





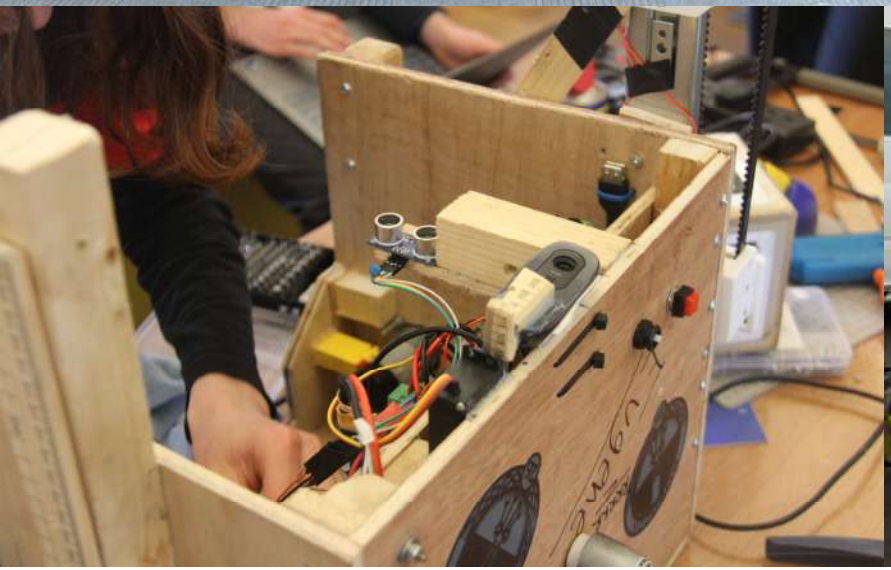
ROBOCON

2027

Robotics at Hills Road

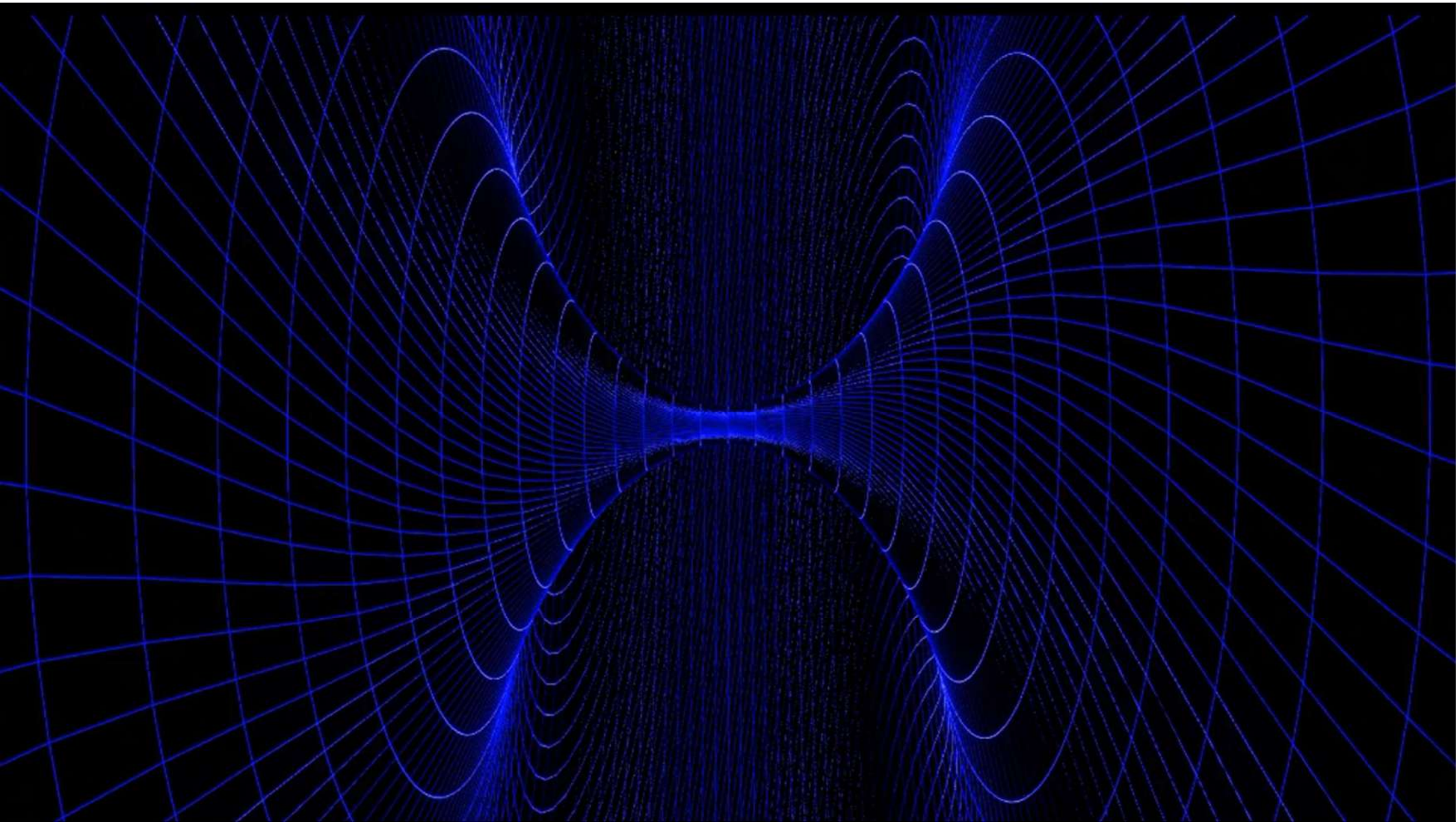








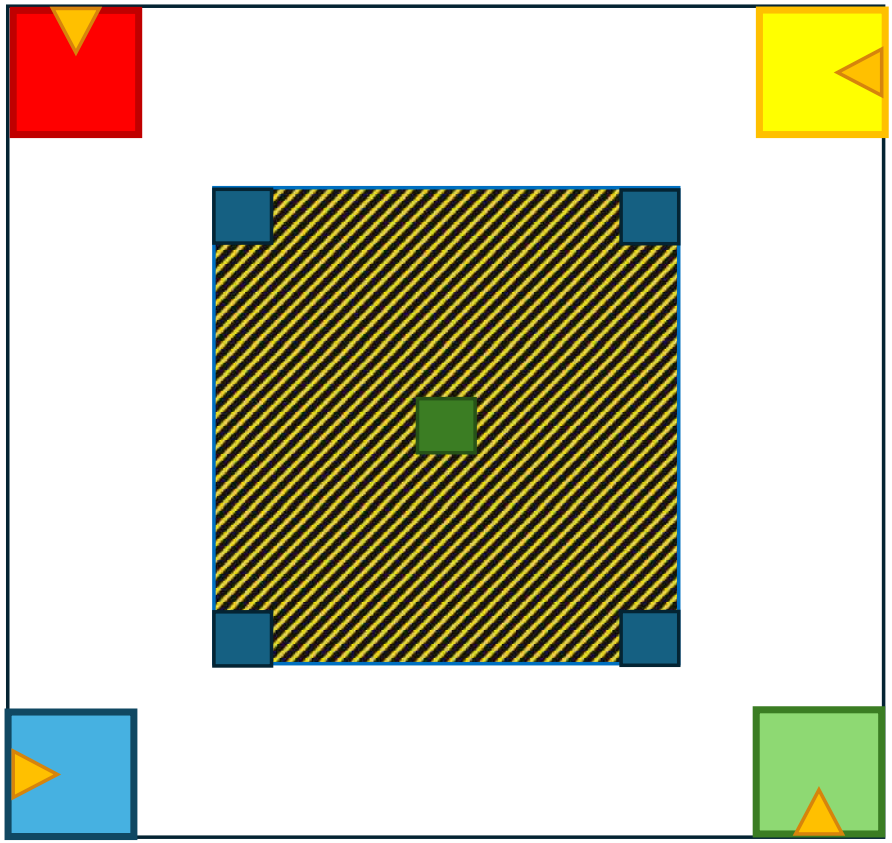

ROBOCON
Building RoboCon



The P.O.W.E.R.D.A.S.H™

Site overview

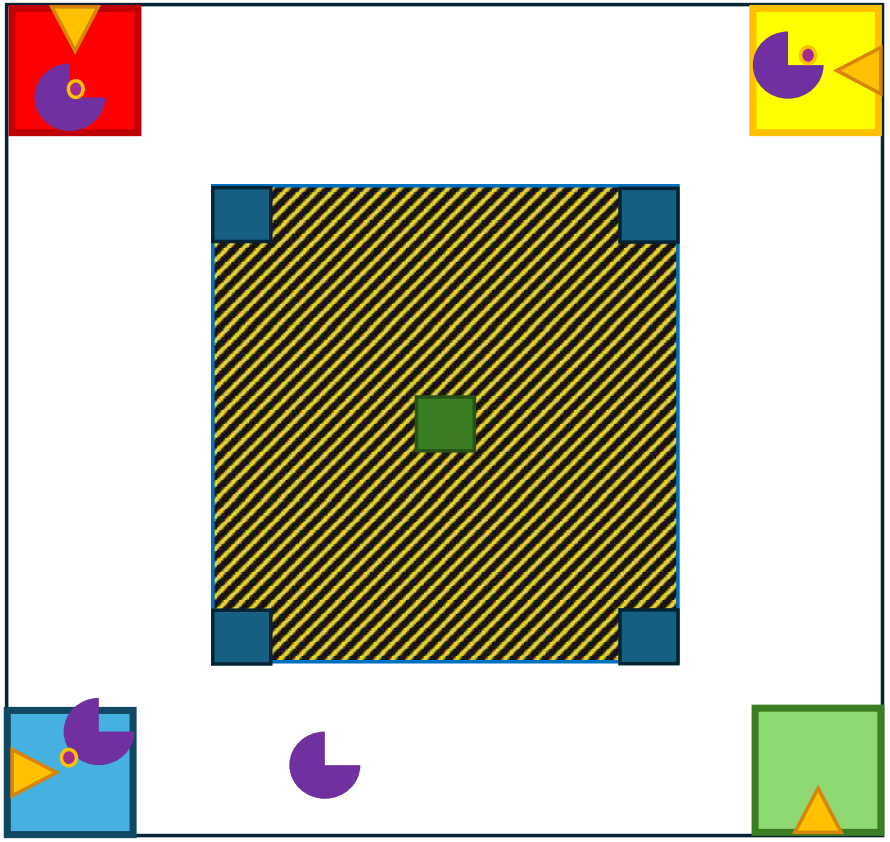
- 4 Power Stations
- A 5th Spicier Power station
- The fallout zone
- 4 REFUEL stations



The P.O.W.E.R.D.A.S.H™

Scoring Rubric

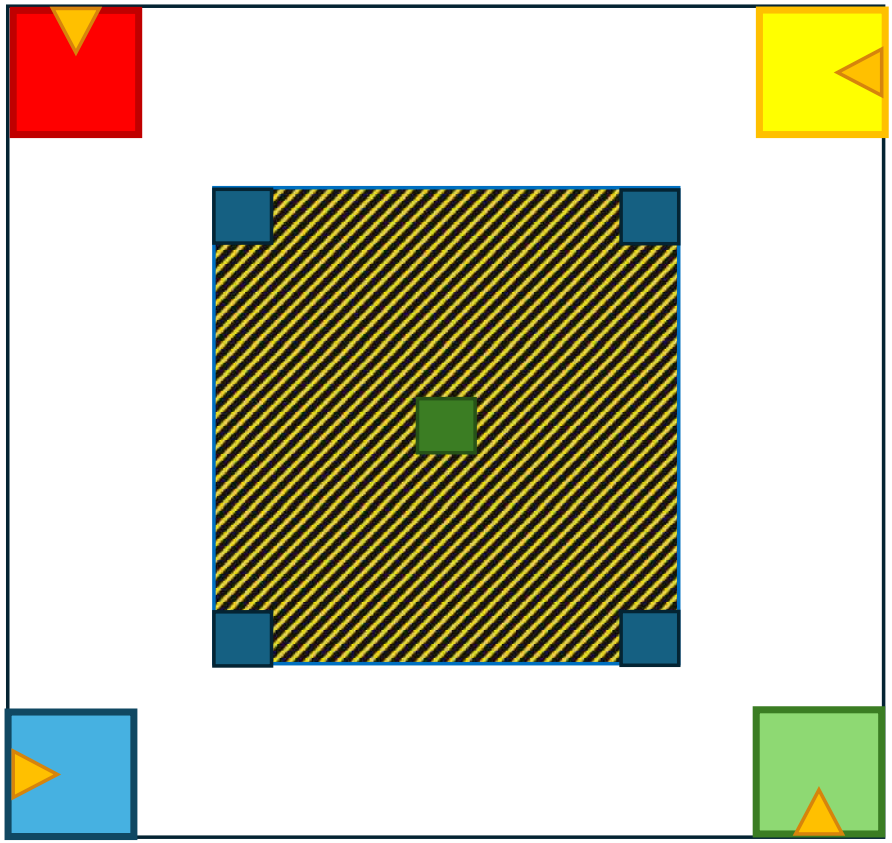
Action	Points awarded
ROBOT leaves starting area	+1
ROBOT collects NRG orb	+2
ROBOT deposits orb in power station	+3
ROBOT deposits orb into Chernobyl	+6
ROBOT deposits orb onto the hazard zone	+1



The P.O.W.E.R.D.A.S.H™

The Scoring Rubric - multipliers

Number of stations powered	Multiplier
1	X1
2	X2
3	X3
4	X4
5	X5



The P.O.W.E.R.D.A.S.H™

Trial structure

League Trials

Competing ROBOTs will be awarded:

First:	8 points
Second:	6 points
Third:	4 points
Fourth:	2 points

Tied ROBOTs will receive the average of the position points

e.g. Two-way tie for 2nd – Both ROBOTs will receive 5 points

Knock out Trials

ROBOTs will be seeded based on League points position

The two highest scoring ROBOTs will pass through to the next round

Winners of tied positions use League points to decide. Except for in the final at the discretion of The Director General.

ROBOCON

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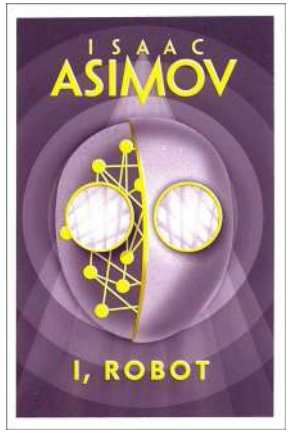
Game Q&A

Asimov's Three Laws of Robotics

1. **A robot may not injure a human being** or, through inaction, allow a human being to come to harm.
2. **A robot must obey orders given it by human beings** except where such orders would conflict with the First Law.
3. **A robot must protect its own existence** as long as such protection does not conflict with the First or Second Law.

1. Robots should be designed so there is **no possibility of injury** to operators, marshals or the public.
2. Robots must not move until the start button is pressed, and **must include a prominent kill switch**.
3. Robots should be designed to compete in a non-combative manner, but should be **designed to withstand accidental contact**.



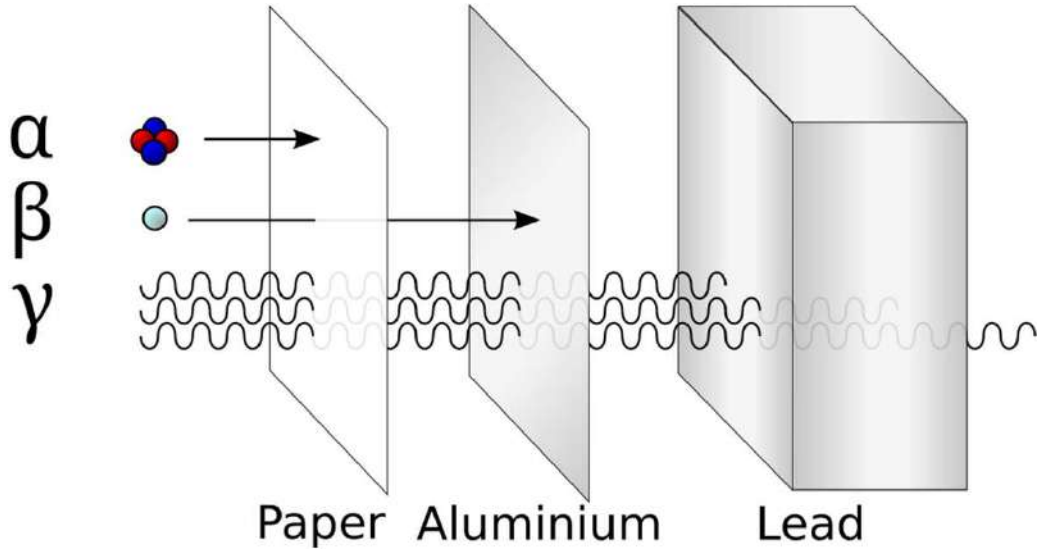


Awards



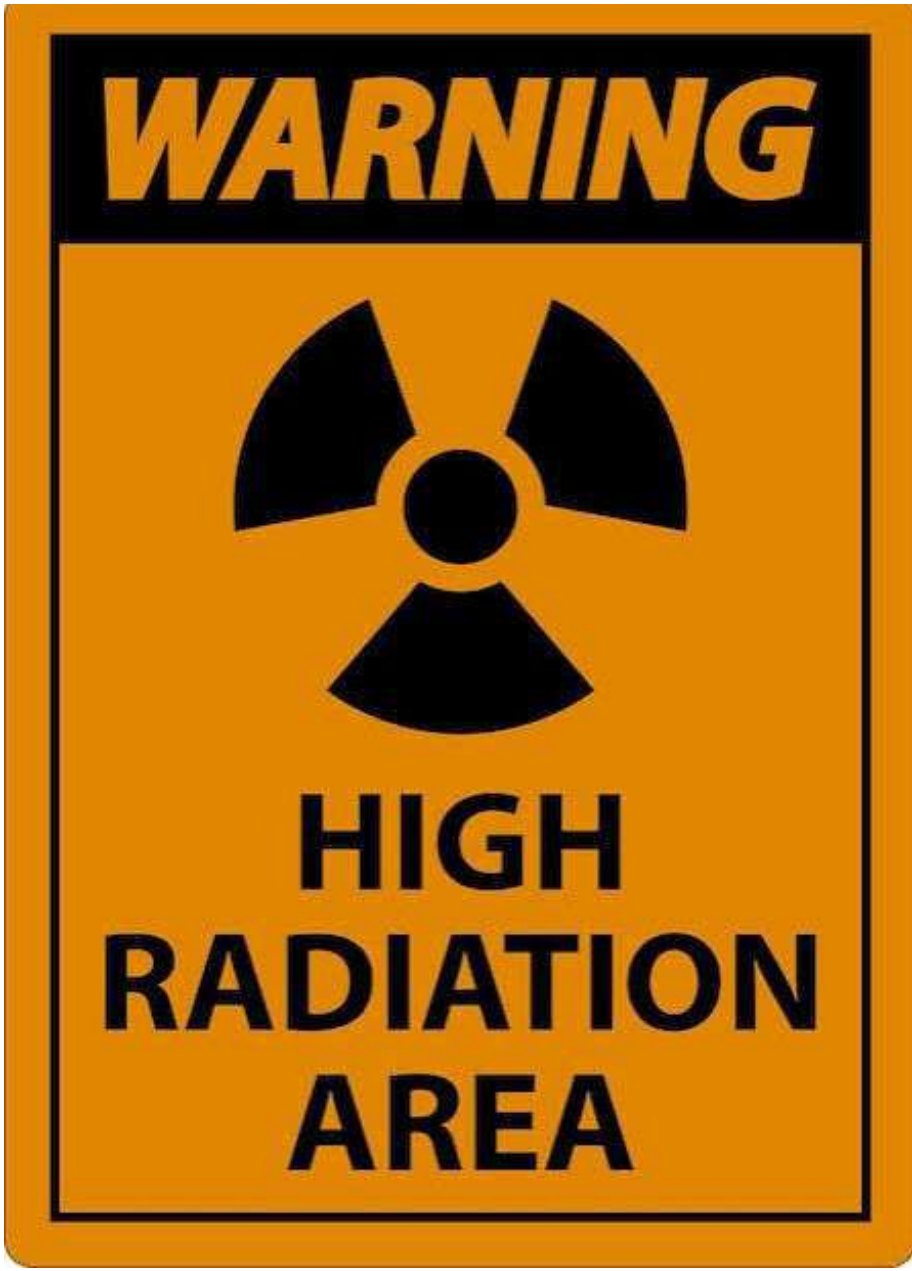
The Alpha Beta Gamma Awards

Prizes are given to the districts that place highest at the end of the competition. These will be These will be the teams in 1st, 2nd and 3rd place.



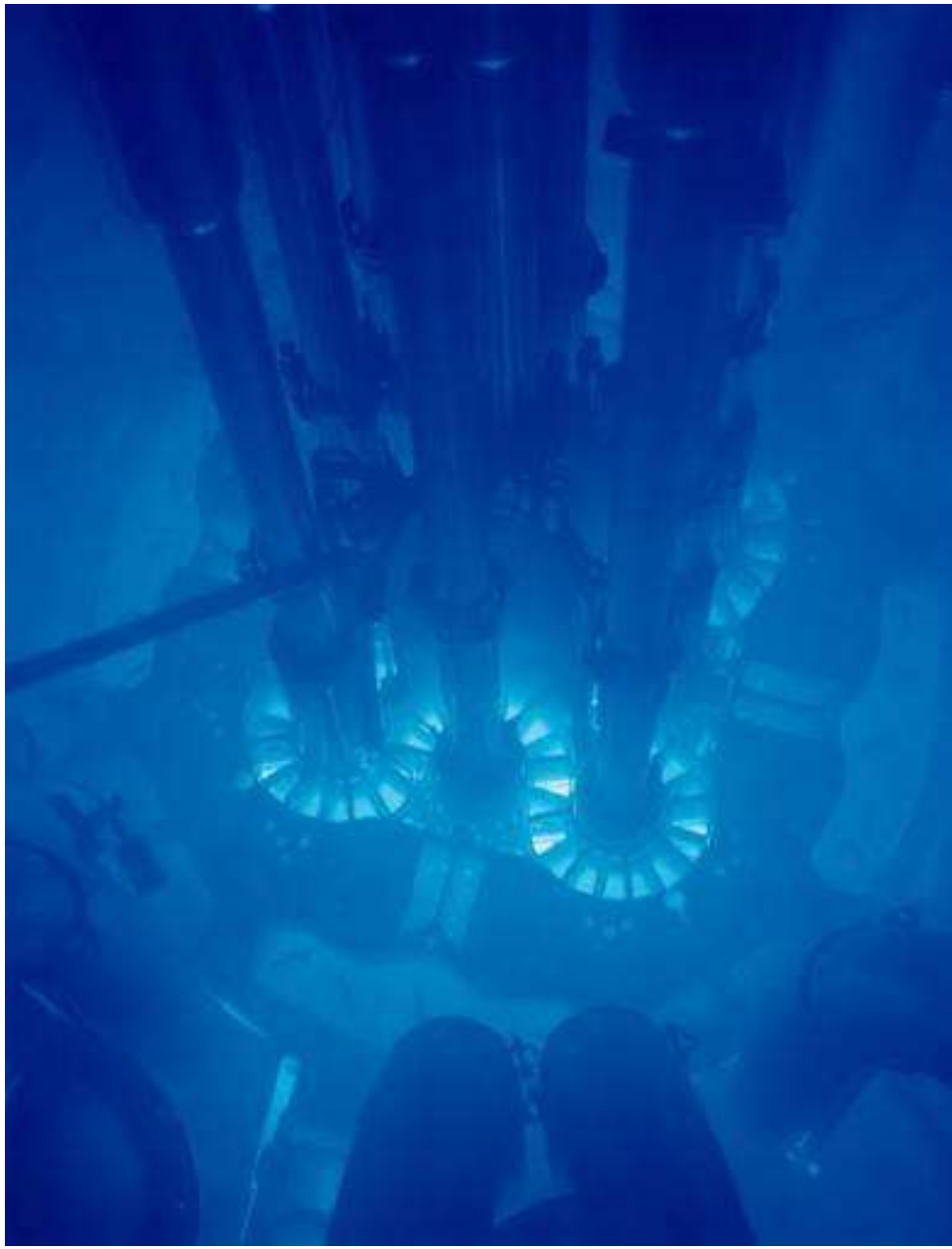
The Outside the Zone award

The prize that is given to the vendor that impresses the judges through either an ingenious technical or logical advancement.



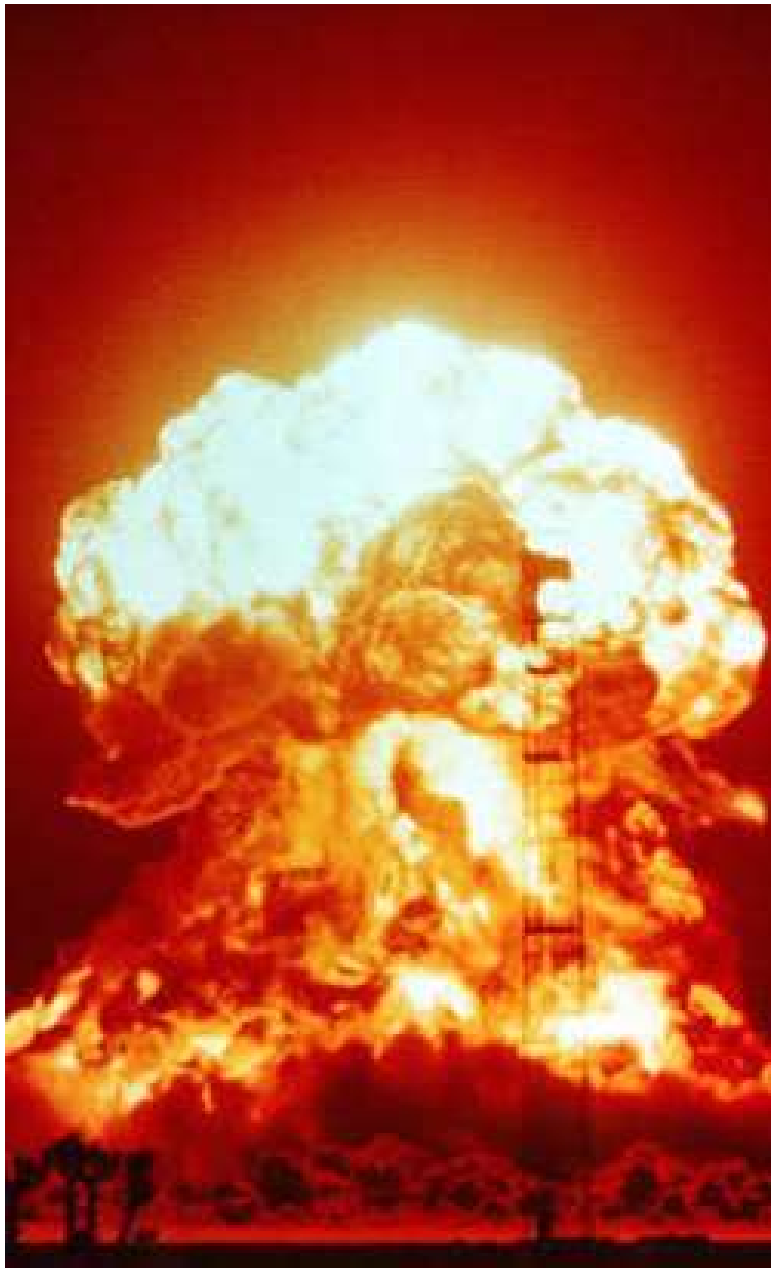
Irradiating design

The prize that is given to the Vendor with the most ROBOT and team flair.

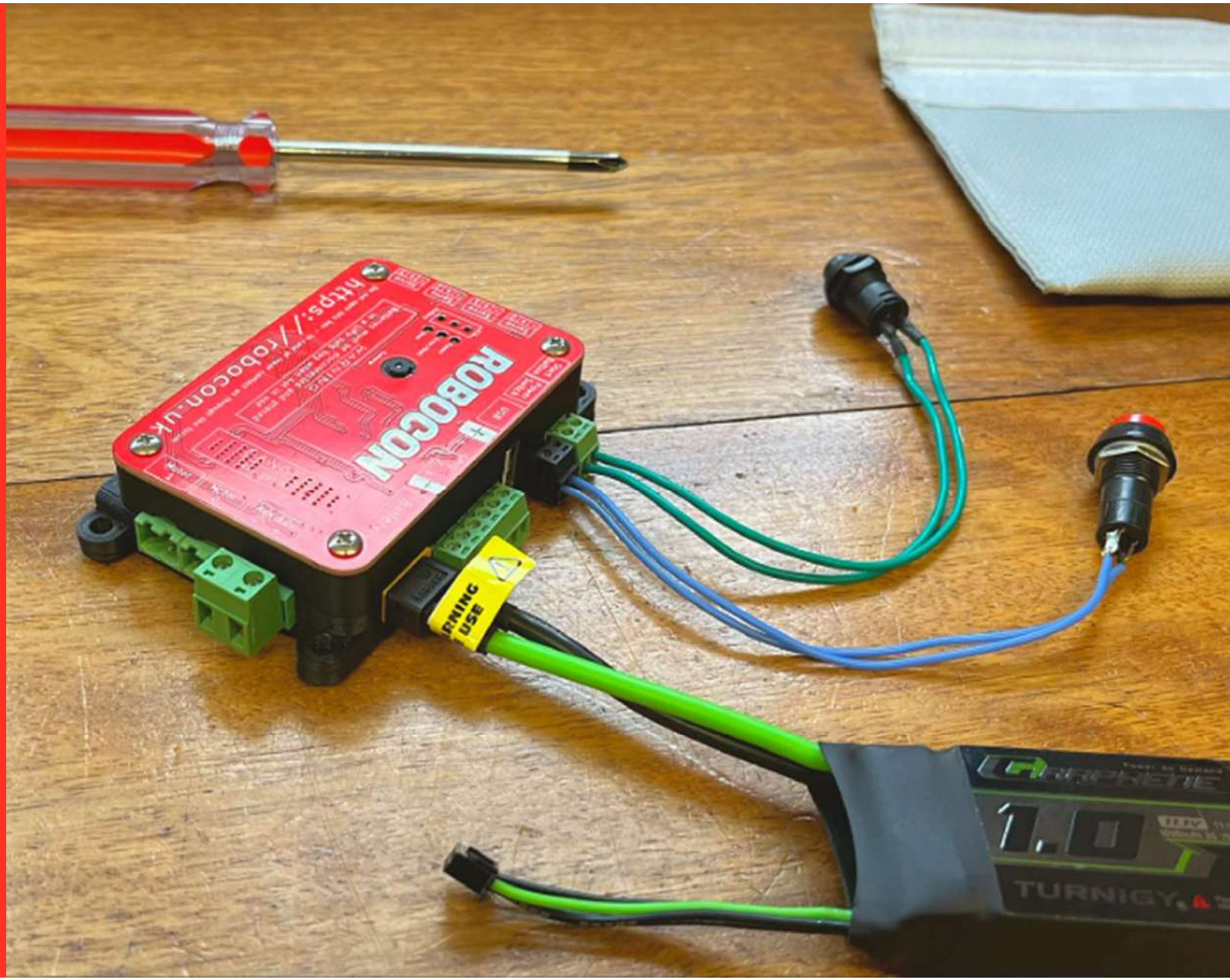


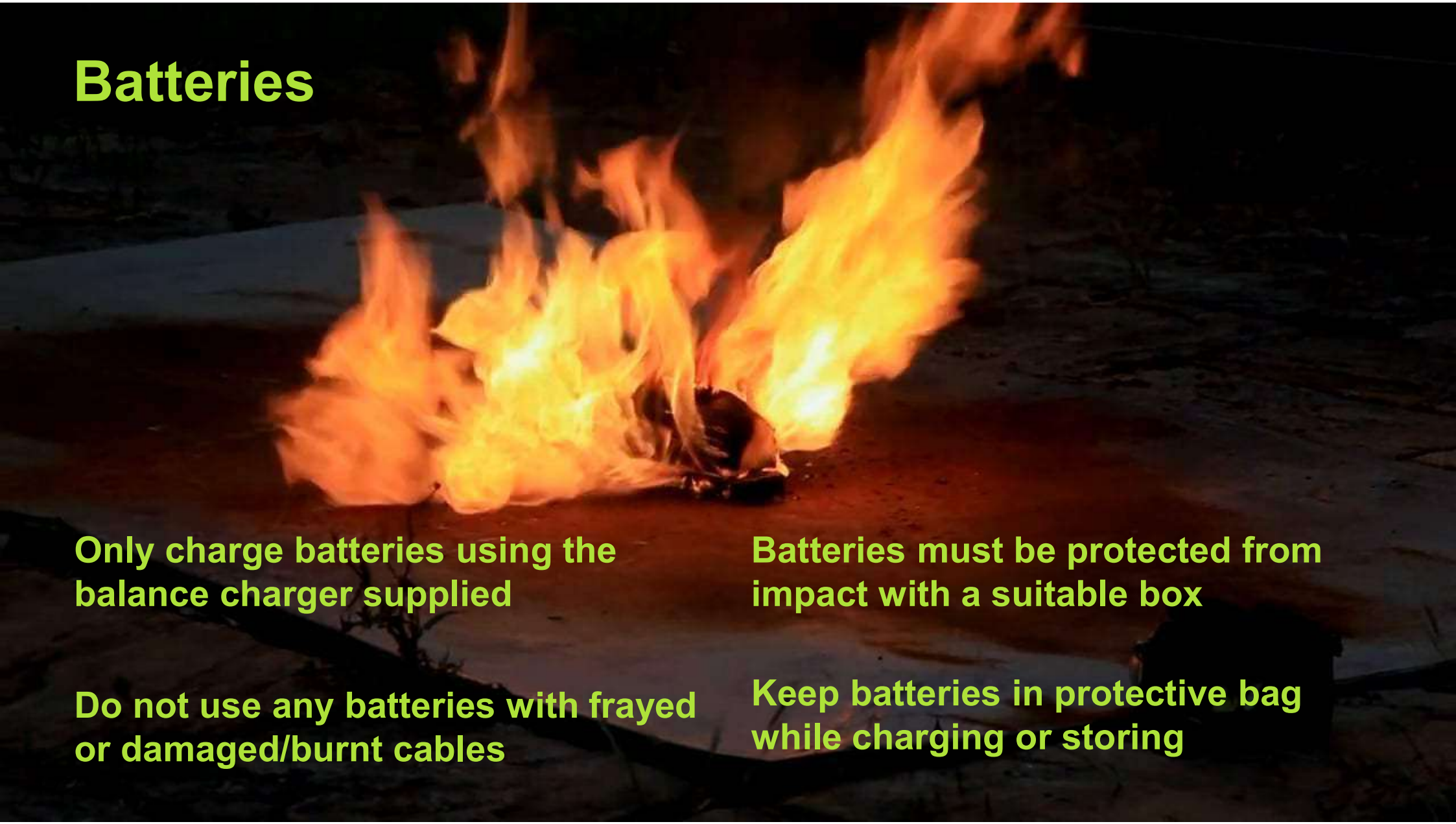
Meltdown management

The Meltdown management award is given to the vendor who demonstrates the most perseverance in the face of adversity.



The Brain Box





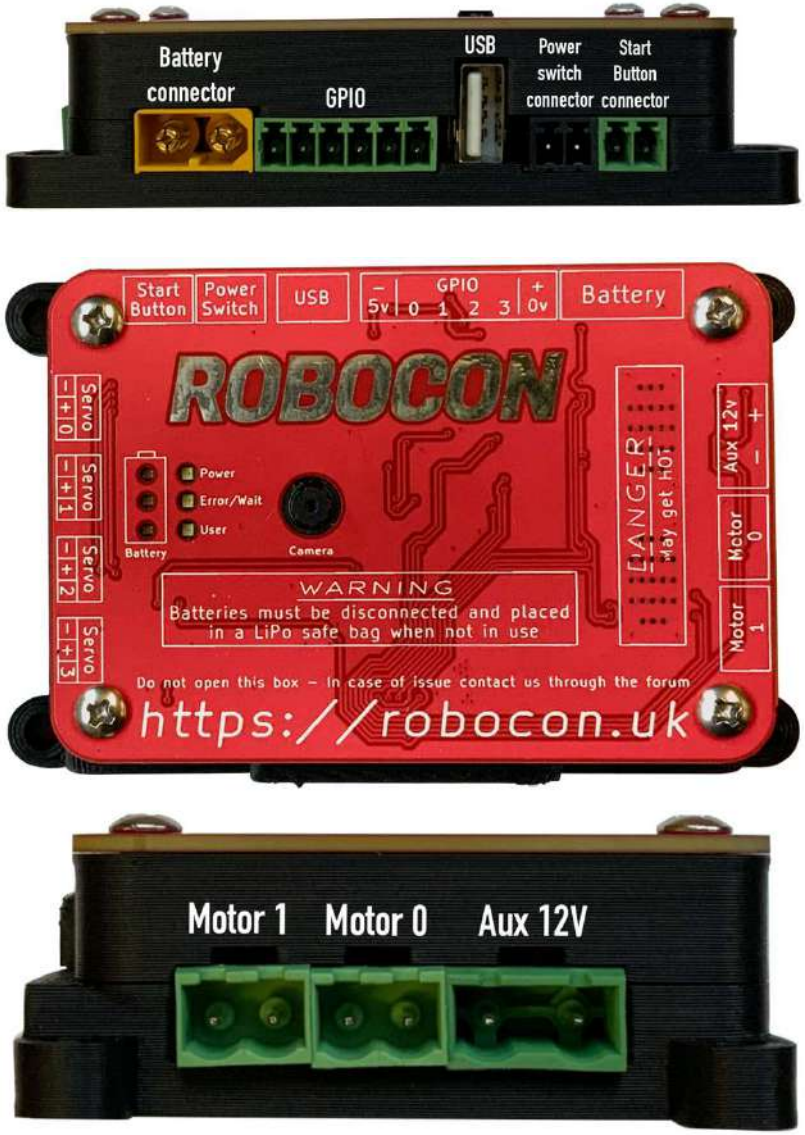
Batteries

Only charge batteries using the balance charger supplied

Batteries must be protected from impact with a suitable box

Do not use any batteries with frayed or damaged/burnt cables

Keep batteries in protective bag while charging or storing



- Power
- GPIO
- USB
- PWM Pins
- Motors
- Aux 12V
- Start button
- Power button
- Print logs

More info on these in the docs (docs.robocon.uk)

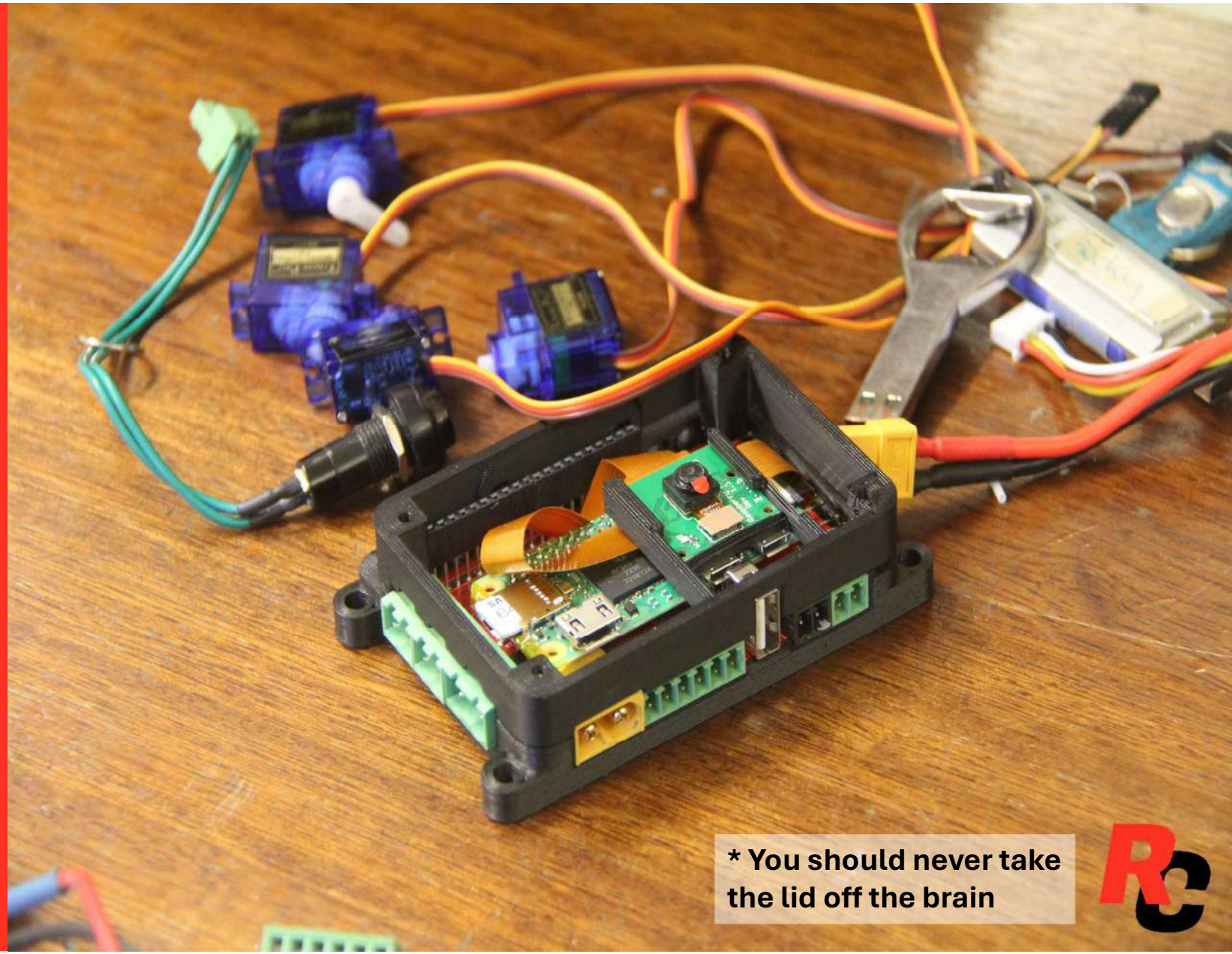
Branding is essential

What you do is not nearly as important as how cool you look doing it.

- Make a logo
- Establish your brand
- ?
- Profit

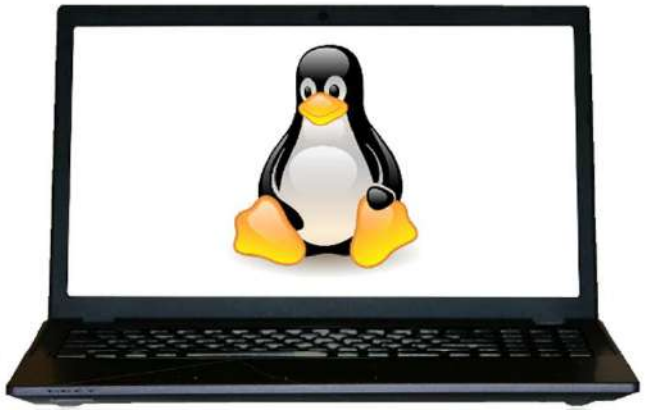


The Robot Kit



Functionality

- Linux Laptop
  - Write, upload and run you code!
- Minibot
  - Your easy to build, simple robot
- DC Motors
  - Remember to configure power!
- Servos
  - Up to 4 servos can be driven by PWM







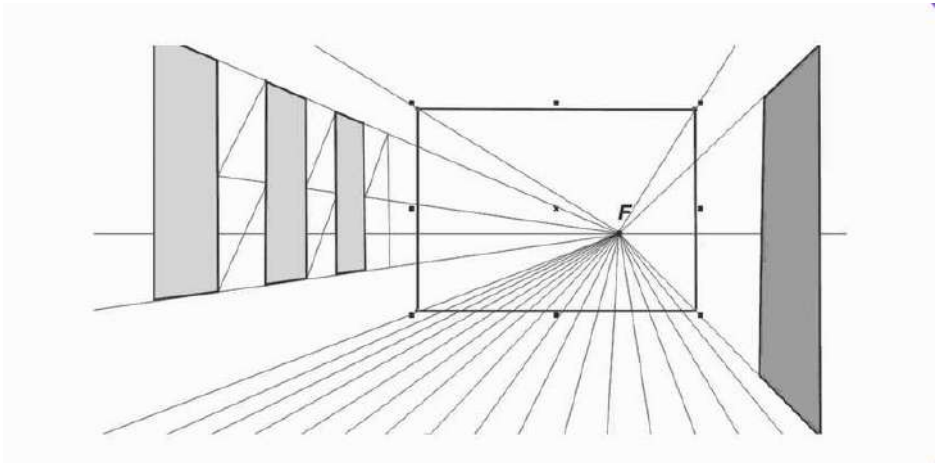
```
from robocon.brain import IO

I = IO()

# set motor 1 to 60% power
I.motors[0] = 60
```



Vision




```
from robocon.vision import Camera
from robocon.brain import IO

I = IO()          # initialise i/o controller
C = Camera()      # initialise camera controller

markers = C.capture()


print(markers)
```

DC Motors

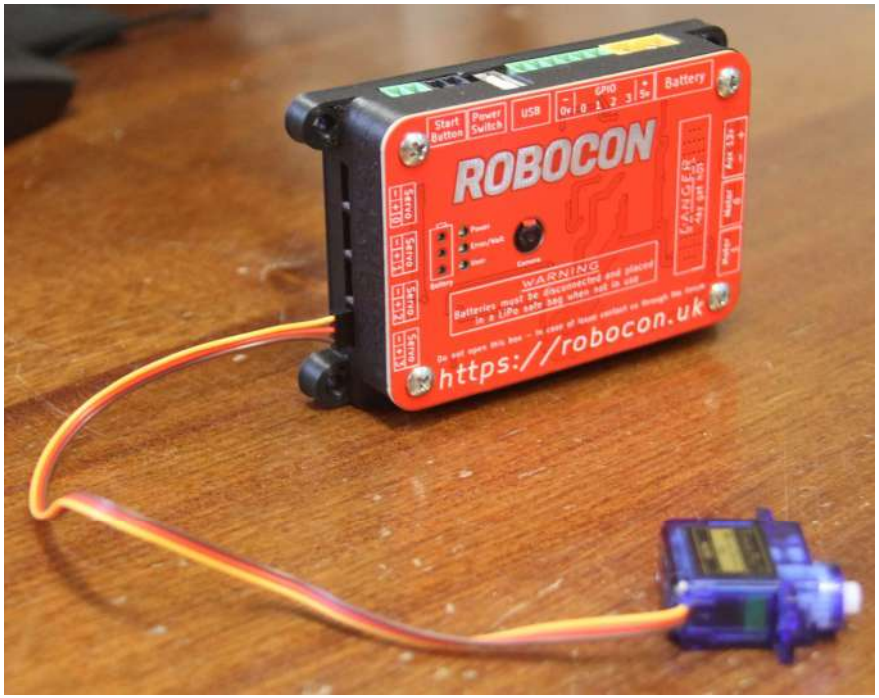
```
from robocon.brain import IO

I = IO()

# set motor 1 to 60% power
I.motors[0] = 60
```



PWM outputs for Servos




```python
from robocon.brain import *
import time

I = IO()
I.servos[0].mode = PWM_SERVO

while True:
    # set servo 0 to the 50% position
    I.servos[0] = 50

    # wait for the servo to finish moving
    time.sleep(1)

    # set servo 0 to the -100% position
    I.servos[0] = -100

    time.sleep(1)
```

Support

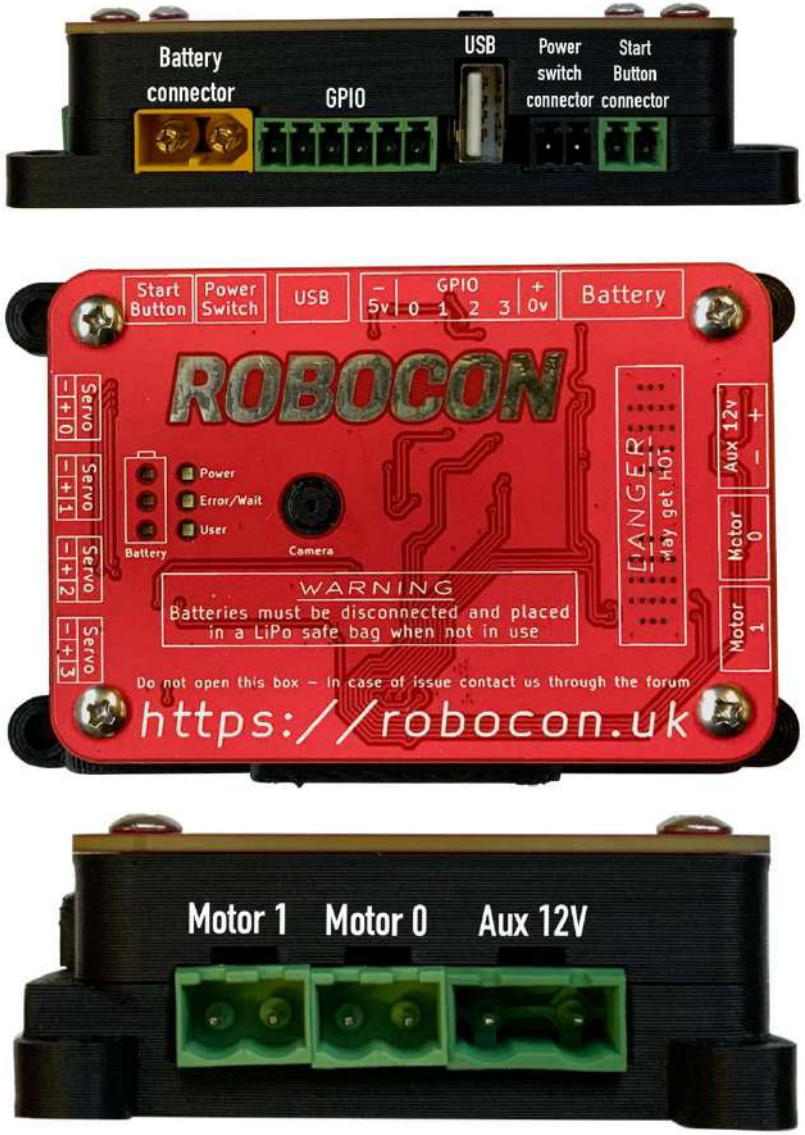
- Email: robotics@hrsfc.ac.uk
- (Almost) Every Saturday we have a meeting
  - Check with us first
- Website:
  - Documentation

ROBOCON

2027

Final Q&A

What Now?



- Power
- GPIO
- USB
- PWM Pins
- Motors
- Aux 12V
- Start button
- Power button
- Print logs

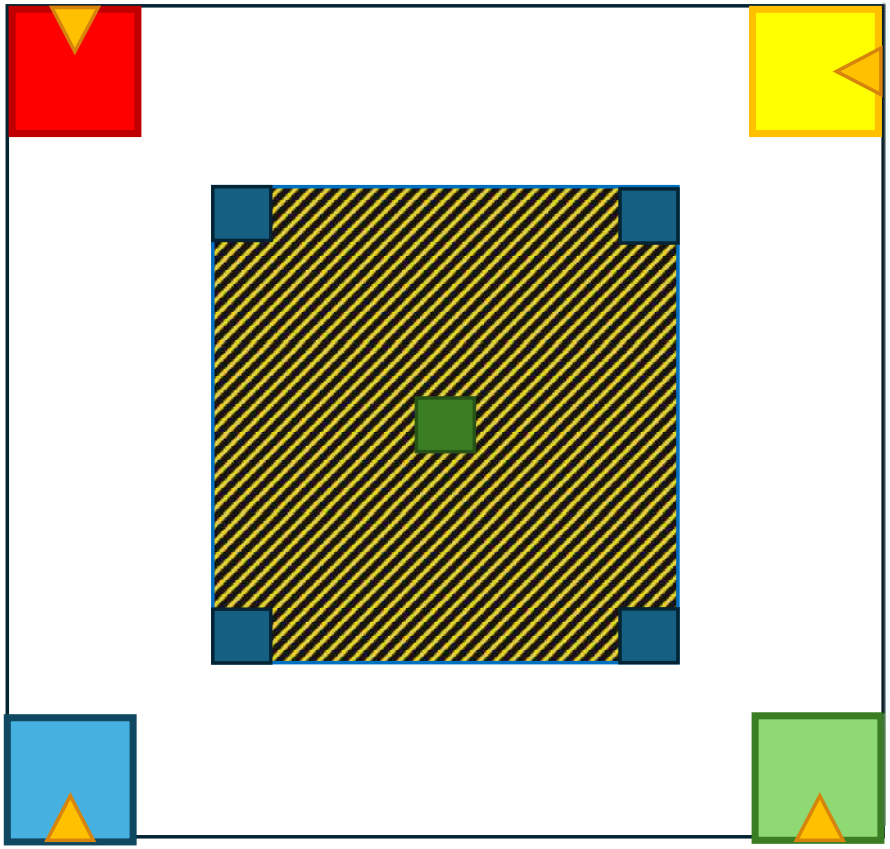
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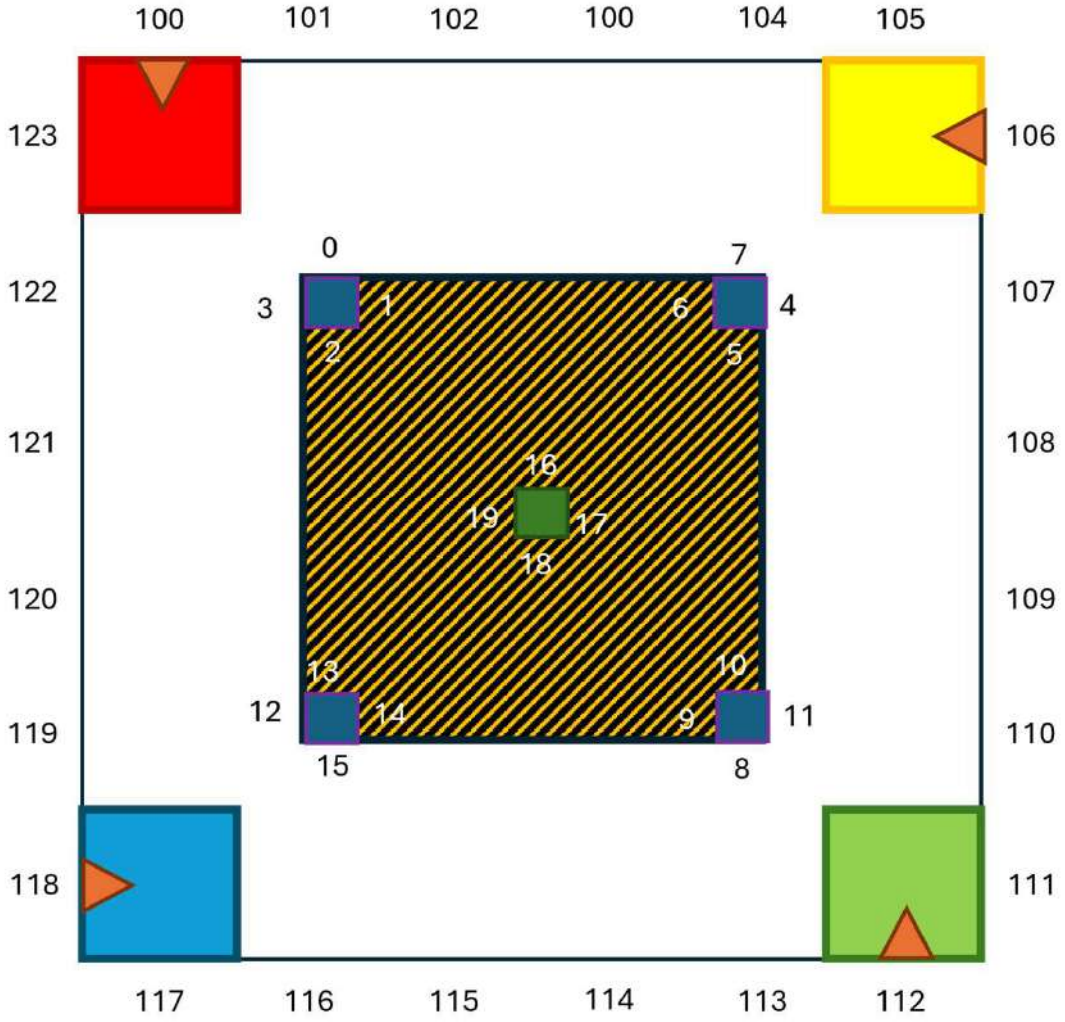


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