ABSTRACT

Currently the development of increasingly rapid technological developments and to this communication by utilizing the TCP / IP already starting to bloom. And with the widespread use of these protocols it will trigger the transition from analog communications system communications to digital communications. For example, VoIP (Voice over Internet Protocol) and digital TV. And communication that are still in demand today are some people on the radio. Many radio stations (which is one of simplex communication) is currently utilizing existing IP network as a means of communication. This work system enables radio *broadcast* heard around the world as long as listeners have Internet *device*. In the utilization of the benefits include a very wide range compared to using an analog radio *frequency*.

In this final project have been designed and implemented an IP-Radio *transceiver* and audio processing based FPGGA SPARTAN-3. Concentration of this thesis lies in the design, control of RAM, an *audio codec* AKM4551 control and serial communication with the FPGA anatara Wiznet WIZ620wi as converter serial to LAN on SPARTAN-3 FPGA.

Testing is done by including an analog input from the microphone and the results transmitted by using a serial *encoding* and utilizing WIZnet module to use the media mentrasnmisikan TCP / IP. Results of test *synthesis* can be seen from the results of the *synthesis* system that requires a minimum period: 6.084ns (Maximum Its *frequency*: 164.366MHz) Minimum input *delay* before *clock*: 5.115ns minimum *delay* after *clock*: 6.456ns and total memory used is 133 628 kilobytes. And the *synthesis* report of the results can be concluded that the system has been designed IPRadio obtained the amount of resource required is the number of slice registers 98%, the number of LUTs (*Look Up Table*) 36%, and the number of IOB 8%

Keywords: FPGA SPARTAN -3, *audio codec* AKM4551, control RAM.