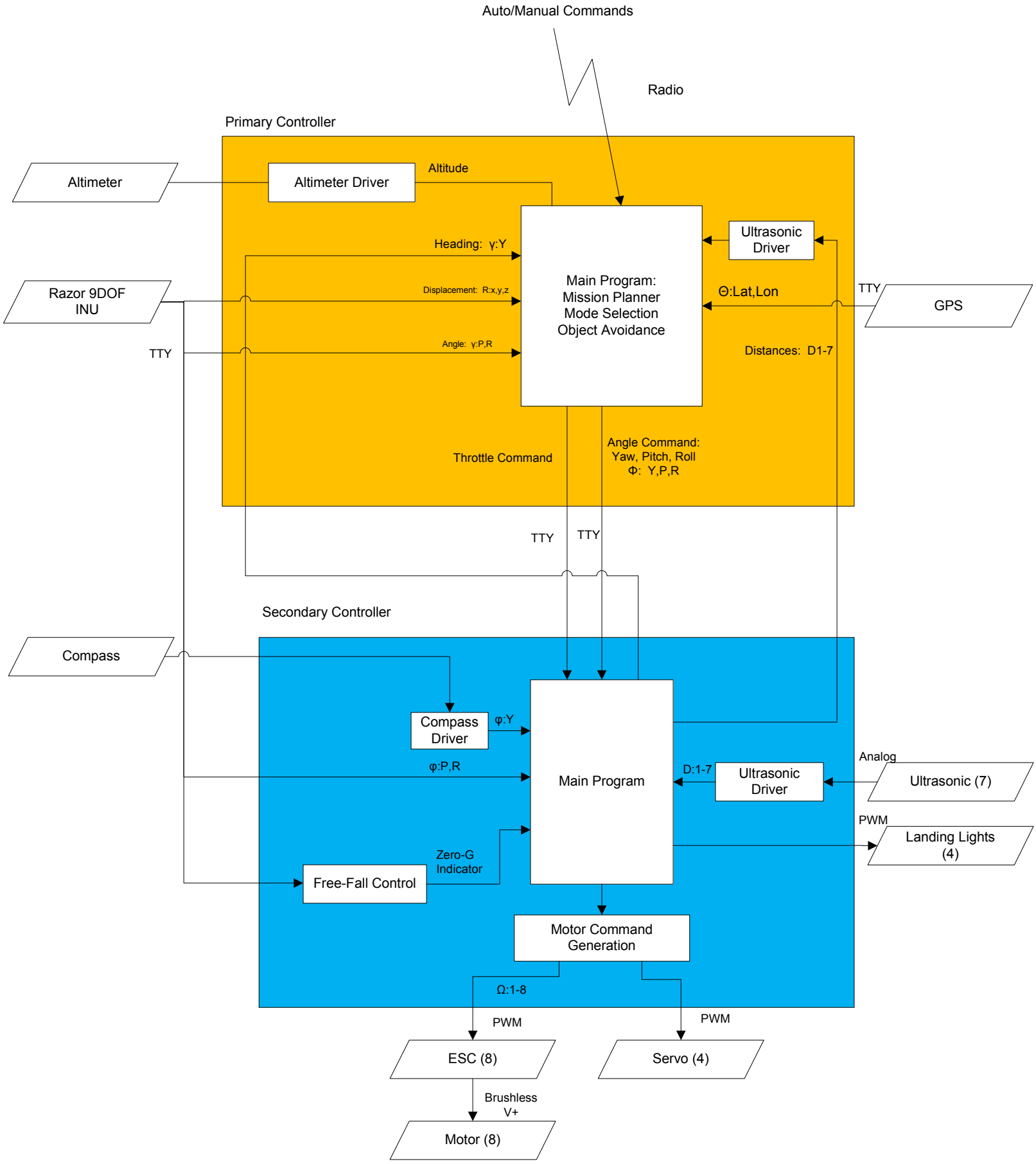
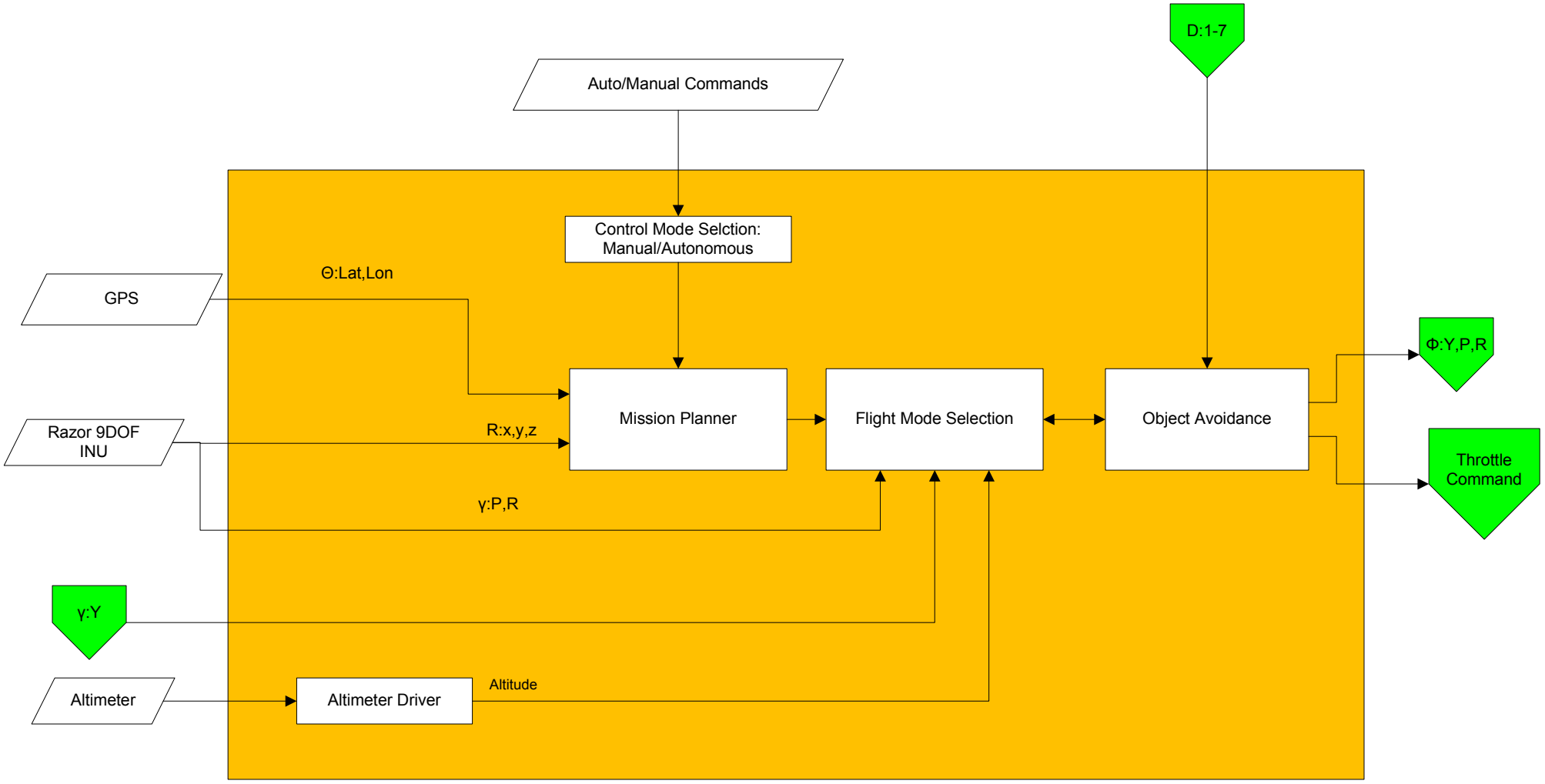
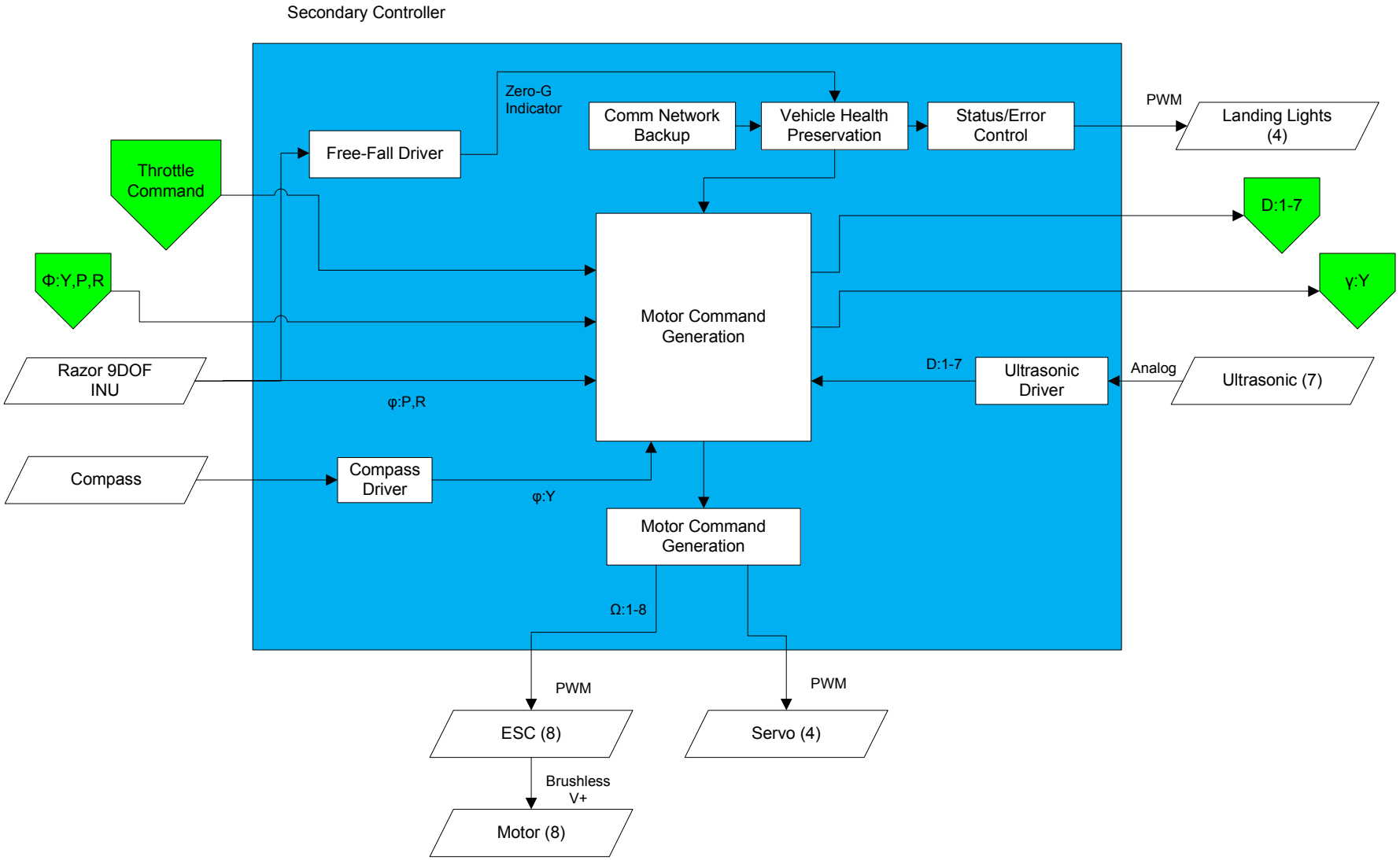
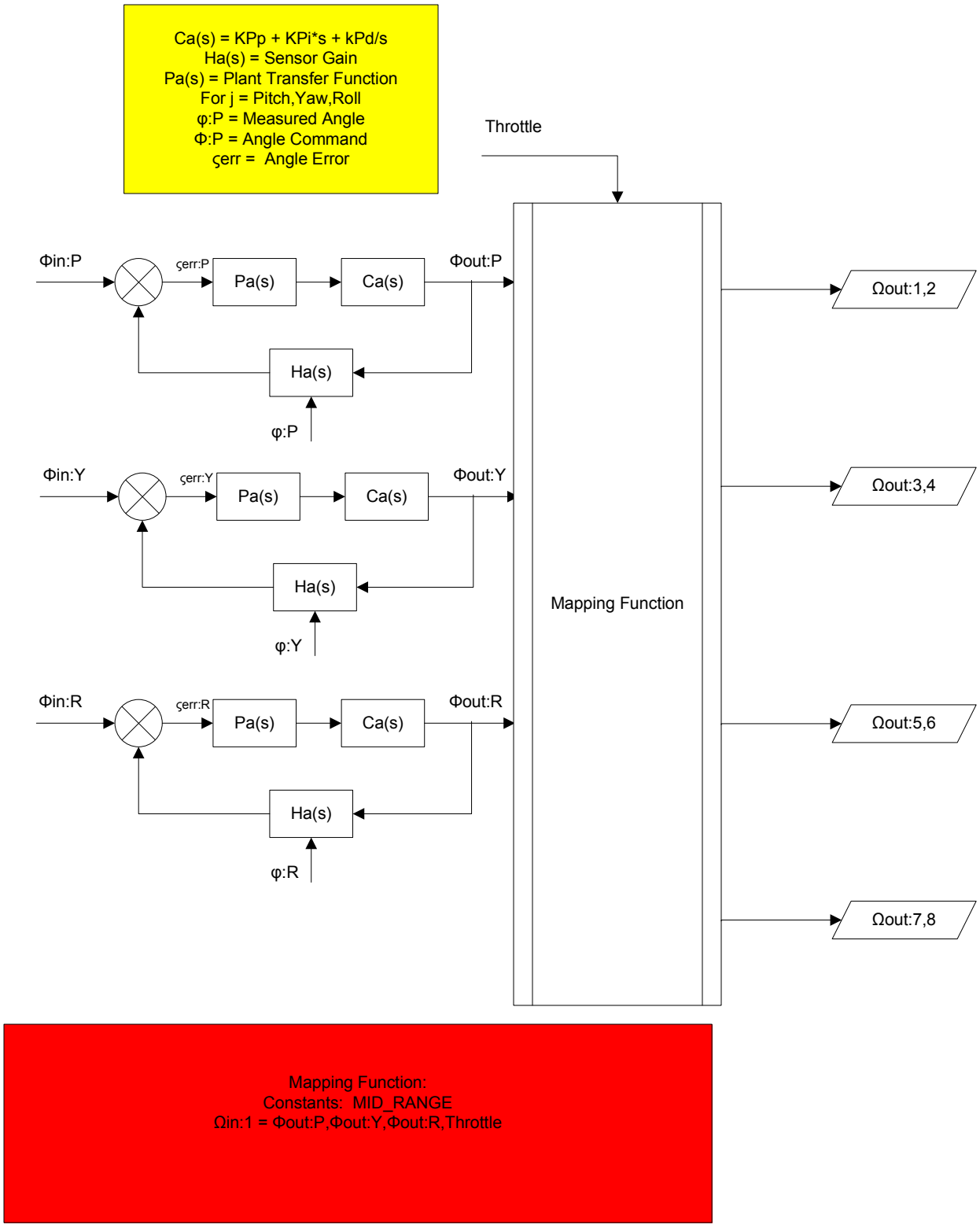

Auto/Manual Commands
Radio
Primary Controller
Altimeter
Altimeter Driver
Altitude
Heading: γ:Y
Displacement: R:x,y,z
Angle: γ:P,R
Razor 9DOF INU
TTY
Main Program:
Mission Planner
Mode Selection
Object Avoidance
Ultrasonic Driver
Θ:Lat,Lon
TTY
GPS
Distances: D1-7
Throttle Command
Angle Command:
Yaw, Pitch, Roll
Φ: Y,P,R
TTY
TTY
Secondary Controller
Compass
Compass Driver
φ:Y
φ:P,R
Main Program
D:1-7
Ultrasonic Driver
Analog
Ultrasonic (7)
PWM
Landing Lights (4)
Zero-G Indicator
Free-Fall Control
Motor Command Generation
Ω:1-8
PWM
PWM
ESC (8)
Servo (4)
Brushless V+
Motor (8)


D:1-7
Auto/Manual Commands
Control Mode Selction:
Manual/Autonomous
Θ:Lat,Lon
GPS
Razor 9DOF
INU
R:x,y,z
γ:P,R
Mission Planner
Flight Mode Selection
Object Avoidance
Φ:Y,P,R
Throttle
Command
γ:Y
Altimeter
Altimeter Driver
Altitude


Secondary Controller
Zero-G Indicator
Comm Network Backup
Vehicle Health Preservation
Status/Error Control
PWM
Landing Lights (4)
Free-Fall Driver
Throttle Command
D:1-7
Φ:Y,P,R
γ:Y
Motor Command Generation
Razor 9DOF INU
D:1-7
Ultrasonic Driver
Analog
Ultrasonic (7)
φ:P,R
Compass
Compass Driver
φ:Y
Motor Command Generation
Ω:1-8
PWM
PWM
ESC (8)
Servo (4)
Brushless V+
Motor (8)


Ca(s) = KPp + KPi*s + kPd/s
Ha(s) = Sensor Gain
Pa(s) = Plant Transfer Function
For j = Pitch,Yaw,Roll
φ:P = Measured Angle
Φ:P = Angle Command
çerr = Angle Error
Throttle
Φin:P
çerr:P
Pa(s)
Ca(s)
Φout:P
Ha(s)
φ:P
Φin:Y
çerr:Y
Pa(s)
Ca(s)
Φout:Y
Ha(s)
φ:Y
Φin:R
çerr:R
Pa(s)
Ca(s)
Φout:R
Ha(s)
φ:R
Mapping Function
Ωout:1,2
Ωout:3,4
Ωout:5,6
Ωout:7,8
Mapping Function:
Constants: MID_RANGE
Ωin:1 = Φout:P,Φout:Y,Φout:R,Throttle