

## ABSTRACT

Tel-U Sat 2 is a nanosatellite research project from Telkom University through the Nano-Satellite Laboratory orbiting at Low Earth Orbit precisely at an altitude of 500 km above the earth's surface with one of its missions, namely high-speed data communication using X Band frequency. In carrying out this mission, surely a High Gain Antenna (HGA) is needed which can support high-speed data communication to send satellite data to the earth station with the desired BER value. Antennas that are designed must be deployable so that they can be safely stored before launch and deployed after the satellite exits the launch canister and have dimensions that can be placed on the Cubesat 3U structure.

One type of antenna that can be used to support the success of the mission is the reflectarray antenna. The reflectarray antenna is an HGA consisting of two parts, namely the feed as a transmitter/transmitter of electromagnetic waves and the reflectarray panel as a reflector that functions as a collimator of incoming electromagnetic waves. Ease of fabrication and design, as well as minimal manufacturing costs, are the advantages of reflectarray antennas.

In this final project a reflectarray antenna has been designed as a downlink antenna prototype for high-speed data communication missions from Tel-U Sat 2. The Antenna that designed have dimensions that can be implemented on Cubesat 3U structures and deployable. The parameter results achieved in this study are frequency: 8.2125 GHz, gain of 14.177 dBi, unidirectional radiation pattern and antenna dimensions that can be implemented on Cubesat 3U and can be deployed but not entirely.

**Keywords:** microstrip, reflectarray, deployable, cubesat 3U, HGA. satellite