

ABSTRACT

BTS (Base Transceiver Station) construction for WCDMA (Wideband Code Division Multiple Access) networks or third generation network (3G) has been more evenly distributed to the rural areas at this time. However, there are several areas with a low receptivity level, such as the areas that have rice fields or forests with large trees (rural areas). One of the causes of the low receptivity level is the customer's far distance from the BTS therefore it will increase the path loss and will certainly lower the customer's receptivity level. To overcome these obstacles, a repeater can be added at the receiver side.

There are two types of repeater; active and passive, which what distinguishes them is in terms of the need for the power input and the presence of active component (amplifier). If an active repeater requires power input and active component (amplifier), then the passive repeater does not need power input and active component (amplifier). The block diagram of a passive repeater consists of three parts; outdoor antenna, indoor antenna and the transmission line that connect the outdoor antenna and indoor antenna^[1].

In this final project is done the design and the realization of antenna with the testing of a passive repeater to strengthen the radio signal at a WCDMA frequency on the indoor room in rural areas. Based on the measurement result of outdoor antenna which is realized that is 10 elements biquad yagi antenna, the antenna works at a frequency of 2.02 GHz, gain is 8.09 dBi, VSWR is 1.182 and unidirectional radiation pattern. Meanwhile, based on the measurement result of indoor antenna which is realized that is omnidirectional biquad antenna, the antenna also work at a frequency of 2.02 GHz, gain is 1,39 dBi, VSWR is 1,301 and omnidirectional radiation pattern.

As for the result of passive repeater testing on the indoor room in rural area, the highest increasement of RSCP value is at point B that is 8 dB. The increasement of RSCP value at point B is the highest due to the main lobe of indoor antenna is larger in the direction at point B than in the direction at the other point.

Keywords: *Passive Repeater, Biquad Yagi Antenna, Biquad Omnidirectional Antenna.*