

ABSTRACT

The development of electronic technology in the field of geophysics has given birth to the ground penetrating radar (GPR) method which is useful for measuring soil quality and structure. However, in practice classifying soil structures in the highlands is difficult due to uneven contours and land surface, steep terrain, weather conditions and access to places that are difficult to make the data collection process difficult to carry out. The use of Unmanned Aerial Vehicle (UAV) is a solution in overcoming these problems where the tool is used to transport the GPR radar to explore areas in the highlands so that researchers do not need to go directly to places to collect data and reduce the risk of accidents caused by difficult access and conditions of the region. This Unmanned Aerial Vehicle (UAV) can carry the GPR load stably and can move along a predetermined route and is better prepared to face the conditions of an area full of obstacles.

In this study, an Unmanned Aerial Vehicle (UAV) has been designed with a stable hexa x configuration when carrying heavy loads in the form of GPR and can follow a predetermined route autonomously.

The Unmanned Aerial Vehicle (UAV) which is designed in the form of a hexacopter with attitude control using a PID controller can fly stably in carrying out missions autonomously with an average error value of accuracy during Take Off and Landing is 98.8 cm and has an average error value of 93.76 cm in all experiments, with the average value of the accuracy of the hexacopter waypoint system with a range of 44.3 - 146.6 cm and the average value of the accuracy or precision of the waypoint system with a range of 57 - 140.6 cm.

Keywords : UAV, Hexacopter, PID Controller