Robot Contest 2013

Theme and Rules
* Each nation is a piece of the puzzle that forms the world.
* The responsibility to protect the earth thus lies on the shoulder of each person living on it.
* Awareness and actions - that is what we need to sustain life in our common home - THE EARTH
Quick Contest Guide

* Duration of the game is 3 minutes
* Each team will have 2 Robots: 1 Automatic Robot, 1 Manual Robot.
* The Manual Robot picks up the Leaves in the “Leaves Store” and places them in the 3 Rings in the Southern Hemisphere.
* Then, the Manual Robot loads "Leaves" which have been picked up from the “Leaves Store” onto Automatic Robot.
The Automatic Robot must place at least 3 leaves in the Northern Hemisphere (including two leaves in its own zone and at least one leaf in the common zone), then it is allowed to touch the Bud(s) in the Northern Hemisphere.
The Automatic Robot goes to the North Pole Zone and picks up the Buds (made by the team) and loads them into the Manual Robot.
* The Manual Robot stands below the Limit Line 2 and throws the Bud(s) at the Moon. If the team's Bud stands successfully on the moon, the team achieves “THE GREEN PLANET” and wins the game.
Each team shall comprise of **4 members** consisting of **3 students and 1 instructor**, from the same university, polytechnic or college. However, only these 3 students are permitted to enter the Game Field.

Team members must be enrolled in their University/Polytechnic at the time of the international contest. Exceptions are allowed for those who were enrolled in a University/Polytechnic at the time of the domestic contest.

**Post graduates are not allowed** to be engaged in the team's robot production process in any ways.
The Game Field consists of an area having the dimension of 13000 mm x 13000 mm made by emulsion painted plywood and surrounded by a iron fence (100 mm height, 50 mm thickness). The game field is divided equally by an iron fence (60 mm height, 30 mm thickness), along the Prime Meridian.
The Game Field is divided into 2 parts as follows:

- The Earth Zone
  - The Earth Zone is in Sphere Shape. It has a diameter of 8500 mm. The white guidelines made of matt (non-shiny) sticker of 30 mm width represent the Meridian and the Parallel.
A picture of a green tree is drawn, inside the Earth Zone.
There are 7 steel Rings (painted in dark green) in which to place the Leaves in each team's Earth Zone. Each Ring is of following dimension; 50 mm height; 25 mm thickness and the inside diameter is 350 mm. The surface of the game field where the Rings are placed in the Common Zone are painted in yellow. The surface of the game field where other Rings are placed are painted in white.
The Northern Hemisphere is the upper half of the Earth Zone. There is the Common Zone that covers 4 spaces in the center of the Northern Hemisphere. Also, there is the North Pole Zone defined by The First Parallel, where each team arranges their Buds before the game start.
The Southern Hemisphere is the lower half of the Earth Zone.
- The Space Zone surrounds the Earth Zone

✓ There is the Moon in the Space Zone. The Moon is a round plate laid flat on top of the cylindrical stand. The **height** from the surface of the Moon to the surface of the contest field is **1500 mm**; The Moon is positioned along the Prime Meridian and the **distance** from the North Pole to the center of the Moon is **2700 mm**.
There are 2 Limit Lines (30 mm width), namely Limit Line 1 is the continuation of the Equator; Limit Line 2 is drawn at 2950 mm north of the Equator.
The Manual Robot Area

The Manual Robot Area is the Space Zone
Manual Robot Starting Zone

The dimension of the Manual Robot Starting Zone is 700 mm x 700 mm which is painted in red for Red Team and in blue for Blue Team.
Leaves Store

Each team's Leaves Store is located at the bottom of the game field. Before the Game starts, **12 Leaves** will be arranged in the each Leaves Store.
* The Automatic Robot Area

The Automatic Robot Area is the Earth Zone and the surrounding area. There are 2 Automatic Robot Starting Zones that have the dimension **700 mm x 700 mm**, painted Red for Red Team and Blue for Blue Team.
* The Leaf
Leaves are in the shape of a cylinder (250 mm Diameter, 200 mm Height, 200 g Weight). Leaves are made of high-density polystyrene and are coated with emulsion paint, in red for Red Team and blue for Blue Team. The top and the bottom of the leaves are both painted in green.
* The Bud

- Each team must make 3 'Buds' in the shape of a tree.
- The height of the Bud must exceed 500 mm.
- The diameter of the widest part of the 'Bud' must exceed 300 mm.
- The diameter of the bottom of the Bud must exceed 150 mm.
- The maximum weight must not exceed 300 g.
- The 'Buds' must be placed by each team before the start of each match. The 'Buds' can be arranged in any ways as long as they are placed within the team's North Pole Zone.
- **The robot** must be designed so that the 'Bud', under no matter what condition, **cannot travel more than 8 m when the 'Bud' is thrown from the robot**. The travel distance of the 'Bud' will be measured from the 'Bud' to the robot's contact surface of the game field.
- The Bud which has been thrown once cannot be used again in the same match.
To compete in the contest, each team must design and construct the Manual Robot and Automatic Robot by themselves.

For each match, each team is allowed to have 1 Manual Robot and 1 fully Automatic Robot.
* Manual Robot

- The Manual Robot has to be operated via remote control using a cable connected to it or remote control using infrared rays, visible rays or sound waves. **Controlling using radio waves is not allowed. Operators are not allowed to ride on their Manual Robot.**

- When operating via cable, the connecting point of the cable to the robot must be **at least 1000 mm from the ground**. However, the length of the cable from the Manual Robot to the control box **must not exceed 3000 mm**.

- There is a size limit (**700 mm L x 700 mm W and 1200 mm H**) for the Manual Robots at the Manual Robot Start Zones when the game starts.
After the game starts, the Manual Robot's size and form may be changed. However, **the extension limit is 3 m in diameter** when checked from above.

- Manual Robots **are not permitted to separate** during the game.
- Only 1 member of each team is allowed to control the Manual Robot in the Game Field.
* Automatic Robot

- Automatic Robot must be completely autonomous.
- When the Automatic Robot starts, team members are not allowed to touch the Robot.
- Automatic Robot should fit within the size of 700 mm L x 700 mm W and 1000 mm H at its Start Zone before starting.
- After the game starts, the Automatic Robot's size and form may be changed. However, the extension limit is 2 m in diameter when checked from above.
Retry

After a “retry” request is granted by the Referee, team member(s) must bring the Robot(s) that need to be retried back to their Starting Zone and restart the Robot(s) as soon as possible.

Power Supply

- Allowed power supply for Robot(s) shall not exceed 24VDC.
- The pressure of the compressed air power (if any) must be less than 6 bars.
- Power supply that is considered dangerous or unsuitable by the Contest Committee shall not be permitted.
* Weight

All Manual and Automatic Robots, including their power sources, cables, remote controller and other parts of each Robot shall be weighed prior to competition. The total allowable weight of all Robots for each team to be used throughout the contest must not exceed 40 kg.
* Duration of the Match

- Before the match begins **setting of the Robots** need to be completed **within 1 minute** after receiving the signal for setting.
- Each match shall last for **3 minutes**.
- However, the first team to achieve "**THE GREEN PLANET!**" wins the match regardless of the point collected by the opponent. The match ends when "**THE GREEN PLANET**" is achieved.
* Competition Rules

- **The Manual Robot picks up the Leaves** in the “Leaves Store” and places them in the **3 Rings** in the Southern Hemisphere.
After placing Leaves successfully in the 3 Rings in the Southern Hemisphere, the **Manual Robot can load Leaves onto the Automatic Robot in the Automatic Robot Start Zone** or the Manual Robot can carry the Leaves to the Limit Line 1 and drop the Leaves onto the floor of the Game Field. Any parts of the Manual Robot which are in contact with the floor of the Game Field shall not be allowed to cross over the Limit Line 1.
After the Manual Robot fulfilled the task of placing Leaves successfully in the 3 Rings in the Southern Hemisphere, the Automatic Robot is allowed to start.

The Automatic Robot goes to place the Leaves in the Rings in the Northern Hemisphere of their own game field and the Common Zone.
The Automatic Robot can place maximum of 5 Leaves in the Rings in the Northern Hemisphere and the Common Zone. However, it is allowed to place only 1 Leaf in the opponent's side of the Common Zone.
After the Automatic Robot successfully placed at least 3 Leaves in the Northern Hemisphere including 2 Leaves outside of Common Zone.

- The **Automatic Robot** is allowed to pick up the Bud(s) which are placed in the North Pole Zone.
- Once the Automatic Robot picked up any Bud(s), the Automatic Robot cannot place any more Leaves in the Rings.
- The **Manual Robot** can cross the Limit Line 1 to receive the Bud(s) from the Automatic Robot and throws the Bud(s) at the Moon. However, **when throwing the Bud(s) at the Moon, the Manual Robot has to stand behind Limit Line 2.**
- Once the Bud(s) thrown by the Manual Robot successfully stands in the Moon, “**THE GREEN PLANET**” is achieved and the match ends immediately. If neither team achieves “THE GREEN PLANET” within 3 minutes, the team with more score will win the match.
* Points Award

- The team gains point when their Robots successfully place their own Leaves in the Rings.

- Scoring:
  - ✓ Place the Leaf in the Earth Zone: **10 points/Leaf**
  - ✓ The Manual Robot receives the Bud from Automatic Robot: **10 points/Bud**.
Violations and deduction of points
The following actions will be regarded as violations and **10 points will be deducted for each violation**:

- Robot enters or extends over opponent's zone (except Common Zone).
- The Manual Robot enters the Earth Zone.
- The Automatic Robot starts before it is allowed.
- Automatic Robot continues to place Leaves after picking up the Bud(s).
- The act of using adhesives for the 'Buds' to stand in the Moon or to pick up objects in the game field and leaving adhesives on any objects, contest tools and the game field is strictly prohibited.
- Robots move out of the game field.
- Start before referee's whistle or signal.
Deciding The Winner

* The first team to achieve “THE GREEN PLANET” shall be the winner.
* If the two teams achieve “THE GREEN PLANET” at the same time or neither team achieved “THE GREEN PLANET” within 3 minutes, the winner will be decided by the following priorities:

- **Total scores** after points deduction in that match (if any).
- **Time record** of the first Bud(s) to be received by the team's Manual Robot.
- The first team accomplishes the mission: The Manual Robot picks up the Leaves in the “Leaves Store” and places them in the 3 Rings in the Southern Hemisphere.
Disqualification

The following behavior shall be considered for disqualification of the whole team by the referees.

* The team intentionally damages or tries to damage the Game Field, facilities, equipments or opponent's robots.
* Team's members touch their own Robots intentionally.
* Robots enter the opponent's game field.
* Remove the opponent's Leaf.
* Using the radio waves to interfere in opponent's Robot operation.
* Performing any act against the spirit of fair play.
Importance of Safety

* All Robots must be built so that they will not harm any team members, the referees, match officials, audience, equipment and the Game Field.
* To ensure safety, when using a laser beam, it must be less than or equal to Class 2 laser, and used in a way that will not harm any operators, the referees, match officials, audience.
* The Bud must be soft material and safety for operators, the referees, match officials, audience.
* Safety guidelines for the mechanism to shoot the 'Buds’
  * The robot must have a structure that is easy to check its safety by the judges in the robot check video or during the test run.
  * Combustible-fuel-driven engines, explosives, high-pressure pneumatics, power-generating chemicals, are all prohibited, for motion propulsion or expansion of robot's size.
* **Any other behaviors not specified in the rules,** referees are given full authority to make the decision and the decision is final in the event of a dispute.

* The tolerance about dimension of Game Field and tools is ± 5%.

* Any amendments to the rules will be announced by the Contest Committee and be updated on website as the “FAQ” (see the website: aburobocon2013.vtv.gov.vn)

* All teams are encouraged to decorate two Robots in their own styles within the regulations set by the Rulebook.