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EVENT REPORT: RoboCore Winter Challenge 2009

● by Marco Meggiolaro

The fifth edition of the RoboCore Winter Challenge 2009 (www.robocore.net) took place on July 25-26, in the city of Amparo (Sao Paulo state, Brazil), with about 80 robots and 230 builders.

The combat categories were Middle, Feather, and Hobby, plus Sumo 3 kg auto, Sumo 3 kg R/C, Sumo LEGO 1 kg auto, and Hockey Pro. The entrance for the audience was free of charge (courtesy of the city mayor), which helped to pack the benches.

The arena was about 30 ft x 30 ft, with a steel floor and reinforced ceiling, equipped with a lighting and sound system for the fights. All fights were projected on a large screen for the audience, and all brackets and schedules were available online in real time. A nice feature was that they had several large screen LCD TVs all over the pits, so the builders could watch all the fights from anywhere while fixing their robots. The event was also very strict about only allowing the driver and another person to stand near each driver area, which was great.

Friday

RioBotz arrived on Friday

morning. We spent the whole day and night "loctiting" all screws, testing the combots, and finishing our hockey bots (which had been built only a few days earlier). We were competing with MW Touro, FW Touro Feather, HW Touro Jr, and HW Puminha (a wedge), besides Pe de Boi (Sumo 3 kg RC), Pe de Boi+ (Sumo 3 kg auto), and the RioBotz Hockey Team.

Saturday

Most teams arrived on Saturday morning. Safety inspection was fast and well organized. At 3:00 pm, the fights started. Touro won two fights by KO against a wedge/drum and a rammer. Touro Jr also won two fights by KO. Touro Feather got a bye, and ended up not fighting on Saturday.

The RioBotz Hockey Team faced three 10-minute matches against three teams, winning them by (if I'm not mistaken) 12x0, 13x1, and 14x2, advancing to the finals. We couldn't believe it. These hockey bots had been built in a hurry in a couple of days, and the 14x2 was against the RoboCore Hockey Team (2008 Brazilian champs and bronze at RoboGames 2009). The students/drivers deserve

a lot of the credit.

Sunday

Sumos started exactly at 11:00 in the morning. Our Pe de Boi+ got gold after winning all Sumo auto matches, except for one round against the slow but very powerful D-Foker. At 12:15 pm, the Sumo R/C matches started. Our Pe de Boi got silver after losing one round in the finals to D-Foker, while the other two rounds were a tie.

Combats started at 1:30 pm. Touro faced Johnny Bravo, a rugged Touro-look-alike drumbot with a very hard drum spun by a large Mag and a rear wedge. After the first hits, one of our wheels stopped working. We later found that one of our freshmen had forgotten to hot-glue the receiver plugs onto the Victors. Daniel had to drive with a single wheel for the entire match. After a nasty drum-to-drum hit, three out of the four 12 mm bolts that hold Touro's single tooth in its drum channel had sheared, and the tooth started hitting the arena floor until we had to stop the drum. Johnny's weapon seemed damaged as well, so he moved away avoiding us until he got high-centered by the very same



Everybody loves sparks.



Sumo action.



Touro Feather.



Touro Jr.

bolts he had sheared off from Touro, losing the match. Touro was very lucky this time.

Touro Feather then faced two wedges — winning both matches by KO — giving them a lot of air time. Puminha (hobby) and Touro Jr (hobby) also won against other wedges.

After hot gluing Touro's connectors and replacing the tooth screws, we've realized we had to change the long Mag from the weapon, as well. Touro then faced the vertical disk spinner A Besta (The Beast), from Team Uairrior — our arch-rivals since 2003. Nasty weapon-to-weapon hits made A Besta hit the floor and the Lexan walls, bouncing in the arena. Touro was then hit and almost flipped over. A final hit from Touro made A Besta cross the arena and get stuck on the arena's reinforced-concrete bumpers. There's a video at www.youtube.com/watch?v=f4SqkMgaieo.

Touro Feather faced Drakon Feather in the finals, a very tough steel wedge. After some nice hits, TF's drum tooth broke off, leaving us without a weapon. The match then went to just shoving around, and we lost by points. Since it was a double elimination event and we were in the winner's bracket, we had a second chance.

Johnny Bravo won against A Besta in the loser's bracket finals. The final MW match was then Touro against the tough drumbot Johnny Bravo. After some driving and dodging, Touro delivered a nice hit that almost flipped Johnny. After more driving and dodging, Touro hit Johnny again, launching it and making it flip 360 degrees in the air. When Johnny landed, it was stuck on the arena concrete bumpers. Our driver Daniel then decided to free Johnny and go on with the fight. After three attempts to free

him, Johnny was still stuck. Johnny's driver then asked to hit him hard to try to get unstuck. Unfortunately, Touro hit it too hard and totaled Johnny's left side, winning by KO. Touro celebrated with his gyro dance until it got stuck in the arena.

Touro Feather then went again against the wedge Drakon Feather. TF had a hard time during the first minute getting shoved against the arena walls several times. TF's right wheel stopped working, but Daniel used the drum gyroscopic effect to dodge the wedge and hit a huge blow that bent the wedge. After more dodging using only one wheel, TF delivered another huge blow that broke off its tooth, but also broke Drakon Feather's drivetrain.

DF spent the rest of the match barely moving only one wheel, until it completely stopped. DF was counted out with only six seconds remaining in the match. Touro Feather was very lucky, getting first place.

Our hockey team then went to the final match against the Thunderratz team. RioBotz won by 15x2. The match was very fun to watch and the audience loved it.

The last match of the event was the hobby finals. Puminha (our hobby wedge) faced the shell-spinner Butcher — an old rival from Team Uairrior. Puminha's titanium wedge launched Butcher and broke one of its shell teeth. The shell weapon stopped working after the impact, and Puminha spent the rest of the match shoving Butcher around, until it was able to flip it

against the arena edge and make it get stuck. Puminha had won First place!

Besides very nice trophies for all categories, RoboCore awards the equivalent to US\$1,500 for the First middle, US\$1,000 for Second, and US\$500 for Third. Feather and hobbies also receive money prizes.

The award ceremony was very nice; most builders were still present to watch it. RoboCore awards prizes for best design, most original bot, and best new bot (first time competing) for each combat weight class, no matter how well the bot did in the arena. This stimulates every team to stay until the end of the ceremony to see who wins these awards.

RoboCore also hands out the Wellington Branco award, which goes to the builder who most helped other teams during the event. Every builder is voted on by builders from other teams. This helps to create a friendly environment with a lot of information exchange.

After the event, several teams went out to have dinner together, and several uniforms/t-shirts were exchanged. You can't get friendlier than that! Don't be fooled, however! While the arena lights are green, it is a no-holds-barred fight with very passionate cheering! It was a great experience.

Results

In the six categories RioBotz competed, we got five golds



(middle, feather, hobby, hockey pro, Sumo 3 kg auto) and one silver (Sumo 3 kg R/C). Here are the combat results:

Middleweight:

- 1st – Touro (Team RioBotz), drumbot
- 2nd – Johnny Bravo (Team Savuca), drumbot/rear wedge

- 3rd – A Besta (Team Uairrior), vertical disk spinner

Featherweight:

- 1st – Touro Feather (Team RioBotz), drumbot
- 2nd – Drakon Feather (Team Triton), wedge
- 3rd – Cascudo (Team Muqueca), thwackbot/full body spinner

Hobbyweight:

- 1st – Puminha (Team RioBotz), wedge
- 2nd – Butcher (Team Uairrior), shell spinner
- 3rd – Fenilcididina (Team The Killers), wedge **SV**

Action photos by Leandro Bergamo, Bot photos courtesy of www.buildersdb.com.

PARTS IS PARTS: Hole Drilling How-To

● by Nick Martin

In this short fact sheet, we'll cover the most important terms and techniques for trouble-free hole drilling. Hang this up by your drill press for a quick go-to guide.

Drill Geometry

Point angle

Drills come in several standard point angles. The important thing to remember is that larger angles like 135 degrees are better in hard materials such as alloy steel and titanium. Smaller angles (giving a sharper point) will cut very well in soft materials like aluminum or plastic. If you have a range of materials to cut with one drill, go with the larger angle.

Point style

There are two common point styles: standard and split. Standard points are fine for lower accuracy and softer materials, while split points are less likely to wander off location and will start drilling with less pressure. If you use a mix of hard and soft materials, then split point drills will cope with more tasks than standard points. Split point drills often have a thicker web (the core between the flutes) and smaller flutes; this makes them

stiffer but less able to clear stringy material.

Standard points are harder to get started on target and need more force to cut. Their advantages are ease of re-sharpening and lower cost.

Lengths

Drills come in a number of standard lengths. The type you get in hardware stores are 'jobber' length drills and are fine for most applications. Difficult drilling tasks call for special drill lengths:

- *Short* length drills are very stiff and are great for starting off holes accurately as they will not wander off center like longer drills can. Their short flute length means they are only useful for shallower holes, however, I find they cover 80% of drilling operations in my workshop. They are often cheaper than jobber drills, so give them serious consideration.

- *Maintenance* length drills fit between short and jobber lengths. Unless the size drill you need is only available in this length, go shorter for accuracy or longer for reach.

- *Extension* length drills are used

for extra deep holes or hard to reach places. Their extra length allows them to flex more and they are likely to produce a hole that is not straight or properly sized. If possible, start the hole off with a shorter drill and swap to the longer drill only when the regular drill is at maximum depth. Also remember to clear the chips out of deep holes more frequently.

Drill Composition

Drills have to be harder than the material they are cutting – the harder the drill, the less often you have to re-sharpen it. The three most common types of drill material are:

High speed steel (HSS)

These are the drills available at bargain prices from places like Harbor Freight and Home Depot. They are suitable for non-abrasive plastics, softer metals, and mild steel. HSS fails dismally in hardened steel parts or titanium – you may have to re-sharpen between every hole!

Cobalt steel

These are premium drills that will tackle alloy steel and titanium, as well as abrasive composites like