## ABSTRACT

Nano satellite is a type of small-sized satellites developed for a variety of missions and objectives. To communicate with the ground station, the satellite requires a communication protocol that serves to regulate the procedure in communication. The amount of noise in the communication channel is also can interfere the process of sending information because it can destroy small or large portion of information. So, the communication also need a protocol that can detect broken or missing information.

AX.25 Protocol is a communication protocol designed to be used in amateur radio communications. AX.25 protocol is responsible for build a link and transferring capsulated data in a frame between nodes and also detecting errors that occur in the communication channel. This research implements AX.25 protocol to transmit telemetry data such as measurements conducted by satellite to a ground station. AX.25 protocol will be implemented with programming language in the brain of the satellite which is the microcontroller. Telemetry data in the form of sensor data is converted into data fields and then capsulated into an AX.25 frames, after that the frame will be transmitted. When the data has arrived in the ground station, it will be encapsulated to sensor data.

With this research, the earth station builded has been able to perform handshaking to establish a connection with nano satellite, then nano satellite will transmit telemetry data that has been encapsulated with AX.25 frames within 1.715 seconds after the request was sent. The test and simulation results with AWGN channel in MATLAB also indicate that the system created has been able to detect if the frame are error with FCS field in AX.25 protocol, and then resend it again.

Keyword: AX.25 Protocol, AWGN, Nano Satellite, MATLAB, Microcontroller