Overview

The goal of this project is to design and create a device that allows its user to identify the star or planet at which it is being pointed. It should be a low-cost device, to be used by users with intermediate experience. Example usage:

- Star gazing
- Astronomical photography
- Telescope orientation

Requirements

Device

Portable

The device must be able to run on batteries, without the need for an external power source. The device must also be able to operate without ever being connected to the internet.

Ease of use

The device should be designed for users with intermediate knowledge of our solar system and our night sky. The device should be intuitive, and usable without knowledge of its inner workings, and the amount of calibration should be minimal. The device must also be ambidextrous.
After identifying a star or planet, its information should be displayed to the user in a sensible way.

Low cost

The total cost of this device should be below €100,

Measurement accuracy

Measurements made by the device must be accurate until at least 2020, and the device must be usable at any location on the world.

Recognition

Stars

The device must be able to identify a finite number of bright, visible stars, along with its name and constellation.

Planets

All visible planets in our solar system should be identified.

Final Product

The final product will be the design of the device, a working prototype and a final report. This design must include:

- electronic schematics;
- PCB layout;
- all software used by the prototype

Optional goals

In the case of time to spare, the following additions can be made to improve the device:

Complete design

Besides designing the electronics and software of the device, the plastic encasing can be designed.

Hackable

To improve the lifetime and product value of the device, it can be made hackable. For example, adding pins/connectors to the PCB connected with the microprocessor allows the user to reprogram the microprocessor. The microprocessor can also be programmed to output internal values, to be used by another device.