

Troubleshooting  
Tips for  
Competition



A Ghostly  
Tale by  
FRC team  
1482

The Great  
Programming  
Debate

Find Out  
Where to View  
Competitions  
This Year

Chief Delphi and  
Competition





With competitions creeping up on us, we can definitely say it has been a crazy build season! All the teams have been working so hard, and it is amazing to see their visions and dreams coming to life (and promptly getting thrown into a plastic bag to be tagged).

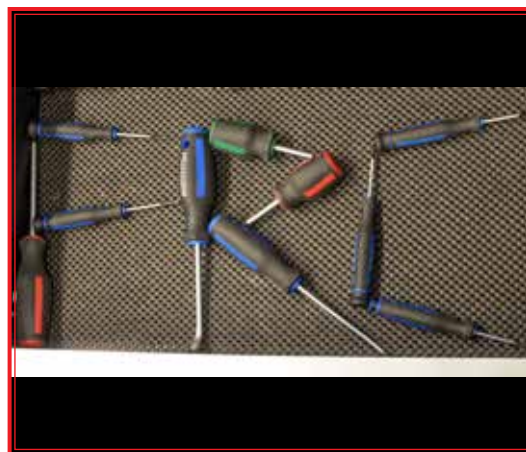
However your team has been doing this season, we hope you can get some good advice from here to help you as you prepare for your competitions.

Keep in mind that the competition stats, and sometimes a live-stream, can be viewed from The Blue Alliance website.

As always, this magazine is dedicated to connecting teens and mentors from all over the world. If you think your team has a story, to tell, please contact us! We love meeting all of you and showing everyone else how each person and each team is a story.

Good luck at your competitions!

~Lydia Sobschak



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# Story of the Ghosts

By Lydia Sobschak, as told by Emmett Rimes

Last year was the height of our team and in my opinion one of the best years of my time at high school. Our team numbered around 25 members, most in their final year and all dedicated to making our team the best. My experience last year started in the beginning of December, since I missed the first months of pre-season because of football. In the short time of preseason left, we were able to prepare for the oncoming build season, gathering materials and organizing our room.

Our team lead, Kyle, took over that, employing members such as myself to assist, while our other team lead, Michaela, worked away to secure as many sponsors as possible. I was worried for the year, since it felt our planning at kickoff didn't seem to operate too well; however, we were able to

establish what we were going to focus on: climbing and carrying the gear. We were able to make some rough sketches that Kyle and Martin were able to set up in a basic design.

Our build season kicked off rather smoothly, completing some of the 3D models of the frame and beginning work on fabricating it while also drawing up ideas for prototyping our gear holder. I like to think I thought up the gear holder, but in truth the whole idea had some parts from everyone.

Halfway through the build season we had the main frame done with our gear holder mounted and being finalized; we also planned to make a shooter for scoring balls with a prototype that seemed promising.

Even though we were working hard, we still had time for team

shenanigans, making several videos of random funny moments from throughout the year. These include, but are not limited to, making a fake Gucci watch and saying robot time or someone beating a bearing into the robot with a rock. My favourite shenanigan was when the toaster oven was belching black smoke, during which the principal walks in and doesn't look surprised at the whole situation.

In the waning weeks of the build, our robot was only needing a few tweaks here and there, but we all felt confident for the regional. Our regional started off almost as well, as we ran headlong into all the problems we did see when building.

Our first couple matches went pretty good, taking a couple wins and a few losses, but our aggressive style began to take its toll.

*Build season is a great time for fun with your FRC family.*



*FRC team 1482 gathers around their freshly bagged bot.*

Our robot began to require maintenance constantly, but our team managed to press on through our qualifications coming in 27th place. By the time of picking for eliminations, we assumed that we were done, until we were surprised to be the third pick for the first place team.

Together, with the help of our allies, teams 2122 and 4334, we were able to modify our robot to climb faster, and we removed the now non-functional shooter. Our alliance was able to play on each other's strengths, with 2122 covering shooting and 4334 running gears while we played a defensive role.

With hard-fought match after match, we eventually rose through the ranks to the final match. The tensions were at a peak as we set up for the final battle of the regional, with resolve to be victorious. Through our combined efforts, we destroyed the competition, winning our regional.

Through my years with my team, I've never seen anyone so hap-

py. All of us fought hard through blood, sweat and tears (all literally, tears only for Ian though). We were so excited and all looked like fools for how hard we were celebrating.

Moments later, the reality of the situation set in: we were going to worlds! This hyped up our team to new levels. The moments between winning and receiving our banner was a blur of excitement and joy mixed with pictures all along the way.

While our alliance members took their banners with the calm composition of veterans who do it all the time, we were a lot more excited since it was the first banner in over five years.

After the multitude of pictures with our new blue, we capped off our day packing up our pits and helping others with theirs.

The next day at school was full of pride for our victory for about an hour, which then led into the hustle of getting ready for worlds and reverting into panic mode.

Our teacher, Mr. Kosloski, was

a miracle worker. Usually an international trip takes six months to approve through the school district; however, we had about a week and a half to get it done. He probably didn't sleep for a week, since his usual strange emails were at an all-time high for weird level.

We were able to get through, though, and pulled off the trip. The wait for the plane and subsequent plane ride were full of energy and anticipation for the upcoming challenge. I was a total mix between happiness and anxiety for the rest of trip ahead. Through long waits and Mr. Kosloski getting lost multiple times, we eventually were able to get to the pits and start on the repair of our battle scarred robot for the fight ahead.

Our first matches started off really well, going on to win our first couple matches; however, just as things were going well, they decided to go bad. Our first misfortune was encountered after a bad hit to our robot, almost destroy-

ing our frame and even breaking a majority of welds. Although we managed to rig our robot back together, our next losses involved bad luck in our alliance pairing with one not showing up in a match. In another match, one of our alliance mates ran into some fiery electrical trouble. Still we continued to press on during the two days of qualifications, trying to stay sane from a combo of jet lag and lack of sleep.

Our team was able to crawl our way back up into 25th place out of the 60 or so in our division. Much to our disappointment, we were not lucky enough to be picked for eliminations. The team had a brief interval of disappointment followed by the relaxing feeling of being completed for our year.

With our team watching various division finals, we were able to wind down from all of the stress of competition. In between eliminations and Einstein's, there was a series of outdoor events, the best being a friendly game of soccer among all the teams, with it being open for everyone to join.

It was so hot outside, but myself and Danny [our resident electronics expert] decided to join in, and it was a blast. We finished off exhausted but with some new friends before heading to the Houston Astros stadium to watch the finals.

I swear we waited in line for at least a couple eternities, but it was worth it completely. We had

some pretty good seats and of course our sleep deprived team found it completely necessary to be the loudest group in the stands. Sporting our white cowboy hats, we cheered and danced, making it onto the screen most of the time. Our focus of celebration was to cheer along the winners of our division, Roebeling, who seemed a bit like the underdogs in the championships.

We watched as the alliances we fought with/against rose through the ranks of the event and eventually came to finals. Here is where the excitement peaked. Every single action had us on the edges of our seats, every point scored having us cheer with every point against having us slink back in our seats. Each match came super close, with our division scraping through the first match with a win only to lose the second.

After a slight break for the FTC, we prepared ourselves for the final showdown: underdogs versus seasoned champions. The match was a new level of intense, with each side making bold maneuvers in hopes of tipping the scales in their favour. The deciding factor hit the match when one of the Roebeling robots disabled a robot in the other teams loading area, ensuing a chaos that forced penalties on both sides. When the smoke finally cleared and the match ended, we cried out in victory as our division winners took down the giants and won worlds.

We didn't stop the celebration until we got back to the hotel that night. Our trip wrapped up nicely with us spending our last day enjoying ourselves while we waited to head home with many fun memories along the way. The flight home was a buzz with a weary excitement, both ready to return but still hyped from the celebration. This trip ended the season for our team strong and the memories achieved throughout the competition will last our team for the rest of our lives, each of us having some amazing story to tell.

*The Ghost's bumpers have many battle scars from their past competitions.*



*Emmett Rimes, captain of FRC team 1482, The Ghosts, has been on the team for three years. The 2016 competition season was the first time he was able to attend worlds, and it was an experience he will never forget.*



# The Programming Debate

By Lydia Sobschak

There are many different methods of programming, even just within FRC. Each programmer has their own preferences and opinions, and a few of these programmers shared their opinions.

Judah Page, an alumnus of FRC team 2013, used the water-fall method as the programmer for his team. This method is started by getting all of the requirements/restrictions for the code. Then, you start brainstorming possible ways to do it, and start writing down pseudo code [fake code] so that your idea is already partially translated when you start programming. From there, you move on to development of the code and the actual writing. The method is finished after debugging and testing, and switching between development and testing until

*Sometimes getting another person to look through the code for errors can be helpful.*



*Each programmer has their own favourite method.*

you're happy with the finished product.

"It makes it a lot easier to think about and break down a problem, and even write code in programming languages you are unfamiliar with."

Judah said the best part about using this method is how it helps manages time and resources. You know what you're doing, how you're doing it, and when you're doing.

This method allows you to in-

volve the entire team in the process, from how the drivers want the joystick programmed, to how the builders want certain parts to work, and how things need to be wired or built for you. It allows for a lot more efficiency within a team.

This method can, however, prove challenging if people don't write down their ideas, or you can't get exactly what the team wants out of it.

"It's hard to code not knowing what people want."

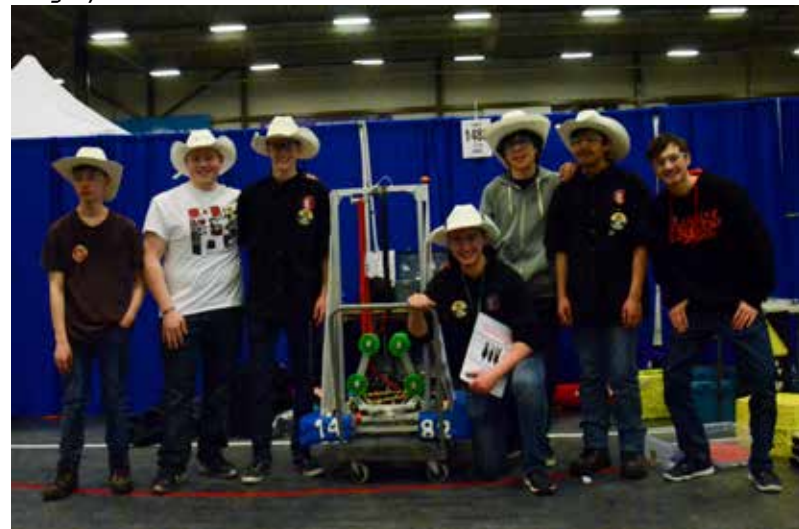
Judah's favourite part about programming is the problem solving. "It's such a thrill to have and solve problems and make powerful things from simply punching keys on a keyboard. Solving a hard problem is so rewarding and makes it so much more fun. Without the challenge it would be almost pointless."

Taylor Reeve, the current programmer for FRC team 6336, is skilled at programming, and even has the "programmer humor."

"I commonly use a keyboard as a method of programming, and occasionally I use a mouse as well, because that's how computers work. I could see this being a challenging method if you were born with no arms. It would hurt if you were to directly hook up your brain to the computer," said Taylor.

When Taylor finally stopped joking around, he shared his opin-

*Team 1482 poses together at the Canadian Rockies Regional in Calgary.*



ions. For programming methods, he likes to mentally make an outline of what he'd like to do, then write it down. It lets him sort out the thought processes required to complete the task at hand."

He said this method can be helpful in terms of robotics as you are able to begin writing the code for it at the same time the robot is being built instead of waiting for it to be completed and having to use trial and error.

However, Taylor said it could be challenging to program this way if you have a hard time interpreting your thoughts or do not have a clear goal in mind when beginning.

Taylor said the best part for him is the happy excitement of things actually working. "It's fun to see

things that you put your mind to forming see work in the real world"

Jesus Cuadra, alumnus of FRC team 4633, enjoys most how logical programming is. There is usually a simple and understandable reason why something doesn't work, and it allows for ease of use after an initial learning curve.

The method Jesus usually uses during programming, and more specifically debugging, is called the Rubber Duck method. This involves explaining the code both as it's being written and after completion to someone or something line-by-line. This lets you catch any errors in logic since you are saying aloud what you're typing or should have typed.

He mentioned that the challenges to this method are similar to any methods that involve only a single person working on it. Everything that you say is in your own point-of-view, and is tainted by your personal bias and ideas of how the code should or could be.

This method helps in terms of robotics as the robots are operated using input and Boolean logic, so speaking your logic aloud and comparing it to what was written helps find any error much more easily.

"That is not to say that any other method of programming is wrong when it comes to robotics or in general, and they all have their specific pros and cons."

*Bellow, team 5630 works on program during the build season. Right, team 1482 works on some programming issues while at the 2018 Calgary regional.*



# Robot Troubleshooting

By Lydia Sobschak

*As the competition season gets going, the bots go through lots of wear and tear. When this happens, it's always handy to have a checklist of what to look for when making fixes. John Morgan, previous build captain for FRC team 2013 shared such a list with us.*

## 1. Is it a mechanical issue?

- Broken parts
- Sprockets, gears, chains, bolts, wheels, frame, track
- Cut wires
- Air leaks

## 2. Is it an electrical issue?

- Motors burning out
- Brown outs
- Sparks
- Hot wires
- Lack of power

## 3. Is it a connection issue?

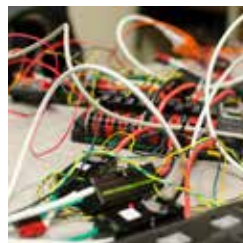
- Canbus wires in correct slots
- Router problems
- Limit switches and encoders
- Do controller buttons work?

## 4. Is it a special issue?

- Things you don't expect to happen

## 5. Is it a code issue?

- [Last because code doesn't change]
- Improper commands
- Correct talon configuration
- Correct code installed/updated/pushed to robot
- Correct button functions for controller
- Restart the rio; power cycle the robot



# Best Part of Competition, Told by Chief Delphi

## Mr Tatorscout

Without a doubt, the best part is seeing multiple teams in a single pit. The kids are teaching, coding, cutting, wiring, disassembling and reassembling a struggling team's bot. When they're done, they meet on the field and give it their all. This level of gracious professionalism that I see at every regional and sometimes at champs is like no other sport. There's a sense of accomplishment that comes from knowing you helped another team succeed and compete. Even if they beat you!

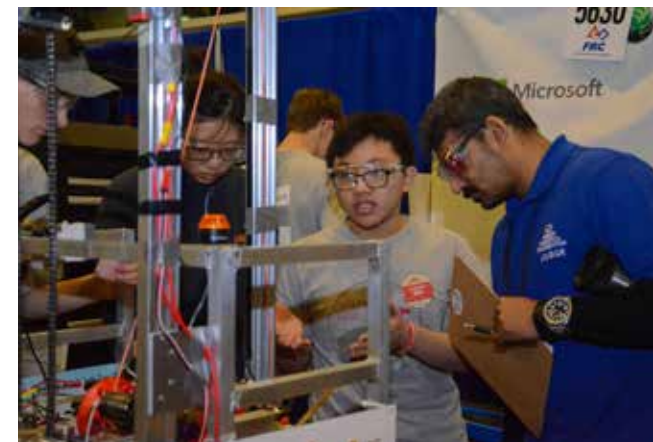


## NerdyCharmax

The robots. Always great to see what my peers come up with!

## hectorcastillo

Being forced to make a mechanical fix that would normally take half an hour in just five minutes because of a tight match turnaround.



## Zeb340

For me The most fun part is seeing how other people solved the same problem and explaining our robot to those who are interested. I like going around the pits on practice day and seeing what other people have made. When the robot is functioning and we are winning matches that's pretty fun too.

### amieagasino

Simply sitting in the stands and cheering has a bad reputation on my team, I would say. But last year during the last 30 seconds of finals match 2, my entire team got up on our feet and cheered as loud as we could. The enthusiasm, adrenaline, and sense of family during those mere 30 seconds pretty much topped anything else for me.



### Mitch Stokes

The moments before matches either in queue or in the pits where you're putting together the strategy for the next match, especially when it seems like you have no chance of victory. When you win those "impossible" matches it's an awesome feeling.



### Gamma +

The smell of fresh game field carpet.



### Thatnameistaken

When i was a driver, it was easily the entire match cycle, from pre-match strategizing to setup to actually playing it to awaiting the score with baited breath. The thrill was like nothing else I'd ever experienced.



### bsmo

For me, its pit scouting. Of course I love meeting new people and seeing old friends, but I especially love seeing other teams pride in the robot they built and how excited everyone is to talk about something they love.

### JKippy

Getting hyped in the stands during eliminations. I always leave competitions without a voice.



### Stoyo

The atmosphere of the FIRST Competitions are the best part of the whole season. Each and every person and team is always willing to help, wanting to cheer, and full of excitement. The best part about it, no matter what happens in the matches, everyone shares that winning spirit, unlike other sports where only one team wins.



### Hitchhiker 42

Auto is really cool. It's basically magic.

### CalTran

Favorite part by far post-student career has been volunteering with, in my opinion, the best dang crew this side of the Mississippi. It's great getting to hang out with some seriously awesome people, and help give back to a program that gave me so much to boot too.

### HolyDollar

I must say one of my favorite parts of the competition has always been going around the pits collecting all the team buttons. I just really get a kick out of making a huge collection out of them (and filling a trench coat to the brim with them).



### Dwight\_2

Most of all the realization that you may all be on different teams from different cities, states, and countries but you are all on one team working to the same goal on the same team, The FIRST team.

# REY Robotics Electronics Starter Kit

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- 36" CAN Wire  
(REY-11-1149)
- 36" 2-Wire Jumper Cable  
(REY-11-1134)
- SPARK Motor Controller (x2)  
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