

## ABSTRACT

Sound Navigation and Ranging (SONAR) is a technology which use for detecting object and measure range use sound wave or acoustic wave as its media. SONAR using time arrival prediction from sent echo wave to know how much range with the object. One application of SONAR system is on the submarine.

From the existing applications of SONAR system, many of them needs more than one transducer and its variety placement. The purpose of this variety placement is enhance its capability, especially beam angle of transducer. This bachelor thesis suggest to install a stepper motor on transducer with the intention of full rotation scanning. This SONAR system uses microcontroller to generate 60KHz working frequency.

This SONAR system could detect target from 70 cm to 600 range and also could display in two dimensional map, complete with information of range and azimuth. In 70 cm range, system's accuracy could detect target up to 100%. But with the increased range, system's accuracy become decreased. Variation of accuracy from 87.23% to 97.5%. Even, in 120 cm range 180° azimuth and 470 cm 45° azimuth, system are experienced of error or overlapping detection with 1.67% and 3.19% of error margin. However, this error rarely happens and caused by AJ-SR04M module as its measuring range which sometime makes a mistake.

**Keyword :** *Sonar System, Underwater Object Detection, Microcontroller, Stepper Motor*