



# YOUTH ROBOT CHALLENGE 2022

## RULES & REGULATIONS (Rev. 01/2022)

Organized by:



**ILKBS**

**Bahagian Pembangunan Kemahiran Belia  
Kementerian Belia & Sukan Malaysia**

Hosted by:



**Institut Kemahiran Tinggi Belia Negara  
Bukit Mertajam**

By registering to this event, team members agree that they will not build or operate a combat robot unless they are qualified to do so. During the tournament, teams are responsible for their robot at all times whether or not have been inspected for safety or otherwise by Y-RoboC crew or safety officer. The Team members' responsibilities include all matters of conformity to law, safety, design as well as the operation of their robots. Common sense and safety awareness are foremost in all areas including the pits, the hall and the arena. Y-RoboC Crew shall have the right to make and apply any required modifications to the Event, in its sole and absolute judgment, to maintain the general safety of all the attendees. The organizer is not responsible for any injury or loss of property during the event. Any injury must be reported to any safety officer or Y-RoboC Crew immediately.

To encourage a healthy competitive spirit among participants, all participants are bound by the rules and regulations and should accept any damages to the respective robots.

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*#All rules are subject to change at any time*

## GAME OVERVIEW

### 1. General Game Play

The game play of the tournament for all three (3) categories will be based on single round-robin format for the Group Stage and knocked-out format the next five (5) stages; Elimination Round 1, Elimination Round 2, Quarter-final, Semi-final and Final. For the group stage, balloting will be carried out during the registration process to divide the teams into group of four (4) teams. The grouping for the elimination round will be based on designated match draw whilst quarter-final and semi-final will be based on balloting process. Table 1 , Table 2 and Table 3 show the number of group and team in each stage for 5Kg Tower Conquer, 8Kg Rumble and 16Kg Multibot, respectively.

Table 1: Number of group and team for 5Kg Tower Conquer category (Based on 64 teams)

Stage	#Group	# Team	Grouping Process	Game Play
Group Stage	16	64	Ballot	League
Elimination Round 1	8	32	Match draw	Knock-out
Elimination Round 2	4	16	Match draw	Knock-out
Quarter-final	N/A	8	Ballot	Knock-out
Semi Final	N/A	4	Ballot	Knock-out
Final	N/A	2	N/A	Knock-out

Table 2: Number of group and team for 8Kg Rumble category (Based on 32 teams)

Stage	#Group	# Team	Grouping Process	Game Play
Group Stage	8	32	Ballot	League
Elimination Round	4	16	Match Draw	Knock-out
Quarter-final	N/A	8	Ballot	Knock-out
Semi Final	N/A	4	Ballot	Knock-out
Final	N/A	2	N/A	Knock-out

Table 3: Number of group and team for 16Kg Multibot category (Based on 16 Teams)

Stage	#Group	# Team	Grouping Process	Game Play
Group Stage	4	16	Match draw	League
Quarter-final	N/A	8	Ballot	Knock-out
Semi Final	N/A	4	Ballot	Knock-out
Final	N/A	2	N/A	Knock-out

For group stage, there will be six (4) matches for each group with two (2) teams fight simultaneously at one time on one-on-one-match. Only the top two (2) teams from each group will qualify for the next stage. Table 4 shows the example of score table for group A during group stage.

Table 4: Example of score table for group stage

Team	A1	A2	A3	A4	Total Point
A1					
A2					
A3					
A4					

The point from each match will be accumulated to determine 1<sup>st</sup> and 2<sup>nd</sup> group placing for every stage. The top two (2) teams from each group will qualify for the next stage.

## 1.1 Beginning of the Match

### 1.1.1 Safety / Technical Inspection

Each robot must be inspected prior to each match. The teams are responsible to show up and have their robot ready at least 20 minutes in advance of the scheduled time for inspection. Failing to show up for the inspection will lead to disqualification from that particular match.

The weight limit and dimension, as specified in Section 5; Robots: Structure and Specification, will be strictly enforced. Weighing is typically performed with the robot in the combat-ready configuration' including batteries (excluding the controller). Failing to comply with any of the design rules may result in disqualification from that match. Other than that, the robot must pass safety inspection which will include but is not limited to;

- a) A demonstration that the robot is controllable and manoeuvrable using the remote control.
- b) A demonstration that all active weapon systems are well-functioned and fail-safe.

### 1.1.2 Quarantine

Before the match begins, teams will be quarantined along with their robot. The quarantined robot cannot be taken out of the quarantine zone.

### 1.1.3 Set-up time

The judge(s) will authorize the teams to enter the arena. Only one (1) operator and one (1) pit crew from each team are allowed to enter the arena. One (1) minute is given for the team to activate and test their robot movement on the battlefield before the match begins. However, the team is not allowed to activate the weapon until the safety doors are closed. The pit crews must leave the battlefield immediately when set-up time is over. 15 seconds is given prior to the match for the team to test their robot's weapon. To start the match, all robots must be in ready position and not moving. Specifically:

- a) Each robot must start completely inside its starting zone.
- b) Each robot and all external components of weapons must be motionless.

## 1.2 Matches

Once the set-up time is over, the team must indicate their readiness to the judge(s) to start the countdown for the match. Pit crews are allowed to instruct the operator but are prohibited from taking over the controller. The match will last for **3 minutes of fighting time**. (Refer to 2.0 Scoring Point). The match will end immediately when there is **only one robot left on the battle field**.

### 1.2.1 False Start

If the judges notice any premature robot movement or any other violation of starting procedure, they may declare a foul, and require the match to restart. Operators must cease all robot movements. If the robot commits more than **one foul in a single match**, the team may forfeit the match.

## 1.3 Rematch

A rematch based on **knock-out/ rumble style** will be performed if two or more teams have the same final score at the end of the stage.

## 2. Scoring Point

### 2.1 5Kg Tower Conquer

The judges' decisions are final. The Judges' decisions are not subject to challenge or appeal. The team will be declared as the winner and earn **100 points** once they have fulfilled one of the conditions as stated below:

- i) The last bot standing on the tower; the match will end immediately;
- ii) Successfully conquer the tower when the fighting time is over.

### 2.2 8Kg Rumble and 16Kg Multibot

The judges' decisions are final. The Judges' decisions are not subject to challenge or appeal. The team will be declared as the winner and earn **100 points** once they have fulfilled one of the conditions as stated below:

- i) The last bot standing on the battlefield; the match will end immediately;
- ii) Successfully demobilized opponent's robot(s).

The robot will be declared as demobilized if it does not show any sign of movement within 10 seconds. The winner will be decided based on which team attacks first (or the first robot completely cross the centre line) if the match does not meet any of the above conditions.

### 2.3 Penalty

**50 points** will be deducted if the team:

- i) Deliberately damaging the field or attempting to damage the field.
- ii) Failed to pass the safety/ technical inspection or in the case of no-show.
- iii) Withdraws from the match. Withdrawal must be made before the match starts. No withdrawal is allowed after setup time begins.
- iv) Deliberately attack demobilized robot after the countdown start.
- v) Pinning the opponent's robot(s) more than 10 second.
- vi) Commits false start

## 3. Battlefield: Structure & Specification

### 3.1 Materials.

5Kg Tower Conquer - The floor of the battlefield is built using aluminium flat surface (4ft x 4ft) – Refer to Appendix 1.

8Kg Rumble and 16Kg Multibot - The floor of the battlefield is built using mild steel checker plate (8ft x 8ft) – Refer to Appendix 2.

#### 4. Robots: Design Requirement

##### 4.1 Robots: Structure & Specification

Table 5 shows the robot structure and specification for each category. The robot weight is including the weight batteries (excluding the controller). The robot must fit into measuring device during the inspection. Idle mode refers to the state where the robot is off and disconnected from the controller whilst active mode refers to the state where the robot is activated and ready for battle. Due to safety reason, the supply voltage **must not exceed 48 volts**. Active weapons are allowed on for 8Kg Rumble and 16Kg Multibot categories.

Table 5: Robots: Structure and Specification

Specification	5Kg Tower Conquer	8Kg Rumble	16Kg Multibot
Weight limit	≤ 5Kg	≤ 8Kg	Total weight ≤ 16Kg
Size and dimension	Unlimited but advisable to keep within 200mm (W) x 200mm (L)	Idle mode: 400 (W) x 400(L) x 400(H)  Active mode: 500 (W) x 500(L) x 500(H)	Idle/ Active mode: 500 (W) x 500(L) x 500(H)
Electrical system	≤ 48V	≤ 48V	≤ 48V
#Robots/ Team	1	1	≥ 1
Weapon	Passive	Passive/ Active	Passive/ Active
Kill switch	Compulsory	Compulsory	Compulsory

## **4.2 Weapons**

Active weapons are allowed only for 8Kg Rumble and 16Kg Multibot categories. Lifting and spinning weapons are recommended. Projectile weapons are forbidden. Robots shall not throw liquid, fire, electricity, powder, or other substances at the opponent. The judges may forbid any weapon that is considered a threat or has the possibility to cause injury to other people. The robot should not secure itself on the battlefield surface by using:

- a) Suction cups
- b) Diaphragms
- c) Sticky thread
- d) Glue or other such devices
- e) Magnet or electromagnet

### **4.2.1 Multiple Weapons**

A robot can have more than one weapon and the use of interchangeable (modular) weapons is encouraged. However, the robot's weight must not exceed the specified limit regardless of weapon configuration.

### **4.2.2 Spinning Weapons**

Spinning weapons must have a fail-safe that causes power to be disconnected from the spinning part(s) if the RC signal is lost. On command from the remote controller, or if the RC signal is lost, the spinning weapons must spin down from full speed to a full stop within 1 minute.

## **4.3 Remote Control**

All robots must be operated using wireless remote control. Only one operator can control the robot for the entire match for 5Kg Tower Conquer and 8Kg Rumble. Number of operators for 16Kg Multibot depends on number of robots per team.

## **4.4 Robot modification**

Only minor modifications are allowed.

## 5. Team Members

### 5.1. Team Size

Each agency/ institute is allowed to register maximum of two (2) teams for 5Kg Tower Conquer and 8Kg Rumble categories and only one (1) team for 16Kg Multibot category. Team structure is shown in Table 5.

Table 6: Team structure for each category

	<b>5Kg Tower Conquer</b>	<b>8Kg Rumble</b>	<b>16Kg Multibot</b>
#Team Manager	1	1	1
#Team Member	2	3	4

## 6. Safety

For safety reasons, the following rules must be complied by all participants:

- a) Follow the safety instructions given by secretariat/ safety officer.
- b) Activation of robots will take place within the arena prior to the commencement of a match. No competitor will be allowed to enter the arena under any circumstances with an activated robot or during the match.
- c) Robots will be inspected for safety, reliability, and conformity to the rules before being allowed to compete.
- d) The organizers reserve the right to ban or disqualify any robot that, in their opinion does not conform to the rules or is unsafe and could cause injury to personnel or damage to the arena, video set or equipment.
- e) For safety reasons; all operators/ pit crews must wear proper attire (i.e. covered shoes).
- f) Comply with the safety operating procedure (SOP) set by the organizer.

## 7.0 Prize Structure

### 5Kg Tower Conquer

- a) Champion: Prize of **RM1,500.00**, trophy and certificate,
- b) 1<sup>st</sup> Runner-up: Prize of **RM700.00**, trophy and certificate,
- c) 2<sup>nd</sup> Runner-up: Prize of **RM500.00**, trophy and certificate
- d) 3<sup>rd</sup> Runner-up: Prize of **RM300.00**, trophy and certificate

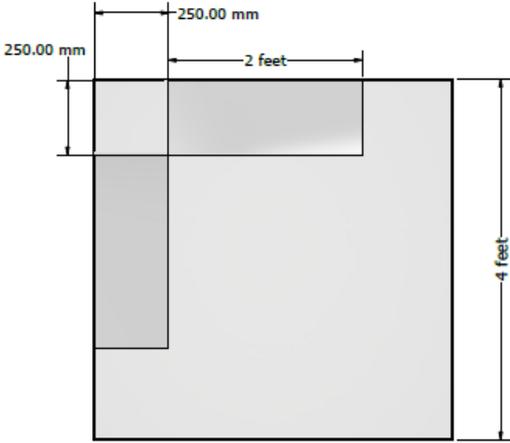
### 8Kg Rumble

- a) Champion: Prize of **RM2,000.00**, trophy and certificate,
- b) 1<sup>st</sup> Runner-up: Prize of **RM1,000.00**, trophy and certificate,
- c) 2<sup>nd</sup> Runner-up: Prize of **RM600.00**, trophy and certificate
- d) 3<sup>rd</sup> Runner-up: Prize of **RM400.00**, trophy and certificate

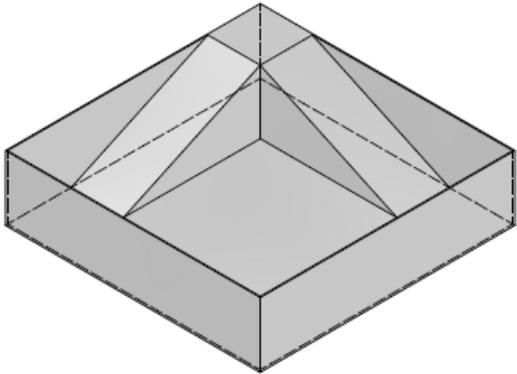
### 16Kg Multibot

- a) Champion: Prize of **RM2,000.00**, trophy and certificate,
- b) 1<sup>st</sup> Runner-up: Prize of **RM1,000.00**, trophy and certificate,
- c) 2<sup>nd</sup> Runner-up: Prize of **RM600.00**, trophy and certificate
- d) 3<sup>rd</sup> Runner-up: Prize of **RM400.00**, trophy and certificate

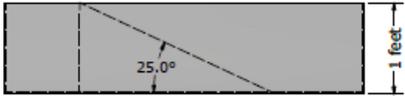
APPENDIX 1  
FIELD DESIGN 5KG TOWER CONQUER



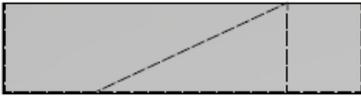
TOP VIEW  
SCALE 1 : 10



ISOMETRIC VIEW  
SCALE 1 / 10

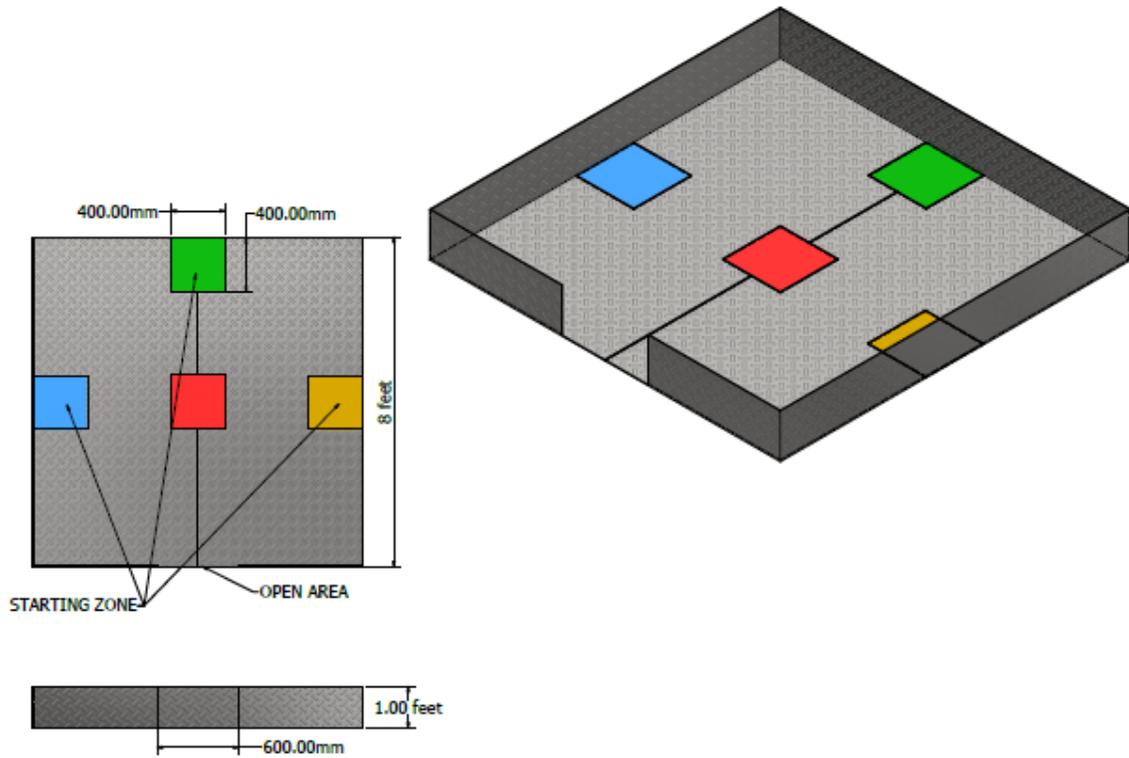


FRONT VIEW  
SCALE 1 : 10



SIDE VIEW  
SCALE 1 : 10

FIELD DESIGN 8KG RUMBLE & 16KG MULTIBOT



\*The field will be covered by a 12ft x 12ft safety cage