

Realisasi Wahana *Quadcopter* dengan Fitur *Position Hold* Menggunakan Modul GPS

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ABSTRAK

Teknologi UAV (*Unmanned Aerial Vehicle*) telah banyak menarik perhatian para peneliti untuk mengembangkannya. Penggunaan UAV saat ini sangat dibutuhkan baik untuk keperluan militer maupun sipil misalnya untuk pencarian dan penyelamatan korban bencana alam serta penginderaan jarak jauh seperti monitoring hutan, monitoring lalu lintas dan daerah perbatasan. Bahkan UAV dapat digunakan untuk kepentingan komersil seperti *aerial filming* dan *photography*.

Pada tugas akhir ini UAV yang akan digunakan adalah tipe *quadcopter*. *Quadcopter* merupakan salah satu jenis *multirotor* yang paling banyak dikembangkan. *Quadcopter* dapat terbang dengan pelan dan stabil. *Flight controller* yang digunakan adalah Arduflyer 2.5.2. Arduflyer telah dilengkapi sensor *gyroscope* dan *accelerometer* yang berfungsi untuk melakukan koreksi posisi dengan menggunakan pengontrol PID, lalu terdapat sensor barometer untuk mempertahankan ketinggian *quadcopter* pada saat terbang. Modul GPS u-Blox CN-06 dapat dihubungkan dengan Arduflyer sebagai sistem navigasi *quadcopter* agar dapat melakukan *position hold*.

Quadcopter mampu terbang dengan stabil lalu melakukan *position hold*. Fitur *position hold* bekerja saat *switch* Flight Mode pada *radio control* diaktifkan dan secara otomatis *set point* koordinat dan ketinggian didapatkan. *Quadcopter* sudah mampu mempertahankan posisi dan ketinggian. Penyimpangan posisi yang terjadi sangat kecil dalam orde sentimeter, yaitu paling jauh 59,103 sentimeter dari *set point* koordinat. Ketinggian *quadcopter* menyimpang hanya setinggi 44 sentimeter dari *set point* ketinggian.

Kata Kunci : *Quadcopter*, Arduflyer, Tuning PID, Sensor *Gyroscope* dan *Accelerometer*, *Altitude Hold*, *Position Hold* , Modul GPS u-Blox CN-06.

The Realization of The Position Hold Feature on Quadcopter Using GPS Module

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ABSTRACT

Technology of UAV (Unmanned Aerial Vehicle) has attracted the attention of many researchers to develop it. The use of UAV are currently desperately needed both civil and military purposes, for example for search and rescue victims of natural disasters as well as remote sensing such as forest, traffic and border areas monitoring. Moreover, the UAV can be used to commercial interests such as aerial filming and photography.

In this final assignment, UAV that will be used is type quadcopter. Quadcopter is one of the most widely developed multirotor. Quadcopter can fly slowly and stable. Flight controllers that used is Arduflyer 2.5.2. Arduflyer has the accelerometer and gyroscope sensor to perform the correction position by using a PID controller, then there is a barometric sensor to maintain altitude of quadcopter while flying. GPS module u-Blox CN-06 can be attributed to the Arduflyer as a quadcopter's navigation system that can perform position hold feature.

Quadcopter is able to fly with the stable then do position hold. Position hold feature work when switch Flight Mode on the radio control enabled and automatically set point coordinates and height is obtained. Quadcopter is able to maintain its position and altitude. The position deviation occurs is very small in the order of centimeters, which is most distant 59,103 cm from set point of coordinates. Quadcopter's altitude error only 44 cm from set point of altitude.

Keyword : Quadcopter, Arduflyer, PID Tuning, Gyroscope and Accelerometer Sensor, Altitude Hold, Position Hold , GPS Module u-Blox CN-06.

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