

## ABSTRACT

In the modern era, the field of telecommunications is developing rapidly, both in the civilian and military fields. In the military field, even the development of the telecommunications sector is very advanced, starting from communication tools. Radar, sonar to control a rocket or missile. Missiles are a technology with a high degree of scientific discipline, from the antenna system, telemetry, radio frequency, thrusters to the protective casing and the destructive power of the rocket.

In this era of high technology, warfare does not use humans directly anymore, but uses rockets and guided missiles where the distance can be very far. The guided missile can be launched by land and through a ship in the ocean. In this research, an antenna will be designed to be placed on a rocket as a control signal receiver from the control station. The rocket developed in this study is an MK 104 rocket type called evolved seasparrow missile. Where this rocket uses the S-Band frequency as its uplink, with a center frequency of 3.1 GHz.

The antenna is one of the devices that plays an important role for rocket communication, so that the main targets and objectives of this rocket are fulfilled, with the development of the antenna that leads to a wide dimension and bandwidth. This antenna works at a frequency of 3.1 GHz using FR4 substrate. The microstrip antenna will be simulated using simulation software, the results will be realized in physical form. The measurement results on this microstrip antenna are expected to show that the antenna has a wide bandwidth and can work at a frequency of 3.1 GHz with a VSWR value  $\leq 2$ , return loss  $\leq -2$  dB, and a minimum gain of 3 dB.

**Keyword:** *simulation software, rocket, Microstript Antenna, Antenna*