ABSTRACT

Satellite technology is progressing which is a solution to the existing problems. Cubesat is a nanosatellite with dimensions of 10 cm × 10 cm × 10 cm and has a mass of 1.33 kg per unit. Cubesat orbits in Low Earth Orbit (LEO), orbiting at an altitude of 500 km. Satellite in its application has many functions based on the mission of the satellite, for example, the clarification of the nadir Attitude Determination Control System (ADCS) subsystem. With this mission subsystem that exists on satellite in the form of sensors, camera, and On-Board Computer (OBC). OBC which in its application is the On-Board Data Handling (OBDH) has the duty to process and manage the load that is in CubeSat.

The Cubesat load in the design of this final project uses a realization method designed to clarify nadir for the ADCS subsystem by using a camera that performs image processing. The solar panel in this design has a maximum power of 990 mW. The solar panel in this design is used to receive sunlight so that the voltage changes from 0 to 25 Volts detected by the DC voltage sensor. That is a requirement to activate the camera and the camera will take pictures if the Z-axis of the gyroscope forms an angle of 75-100 degrees.

From the results of this study, the charge prototype to detect nadirs that have been created is capable of taking five sample photographs. From the test results taking one photo sample size of 640 × 480 requires an average time of 116368 ms with a baud rate of 115200 bps. The average size of taking 5 photo samples is 48 KB. Hexadecimal data and coding results data used are stored in the form of .txt format. Four of the five samples taken were verified and successfully sent to the PC with an average delivery time of 5.17 minutes and the average size of images received was 1.165 MB.

Keywords: *CubeSat, On-Board Data Handling (OBDH), Camera, JPEG Huffman Coding.*