ABSTRACT

ADCS (Attitude Determination and Control System) is a very important system who is the contained in the satellite system. This sub-system have a role as satellite attitude controller while in orbit. ADCS divided into two, there is a sistem active control and pasive control. Active control is a control system that use a power source to move the actuator so that it can move the sattelite back to the original position, as for the pasive control system does not require a source of power supply but the satellite just use magnetic field pull in the satellite. In the final assignment will use active control as a controller satellite and use reaction wheels as a actuator in this case.

In designing and implementing Reaction Wheels in this final project use a close loop scheme between reaction wheels and MPU6050 sensor on air bearing media as test equipment. Gyroscope sensor and accelerometer used is the type of sensor MPU6050 most often used by people in general. For modeling the reaction wheels system of PID control using SIMULINK-MATLAB, then from the design result and control parameter values contained in the simulation will be used as reference value on the actual test by using the air-bearing medium as the testing tool.

For the experimental results the prototype of the nano satellite behavior controller by using the air bearing as a test device, obtained the result of P controller and PI controller for the roll axis with the result of controller P = 0.407 with T_s = 1 sec and angle 35 for PI test T_s = 2.5 seconds with the controller values P = 0.282, I = 2.930 and, the angle is 45 degrees. For test yaw axis by using K_p value = 1 T_s = 1.5 seconds and angle 90 degree, while for testing using PI with value T_s = 2 sec, K_p = 0.309, K_i = 8.54 and, angle = 45 degree. This test issues errors generated by the sensor system against the PI controller used.

Key word: Reaction Wheels, kontrol sistem, PI, MPU6050