

ABSTRACT

The development of communication technology by utilizing radio waves pushes the advancement of technology in the field of satellite. Telkom University are conducting research related to the nano satellites that will operate at LEO orbit with an altitude of 700 km.. The nano satellite is named TEL-USAT1 and uses the S-Band frequency for the purpose of sending camera load data to the ground segment. The first device in the ground segment that will receive data from that segment space is the antenna.

In this Final Project, the type Aperture antenna designed with WR-284 type waveguide refers to EIA (Electronic Industry Association) standard, with the edge of the circular beam for optimal gain with more directional emission. In the process of implementation of array antennas horn conical rectangular waveguide later connected with butler matrix 4×4 to drive the radiation pattern following the movement of the satellite. So the conical rectangular waveguide antenna is arranged into array antenna with distance, antenna slope angle and different matched phases according to the input of the butler matrix 4×4 . The material used for all dimensions is brass with 0.5 mm thickness.

The simulation result of design array antenna horn conical rectangular waveguide working at frequency 2,3-2,45 GHz have return loss ≤ 10 dB, bandwidth > 150 MHz, unidireksional radiation pattern, gain ≥ 17 dBi, and linier polarization. The result of realization and measurement of array antenna horn conical rectangular waveguide can work at frequency 2,3 - 2,45 GHz with return loss ≤ 10 dB, gain ≥ 17 dBi, bandwidth > 150 MHz, unidireksional radiation pattern, gain ≥ 17 dBi , and ellips polarization.

Keywords: *S-band Communication, Horn Antenna, Rectangular Waveguide.*