

A Study of Turntables used for 3D imaging Radars

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1-Introduction

This project is a study of 3D imaging and how turntables are involved in this process to measure the effectiveness of an antenna.

This project was set out to achieve the building and use of a turntable which was achieved with the use of a microcontroller and other implements like a motor.

2- Aims & Objectives

The aims and objectives are shown below:

- Understand why a turntable needs to be built.
- Make a turntable that can be user controlled.
- Turntable must be able to hold the weight of the 10 KG antenna.
- Be a cheaper alternative to current market options
- Make a turntable that is capable of rotating 90 degrees both directions.
- Have a stand to move antenna up and down.
- Make a turntable that is capable of rotating at a controlled speed relative to frequency.
- Get a 3D image of the antenna

3- Research

Research was done to better understand why and how previous designs were built.

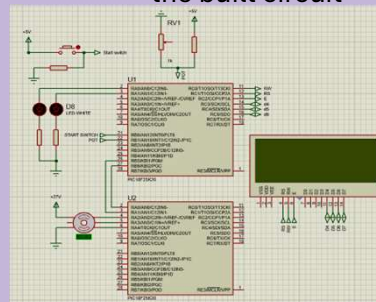
Understanding what 3D imaging is and why it is done was essential to understating the primary use of the turntable and to effectively use it.

Components

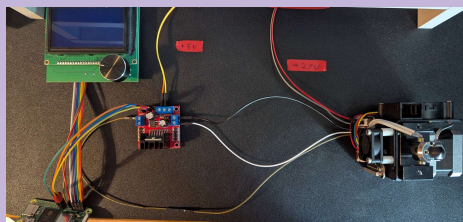
motors and PCBs looked at to best determine which ones would suit best and why.

4- Design

On the left is the circuit diagram of what the turntable should look like, the right is the built circuit



The Circuit diagram helps identify components needed and what should be connected together including a motor driver PCB and motor along with LEDS to



A quick set up for testing to see whether the design would work

5- testing

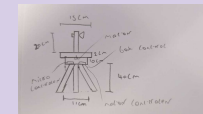
Testing its capability was essential to determining how well the aims where meet.

Tests involved, included:
rotation speed

Ballance

2D imaging

3D imaging



6- Conclusion and Future work

Overall, the project was a partial success as most of the aims and objectives were meet however, getting a 3D image didn't work and a few design choices can be taken away for this, such as the implementation of 360 degrees rotation, other work involves allowing for more user control via a separate system that can be involved whist attempting to get a 3D image