21.0 project plan executed

20.1 version control

Version 1.0 - first version

20.2 introduction

This document describes more in detail what I have done in step 1 to 8. You might go for a different solution so now and then.

Step 1 size

Imagine (and measure) the outline of your DMO. Think about mounting points in your ceiling and where your 220 VAC is.

As my WiFi was rather crowded and RPI's are not the best WiFi receivers I installed an extra router for the DMO.

If you are going to use a winch, think where it should be and how it is going to be fixed to the wall for example. Remember: the smallest DMO weighs more than 80 Kg, it better be safe.

Step 2 set up and first planet

Set up your webserver and instal the JS Orrery scripts. Copy the client-software to your own GIT account and work from there.
Build the electronics for one planet (so 1 RPI, 1 driver etc.) in order to find out if you are comfortable enough to go all the way.

The local power supply and the reed switch stuff are a bunch of components (see the electric scheme). Somebody (again via fiverr.com) created a Printed Circuit Board file (a so called gerber file) for me which I send to PCBway.com. You can design one your own or drop me a line and you get my gerber file. TIP: order more then 6, they are cheap and you will probably mess up a few during this project.

Step 3 dimensioning the DMO

When you know how big your DMO is going to be it is time to measure. All the rings and dishes are related to each other.

I have made a spreadsheet in order to prevent miscalculations, see “80.0 DMO drawing example sheet”. The bigger (non darkened cels) can be filled in and the rest is calculated. The sheet is in Dutch for now.

Please note that the bigger circles have an A and a B, that is because of the maximum size of the CNC cutting table (and MDF sheets which are standard available). In total I needed 32 parts.

Most CNC machines work with DXF-files and you will need those in order to get your CNC-work done.

Once you are satisfied with the dimensioning make a drawing book, see “81.0 DMO drawing parts”, if you do not know how to get to a DXF-file. I have used fiverr.com to find a guy to do it for me for little money. He needs the book in order to fully understand what you want.

You can control his work by letting him generate a picture of the DXF-files. Example: “82.0 DMO dxf control file”.

When you have the DXF file you can go to your local CNC cutter and let them do the work.

Step 4 frame and winch

Do the CNC cutting (or find a company which will do it for you), make the frame. If you decide that you want to use a winch instead of manual hoisting do that before you make the frame.

TIP: go for the winch! It is spectacular for your visitors but I did find out that it is really useful when you are working on your DMO.

Step 5 inner system

Build the inner system. Halfway this project a bought myself a 3D printer: very useful for all special parts.

Step 6 outer planets

Build the cars for the outer planets.

Step 7 test and calibrate the DMO

As the magnets are randomly placed in the orbits you need to calibrate the system. You should make a few test-scripts in which the planets run for one round so you can count in how many steps a car (or dish) makes a round. You need these figures in the client software.

Step 8 paint

If all works fine you can paint and place the graphics.

TIP: On the DMO are numbers for months and Zodiac signs. If you do not have a steady hand you need another solution. I have somebody designed a set of stickers for this.