



Cybot 6 DOF 3D printed Robot

Version 1.5 Draft

20.01.2024

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Introduction

Thank you for your interest in my Cybot Project !

If you have any question, please feel free to contact me to my mailbox quartit@gmail.com

I will update this document with more description according to your questions.

I have added a new project on cult to add an extra gripper to cybot. Please find it here

<https://cults3d.com/en/3d-model/gadget/cybot-gripper-for-cycloidal-disk-robot-arm>

Regarding the NEMA motors you will need 3 nema23 and 3 nema 17 + one extra nema 17 for the gripper. Nema 23 this I used version 1.26 Nm 6.35mm it would have been better to have version 1.9Nm if you can buy it but only to play, this is less expensive.

For nema 17 I took the most basic one in 47mm but can go until 55mm.

Nema 23 cannot exceed 54mm as they have to fit inside the Robot.

For beginners :

Here is the cybot_arduino git project that contains an easy setup with arduino MEGA shield that will allow you to run Cybot with command lines :

https://github.com/quartit/cybot_arduino/blob/main/README.md

For advanced users :

I develop on a Raspberry connected with UART to a STM32 bigtreetech GTR that support 6 steppers + one extra stepper for the gripper.

I'm using ROS1, ROSSERIAL PYTHON, moveit (to be finalized) , FlexyStepper library. And can be connected with a gamepad (e.g. logitech) (see youtube video)

You can find URDF file here for moveit: https://github.com/quartit/cybot_support

and I will add later the code of the CubelDE project in C++ .

The stm32 main.cpp connect to ROS /joint_states and /joy topics.

Base joint

Hardware :

6816zz x2

6804zz x2

625zz x8

M5x20 x8

M6x50 x8

M6x40 (or >40) x12

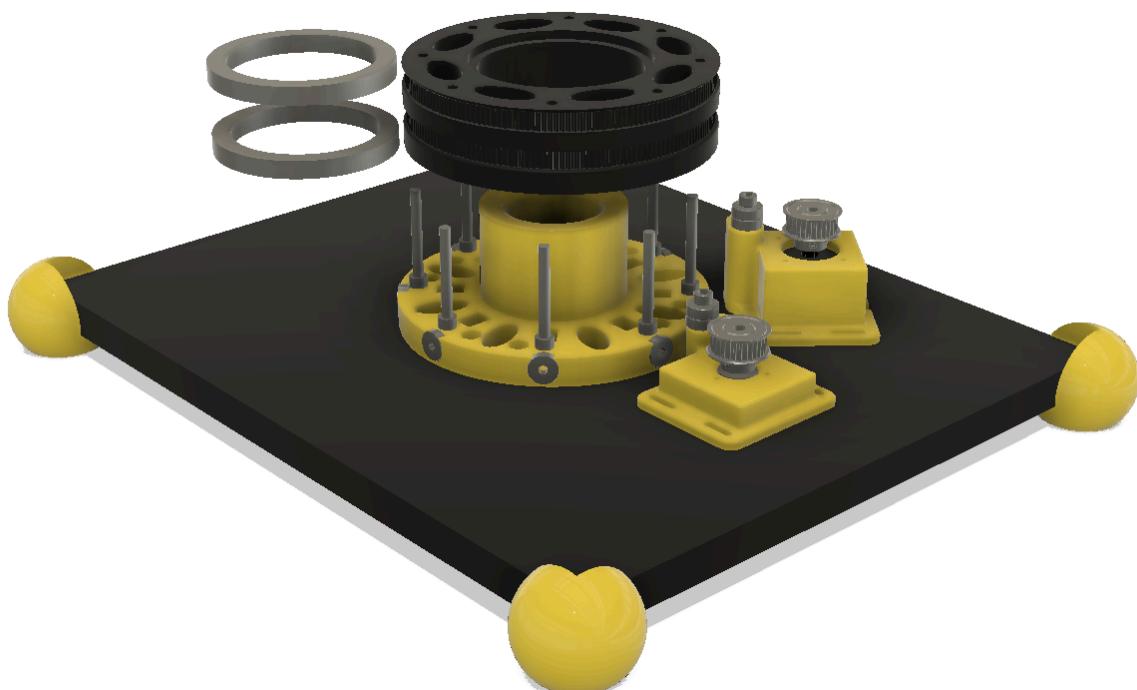
M6 Screw nut x8

606zz x4

Timing Pulley 3M 30T (12mm width) 2x (Check encoder and stepper axis width !)

Timing Belts HTD648-3M x2





Cycloidal Disk 1:23 and 1:20

Hardware :

6813zz x2

6804 x5

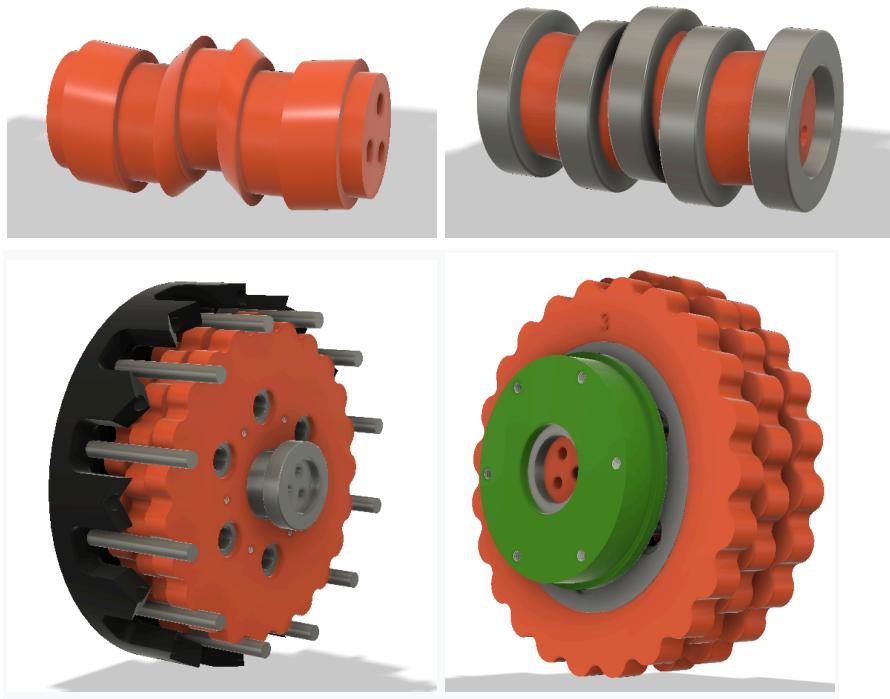
688rs (16/8/5) x18

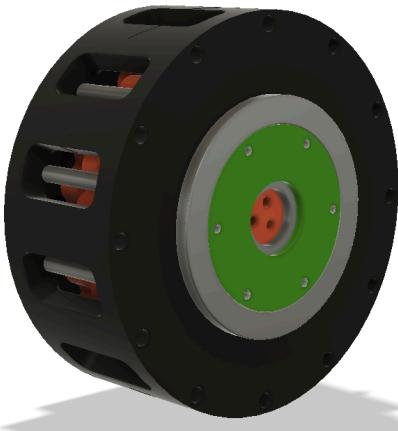
pins M6x50 x12 for 1:23. and x14 for 1:20

long Threaded shaft M4 (3.85mm) to be cut

screw plated M6x70 and bolt x12

(same shaft files for both gears)





Cycloidal Disk 1:11

Hardware :

6705zz x4

6812zz x2

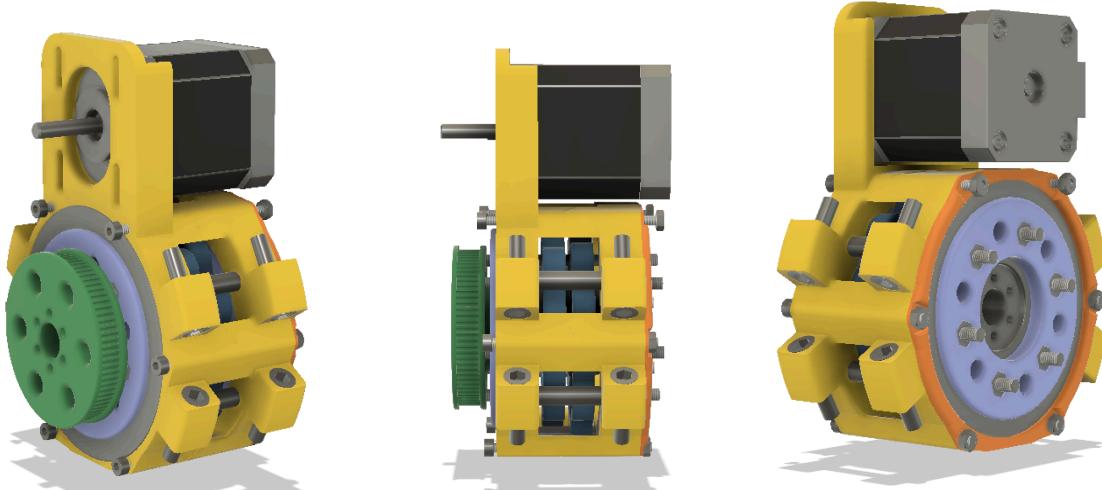
Screws M5x20 (x4 or x8 depending on version)

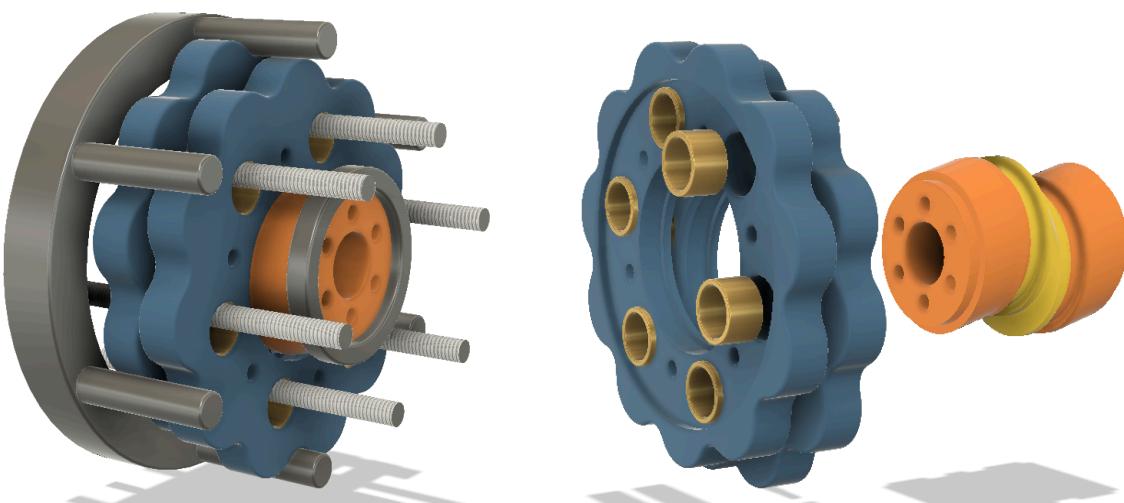
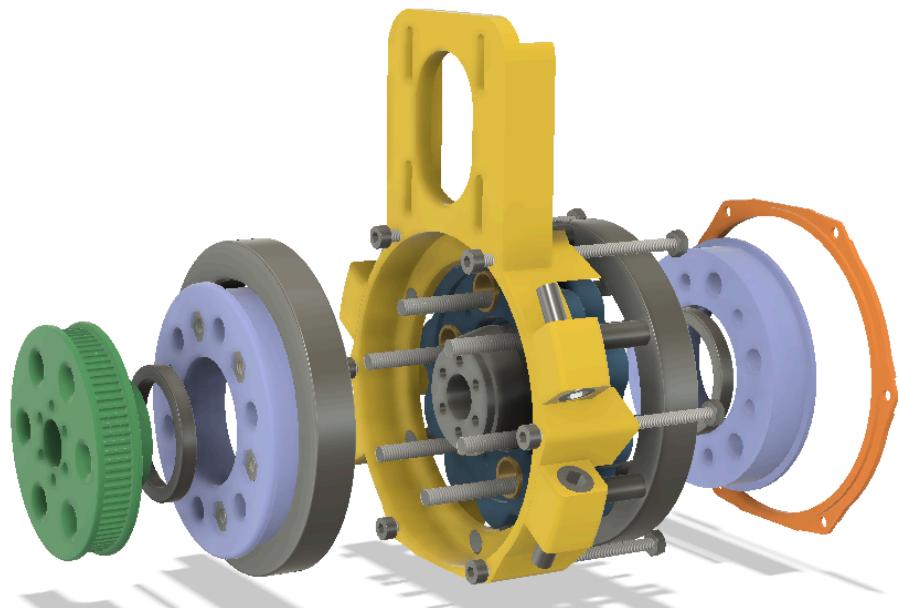
long Threaded shaft M4 (3.85mm) to be cut + bolts

long Threaded shaft M3 (2.85mm) to be cut + bolts

Pins 6x25 x6

copper/brass Bushing 8x10x6 x12





Axis 4-5-6

Hardware :

6812zz x2

6810zz x2

6804zz x2

HK0608 x4

M6X25 x2

Timing Belt 232-2GT x1

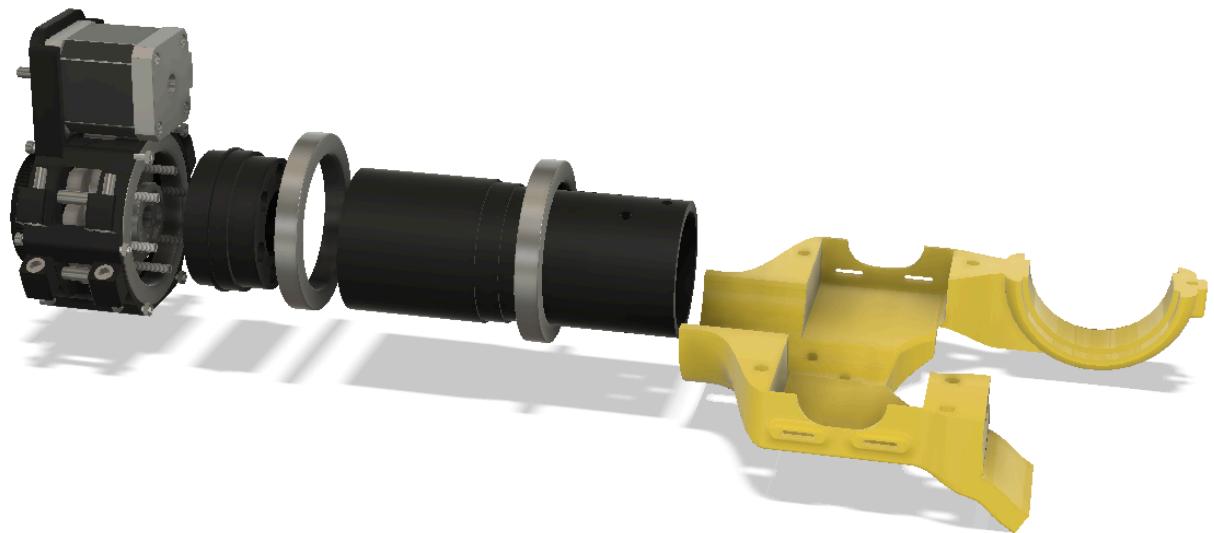
Timing Belt 308-2GT x3

Timing pulley GT2 40 Tooth x2

Timing pulley GT2 20 Tooth x1







Main Body

Hardware :

6804zz x2

606zz x8 (For tensioners)

screws M6 (For tensioners)

Timing Belt : HTD477-3M x4

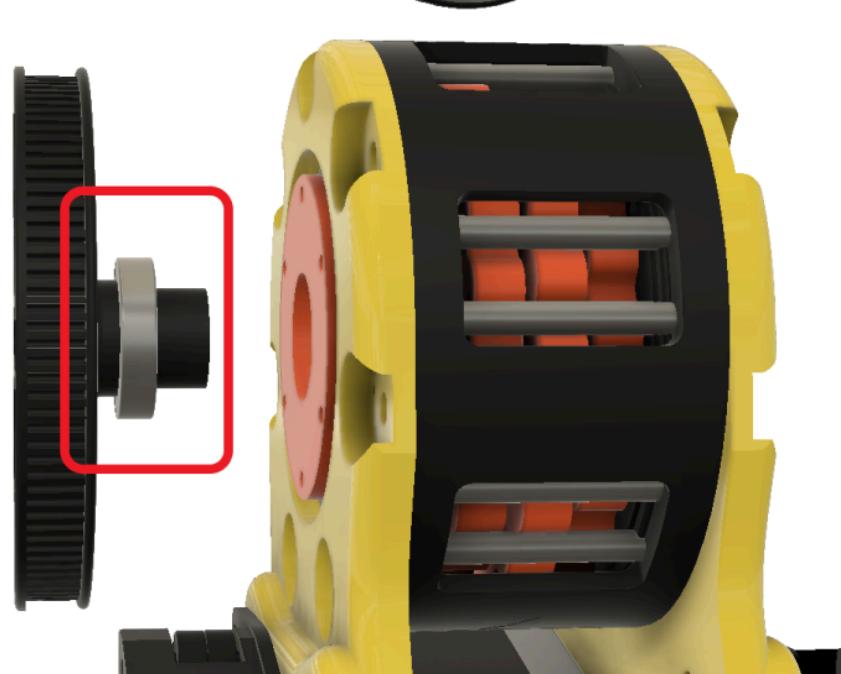
Timing Pulley : 3M 20T (15mm width) x1

Timing Pulley : 3M 30T (12mm width) x3

encoder E6B2-CWZ6C 3x

NEMA23 x2

NEMA17 x4



One side rotates, other side is fixed to the main body



