

## ABSTRACT

*Panser is a combat vehicle that is often used by the military in ground battles that require a vehicle that can hit the field, is bulletproof and has a variety of adequate systems. There are so many findings from researchers and scientists of the world that make it easier and more useful for human work. One technology that is currently the focus of researchers is autopilot technology which has been widely used in various automatic vehicles such as the Unmanned Ground Vehicle (UGV). UGV is a mechanical device that can be operated manually or automatically for purposes of transportation, logistics industry, Search and Rescue activities and military purposes for surveillance, even combat.*

*In this final project, the author will design an Unmanned Ground Vehicle (UGV) that can move automatically using the waypoint navigation method by utilizing several sensors contained in flight control such as Accelerometer, GPS and compass to complete the specified mission.*

*This study uses a PID control system for steering and throttle in order to get the appropriate response during auto mode, getting  $P = 0.382$ ,  $I = 0.174$  and  $D = 0.210$  for steering and getting  $P = 1000$ ,  $I = 0.416$  and  $D = 0.600$  for steering throttles. Using the PID value, it produces an average deviation of 0.000010035% degrees of latitude and 0.000000074% degrees of longitude when converted into meters, the shift that occurs is 0.385 meters or 38.5 cm when testing the waypoint navigation method.*

**Keywords:** *Unmanned Ground Vehicle, UGV, PID, Mission Planner, Rover, flight control, PixhawkPX4.*