The missions will be:

• Making cakes,

• Putting cherry on the cake,

• Dropping the remaining cherries in the basket,

• Putting the wheels in the dish, at the end of the service,

• Deguise to make the party,

• Estimating your performance.Warning! All actions are independent from one another and no specific sequence is imposed whatsoever. No single action is compulsory. Give careful thoughts to your strategy. It is strongly recommended to design simple and reliable systems with a limited number of actions.

The playing area is a horizontal rectangular plan of 3000 mm by 2000 mm with borders of 70 mm height on each side. Depending on the building process, it may consist of one or more pieces (eg 3 pieces of 1000 mm per 2000 mm).

This is an image of the playing area descriped in HTML Image Map:

<!-- Image Map Generated by http://www.image-map.net/ -->

<img src="table.png" usemap="#image-map">

<map name="image-map">

<area target="\_blank" alt="Protected blue dropping area on the top left corner" title="Protected blue dropping area on the top left corner" href="" coords="333,-1,8,335" shape="rect">

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<area target="\_blank" alt="Non-Protected blue dropping area on the bottom right corner" title="Non-Protected blue dropping area on the bottom right corner" href="" coords="1165,1913,1493,2243" shape="rect">

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<area target="\_blank" alt="3 cream pile bellow the top left corner and bellow the 3 icing pile" title="3 cream pile bellow the top left corner and bellow the 3 icing pile" href="" coords="169,576,42" shape="circle">

<area target="\_blank" alt="3 sponge cakes pile on the northwest of the map center" title="3 sponge cakes pile on the northwest of the map center" href="" coords="543,845,45" shape="circle">

<area target="\_blank" alt="3 sponge cakes pile on the southwest of the map center" title="3 sponge cakes pile on the southwest of the map center" href="" coords="542,1404,43" shape="circle">

<area target="\_blank" alt="3 cream pile on the bottom left (on top of the bottom left corner's dropping area)" title="3 cream pile on the bottom left (on top of the bottom left corner's dropping area)" href="" coords="171,1665,44" shape="circle">

<area target="\_blank" alt="3 icing pile on the bottom left (on top of the bottom left corner's green dropping area, bellow the 3 cream pile)" title="3 icing pile on the bottom left (on top of the bottom left corner's green dropping area, bellow the 3 cream pile)" href="" coords="169,1816,42" shape="circle">

<area target="\_blank" alt="3 icing pile on the bottm right (on top of the bottom right corner's blue dropping area, bellow the 3 cream pile)" title="3 icing pile on the bottm right (on top of the bottom right corner's blue dropping area, bellow the 3 cream pile)" href="" coords="1325,1814,43" shape="circle">

<area target="\_blank" alt="3 cream pile on the bottom right (on top of the bottom right corner's dropping area)" title="3 cream pile on the bottom right (on top of the bottom right corner's dropping area)" href="" coords="1329,1668,46" shape="circle">

<area target="\_blank" alt="3 sponge cakes pile on the southeast of the map center" title="3 sponge cakes pile on the southeast of the map center" href="" coords="953,1402,48" shape="circle">

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<area target="\_blank" alt="ArUco marker number 20 on the northwest of the map center" title="ArUco marker number 20 on the northwest of the map center" href="" coords="375,376,476,481" shape="rect">

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<area target="\_blank" alt="ArUco marker number 21 on the northeast of the map center" title="ArUco marker number 21 on the northeast of the map center" href="" coords="" shape="rect">

<area target="\_blank" alt="Cherry dispenser on the top" title="Cherry dispenser on the top" href="" coords="733,1,758,228" shape="rect">

<area target="\_blank" alt="Cherry dispenser on the left" title="Cherry dispenser on the left" href="" coords="22,1233,1,1004" shape="rect">

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<area target="\_blank" alt="Cherry dispenser on the right" title="Cherry dispenser on the right" href="" coords="1476,1004,1493,1243" shape="rect">

<area target="\_blank" alt="Basket Support on the left for the blue team" title="Basket Support on the left for the blue team" href="" coords="8,5,333,22" shape="rect">

<area target="\_blank" alt="Basket Support on the right for the green team" title="Basket Support on the right for the green team" href="" coords="1161,-1,1493,22" shape="rect">

<area target="\_blank" alt="Central tracking device on the top (must not exceed beyond a horizontal plane of 600 mm above the platform’s upper surface, It must also not surpass a horizontal plane of 60mm below the platform’s lower surface.)" title="Central tracking device on the top (must not exceed beyond a horizontal plane of 600 mm above the platform’s upper surface, It must also not surpass a horizontal plane of 60mm below the platform’s lower surface.)" href="" coords="701,22,798,1" shape="rect">

</map>

Each team has 5 dropping area, they are squared surfaces of 45 cm side delimited by a line on the table of the team’s color (the line is included in this zone). Thoses area are both the starting areas for their robots (it’s not mandatory to start all the robots from the same zone), the drooping area for the cakes, and the final area for the robots. (Check the distribution of the dropping areas in the general plan of the table)

At the end of the setup time, the vertical projection of the robots must not exceed the limits of their starting area.

Make sure your robots can fully enter their starting area. The starting area does include the colored lines.

During the 3 minutes of preparation time, a robot can to change its starting zone among all the zones of the team. After the 3 minutes, the robot have to start from the zone in which one he is.

Cake layer: The cake layers are solid discs, with an external diameter of 120 mm, a thickness of 20 mm and a maximum mass of 100 g. They are cover by vinyl on both side, vinyl which containt aruco tag. They are 36 in number, and are initially located on predefined locations (grouped by 3 of identical color) placed by the markings on the playing area:

ArUco 4x4 tags are printed on the faces of cake layers in the following way:

• A tag number 47 on the face of the icing colored in pink.

• A tag number 13 on the face of the cream colored in yellow.

• A tag number 36 on the face of the sponge cake colored in brown.

The plates and platters: They are dropping areas of each team arranged along the edges of the playing area. The drooping area in the back corner are exclusively for the team usage, and are named "platters". THe other dropping area are named "plates". (Check the distribution of the dropping areas in the general plan of the table).

The cherries: The cherries are red foam balls compatible with Nerf RivalTM. They are 60 in total on the table (40 on supports, and 20 preloaded on robots).

Cherry support: The cherry support are drilled planks filled with 10 cherries. There are 4 scattered around the table.

Basket support: The horizontal surface of the basket support is leveled with the top of the playing area border, located at the back of the table, on the same side of the team.

Basket: Made by the team, the basket is the item in which teams deposit the cherries after picking them up. It must be fixed to the basket support during the preparation phase of the game.

D.5. MAKING CAKES

Actions:

• The robots must pick up the layers of cake, sort them, and assemble them by stacking the layers in a

precise order. Once the cakes are done, robots will have to place them in the dropping areas provided

for this purpose.

Constraints:

• For a cake to be valid, it must be composed of at least 1 layer, and at most 3 layers.

• A layer is considered part of a cake if it is in horizontal contact with the play area for the first layer, or if it rests mainly and by horizontal contact on a lower layer. A layer will count only for 1 cake.

• A cake can be valid with any type of layers.

• The legendary recipe is composed of the 3 following layers, in order, from top to bottom:

- Icing

- Cream

- Sponge cake

Respecting this order grants bonus points on the cake.

• To be considered valid, a cake must have all or part of vertical projection of one of its element in a team’s dropping area.

• A dropping area cannot accommodate more than 3 cakes, any additional cake will not be counted. In this case, the counting of points will be done to the advantage of the team.

• Only the cakes dropped in the dropping area at the bottom of the table (in front of the basket supports) will be for the use of the team exclusively.

• If a cake is still under a robot’s control at the end of the match, it will not be counted.

D.5.c. POINTS

• 1 point per layer in the cake

• 4 extra points if the cake respects the legendary recipe

D.6. PUTTING THE CHERRY ON THE CAKE

The cherry-er the better for your cakes! It is up to you to put a cherry on top of every cake

Actions:

• Collect the cherries to place them on the cakes

Constraints:

• For a cherry to be considered valid on a cake, it must be present on the top layer of a valid cake.

• The limit is 1 cherry per cake.

• Teams will be able to pre-load up to 10 cherries into their robots during preparation time. Among these cherries, the non pre-loaded ones will be taken out of the playing area for the all game. They must be easily recoverable at the end of the match.

• The rest of the cherries are placedon the cherry dispensers at the start of the match.

D.6.c. POINTS

• 3 points for each cherry placed on a cake;

D.7. DROPPING CHERRIES IN THE BASKET

Grandma Monique would like that all the ingredients are not lying around: you have to drop the cherries in the basket. Your robots are helped with an intelligent basket that counts the remaining cherries for inventory

Actions:

• The team must drop the cherries in the basket of its colour.

• The basket, made by the team, must indicate the number of cherries it contains.

Constraints:

• A cherry is valid in the basket only if it is present in it at the end of the match.

D.7.c. POINTS

• 5 points if the team places a basket during the preparation time;

• 1 point per cherry in the basket

• 5 extra points if the count is correct and not null

D.8. PUTTING THE WHEELS IN THE PLATE

Once their work is done, the robots will wait for the guests in their plates to party with them. As nobody wants a tire mark on their cakes: between a area full of cakes or a robot, it’s time to choose!

Actions:

• At the end of the match, the robot must be stopped in their own dropping area.

Constraints:

• To be considered valid a robot vertical projection must be at least partially inside the limits of the dropping area of the team.

• Any other element in the team’s dropping area will not be take into account.

• A team with multiple robots can only validate this action if both robots are in the same dropping area.

D.8.c. POINTS

• 15 points if all team’s robot are in its own dropping area;

D.10. ESTIMATE THE PERFORMANCE

ACTIONS AND CONSTRAINTS

• The team must evaluate the number of points scored in the match by its robot(s). For this, there are two exclusive options:

– Pre-match evaluation on a static display: the team writes the score it intends to make during the

match.

– Evaluation during a match on a dynamic display device, which must continue to show the estimated score after the end of the match.

D.10.c. POINTS

The assessment is based on all the previous actions.

The estimation bonus is calculated as follows: Bonus = 20 points - Delta

• The score is the one scored by the team during the match on standard actions.

• The delta is the difference between the score made by the team during the match and the score estimated

by the team. This one is always positive (Absolute value).

• The bonus is an integer value (rounded up).

• The bonus is added to the points of the team.

• A negative bonus is reduced to 0.

• The bonus for not "forfeit" is not include in the performance estimation.

• The penalties are not include in the performance estimation.

Our Robots: