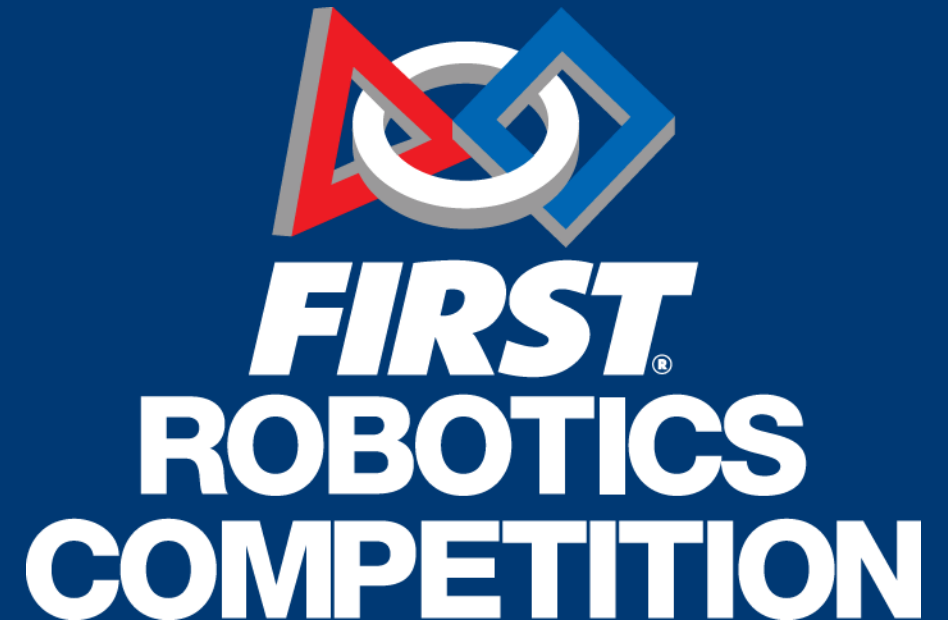


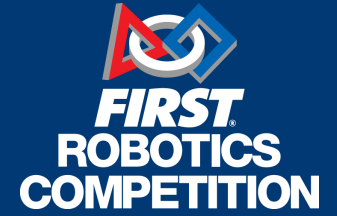
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# CONNECTING TO THE FIELD AND STAYING CONNECTED

Kevin Dieterle  
Mid-Atlantic Robotics FTA Coordinator  
January 9, 2016



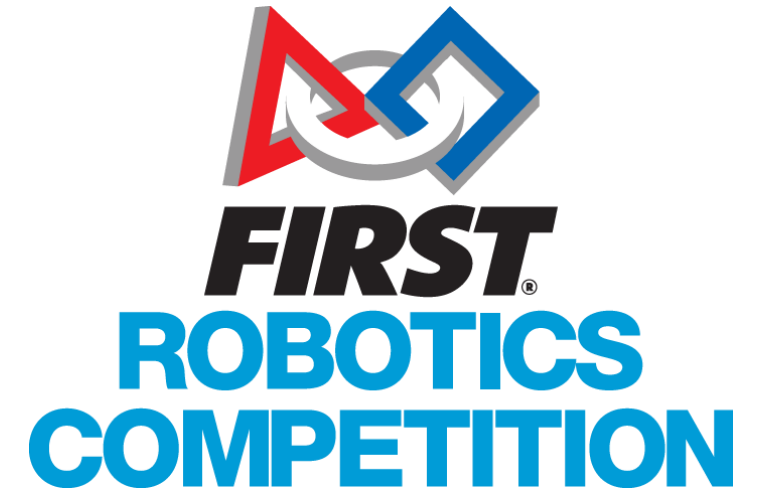
# AGENDA



- Introduction
- Common Problems
- Driver Station
- Robot Issues
- 2016 Radio

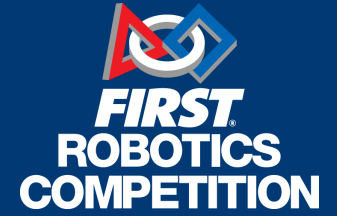
# WHAT IS AN FTA?

- **FIRST** Technical Advisor
- Trained at *FIRST* HQ each year
- Representative of *FIRST* at FRC events.
- Large responsibility for the quality, consistency, and success of event.
- Key advisor for the field, game, and competition.
- Monitors matches, wireless connections, robot linking, and helping teams as appropriate.

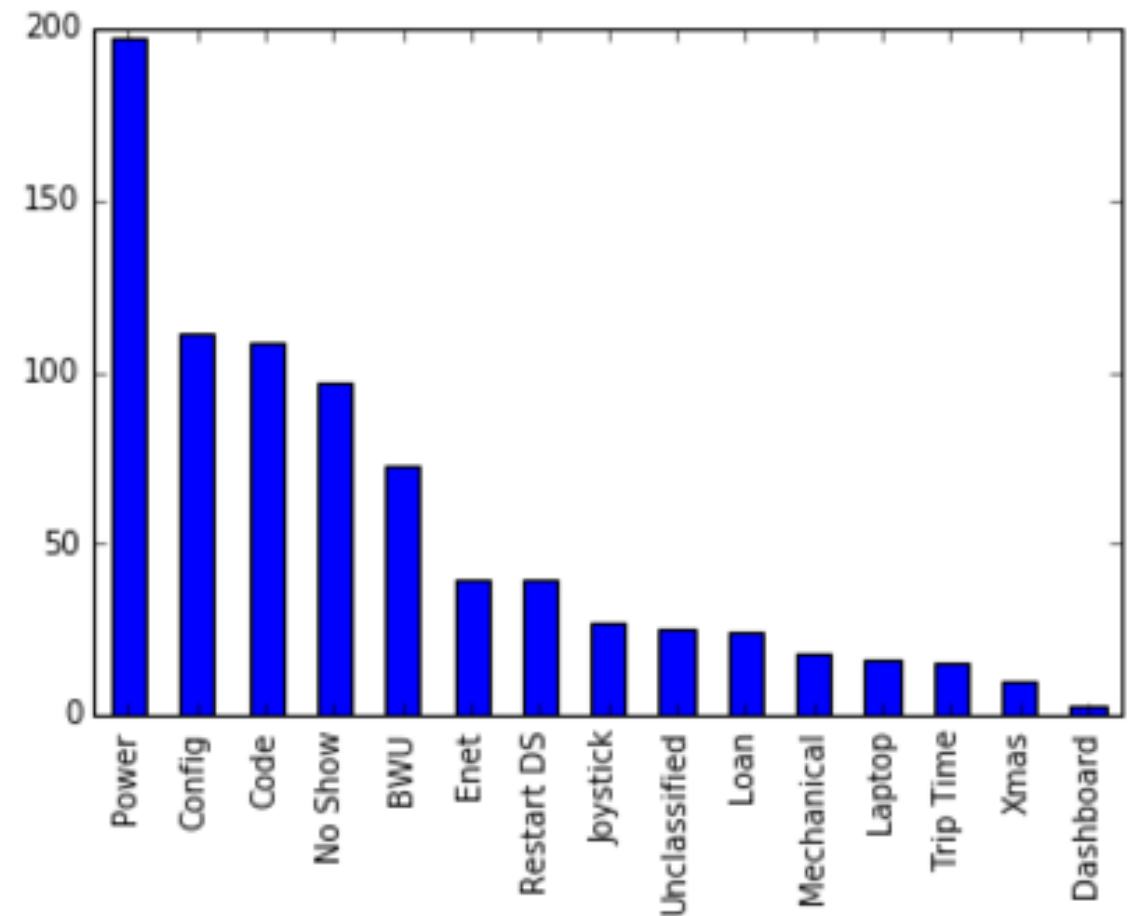


# COMMON PROBLEMS

# COMMON PROBLEMS

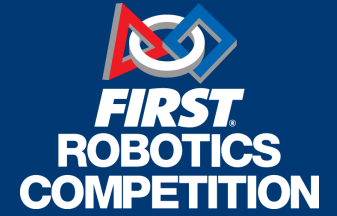


- Data gathered by multiple FTAs across all events
- Most common problems:
  - Power
  - Configuration
  - Robot Code
  - Ethernet Issue (DS or Robot)

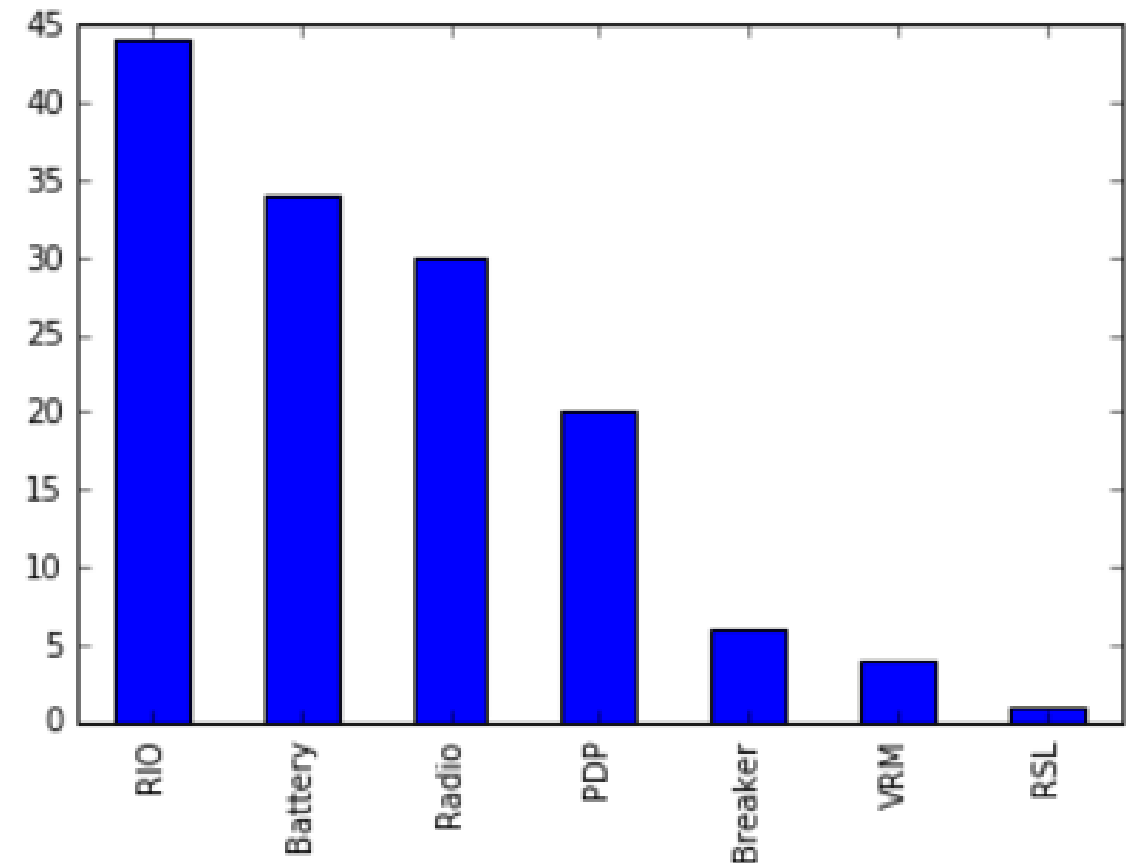


*Data credits to FTA Oliver Graff and FTA Notepad app team*

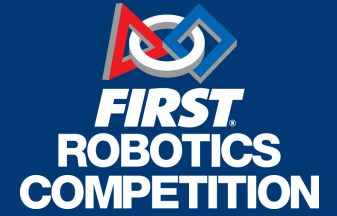
# POWER PROBLEMS



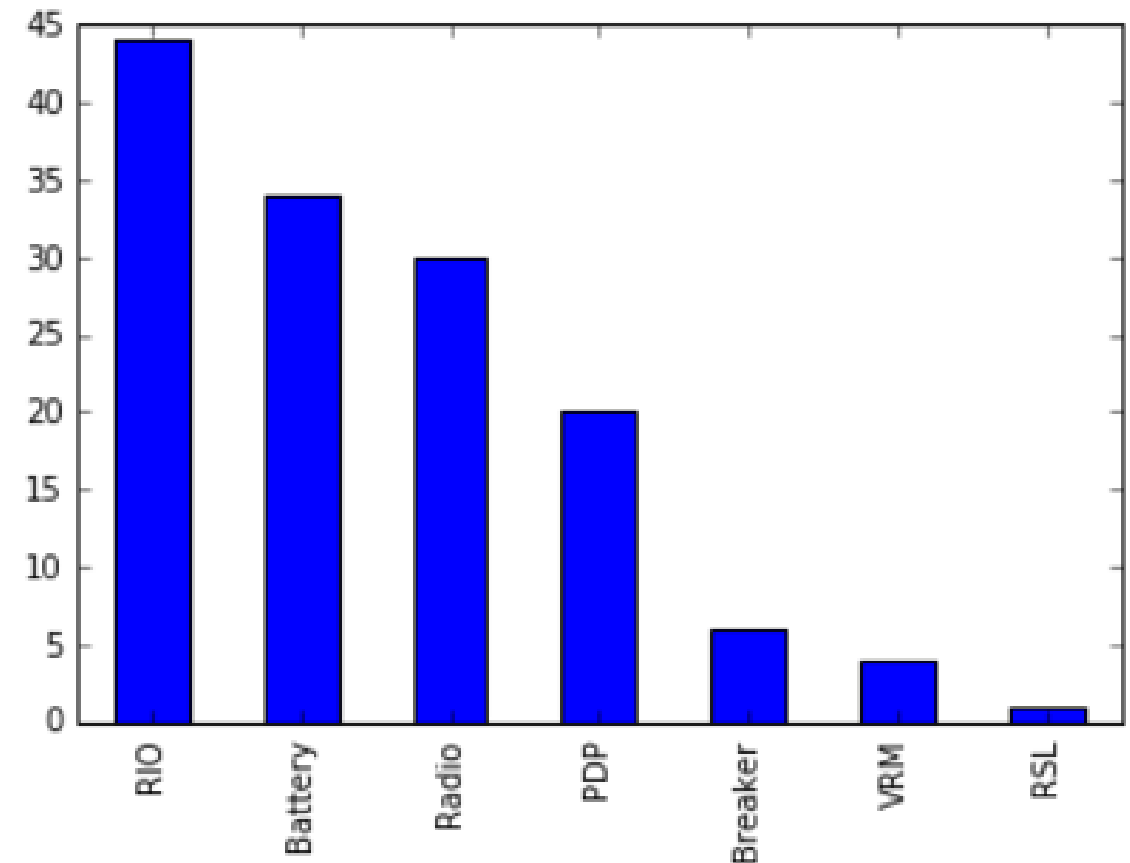
- RoboRIO
  - Bad connection from PDP
  - Low battery voltage
  - Temporary voltage drop due to high current draw (motors, short circuit, etc.)
  - Fuse on PDP for RoboRIO power not fully inserted



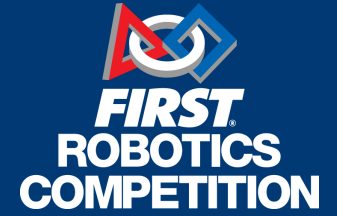
# POWER PROBLEMS



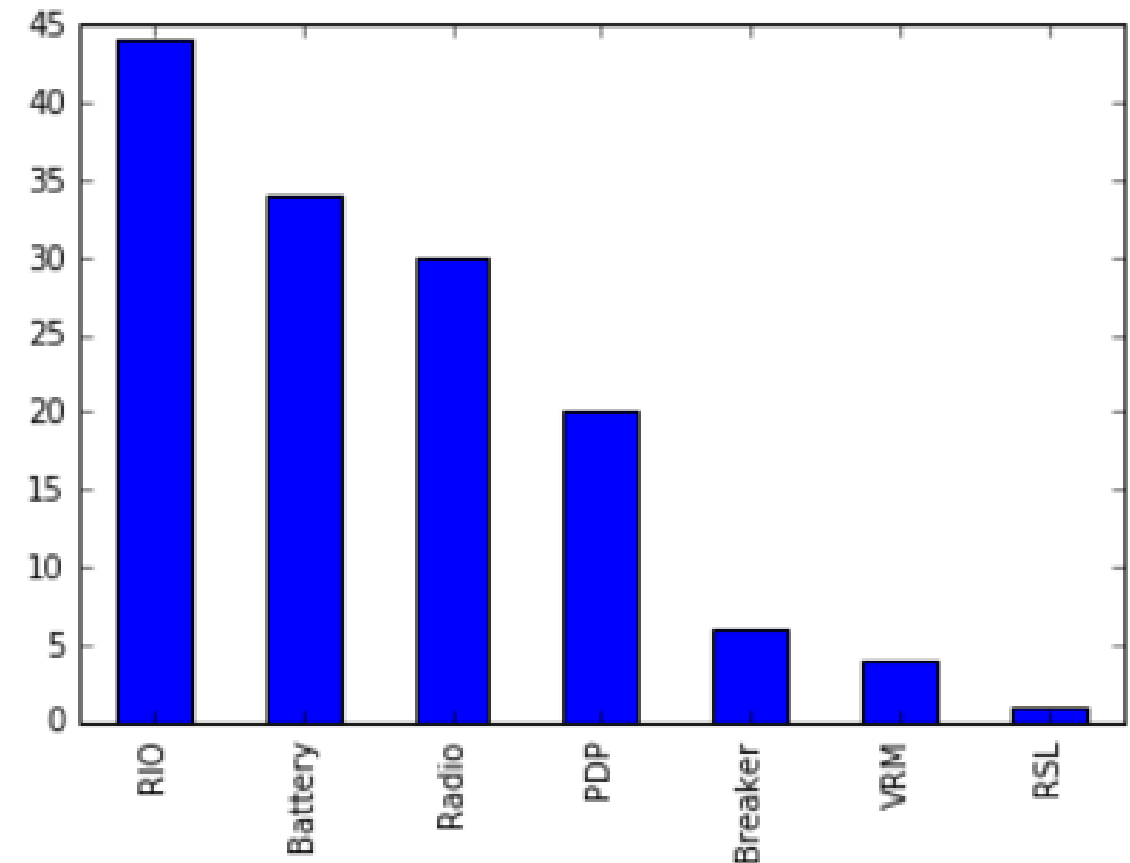
- Battery
  - Bad connection between battery, main breaker, and PDP (loose terminals, etc.)
  - Battery not fully charged
  - Bad battery



# POWER PROBLEMS

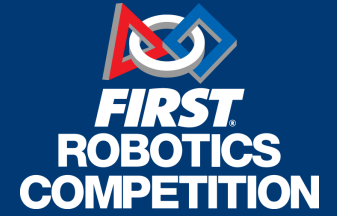


- Radio
  - Power connector loose or not connected
  - Power connected to wrong VRM connection (**12V/2A for 2016**)

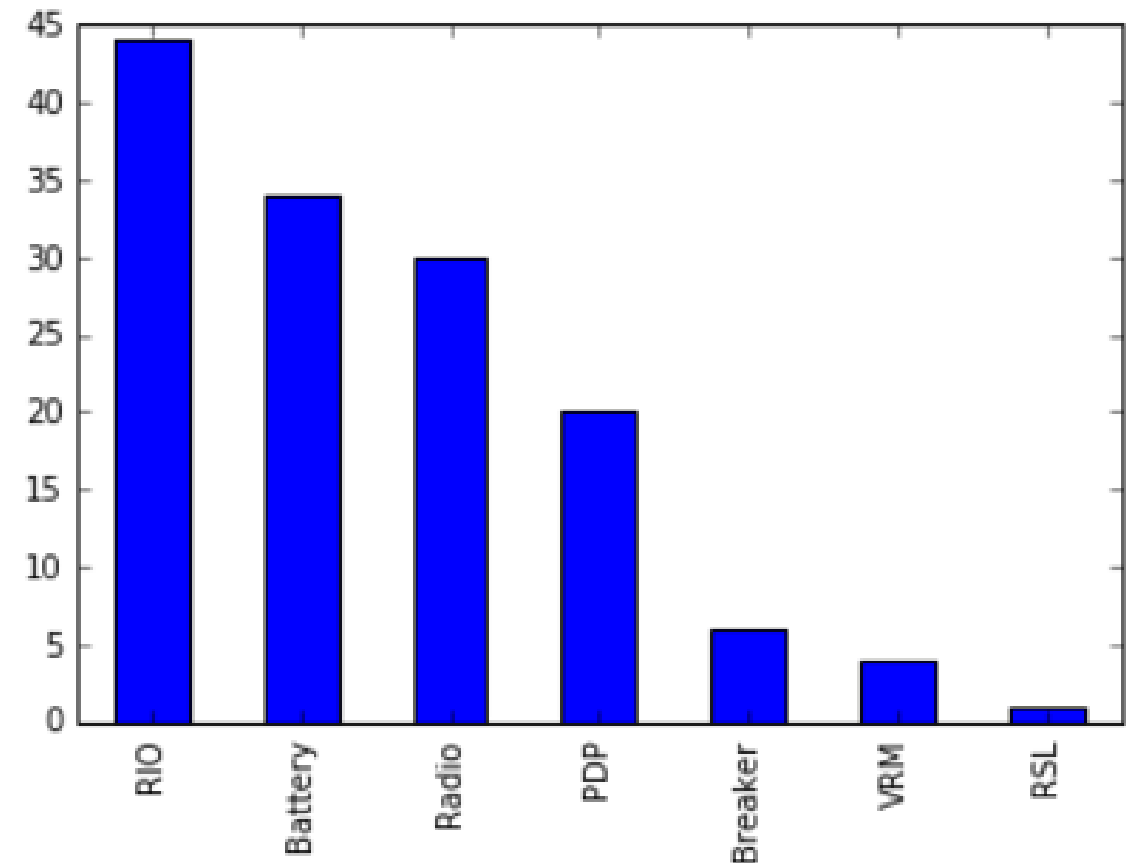




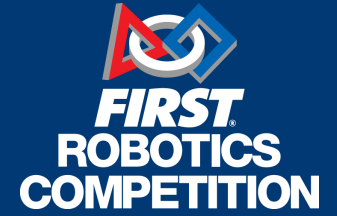
# POWER PROBLEMS



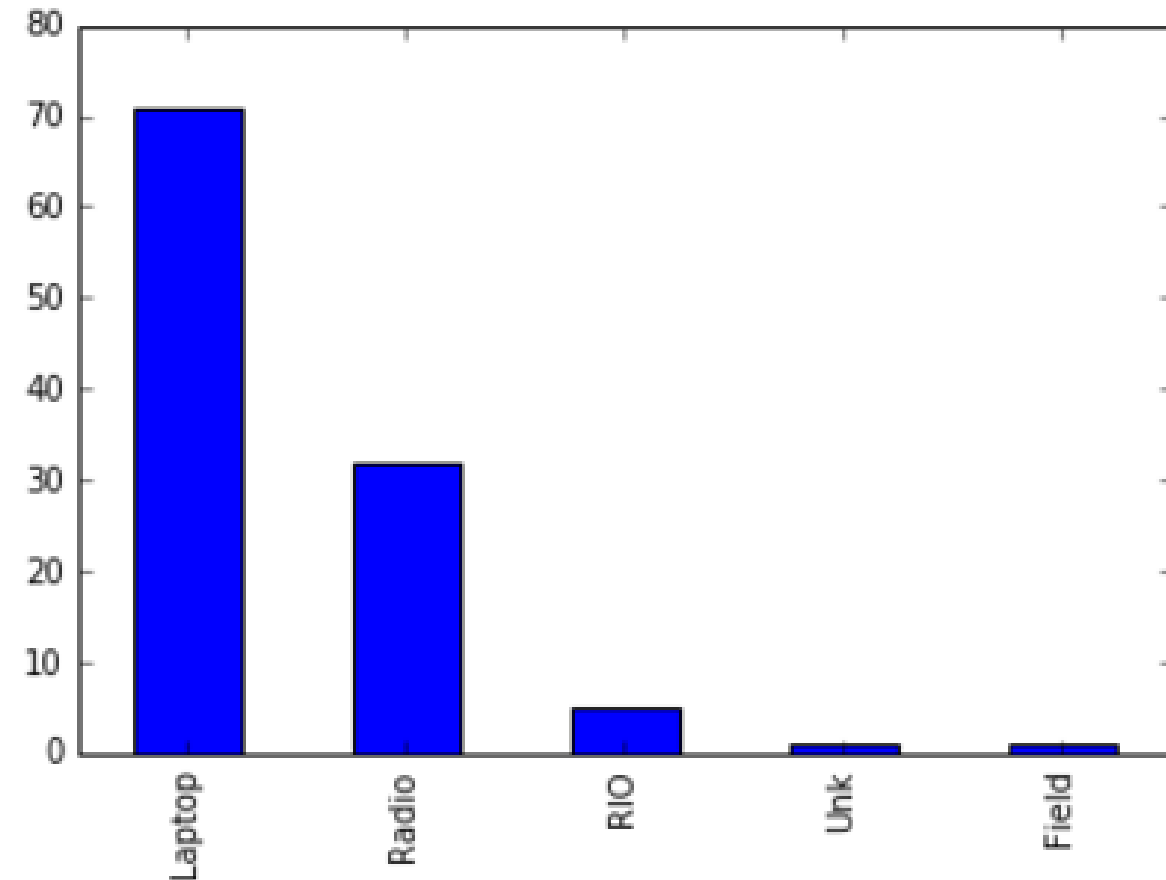
- Power Distribution Panel
  - Loose or disconnected wires
  - Breakers or fuses not inserted all the way



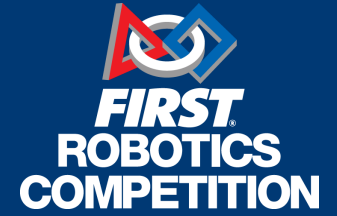
# CONFIGURATION PROBLEMS



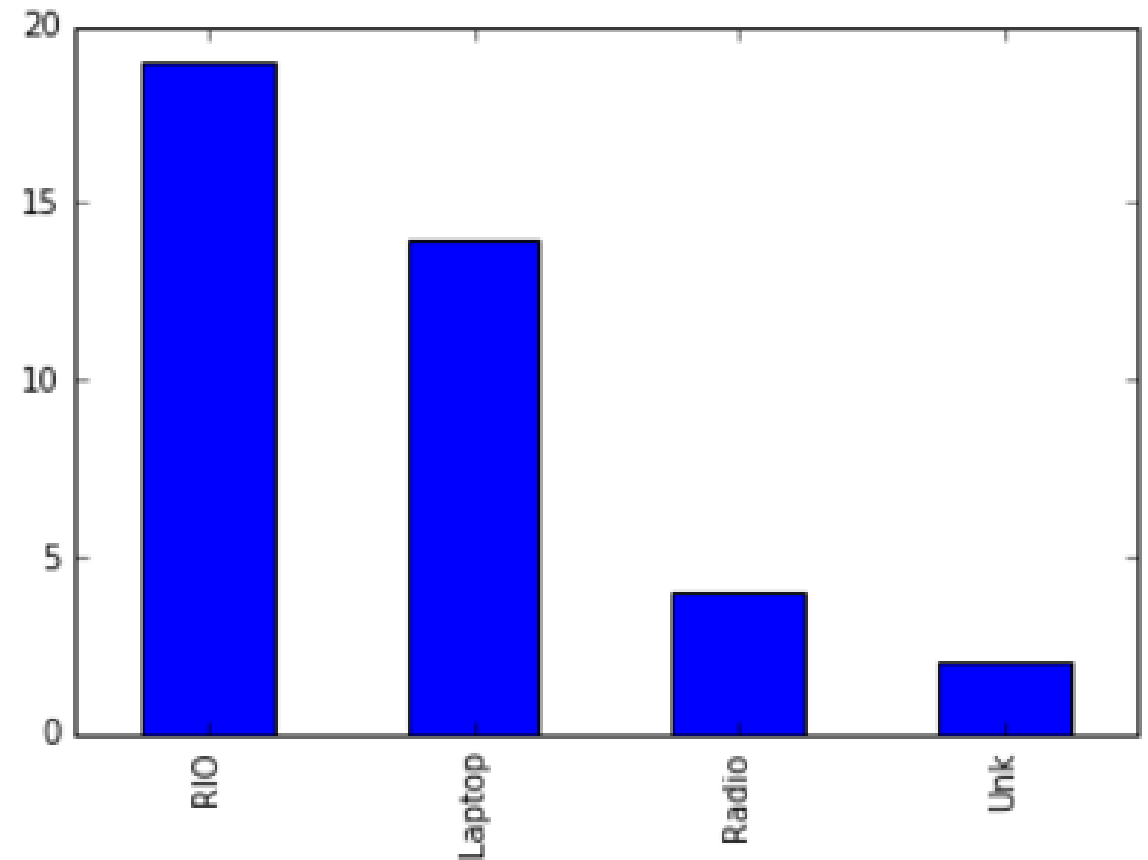
- Laptop/Driver Station
  - Radio
  - RoboRIO
- 
- Follow instructions on WPILib Screensteps Live to avoid

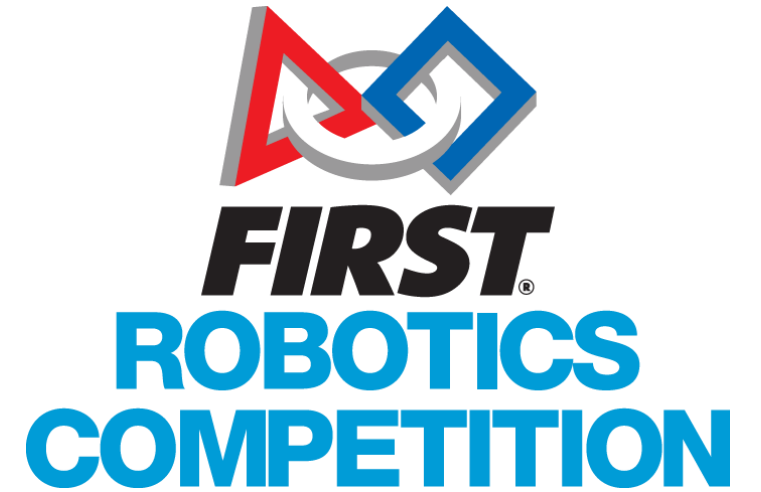


# ETHERNET PROBLEMS



- RoboRIO
  - Ethernet cable loose or unplugged
- Laptop
  - Ethernet cable loose or unplugged
  - Damaged Ethernet port on laptop
- Radio
  - Ethernet cable loose or unplugged
  - RoboRIO connected to wrong port

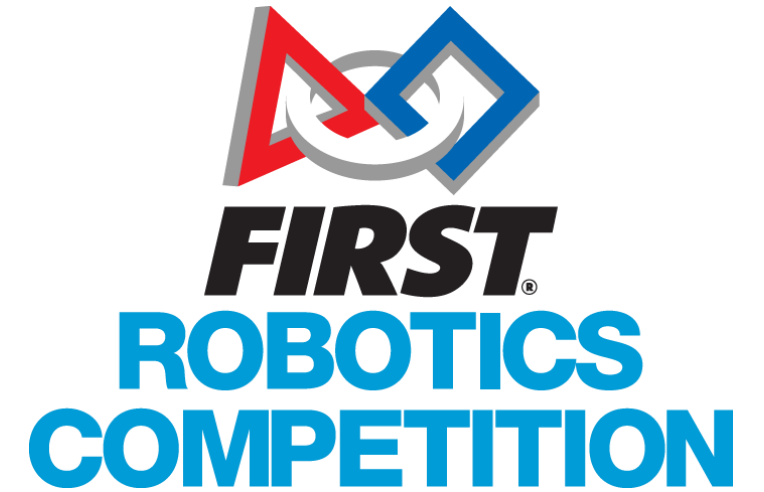




# VERY COMMON DRIVER STATION ISSUES

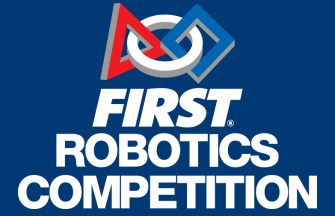
# DRIVER STATION ISSUES

- Make sure your drive team has **administrator** access to laptop
- Disable all firewalls and anti-virus software
- Make sure you are running the correct version of the DS software
  - Updates may occur during season
- Field network/IP address settings should be **DHCP**
- Reboot your laptop throughout the event
  - It is Windows after all!
- **Press F1 to refresh your joysticks if they unplug during a match**



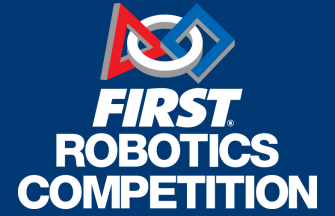
# VERY COMMON ROBOT ISSUES

# STATUS LIGHTS



- Please, please, **PLEASE** try to keep the status lights of the RoboRIO, radio, and RSL visible from the side of the field.
- Greatly aid field staff in helping you troubleshoot issues.

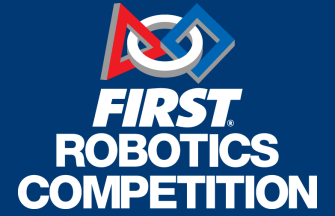
# POWER CONNECTIONS



- Loose wiring is by far the most common robot issue
- Perform a pull/wiggle test to make sure all connections are solid
- Check your battery terminal connections
  - Just because it was fine last year doesn't mean it still is!
- Make sure all terminations don't have exposed copper wire

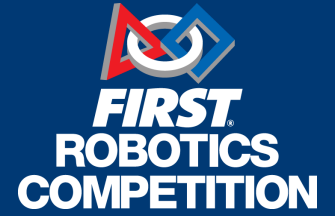


# CODE ISSUES



- Use the Practice Mode of the DS to run a full match at home
- Be careful how you initialize sensors
  - You may be waiting for awhile after you turn on your robot
  - Do not make assumptions on robot state

# RADIO ISSUES



- Program your radio (and any backups) soon after you arrive at the event.
- Radio Placement
- Bandwidth utilization
  - 7Mbps limit

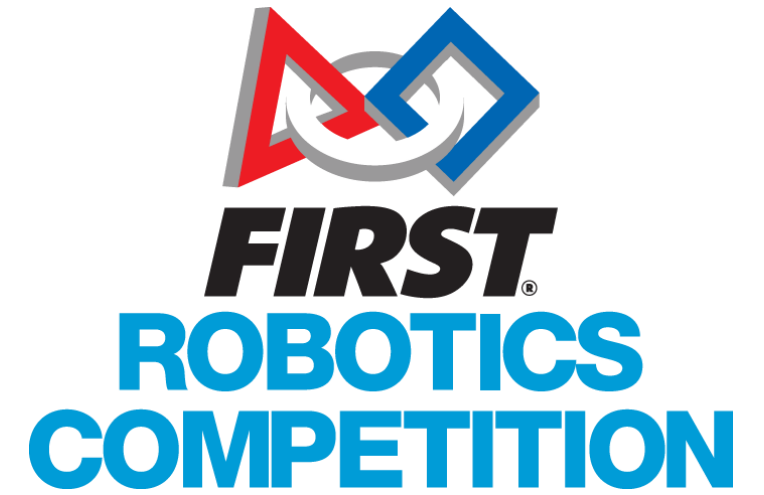
# RADIO PLACEMENT

- For best field connectivity, radio should have a clear line of sight outside the robot on all sides.
- Radio antenna are located along the sides of the radio.
- **Good guideline:** Place the radio high and on the outside of your robot.
- **#1 Bad practice:** Burying your radio at the bottom of the robot in between all the motors powering your drivetrain.



# RADIO PLACEMENT

- Mount your radio **securely**...
  - If you can move your radio easily with your hand it is **too loose!**
- ... but make sure you can **easily remove it for programming** it at the event kiosk.
- Sides and bottom of radio have ventilation holes.
  - Do not cover them with Velcro, tape, etc.



2016 RADIO

# NEW RADIO

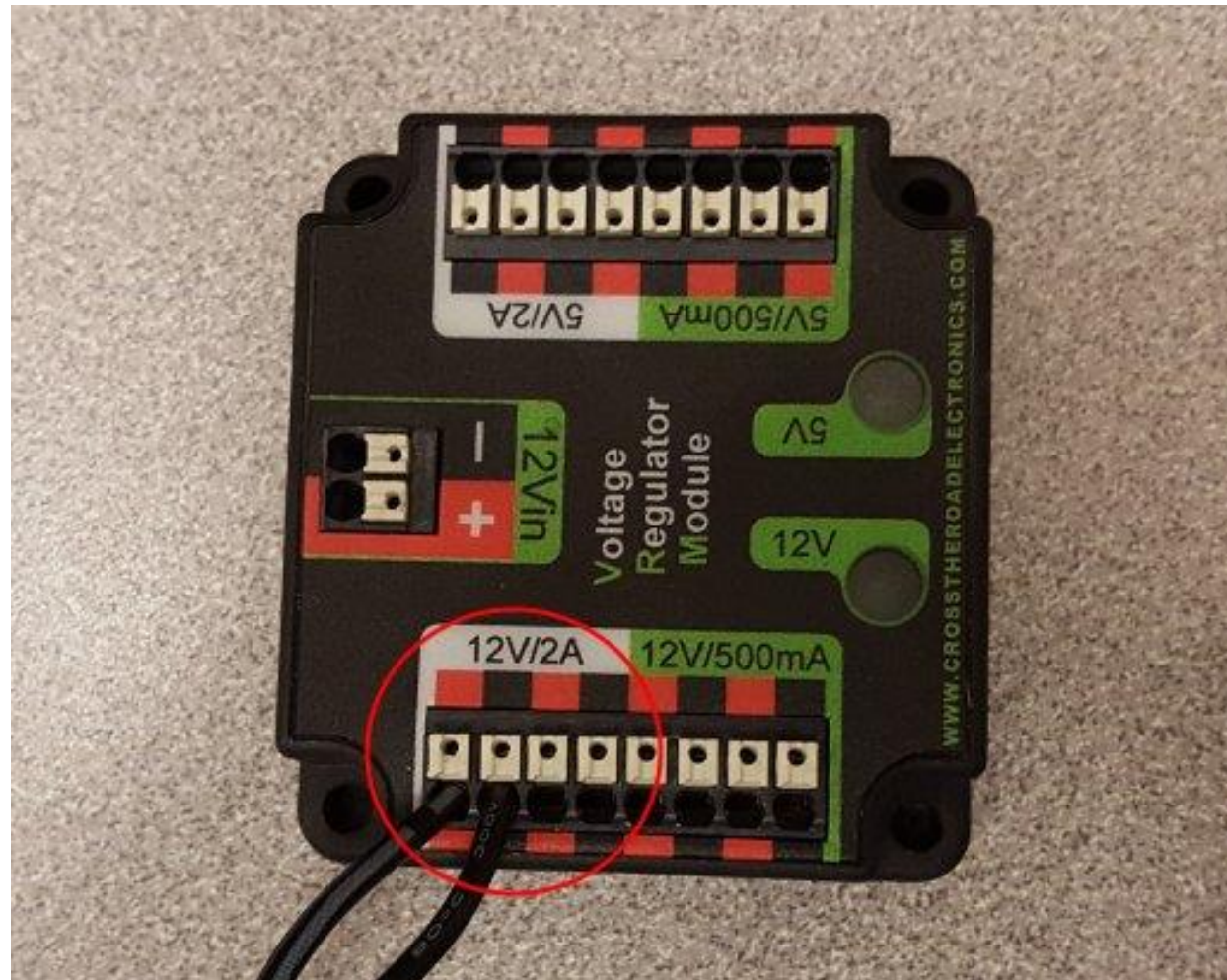
- Major change: there is a new robot radio.
- The old D-Link DAP-1522 will not be legal. **Don't use your radio from previous years on your competition robot!**



# 2016 RADIO POWER

- The new radio uses the 12V, 2A output on the Voltage Regulator Module (VRM)
- ***THIS IS DIFFERENT THAN 2015!***
- Use one of the 12V, 2A outputs solely for the radio.
  - Do not use the 12V, 500mA output for the radio
  - Do not have other items using the same 12V, 2A output as the radio

# 2016 RADIO POWER





# RADIO ETHERNET PORTS

- There are 2 Ethernet Ports on the new radio:
  - Keep the one closest to the power connection connected to the roboRIO **at all times**.
  - Use other port for tethering, camera, Ethernet switch, radio setup, etc.

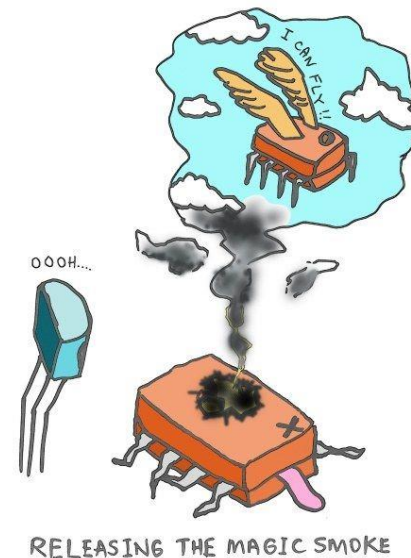


# 2016 RADIO FIRMWARE

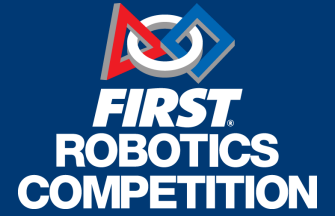
- The Kit Supplied radio will have the FRC firmware pre-installed.
- Additional radios purchased from any source will need to be flashed with the FRC firmware.
  - This will be handled by the home radio kiosk.
  - Please do this before you get to your events!
- Keep an eye out for any firmware updates for the radio during the season!
  - Please update ALL your radios if this happens before you get to your events!

# SWARF WARNING!

- The radio has a lot of vents!
- Protect the radio from contamination by metal dust or fragments!
- Don't poke anything through the ventilation slots!
- Once the magic smoke has been released, you can't put it back in!



# QUESTIONS?



- Ask now! (if we have time)
- Find me later today!
- E-mail me: [kdieterle@midatlanticrobotics.org](mailto:kdieterle@midatlanticrobotics.org)
- Presentation will be posted to [www.midatlanticrobotics.org](http://www.midatlanticrobotics.org)

