



**FALCONS**  
supported by **ASML**

## MSL 2014 Workshop – Falcons Introduction

ASML Falcons Team

2014/11/10



# Subject

Introduction

Our organization

Our status

Software Architecture

Mechanical overview

# Introduction: Who are we?



## Falcons Robocup Team

- Started Nov '13

± 20 ASML'ers with:

- different background,
- different skills,
- different hobbies,
- **one goal**



# Introduction: Why does ASML participate?



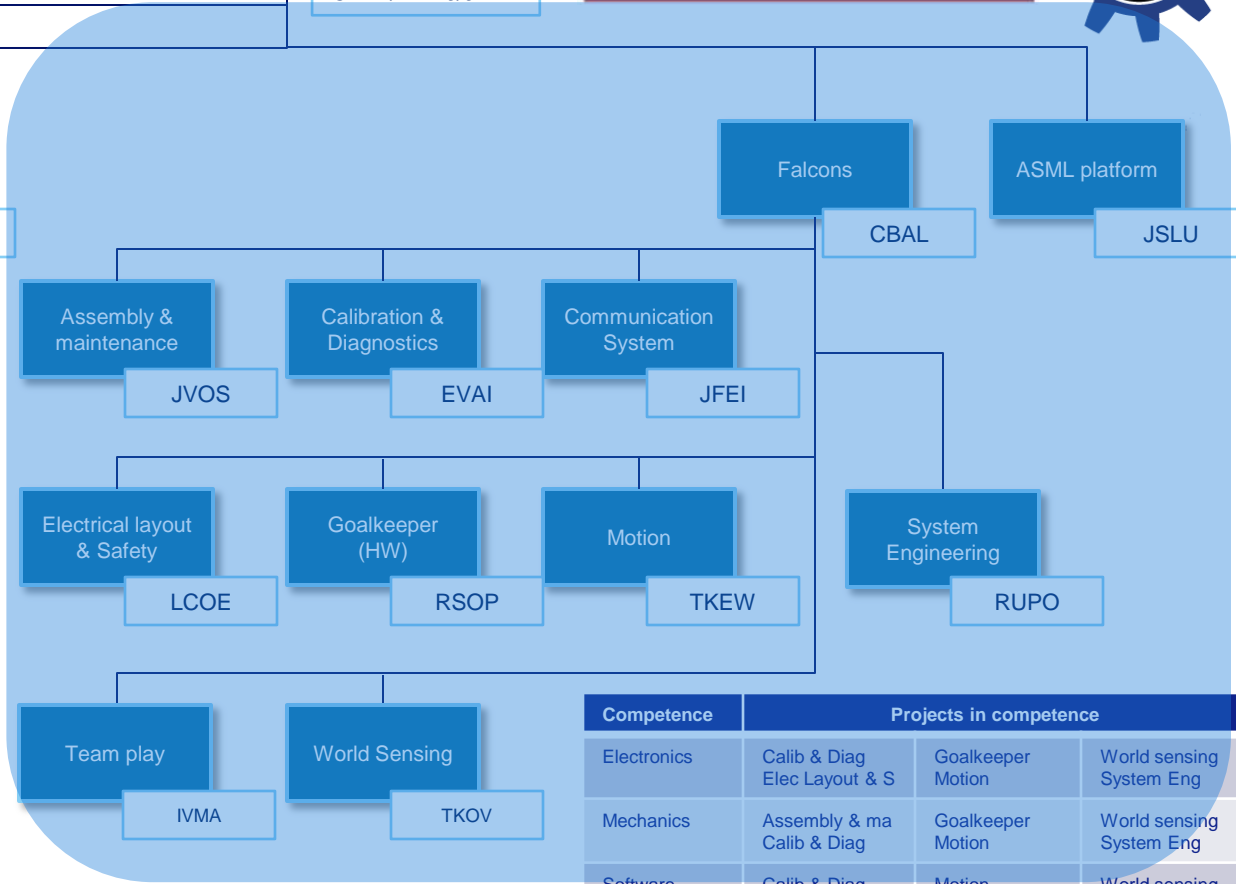
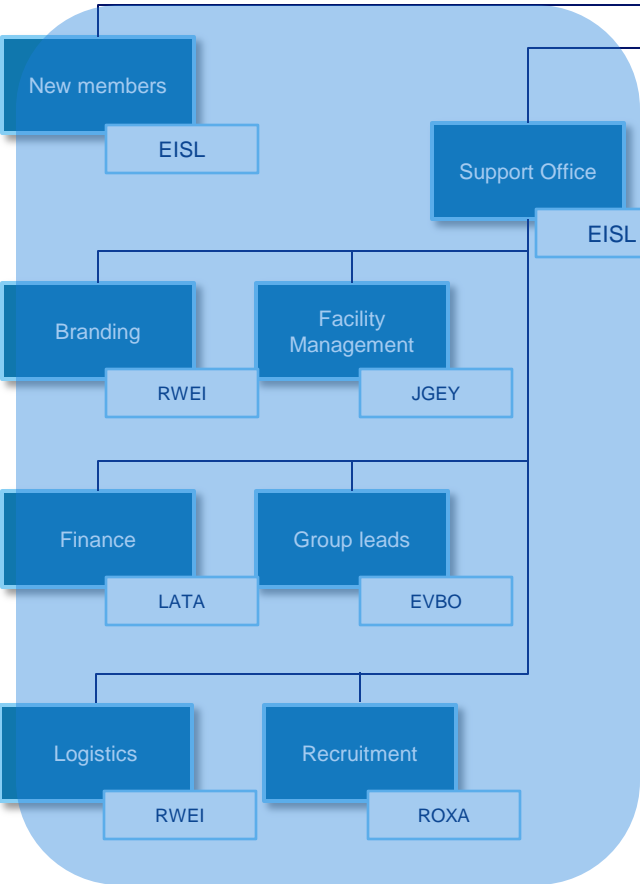
- Promote multi-disciplinary teambuilding and co-operation
  - Expand network and get in touch with colleagues other fields of expertise
- Personal development for its employees
  - Experiment in other fields of expertise
  - Experiment in other roles
  - Technical and non-technical
- Promotion
  - Demo's on fairs, schools, for suppliers, for customers, ...
  - Contact with potential new employees
- Generate enthusiasm and have lots of fun

# Our Organization

RoboCup

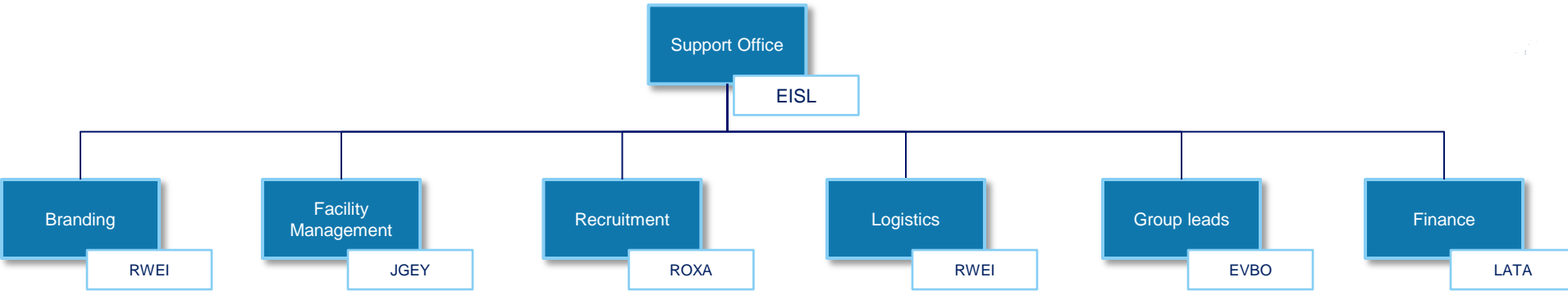
CBAL/RMFJ/JEFR

- ASML support board:
- D&E management (Jelm Franse)
  - RoboCup WorldWide liason (Roel Merry)
  - Infrastructure & safety (Jan Stoeten?)
  - IP protection (Sandra Konings?)
  - Communications (Sander Hofman)

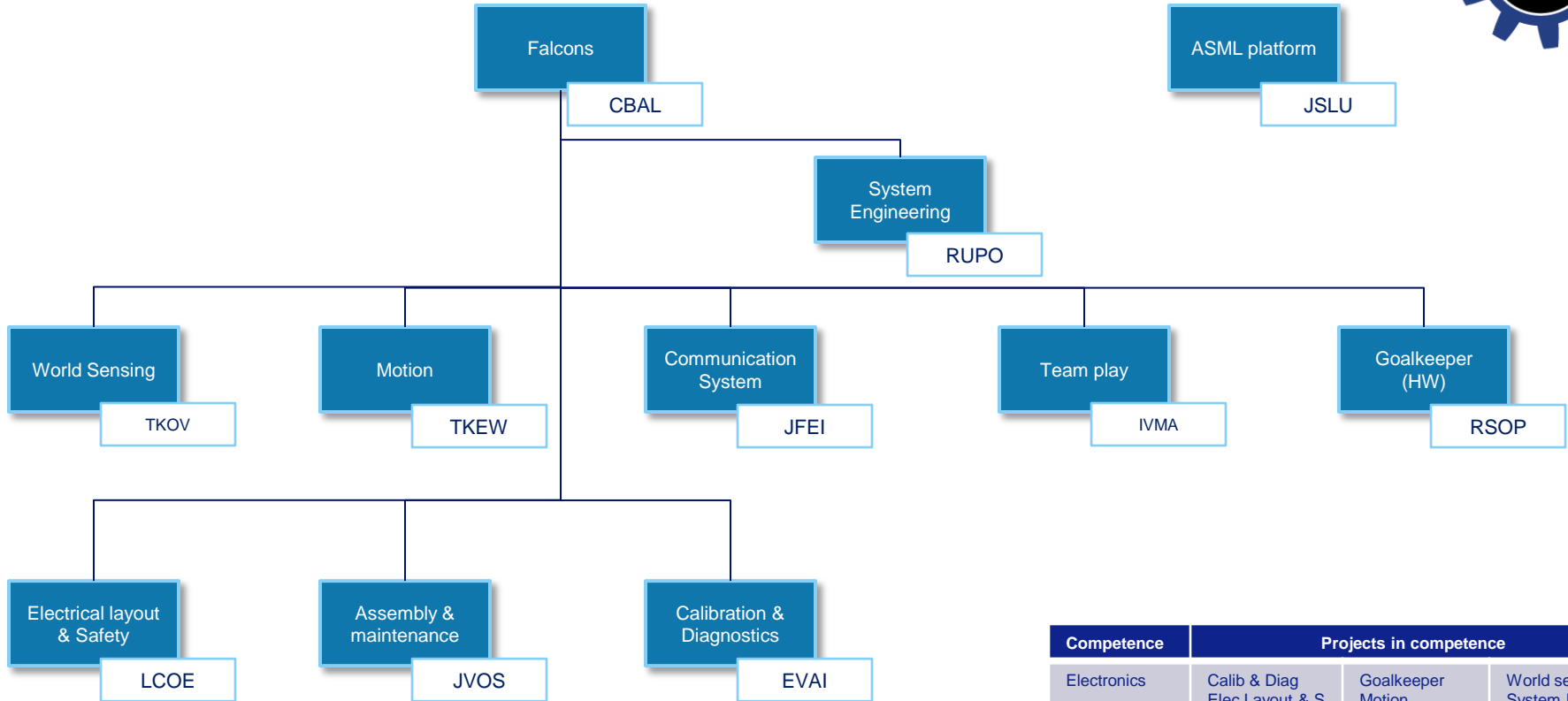


Competence	Projects in competence		
Electronics	Calib & Diag Elec Layout & S	Goalkeeper Motion	World sensing System Eng
Mechanics	Assembly & ma Calib & Diag	Goalkeeper Motion	World sensing System Eng
Software	Calib & Diag Comm System	Motion Teamplay	World sensing System Eng

# Our Organization: Non Technical



# Our Organization: Technical



Competence	Projects in competence		
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# Our Status



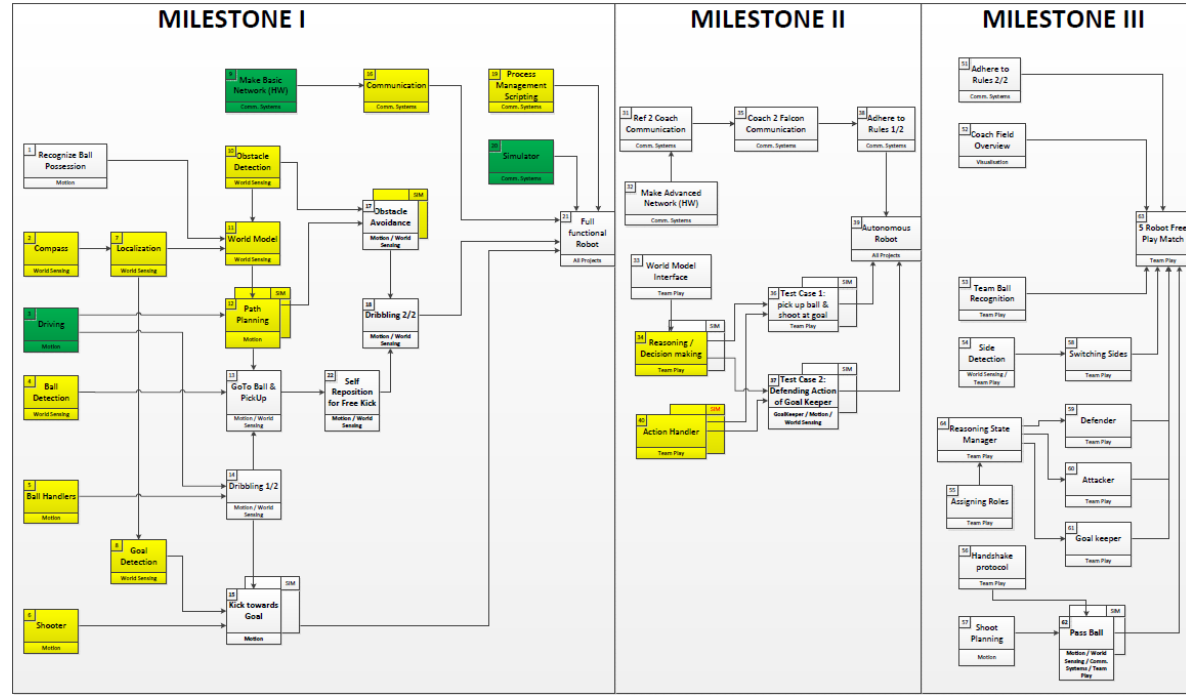
- Start plan (2013): Buy Turtle 5K robot and go to Brazil to learn
  - Hardware delivery promised end 2013
  - SW effort on higher level only and strategy required
- Reality:
  - Late delivery of the HW + various modifications required
  - Quite some issues with basic SW
- Actual status:
  - HW OK – based on Turtle 5K
  - SW: integration ongoing – Based on Turtle 5K + modifications
- Target:
  - We will be present in 2015 World Cup.



# Our Status: Integration

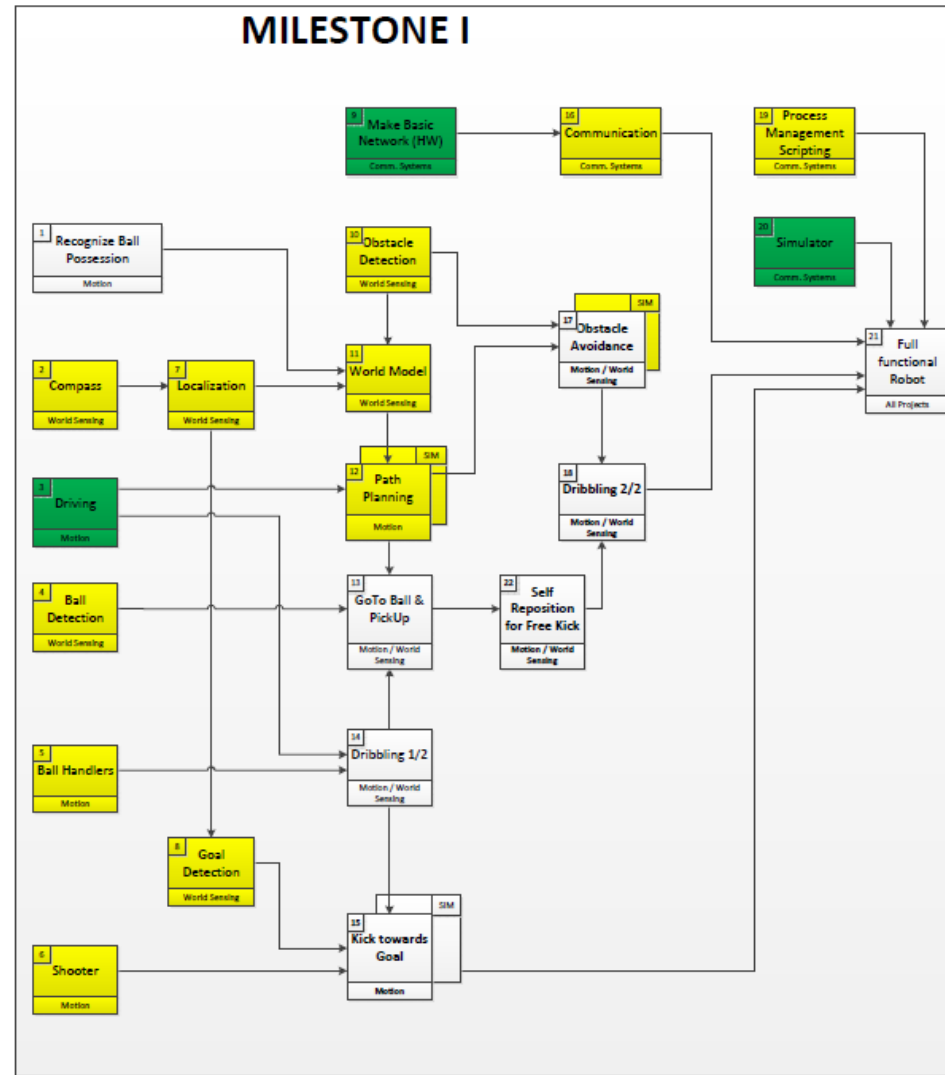


- Milestone 1: Full Functional Robot
- Milestone 2: Autonomous Robot
- Milestone 3: Team to play a match



# Our Status: Integration

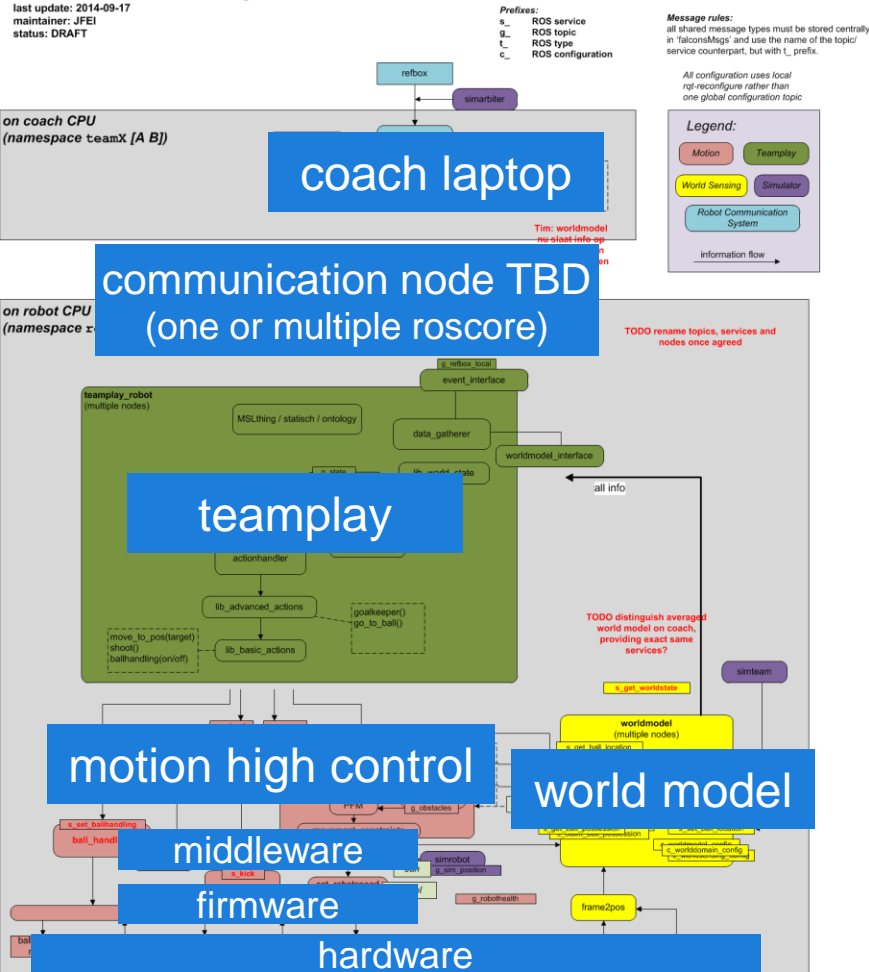
- First main function integrated: Driving
- Localization / world model / Path planning ... are work in progress.
- Next integration target:
  - Obstacle Avoidance
  - Dribbling



# Software Architecture

- motion low control moved from OROCOS to firmware+middleware
- custom made basic simulator
- robot intelligence at teamplay
  - teamplay at coach only performs role assignments and refbox relay
- unclear if one roscore can support complete team network

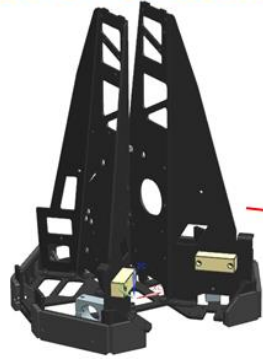
## ROS architecture diagram





# Mechanical overview

Mechanical structure



CPU



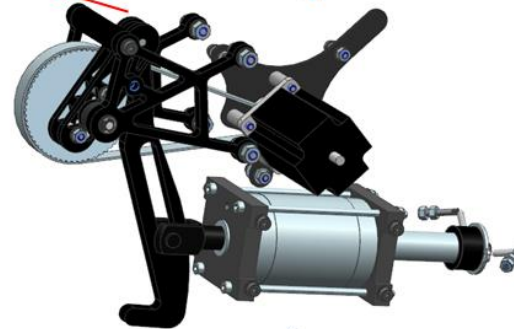
Vision System



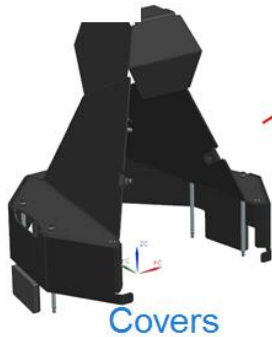
WiFi module



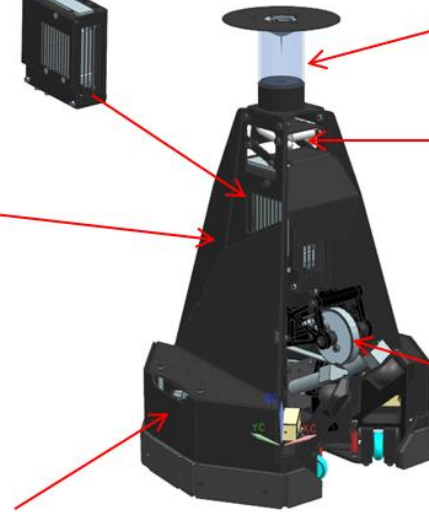
Shooting mechanism



Driving motors



Covers





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