

## 7.0 Outer planets car and track

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### 7.1 Version control

Version 1.0 - 2 February 2021 - first version

Version 1.1 - 9 February 2021 - typos fixed

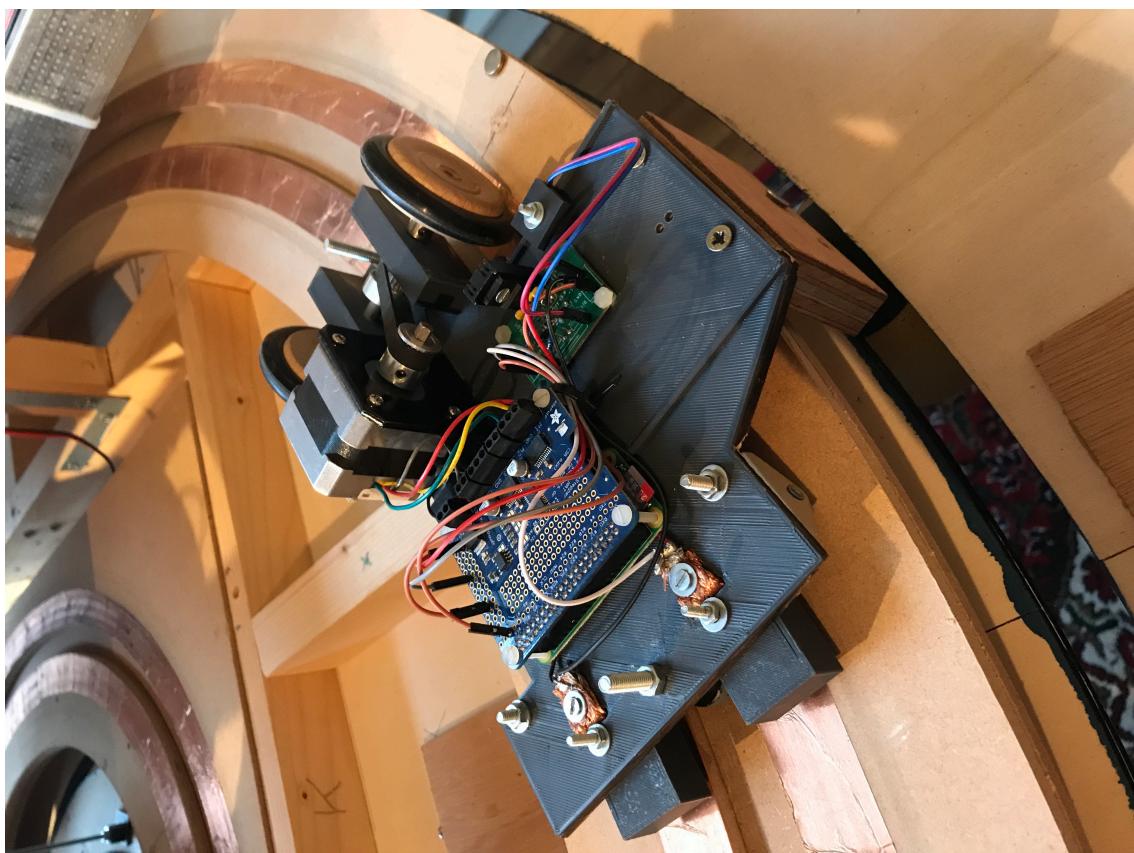
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### 7.2 Introduction

The outer planets (Saturn, Jupiter and Mars) are cars which run on a track.

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### 7.3 Car



It is a front wheel drive car which gets its electricity via two sliding contacts which are mounted on the back of the car. The sliding contacts are pushed down with the grey 3D printed blocks.

The rails conduct electricity via the adhesive copper tape, the contacts at the car are copper wires. It works the same as a Carrera racetrack for kids.

## 7.4 Construction

The base plate is 3D printed (PLA filament) and strengthened with wood. Underneath the base plate at the front and at the back a guiding wheel makes sure that car sticks on the track.

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## 7.5 Drive train

The NEMA17 spins and via a GT2 pulley and belt the front wheels are turned. The front wheels pull the car along the track. The wheels at the back are little ones just to make sure the car drives smoothly and will not tilt.

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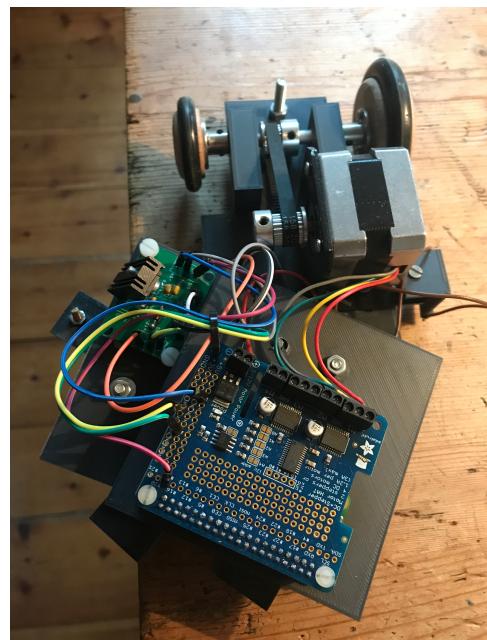
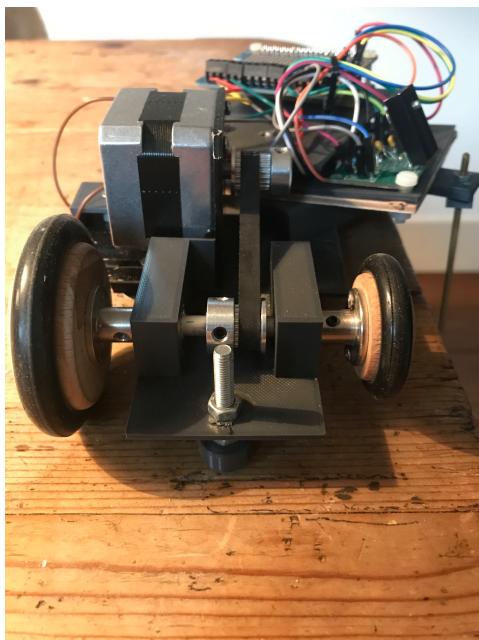
## 7.6 Planets

Saturn and Jupiter are polystyrene balls (because of the weight). Saturn has a MDF ring glued to it. Mars is a wooden bead. All sprayed gold. The planets are attached to the car with a rod which slides through the orbit slot in the frame.

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## 7.7 Mars

Because Mars has to make a very short circle it has the tendency to slip and slide with the front wheels. With heavy sliding the accuracy of counting steps is low so Mars does not know where it is. In order to minimise sliding the left front wheel is smaller than the one on the right and the base plate is tilted so it cuts much more smooth through the corner.



Visible in the left picture is also the front guiding wheel which are also on Saturn and Jupiter.