ABSTRACT

Airport Surveillance Radar (ASR) is a radar used to monitor the movements of commercial aircraft when it enters / exites a certain airport area. However, today a surveillance radar. Nowadays Surveillance Radar owned airports are still cannot cover all the airspace of the Republic of Indonesia. So that LIPI is developing Surveillance Radar.

One of the crucial components in the Airport Surveillance Radar (ASR) system is an antenna. The Antenna used is a phased array antenna which consists of several elements of antenna, and use variable phase or time-delay control of each port to scan the beam by a certain angle thus it allows more precise control of the radiation pattern. In order to provide the phase variation radiating element, in order to provide the phase radiating element variation, phased array antenna is set to give cable length supply for each antenna port.

Antenna was realized using epoxy substrate material FR-4 with values (εr = 4,6 and h = 1,6 mm). Antenna works at the frequency of the S-Band (2.975 to 3.025 GHz) which produces VSWR are 1.065,1.023,1.042,1.054 in each port, linear polarization, Gain 17,244 dBi and unidirectional radiation pattern. The dimensions of realized antenna is (328,7 × 405 × 7,76mm) that has effective bandwidth ≈ 60 MHz. Phase shift of 30˚and 60˚ produce unidirectional radiation pattern in 10˚ and 20˚ direction. With these specifications, the phased array antenna is work well for the performance of Airport Surveillance Radar (ASR).

Keywords : *Airport Surveillance Radar*, Antena *Phased Array, Phased Shifter,S-Band*