ABSTRACT

(Unmanned Aerial Vehicle) A UAV is a flying machine that is controlled manually or automatically remotely. UAVs have been widely used in logistics, industry, and business. The UAV energy source comes from the battery. The battery power in the UAV takes a long time, so the use of the UAV is not hampered. Existing charging is done manually or wirelessly.

Automatic Battery Swap System is an effort to increase the time in charging the battery to be more efficient, where all processes can run in the fastest time. This exchange system is made with a runway as a place for exchanging batteries on the UAV with batteries in the cabinet. This final project will be implemented, which focuses on the mechatronic system on the runway as a UAV landing. An aluminum profile carries out this landing at the Y coordinate followed by the X coordinate, assisted by ultrasonic sensors as bait to help the distance according to the desired set point. The X and Y coordinates can adjust the set point within 10 *s* with the values of K_p = 1, K_i = 0.01, and K_d = 0.01. Followed by a IMU sensor so that it can direct the UAV according to the set point within 10 *s* with a value of K_p = 0.5, K_i = 0.2, and K_d = 0 so that battery exchange can occur according to its direction.

Keyword : *Unmanned Aerial Vehicle, system mechatronic, control PID, ultrasonic, BNO055*.