

ABSTRACT

Nano satellite is a satellite has a mass of about 1 – 10 Kg. The size of nano satellites generally refers to the standardized Cubesat that is 10 cm × 10 cm × 10 cm. Nano-satellites developed for many diverse purposes such as education, communication, space observation and so on. Telkom University along with I - Satellite Society (ISS) are developing a nano-satellite named Tel – U SAT. It uses 3 band frequencies from Indonesian Amateur Organization (ORARI) i.e. 144 MHz, 437 MHz and 2400 MHz. These frequencies work as APRS (Automatic Packet Reporting System), TTC (Telemetry, Tracking and Command) and Remote Sensing as mission. So it requires antennas that can work well on these frequencies.

The antenna that will be used on the TTC and APRS i.e. monopole antenna while on Remote Sensing is a microstrip antenna. For the microstrip antenna used the circle patch with a slot then form an array 2x1. Afterwards for the monopole antenna has been supported with the deploy mechanisms. The mechanism is required because the antenna has a long size so with such a deployable antenna mechanism, the antenna can be loaded in the structure of nano-satellite. Later the antenna will deploy after ± 30 minutes when the RBF (Remove Before Flight) has released. Last after the antenna deploy successfully, the current flowing in the system will be discharged. Electrical system for deploy mechanism using CD4060BM timer chip along with the supporting components, bipolar transistor with NPN type, 4 heating resistors and 2 microswitch.

The realization of this final project obtained that antenna succes to deploy within time expected earlier that 30 minutes ± 2 minutes and three antennas have VSWR < 2 . For TTC and APRS antenna have omnidirectional radiation pattern with linear polarization as well as the gain of antennas are 2.5 dB and 1.66 dB while remote sensing antenna has unidirectional radiation pattern with circular polarization as well as the gain of antenna is 4.12 dB.

Keywords : Nanosatellite, Deployable Antenna, APRS, TTC, Remote Sensing, Microstrip