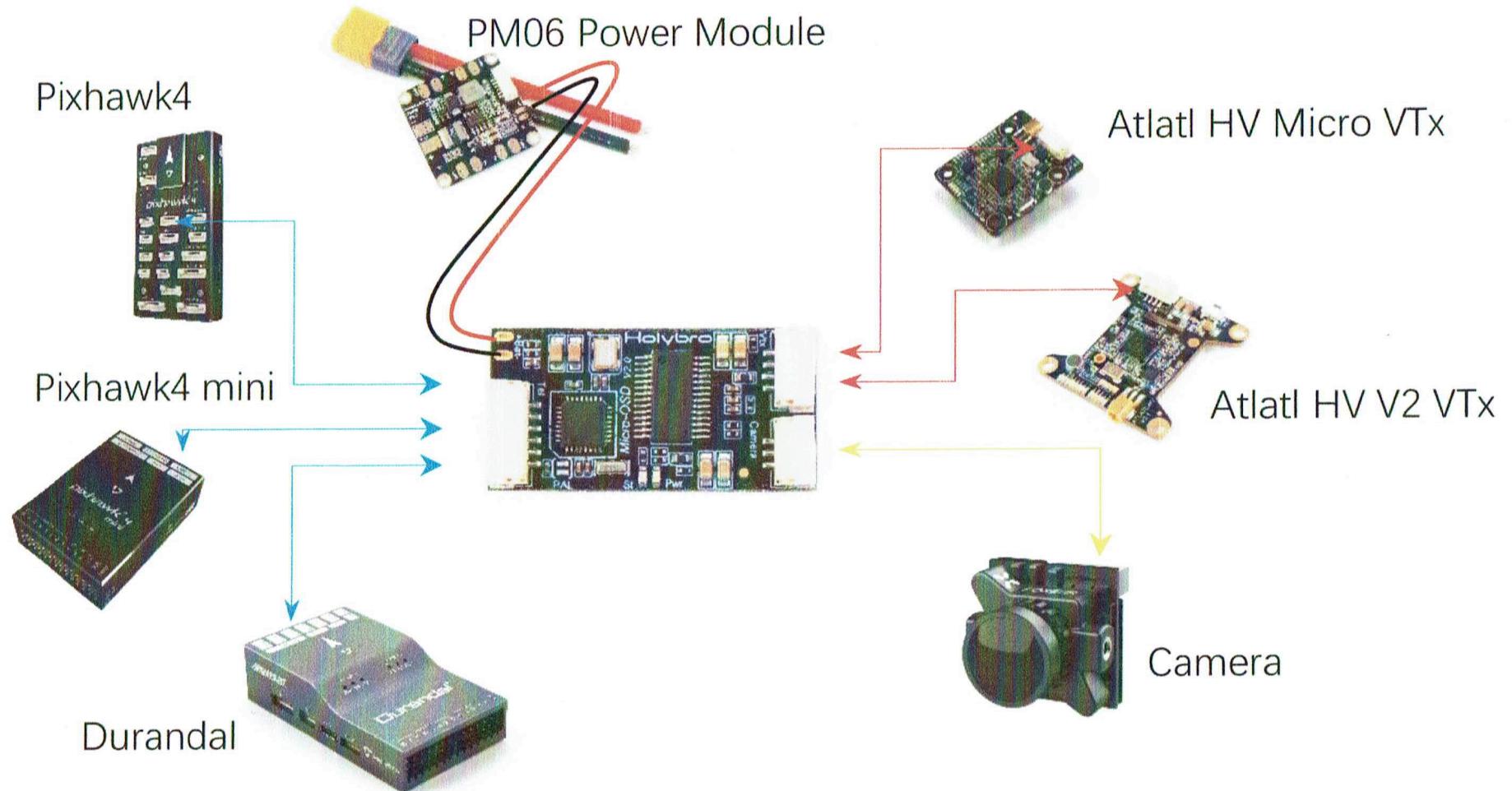


CONNECTORS

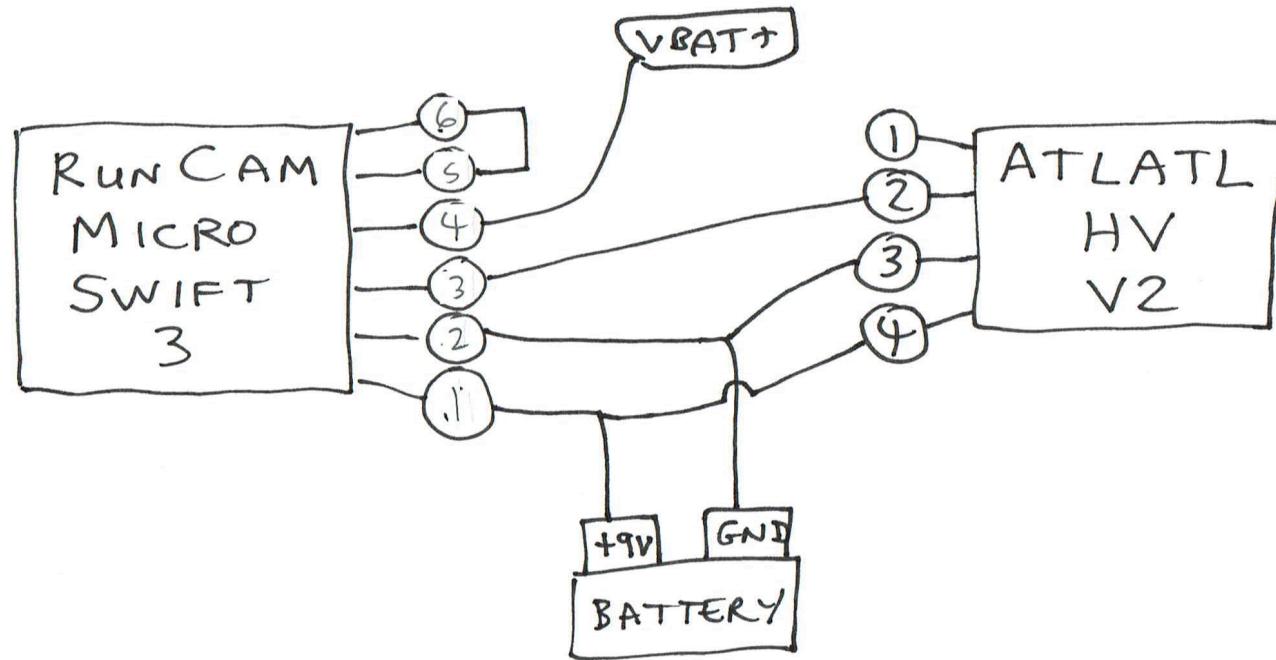
DF13 NO TONGUE
JST-GH TONGUE

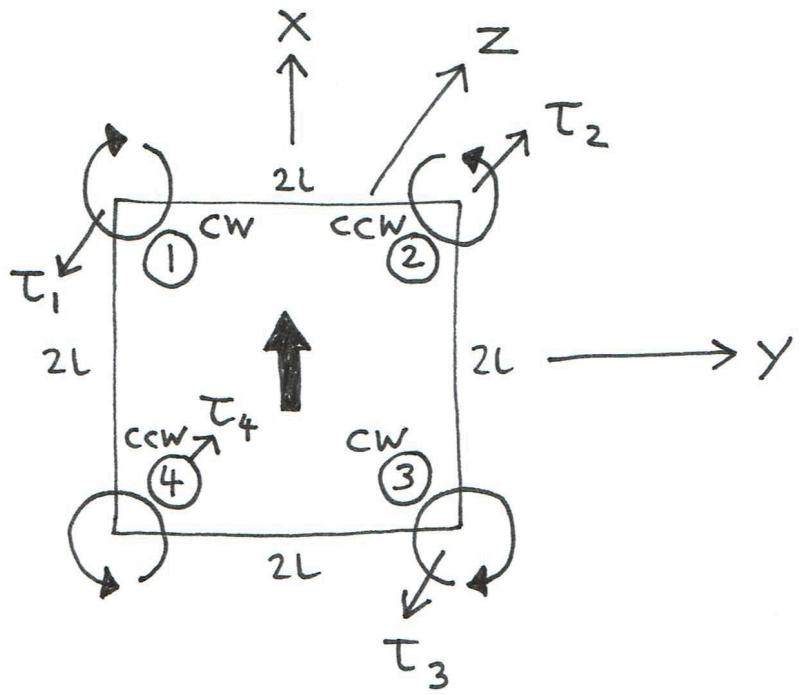


TBS
PROTOCOL
5.8GHZ



SIMPLE VIDEO TX





$$F_i = K_f \omega_i^2$$

$$\tau_i = K_m \omega_i^2$$

$$F' = \begin{pmatrix} 0 \\ 0 \\ -F_1 - F_2 - F_3 - F_4 \end{pmatrix}$$

$$\tau' = \begin{pmatrix} L(F_1 - F_2 - F_3 + F_4) \\ L(F_1 + F_2 - F_3 - F_4) \\ -\tau_1 + \tau_2 - \tau_3 + \tau_4 \end{pmatrix}$$

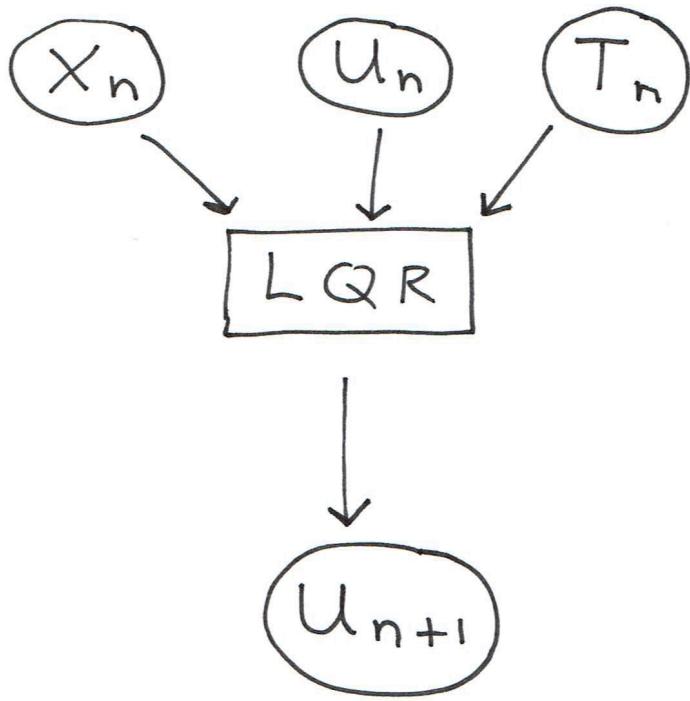
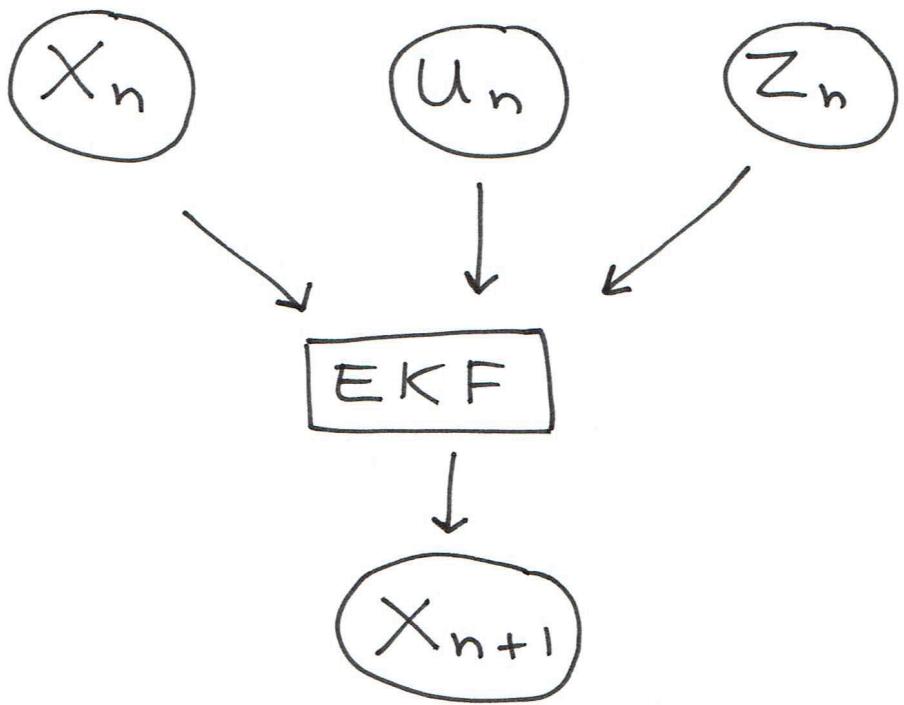
$$\Pi_1 = - \frac{F'_z K L - K \tau'_x - K \tau'_y + L \tau'_z}{4 K L}$$

$$F_2 = - \frac{F'_z K L + K \tau'_x - K \tau'_y - L \tau'_z}{4 K L}$$

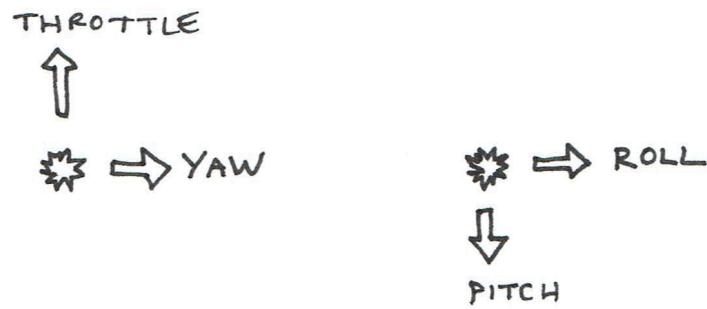
$$F_3 = - \frac{F'_z K L + K \tau'_x + K \tau'_y + L \tau'_z}{4 K L}$$

$$\Pi_f = - \frac{F'_z K L - K \tau'_x + K \tau'_y - L \tau'_z}{4 K L}$$

$$\tau_i = \frac{\kappa}{\kappa_f} \Pi_i \quad \Rightarrow \quad \kappa = \frac{\kappa}{\kappa_f}$$

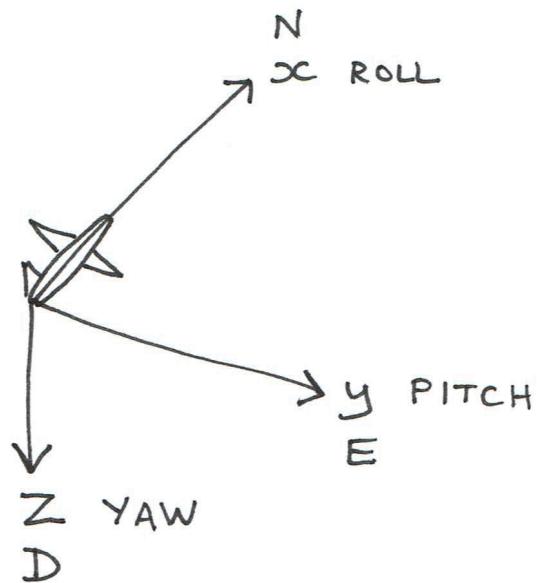


MANUAL CONTROL

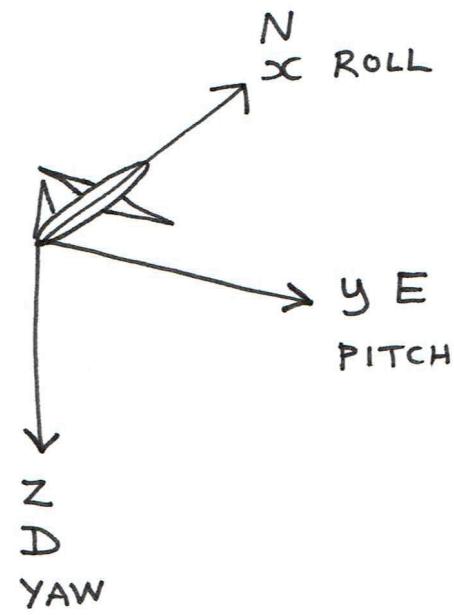


EXAMPLE :

THROTTLE	$\circ\circ\circ$	$-v_z'$
ROLL	$\circ\circ\circ$	v_y'
PITCH	$\circ\circ\circ$	$-v_x'$
YAW	$\circ\circ\circ$	w_z'



X	State
d	
v	
a	
r	
w'	
α'	

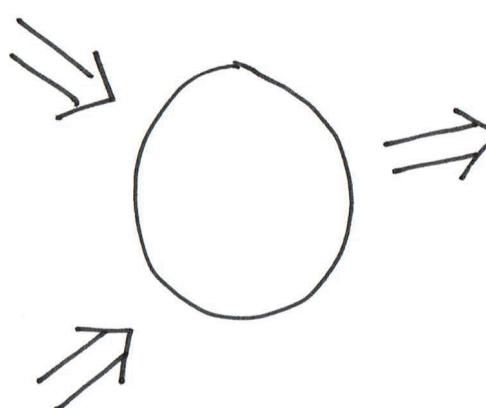


U	Control
	F'
	τ'

Z	Measure
	GPS
	dis
	vel
	Sensor
	acc'
	mag'
	gyr'

INPUTS

- SYSTEM-TIME
- HIL-SENSOR
- HIL-GPS
- HIL-STATE-QUATERNION



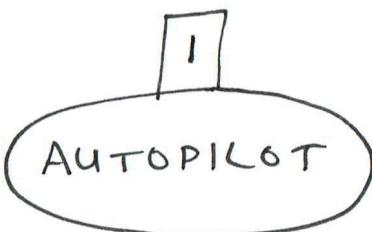
OUTPUTS

- HIL-ACTUATOR-CONTROLS

CONTROLS

- HIL-RC-INPUTS-RAW
- MANUAL-CONTROL

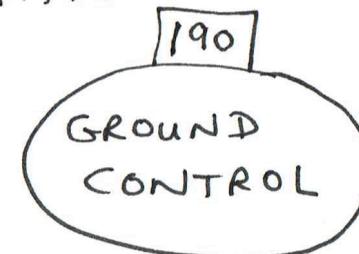
ATTITUDE
ATTITUDE_TARGET
ESTIMATOR_STATUS
GPS_RAW_INT
PING
SYS_STATUS
VIBRATION



e.g. Px4

POSITION_TARGET_LOCAL_NED
GLOBAL_POSITION_INT
→ write(Autopilot.???)

SERVO_OUTPUT_RAW
LOCAL_POSITION_NED
VFR_HUD
ATTITUDE_QUATERNION
HEARTBEAT
BATTERY_STATUS
ALTITUDE
EXTENDED_SYS_STATE



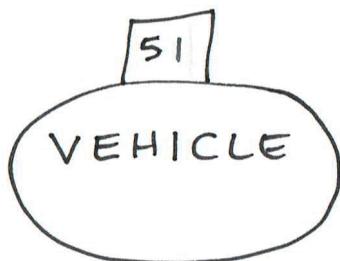
e.g. Q Ground Control

←
read : Ground Control.???

read : Vehicle. ???

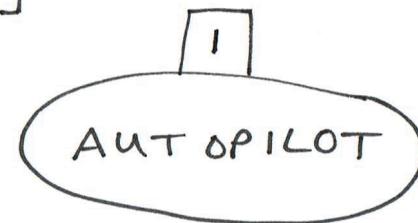
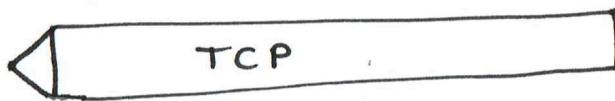


HEARTBEAT [1/s]
HIL_STATE_QUATERNION [100/s]
HIL_GPS [15/s]
HIL_SENSOR [200/s]
HIL_OPTICAL_FLOW
HIL_RC_INPUTS_RAW
SYSTEM_TIME [1/4s]



e.g. jMAVSim

4560



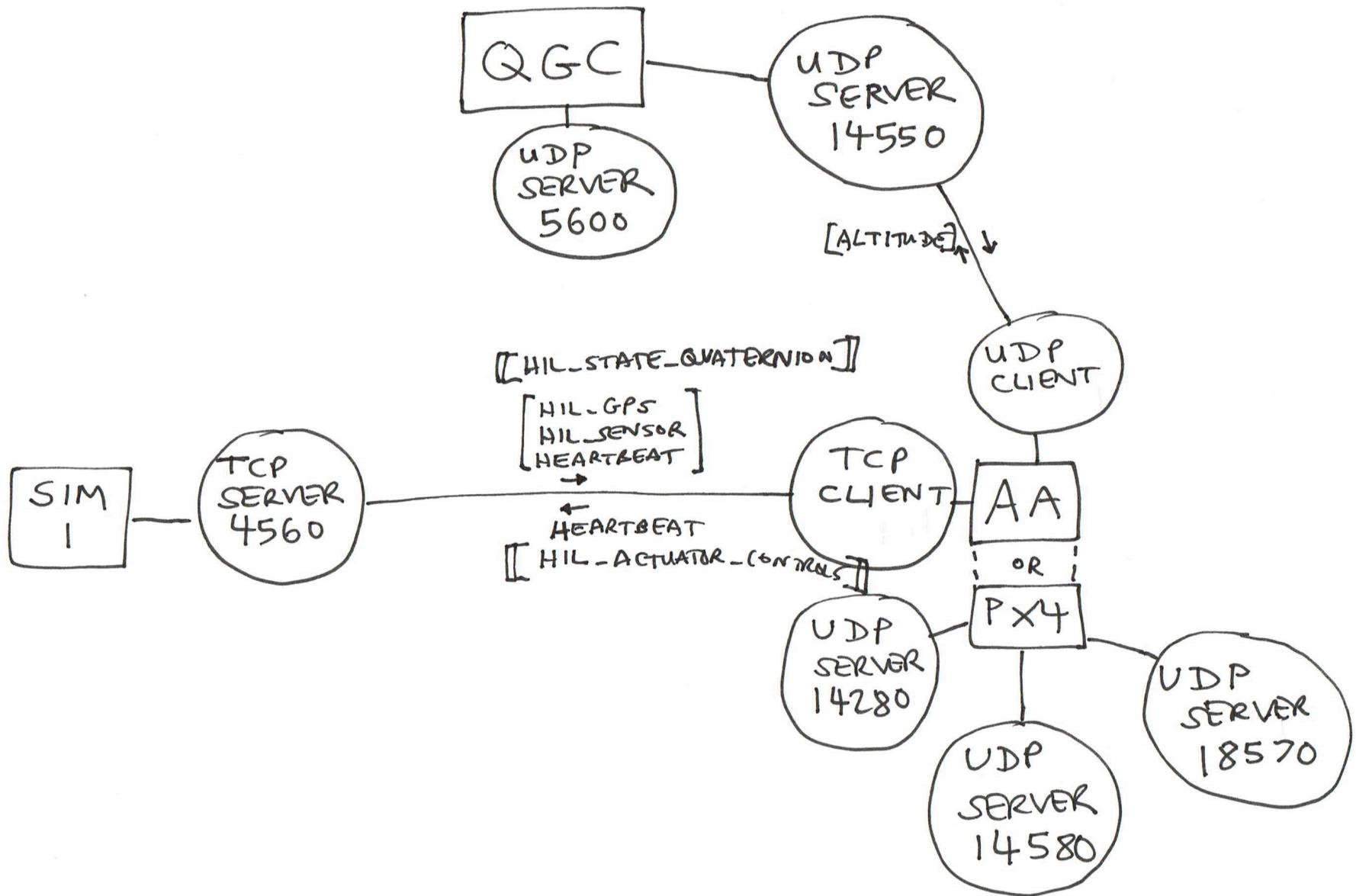
e.g. PX4

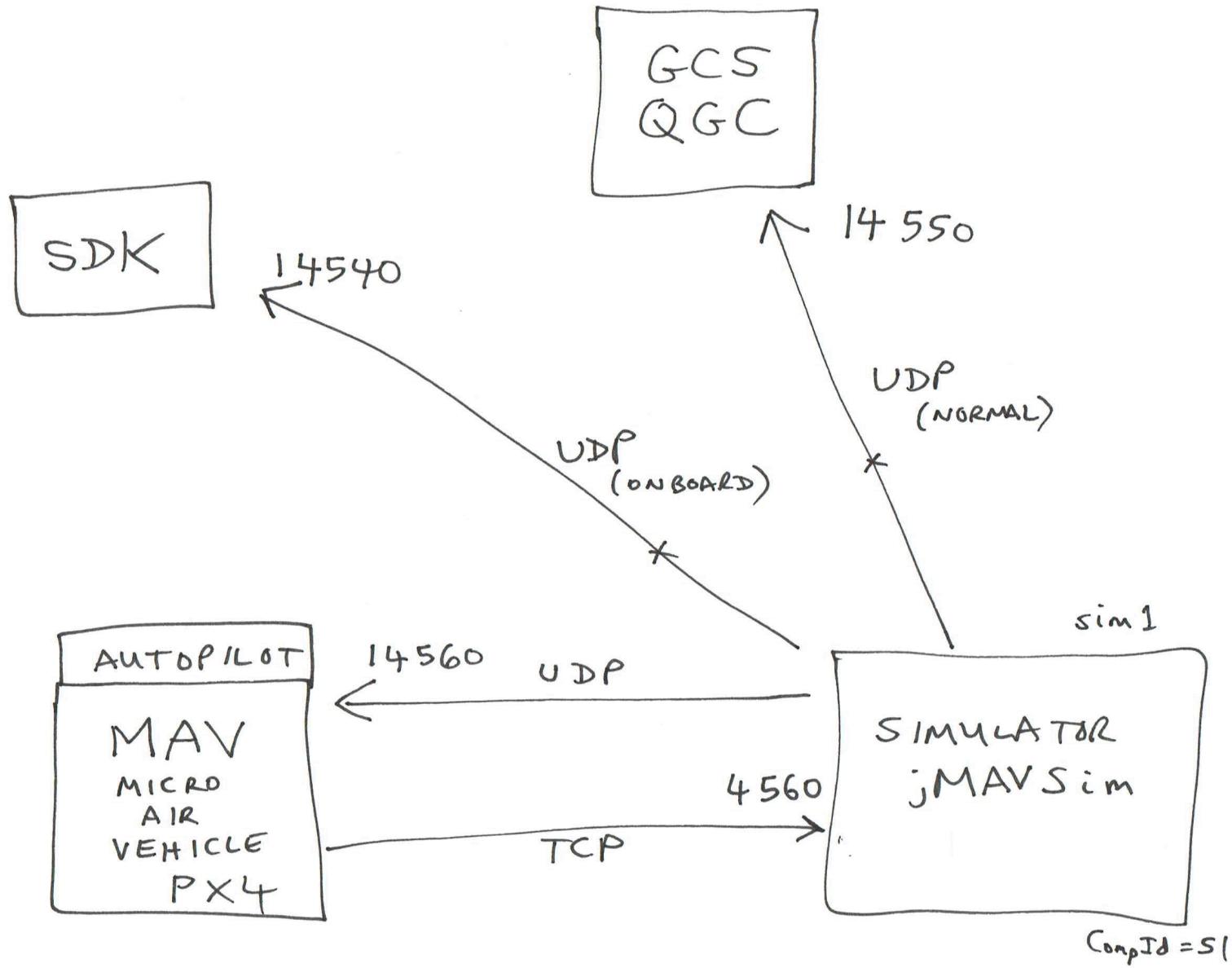
HEARTBEAT [ONCE]

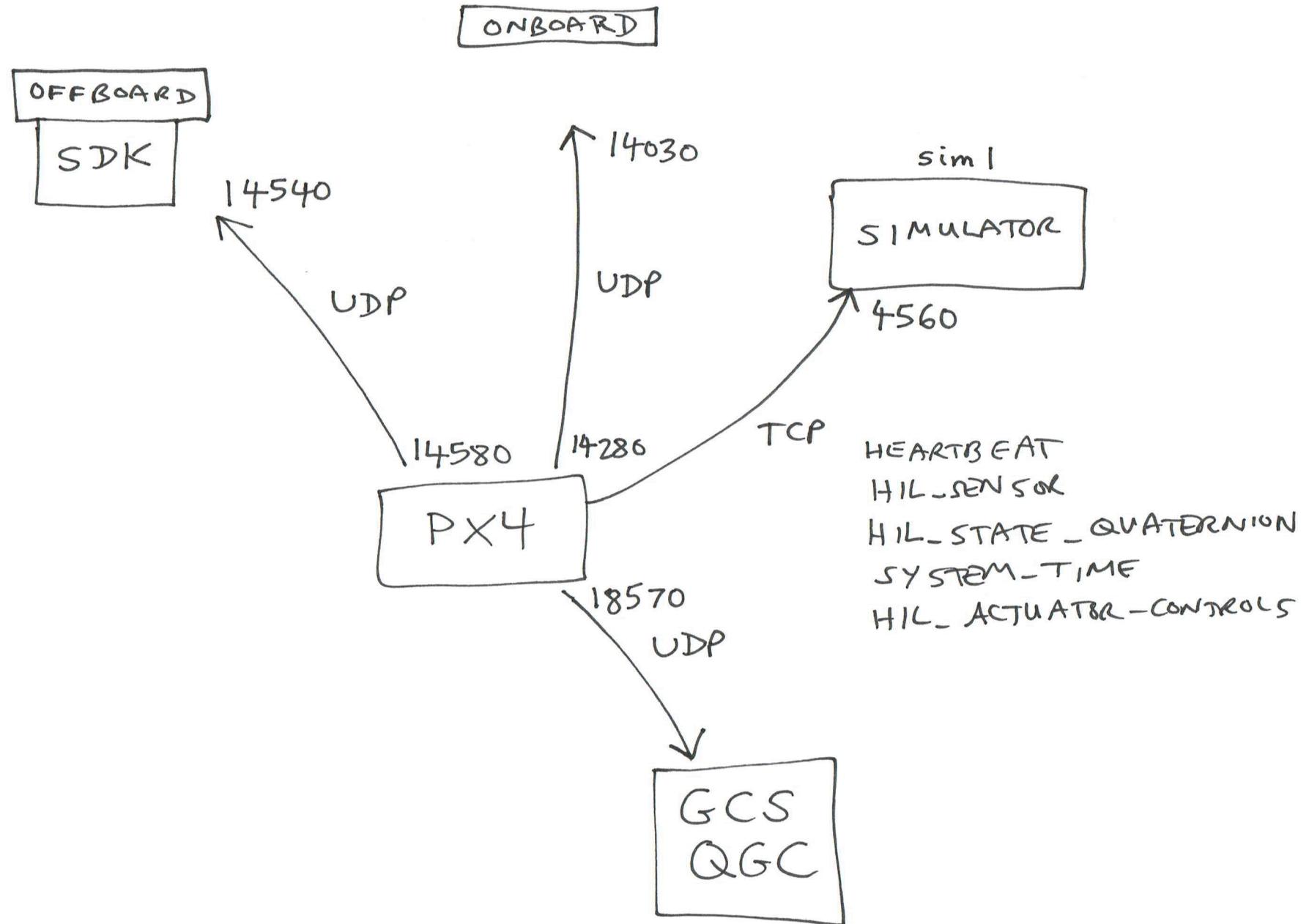
HIL_ACTUATOR_CONTROLS [200/s]
COMMAND_LONG [ONCE]

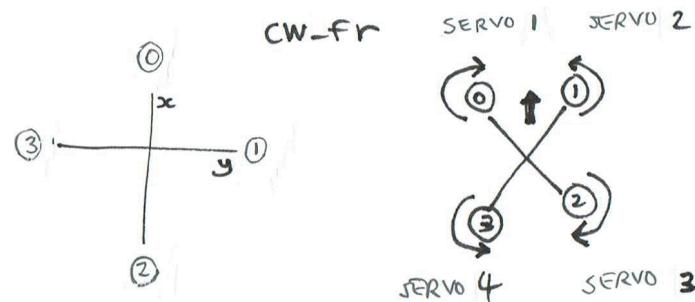
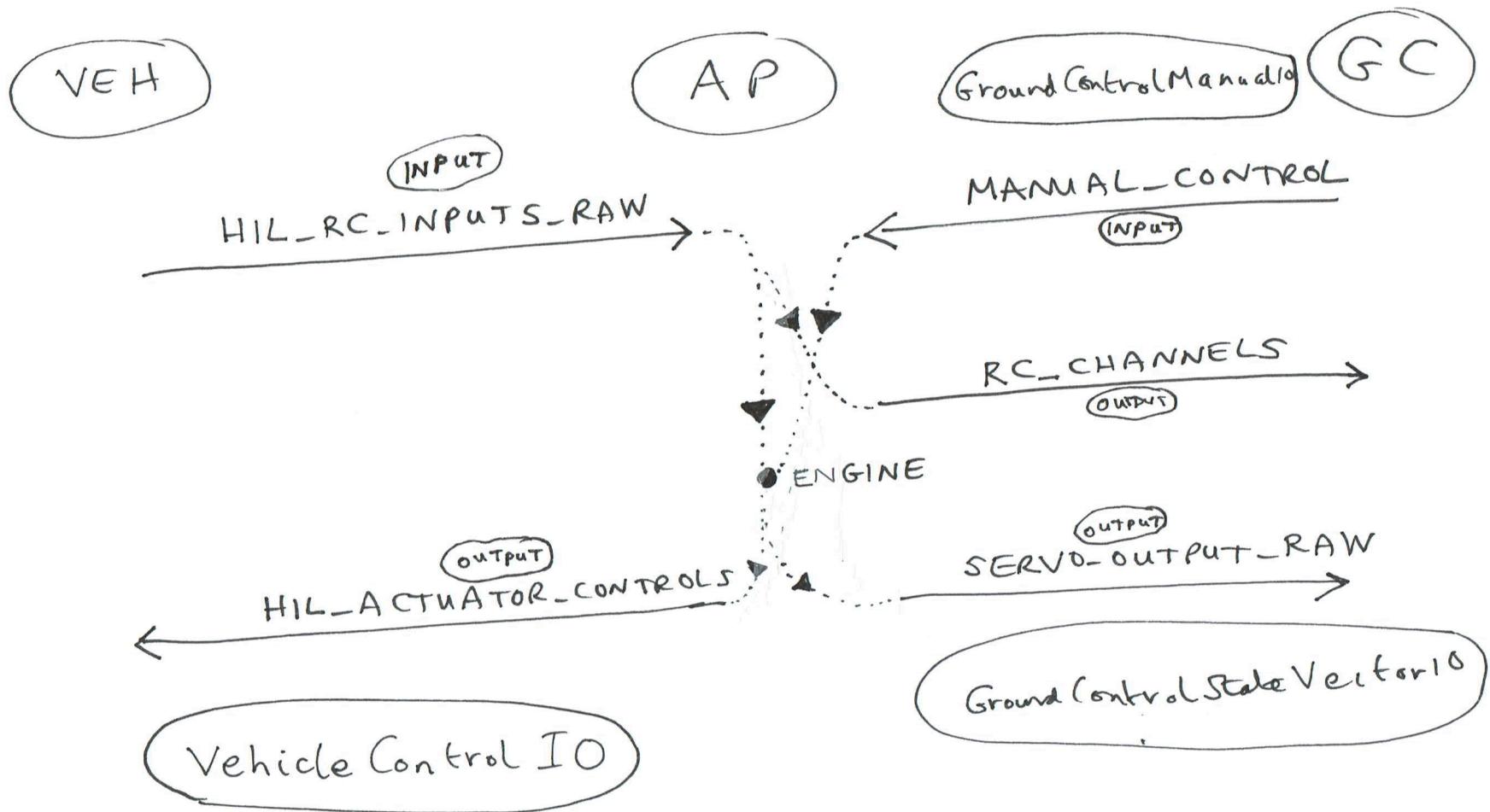


write (Autopilot. ???)







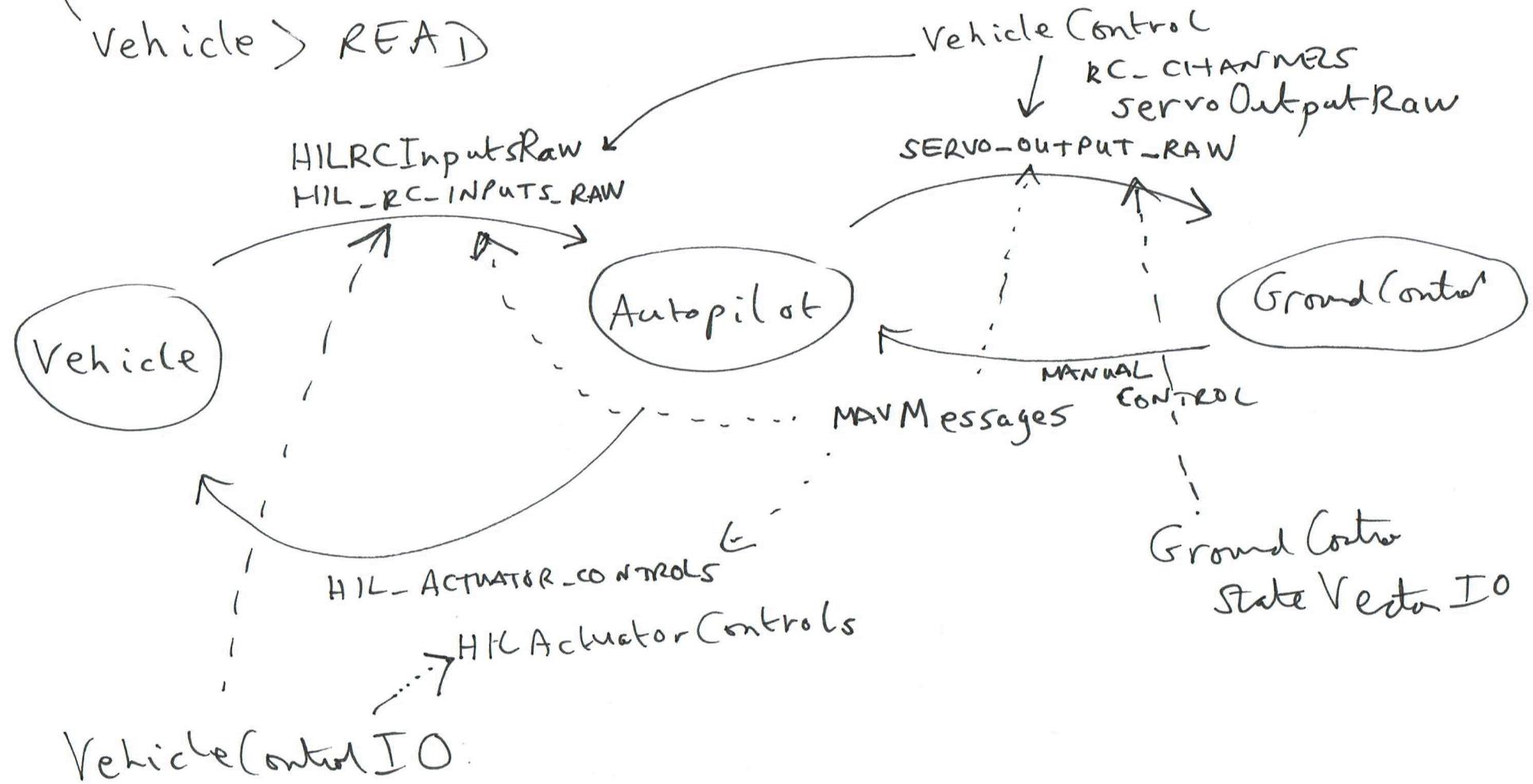


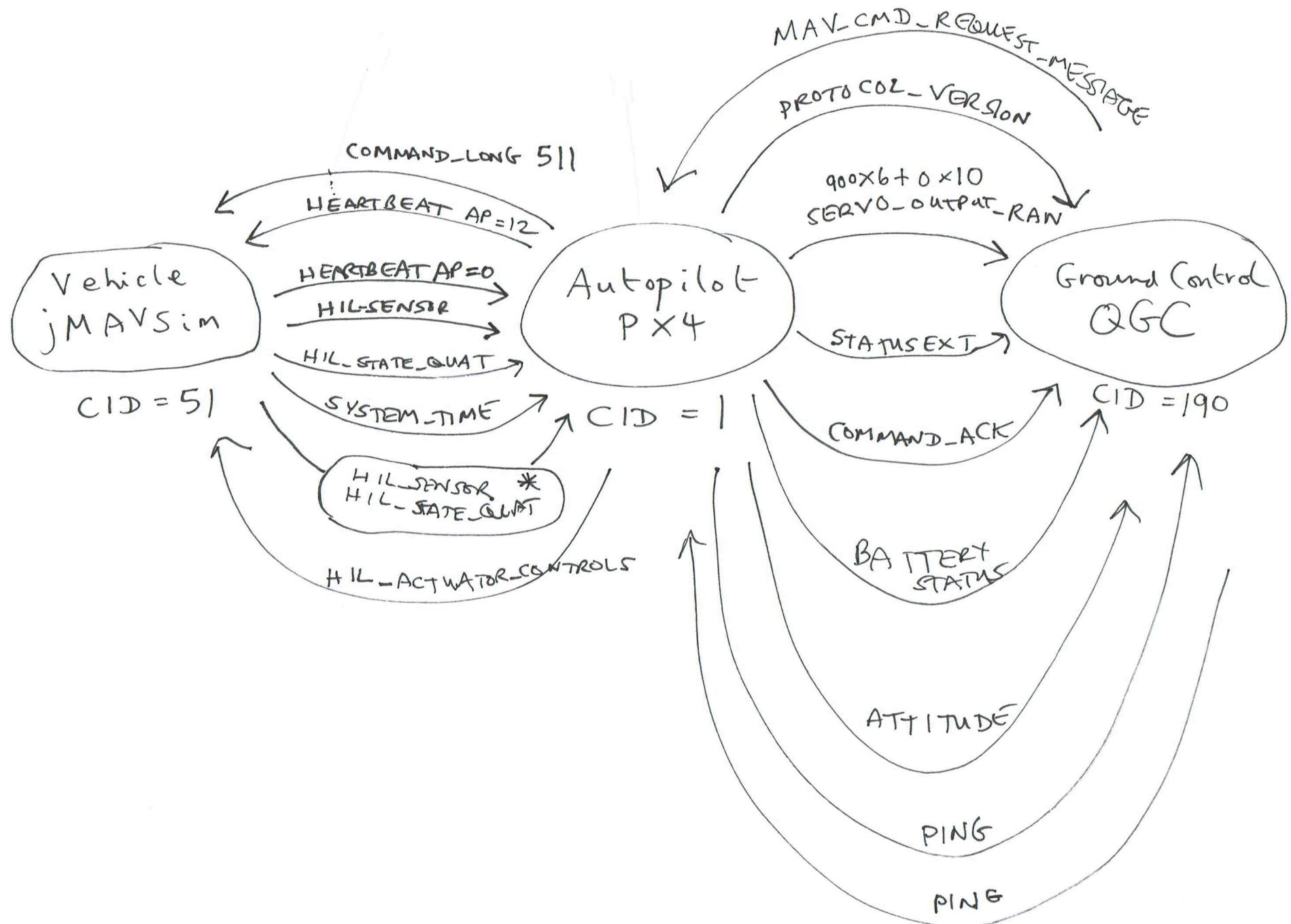
Vehicle > WRITE

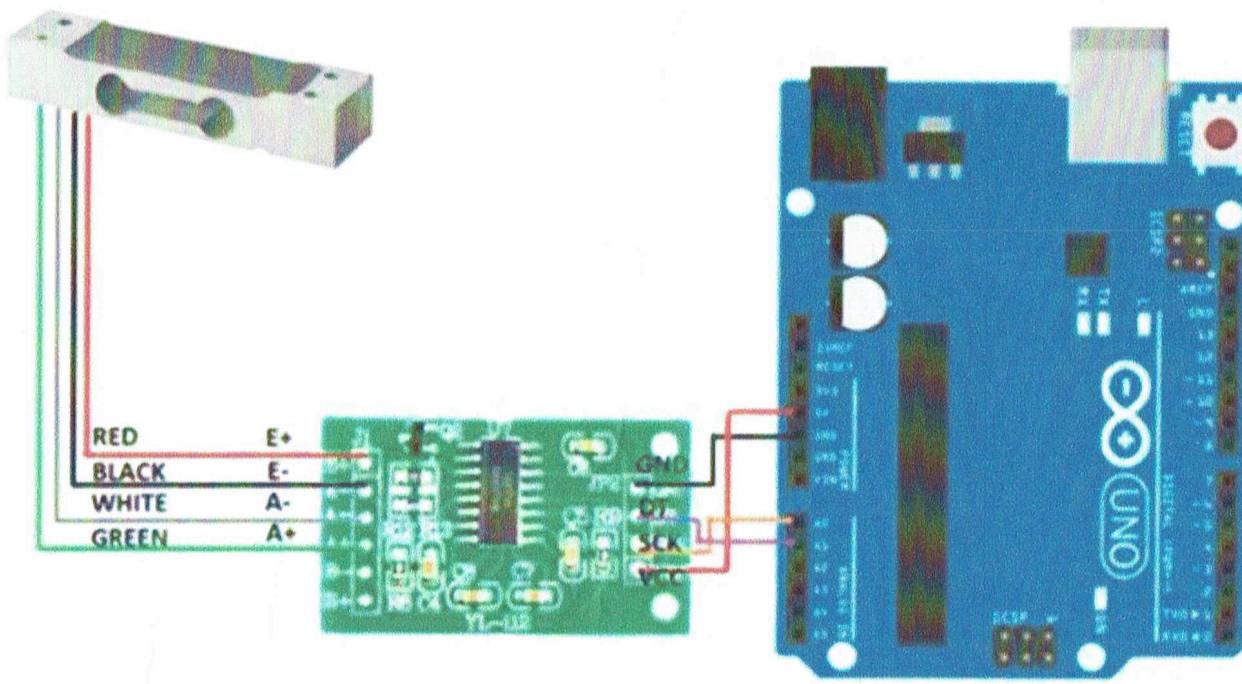
Vehicle reads 1 COMMAND_LONG from Autopilot for MAV_CMD_SET_MESSAGE_INTERVAL:200 times per second
Vehicle reads 1 HEARTBEAT from Autopilot
Vehicle reads HIL_ACTUATOR_CONTROLS 200 times a second from Autopilot

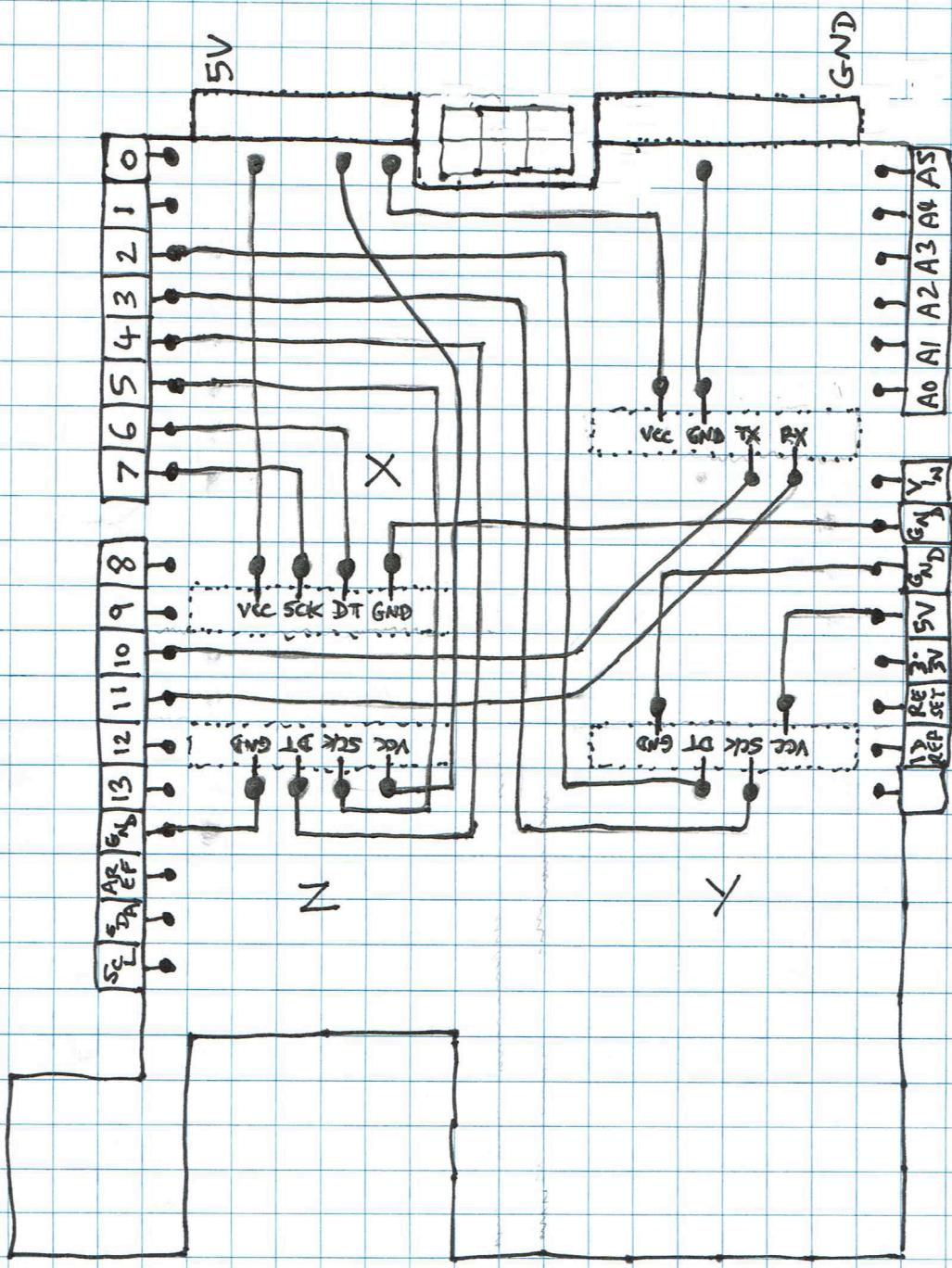
Vehicle writes HEARTBEAT every second to Autopilot
Vehicle writes HIL_GPS 15 times per second to Autopilot
Vehicle writes HIL_SENSOR 200 times a second to Autopilot
Vehicle writes HIL_STATE_QUATERNION 100 times a second to Autopilot
Vehicle writes SYSTEM_TIME every 4 seconds to Autopilot

Vehicle > READ









X	SCK	7
	DT	6
Y	SCK	3
	DT	2
Z	SCK	5
	DT	4

