

# 2012 Skills Canada Robotics Questions Summary / March 22

## Virtual Robotics Robotics Platform Change

The Skills Ontario Virtual Robotics is moving from MS-RDS 4 Beta to MS-RDS 4.

The version for MS-RDS 4 is available at:

<http://www.microsoft.com/download/en/details.aspx?id=29081>

1) FtTxBot Simulation:

[http://web.inter.nl.net/users/Ussel-IntDev/fischertechnik\\_public/FTxxService/FtTxBot\\_sim\(2012-03-10\).zip](http://web.inter.nl.net/users/Ussel-IntDev/fischertechnik_public/FTxxService/FtTxBot_sim(2012-03-10).zip)

2) FtTXService:

[http://web.inter.nl.net/users/Ussel-IntDev/fischertechnik\\_public/FTxxService/FtTxService\(2012-03-10\).zip](http://web.inter.nl.net/users/Ussel-IntDev/fischertechnik_public/FTxxService/FtTxService(2012-03-10).zip)

3) The Skills Ontario Virtual Robotics 'Real Robot Component Assembly Instructions' are available at:

<http://www.youtube.com/profile?user=TechOneh>

## First 2012 Robotics Challenge Question

hello,

my name is Rob Epp and i am with Eden High in Dave hunters class.

I have a few questions concerning the construction of the 'pan' and the wood blocks.

-Are the wood blocks available for purchase at a toy store etc., if not what type of wood are we using pine, oak, cherry rough cut, sanded... and paint.

- i can't seem to find any specifications on the top ring of the pan, what material is it made out of and what is the thickness and its diameter.

-the supports for the upper ring i am assuming is threaded rod with a double nut

Rob-

Response:

- 1) The 'Nuggets' will be made from Cedar and painted. The expectation is that 3.5 inch blocks will be cut off a 4 by 4 Cedar Board.
- 2) The Top Ring at the Ontario Competition will be made using 1 inch Black Poly Pipe. The Top Ring is a 'Do Not Touch It' element intended primarily to assist competitors and the referee to see where the Pan's Perimeter Vertical and Top of the Pan 'Do Not Cross Planes' are located. It is possible Team's could use other material when creating their Practice Pan. Alternate Ring material could include Dishwasher Hose or a Hoola Hoop.
- 3) Yes the supports for the Top Ring are Threaded rods with Washers and Double Nuts.

### **Second 2012 Robotics Question**

Good day,

Our question is:

Can teams simply design a robot that's sole purpose is to smash into the 'pan' to knock out opposing teams nuggets.

It is stated in the rules that you can push and bump it but we want to know about excessive force.

It's also stated that you cannot smash into other robot intenially you will get a warning. Is it the same for the pan?

Thank You...

Jaret Paul Brown  
Lead Mentor REBotics  
Skills Canada School Contact  
Eastwood Collegiate Institute

Response:

Response: **All Teams are expected to design a robot with the intention of completing the entire competition task.** A Robot designed to only move the Pan around and not having both a Nugget Collection System and a Nugget Delivery System **DOES NOT MEET the competition expectations.**

Teams arriving at the Skills Ontario Robotics Competition Area with a Robot that does NOT have a Nugget Collection / Delivery System as part of their Robot will NOT be allowed to participate.

It is a very different situation if a Team designs and builds a Nugget Collection / Delivery System that does not work as effectively as they had hoped compared to a Team that has no Nugget Collection / Delivery system at all.

It is also the case that Teams often have to work through equipment problems / breakdowns as the two day tournament takes place and we will continue our practice of encouraging these teams to stay on task and continue to participate as they work through the process of attempting to solve their varied performance issues.

Keep in mind we cannot and are not attempting through rules to mandate a minimum quality performance requirement for the Robots to be allowed to participate. Our competition is intended to have room for and provide a positive experience for all participating Teams from the Inexperienced First Time Teams through to the Repeat Medal Winning Teams.

Regarding 'Bumping / Pushing' the Pan YES this is allowed.

Regarding 'Smashing' the Pan, all teams must keep in mind they are not allowed to damage the court and the Pan is part of the court.

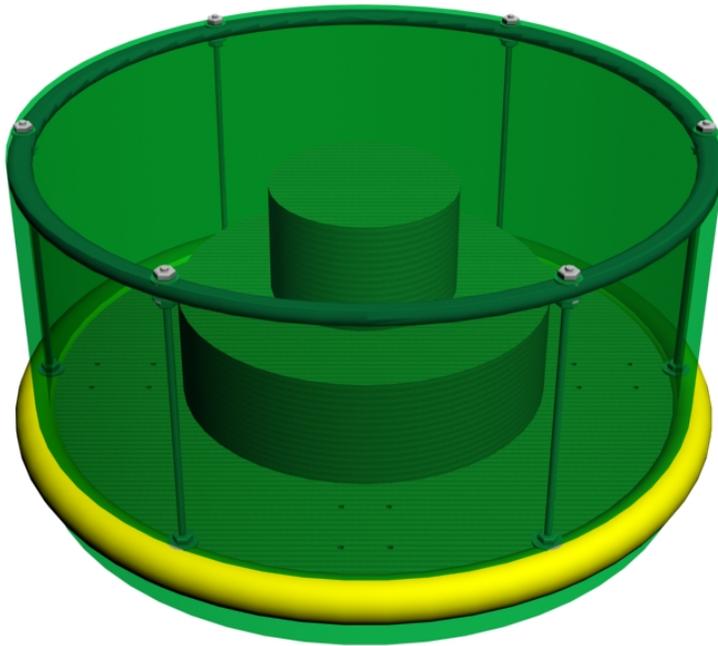
### **Third 2012 Robotics Question**

The Top of the Pan Plane is defined by the Top Ring and the Area Inside Top Ring.

The Side of the Pan Plane is defined by the Top Ring and a Cylinder Extending Down to the Court Floor From the Top Ring.

I have created a JPG of the Pan Planes to support the Planes definition.

Bob



Hi Bob

Seems to be contradiction

Page 9 says no part of the robot is allowed to cross these planes at anytime

Page 10 says

Teams may deliver nuggets by

Reaching out over the pan and dropping a nugget into the pan

Then you have a 24 inches delivery restriction

Something is not clear

Can you clarify how you see this

Mario

**Response:**

The intention is that Robots can Flip / Throw / Push Nuggets into the Pan through the Side of the Pan under the Top Ring or Drop / Throw Nuggets into the Pan through the Top Ring's Horizontal Plane without any part of the Robot breaking either Plane.

It is allowed to extend part of a Robot's Nugget Delivery System into the space above the Pan's Top Plane as long as no part of the Robot breaks either the Side or Top Plane at anytime.

The 24 inch delivery restriction applies to how far forward a Nugget can travel before landing (example: The distance travelled sliding on the Pan Floor after the Nugget lands is not included in this 24 inches). The 24 inches is measured from the point where the Nugget exits the Robot's Nugget Delivery System.

**2012 Robotics Question Four**

Hello

We at Eden High school had another question regarding the nuggets. What type of paint should be used on them; whether it be spray paint, acrylic, etc.

Also, do the threaded posts have a set diameter that they should be?

In regards to the tiers, should they be hollow or solid? We were assuming also that they are also made out of plywood and not painted.

Levi Pauls

On behalf of David Hunter's Eden robotics class

**Response:**

- 1) The Cedar Nuggets will be sealed with Krylon Sealer and painted with Krylon brand Gold, Silver and Chrome paint available at Home Depot or Lowes.
- 2) I will be using 1 Inch Black Poly Pipe (outside diameter 1 3/8<sup>th</sup> inches) for the Ontario Competition Pan's Top Ring
- 3) I will be using ½ inch threaded rods as the Top Ring Support Poles
- 4) With respect to the Tiers our only concern is with the Outside Dimensions. Teams can use whatever interior support pattern they wish.

### **2012 Robotics Question Five**

Hi Bob,

I hope all is well. Is a driver allowed to purposely push the pan into another robot? I understand you are not supposed to purposely damage other robots with your robot but one can argue that they are pushing the pan and not the robot. We also read that a robot can't interfere with another robot while it is picking up blocks. Once again, can a driver push the pan and make the pan interfere with the retrieval of blocks. I think it is important to clarify this ASAP. Cheers,

Luca

### **Response:**

- 1) A Robot is NOT allowed to deliberately push the pan into their opponent robot. However, everyone must keep in mind that the Round Pan when hit by Robots of different shapes will move away in a somewhat uncontrolled manner and Robots will occasionally get hit by the Pan.
- 2) A Robot CAN push the Pan into the Nuggets on the court to move them away from their opponent. However, the expectation is when a Robot is in the act of collecting a particular nugget then opponents cannot use the pan to move that particular nugget. This is intended to protect Nugget Collection Systems given they are likely most vulnerable when they are in the act of collecting a nugget.

### **2012 Robotics Question Six**

To Whom it may Concern,

After some discussion, our group arrived upon a peculiar predicament, in regards to the 2011 Skills Canada Rules. The question remains, is it within our jurisdiction to ram the scoring platform at full speed with the intention of pushing it? We would appreciate it if you were to shed light on this conflicting situation. Thank you.

~Sincerely The Sullivan Heights Robotics Team

### **Response:**

YES a Robot can ram the 'Pan' at full speed with the intention of pushing the Pan. However, Teams must keep in mind they are NOT allowed to damage the Pan.

The expectation is when a Robot hits the Pan:

- Your intention is to push the Pan away from your opponent NOT into your opponent, or,
- Your intention is to push the Pan into a cluster of Nuggets to scatter them about the court surface.

### **2012 Robotics Question Seven**

**Response to Question One is:** The Nugget is NOT part of the Robot. YES the Nugget can be used to push / move a Nugget on the Pan as long as the Robot's Nugget Holding / Grasping Mechanism does NOT cross the Pan's Side or Top Planes.

**Response to Question Two is:** YES you can push a Nugget extending above the Pan's Top Plane OFF the Top Tier with your Robot's Nugget Holding / Grasping Mechanism as long as NO Part of the Mechanism crosses the Pan's Top Plane.

Bob

Hi Bob

Please clarify the following questions:

Question 1: If a robot grasps a nugget, is the nugget considered "part" of the robot? Thus, if a robot has possession of a nugget, can the nugget in its possession be used to go through the side plane and push a nugget sitting of the bottom tier off of the pan as long as no part of the grasping mechanism travels through the plane?

Question 2: If an opponent's nugget is sitting on the top tier, it protrudes above the top plane. Can a robot push a nugget off of the top tier using a mechanism such as an arm as long as it remains above the top plane?

Regards,

Glenn Raake  
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Woodstock, Ontario  
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### **2012 Robotics Question Eight**

**Response:** You are NOT allowed to deliberately conceal the location of an opponent's Special Nugget in particular. This would be a variation on taking possession of your Opponent's Special Nugget which is definitely NOT allowed.

Bob

Hi Bob,

I hope all is well. I have a question that I am going to do my best to explain. Say a team decides to push pieces around using a flat blade bulldozer type of attachment. I think that is perfectly OK. What happens if a team builds a similar bulldozer blade but instead of it being with a flat blade, it has a half a moon shape. In this case, the pieces are somewhat concealed from the other team while they are being pushed. Would this be allowed?

Cheers,

Luca

### **2012 Robotics Question Nine**

Hi Bob

Our team requires a clarification on the rule regarding the maximum distance a nugget can be thrown. The rules state:

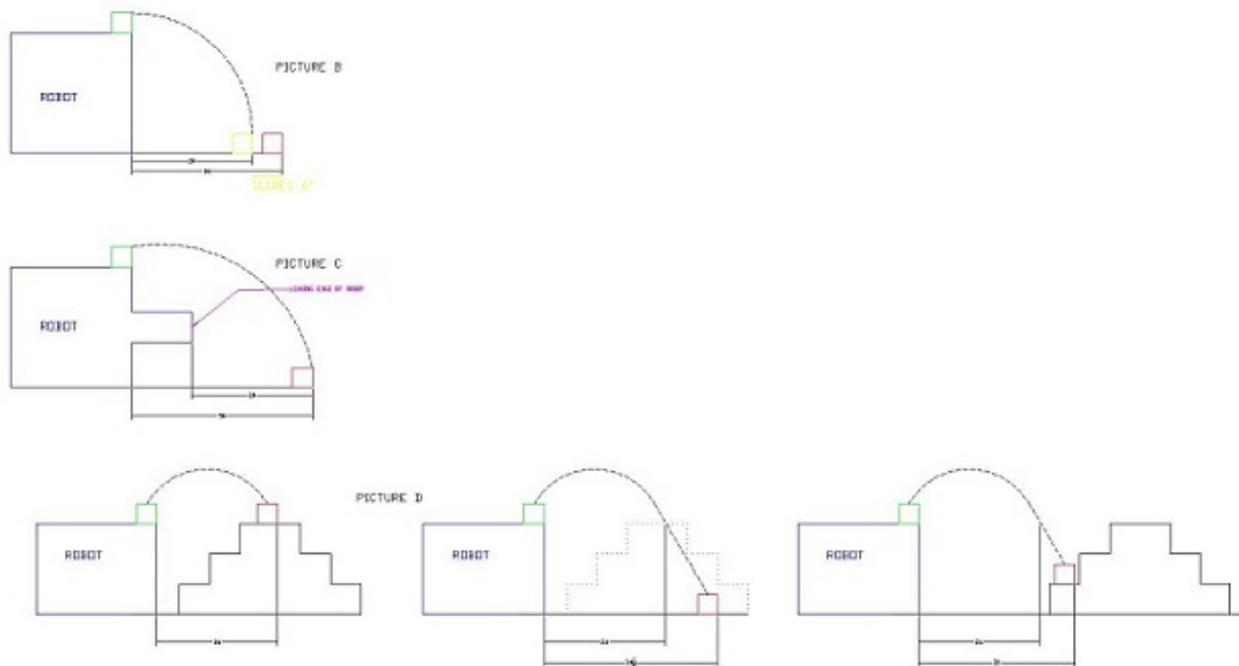
The MAXIMUM distance a nugget delivery system is allowed to project / deliver a nugget is 24 inches measured from the leading edge of the robot. **Nugget delivery system performance will be tested during the robot inspection process and robots not complying with the maximum 24 inch delivery restriction will NOT be allowed participate in games until they have modified their delivery system to be in compliance with the 24 inch delivery restriction.**

I have attached a jpg file for clarification. Please let me know if you are not able to view the pictures.

The situation in the middle has the exact same projection from the robot without the pan showing a distance of 34.5".

The situation on the right has the exact same projection from the robot with the pan in a different location showing a distance of 31".

How will the inspectors test and rule on these three situations with the exact same projection/ delivery system?



The scope says:

- The MAXIMUM Distance a Nugget Delivery Systems is allowed to Project / Deliver a Nugget is 24 inches measured from the leading edge of the robot.

If a team has a Nugget Delivery System that reaches / extends out beyond the perimeter of the robot **BEFORE** executing the Nugget Delivery process then the 24 inches will be measured from the point where the Nugget is released from the Delivery System.

The position of the extended Delivery System at the Time of Nugget Delivery will be considered 'the leading edge of the robot' even when this point is well beyond the perimeter of the robot itself.

Responses to the specific questions asked.

**Question #1:** In picture B, the nugget was thrown 24" and then slides 6". Is the slide counted in the distance?

**Response to Item One:** The 'Slide Distance' is NOT included in the 24 inch delivery restriction.

**Question #2:** In picture C, the nugget was thrown a total of 36" but if measured from the "robot leading edge" it is only a 24". Is this considered a 36" throw or a 24" throw?

**Response to Item Two:** If the Nugget release point from the Delivery System is within the Perimeter of the Robot then the 24 inches will be measured from the point where the Nugget crosses the Perimeter of the Robot so this is a 24 inch throw.

**Question #3:** In picture D, the situation to the left shows a nugget thrown 24" landing on the pan.

The situation in the middle has the exact same projection from the robot without the pan showing a distance of 34.5".

The situation on the right has the exact same projection from the robot with the pan in a different location showing a distance of 31".

How will the inspectors test and rule on these three situations with the exact same projection/ delivery system?

**Response to Item Three:** The compliance with the Delivery Restriction will be determined based on a demonstration of the Delivery System during the Robot Inspection Process and in that situation the Nugget will be delivered onto the Open Court Floor with a Tape Line identifying the 24 Inch Distance.

Note: If during game play a Robot appears to no longer be in compliance with the Delivery Restriction then it will be re-examined using the original Tape Line On the Floor Reference.

Note: The Pan in Image D appears to have three Tiers of equal height but the Competition Pan has only 2 Tiers. Tier One is 6 inches above the Pan Floor and tier Two is 12 inches above the Pan Floor and the Top of the Pan Floor is 3.55 Inches above the Court Floor.

Regarding, How would these three situations with the exact same projection/ delivery system be ruled?

I expect the different throw results relate to how close the Robot is to the Pan when the Nugget is delivered and all would be allowed as long as the basic delivery is in compliance with the 24 Inch Delivery Restriction.

### **Robotics Question Ten**

Can you explain the 24 inch delivery restriction and also can we hit the pyramid of blocks down at the beginning?

**Response:** See '2012 Robotics Question Nine' above given it deals directly with your question about the 24 inch delivery system.

Regarding your second question: 'Can we hit the pyramid of blocks down at the beginning?'

**The response is:** YES. It is expected the pyramid will be knocked down at the start of games either as a result of the Pan being hit into the pyramid or a robot driving into the pyramid.

### **Robotics Question Eleven**

**Question:** Just to clarify, from the edge of the robot to the end of the extended arm cannot exceed 24 inches?

**Response:**

The 24 inch restriction applies to how far the Nugget travels once it is released from the robot's nugget delivery system.

**If** a team decides to include an extended arm in their design there are no restrictions applied to the arm size other than the overall robot (including the arm) must not exceed the 8 cubic feet start of the game robot size limitation.

### **Robotics Question Twelve**

**Response:**

The Nuggets will be cut from a 4 by 4 Cedar Post (which is in reality a 3.5 by 3.5 inch post).

I cannot state an exact / precise mass value for each nugget.

I expect all teams will create practice nuggets and can weight these and obtain an approximation of what the competition nuggets mass will be.

**Question:**

Hey,

Firstly, I would like to thank you for the amount of time you will put into reading/ replying to this email. I appreciate your efforts and time spent on answering the question.

My question is; what is the mass of the nugget that will be used in the competition . It does say it is wooden, but what kind of wood is it? It would be even better if the mass was known.

Thanks again for your time.

-Rohit Verma

**Robotics Question Thirteen**

What grit sandpaper should we use and what is the fourth color? You said seal with krylon and spray with chrome, gold and silver. Or is the sealer the other color? So: sealer, gold, chrome, silver?

Rob-

**Response:**

In the scope it states:

There are 56 Nuggets in play

Teams are assigned 27 Copper or Nickel Nuggets

Teams are assigned either 1 Silver or 1 Gold Nugget

Yes the special nuggets will be Silver and Gold using the Krylon Gold and Silver.

The remaining 54 nuggets are identified in the scope as being 27 Copper Nuggets assigned to one team and 27 Nickel Nuggets assigned to the other team.

The scope colour reference Copper and Nickel should not be taken literally.

**In practical terms these Nuggets need to be distinct colours to support the spotters and drivers being able to identify the Nuggets they should seek out and those they should leave alone.**

**In Ontario we will paint one set of 27 Nuggets Black and the other set of 27 Nuggets White.**

Regarding the grade of sandpaper to use a standard fine grade would be ok.

Teams can expect the Nugget surfaces to be relatively smooth and non-porous based on these surfaces being painted.

Teams should not expect these surfaces to be sanded with wet / dry sandpaper and painted multiple times to generate a glass like degree of smoothness.

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### **Accommodation for a special situation**

hello,

I'm part of the E.C. Drury robotics team of 4. I was hoping you could answer the following question:

would the driver and spotter be able to use 2 way radios to communicate?

I'm asking because I'm hard of hearing and found it really difficult to hear my spotter last year.

thanks for your time.

AUSTIN MCNEIL

E.C.Drury

STUDENT MODERATOR

Response;

**YES** Austin you and your spotter will be allowed to use 2 way radios to communicate at the Skills Ontario Robotic Challenge. The Skills Canada National Technical Committee has also confirmed that if the E. C. Drury Team advances to Edmonton then they will allow your team to use the 2 way radios to communicate at the National Competition in Edmonton.

Note: This is an 'Accommodation for a special situation and does not represent any changing of the rules as defined in the scope and does not extend permission to all teams to use 2 way radios to communicate between their Driver and Spotter.

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### **Robotics Question Fourteen**

It appears I had a 'Senior Moment' and failed to respond to a question submitted awhile ago regarding "the pool noodle geometry and fastening process".

The image below displays my understanding of the Noodle Bumper Dimensions.

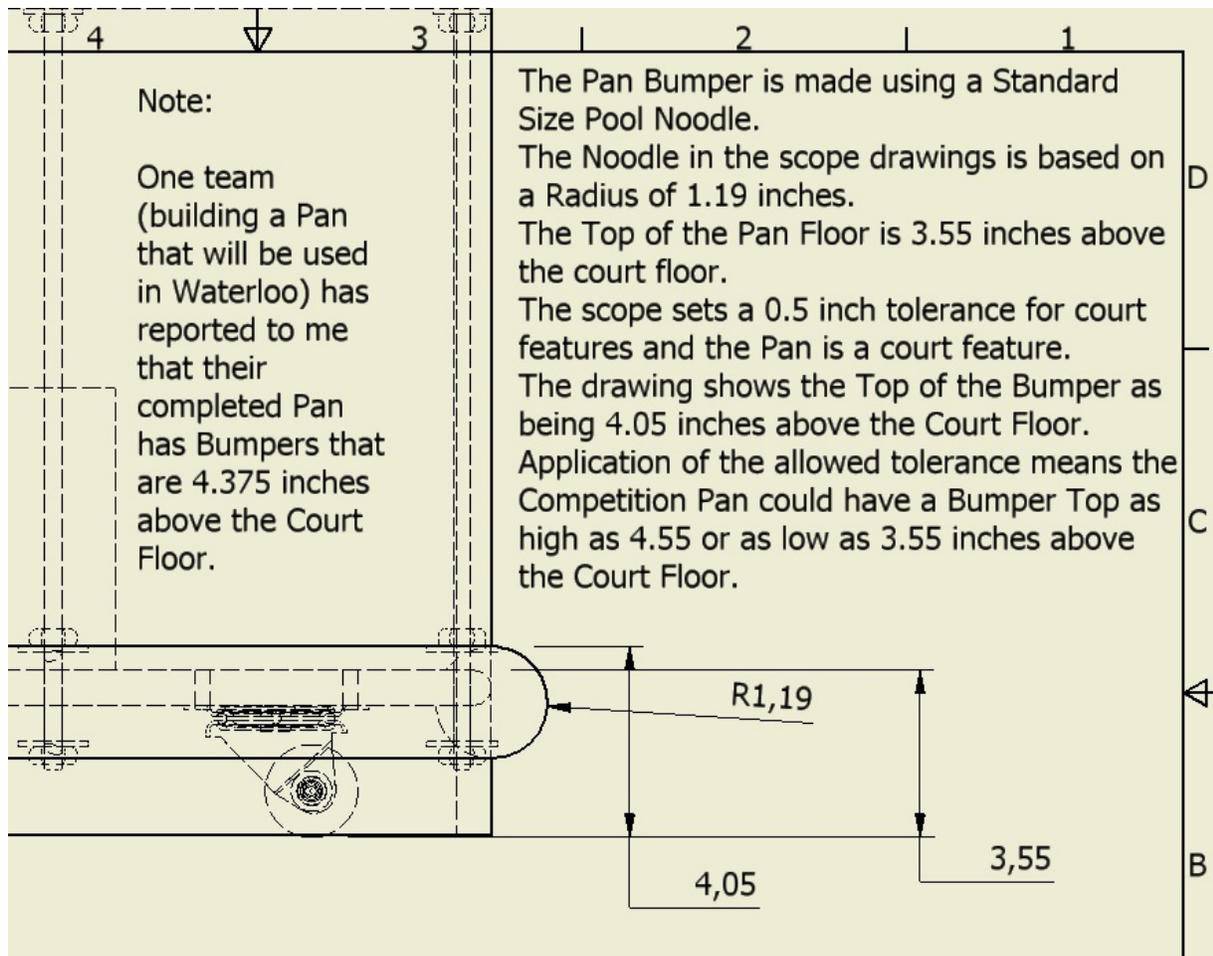
The threaded rods that hold the upper rim pass through the Bumper Noodle and there will be top and bottom Nut / Washer combinations on these threaded rods pinching the Bumper Noodle and holding it in place.

I expect the Top of the Noodle Bumper to be no more than 4.55 inches above the court floor.

The Team building one of the Pans that will be used in Waterloo reports the Top of the Noodle Bumper is  $4/375$  inches above the court floor.

Sorry for the delayed response.

Bob



## **2012 is a Team Canada Selection Year**

I understand that most Teachers have more than FOUR students involved in the Robot Creation Process.

Teams participating in Robotics at the Ontario Technological Skills Competition are limited to FOUR Competitors.

All Four Members of the 2012 Skills Ontario Gold Medal Robotics Team will be eligible to advance to the 2012 Skills Canada National Robotics Competition in Edmonton.

However, ONLY TWO Members of the 2012 Skills Canada National Gold Medal Robotics Team will be eligible for membership in Team Canada 2013.

The Teacher of the 2012 Skills Ontario Gold Medal Robotics Team will be required to identify, **BEFORE they go to Edmonton**, which TWO members of their team will be the 2013 Team Canada Mobile Robotics Competitor Candidates.

The attached PDF Mobile Robotics at Worldskills 2013 provides some background information related to what participation in WSI Mobile Robotics involves.

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### **Robotics Question Fifteen**

Hey I want to know if having two 24 volt motors connected to one speed controller each drawing 10 amps would be considered one circuit or can they be considered as two different circuits.

**Response:** The scope states:

#### Power Sources / Management

1. The total voltage in any individual circuit cannot exceed 24 Volts.
2. The maximum continuous power rating allowed in any circuit is 240 W, which will be limited by voltage and fuse selection. Example:  $12\text{Volts} \times 20\text{ Amps} = 240\text{ Watts}$

Given the maximum fuse you can have in a 24V circuit is 10 Amps it is quite likely your two 24V motors in one circuit each drawing 10 Amps will be unstable.

If your speed controller is a dual motor unit then you can dedicate a separate 10 Amp fuse to each motor given the speed controller is effectively connected to two circuits.

## **Robotics Question Sixteen**

A few Nugget Questions.

**Question One:** If a Nugget is sitting On the Pan Bumper, not touching the Pan Floor at all and has only partially passed through the Pan's Plane does it count for scoring purposes?

**Response: YES,** a Nugget sitting On a Bumper is completely free of the court floor, in possession of the Pan and will be awarded a Single Point = to the value of being on the Pan Floor even if this Nugget has not passed completely through the Pan's Vertical Plane.

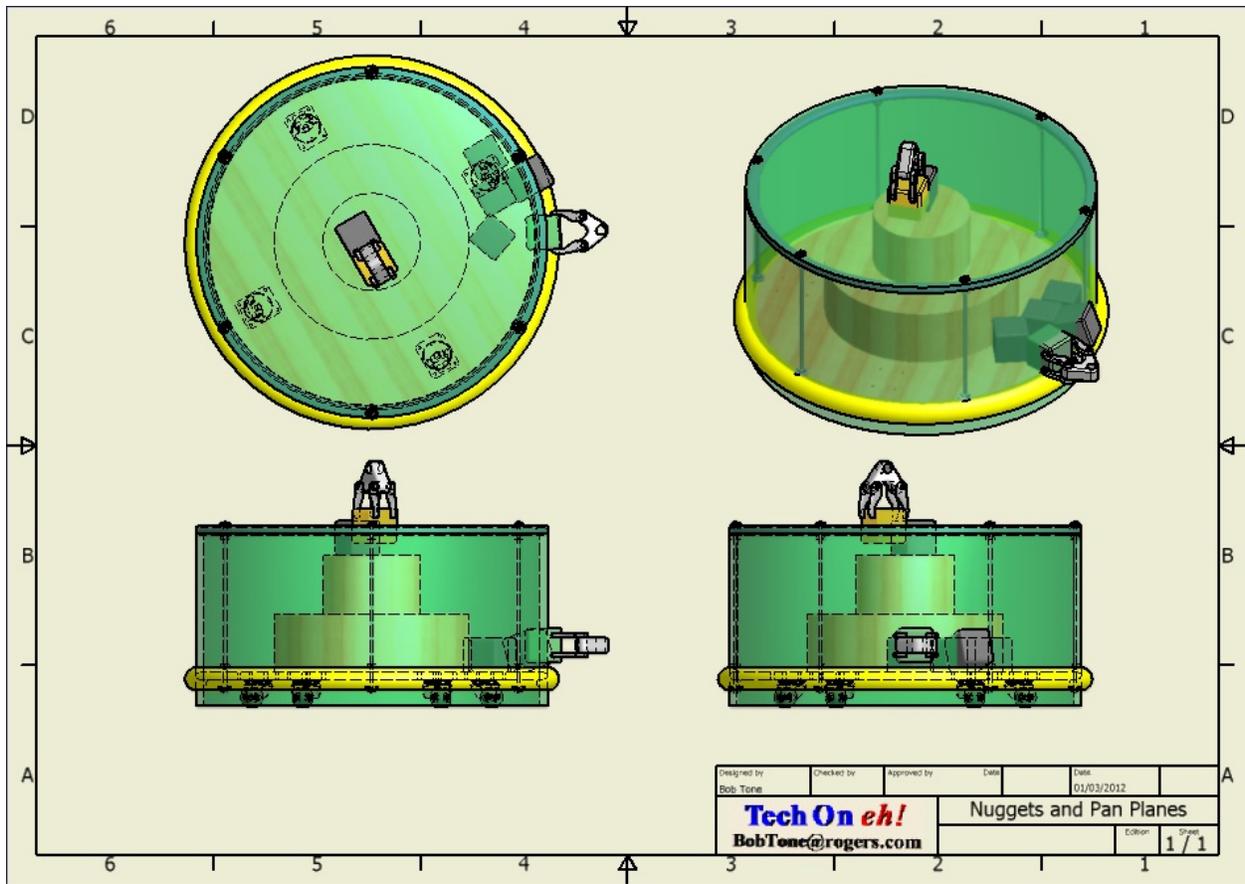
**Question Two:** Is a Nugget considered part of the robot when it is in the delivery system?

**Response: NO,** a Nugget is NOT part of a robot when it is in the delivery system

**Question Three:** Can you knock the other teams Nugget off the top platform or push an already on the Pan Floor Nuggets when delivering a Nugget onto the Pan?

**Response: YES,** you can Deliberately Move / Push Nuggets on the Pan if your Nugget Delivery System controls / holds the Nugget in a manner that allows a portion of a Nugget to cross a Pan Plane before being released from the delivery device. **This is allowed as long as the delivery device itself does not cross the Pan's Plane** (see the Claws in the image below).

**Please Note:** A Nugget sitting on the Top Shelf of the Pan will extend approximately 1 Inch ABOVE the Pan's Top Plane.



### Robotics Question Seventeen

The team is busy designing and building our robot for this year's skills competition.

Wondering if you could clarify a couple of things for me. Grasping the pan.

If for example a robot had a curved bulldozer style blade or the front of the robot was curved to help push/gather nuggets and move the pan.

Assuming if the robot moved left or right the pan would roll off.

Would this be considered grasping?

Also, if a robot was pushing the pan and then moves between the pan and an approaching robot to move the pan in a different direction would this be considered blocking?

**My responses** to your questions take into account the actual competition experiences we had on March 3<sup>rd</sup> at the Toronto Catholic District School Board Robotics Challenge.

**Regarding Grasping the Pan:**

- You cannot have any mechanism (Hook / Pincher) that places a direct grip on any part of the Pan. There is no restriction in place regarding the shape of a Robot at the point where it contacts the Pan Bumper other than it cannot grasp the Pan. A U-Shaped Robot Front would interact with the Pan Bumper in a manner similar to a Curved Bulldozer Style Blade.

**Regarding controlling the Pan through contact with the Pan Bumper:**

- You are allowed to Control / Move the Pan by Hitting / Bumping Into the Pan Bumper, or by asserting a continuous contact with the Bumper Pushing action.
- Note: The rules state you cannot deliberately Hit the Pan INTO your opponent. However, IF a Robot is pinching the Pan up against the court wall (in particular at a corner of the court) then it is unavoidable that when an opponent hits the Pan to try and free it the Pan will be pushed both into the Robot trying to pinch the Pan against the court wall as well as the court wall itself.

**Regarding Blocking:**

- When a Robot is approaching the Pan an opponent Robot can move in front of the approaching robot for the purpose of hitting the Pan or delivering a Nugget of their own into the Pan as long as there is open space large enough for the Robot to fit between the Pan and their opponent without hitting their opponent.
- The type of Robot behaviour that would be considered Blocking and be unacceptable would be if a Robot was manoeuvring to stay in front of

their opponent while not trying to either Move the Pan or Deliver a Nugget into the Pan.