



2019 Back to Build Notes

January 15, 2019



Presenters

Anne Shade - Session Moderator, Former Regional Director, Senior Mentor, LRI and Head Referee
(ashadefirst@gmail.com)

Steve Shade - Game Modeler and Head Referee (11th year) (steven.shade@gmail.com)

Lisa Sedares - Head Referee (4th year)

Kevin Genson - SLRI (6th year)

Ryan Wolfrum - FTA (1st year)

Ron Therrien



Disclaimer

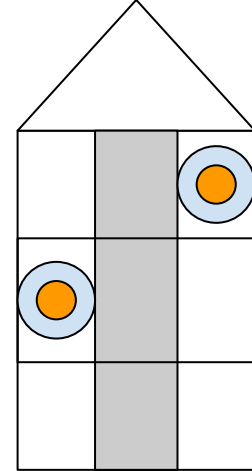
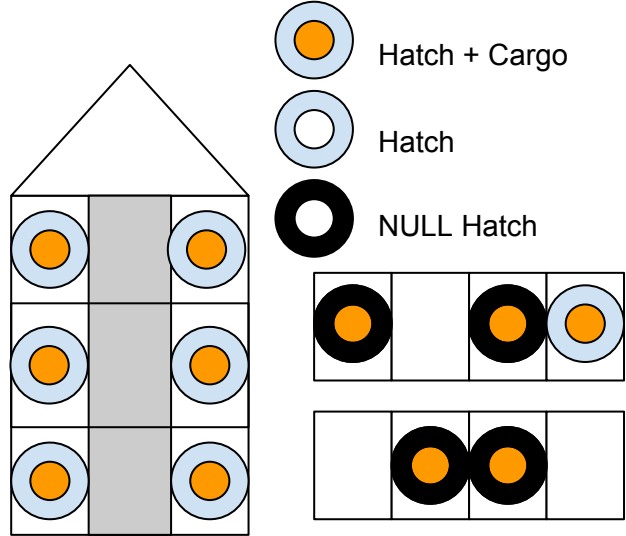
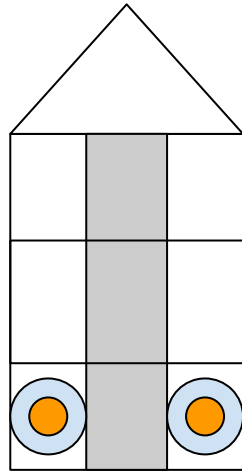
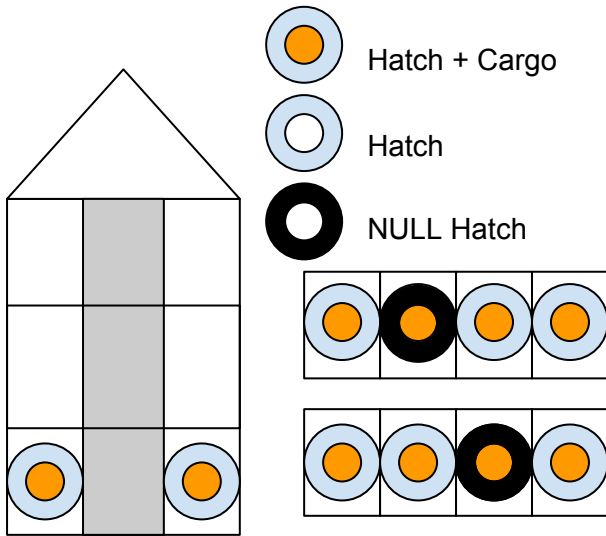
All discussion tonight is based on the best information we have to date. Official volunteer training has (mostly) not occurred yet and is still being developed. The Game Manual, including Team Updates, and Official Q&A take precedence over any advice provided tonight.



Game Analysis Thoughts - Ranking

- Read The *FIRST* Manual
 - This is a clear manual and clear gameplay
 - Lots of variety for scoring points
 - Don't Forget Team Updates!
- Ranking points
 - W-L-T
 - HAB Zone Bonus (15 pts)
 - Rocket Completion Bonus (Entire Rocket Scored)

Left or Right? Which score is higher?





Game Analysis - Anne and Steve's Predictions

Let's look at the mathematical model -

Max Score for Alliance

Pre-match Choices

Minimum Scores to achieve Bonus RPs

What is feasible with time?

Final Score Breakdown



Game Resources

- Ri3D - Florida guys (1.0), Snow Problem, etc...
- MCC Matches / Everybot
 - **118's Everybot** - <https://www.chiefdelphi.com/t/the-robonauts-118-2019-everybot/337838>
 - https://www.youtube.com/watch?time_continue=1&v=guq1MxVg6eI
 - https://www.youtube.com/playlist?list=PLkZ6_Ld1x9Y9KHbO_6yFjb5xq11inq0Tw
- Spectrum 3847 Blog <http://blog.spectrum3847.org>
 - <http://blog.spectrum3847.org/2019/01/spectrum-2019-resource-collection.html>
- John V-Neun Blog <https://johnvneun.com/>



Role Reminders

- Drive Team Roles (H2)
 - Reminder Coach can be Adult or Student,
 - Technician role
 - i. Cannot coach or signal to driver's during the match (H13)!
 - ii. Can help setup, go onto field between matches, troubleshoot issues



Referee Thoughts

- G5. Don't mess with opponents' scored GAME PIECES (F+RRP)
- G6. No Throwing HATCH PANELS (RC) {see R6}
- G12. Duck in the HAB ZONES (F+YC)
- G13. Opponents in their HAB ZONE are off-limits (F+Lvl 3 last 30s)
- G16. Don't Touch opponents' ROCKETS at the end of the MATCH (F+RRP last 20s)
- H9. Between the (STARTING) LINES (TF)
- H10. No Peeking (TF)
- H13. Don't Abuse ARENA access (YC)
- H16. Don't bang on the glass (YC)



Inspection - Kevin Genson

- My e-mail - kgenson@firstchesapeake.com
- Robot Inspectors are your friends
- Three priorities:
 - Safety
 - Compliance
 - Fun
- Goals
 - Get all teams on the field for all matches
 - Help teams improve their robots



2019 Changes

- R3: Frame perimeter ≤ 120 ", starting height ≤ 48 " (last year was a box), no height limit outside of HAB.
- R4: Max extension beyond frame perimeter is 30" (16" last year IIRC) [there is no HAB exemption!]
- R5: Max weight 125 lb (last year 120lb)
- R6: Robots may not be designed to violate G6 (launch a hatch panel more than 3 feet beyond frame perimeter)
- R12: BOM (no longer CAW) increased to \$5,500 with limited exemptions
 - a. Items less than \$5
 - b. Items in **current** year's KOP **up to quantity**
 - c. Items from FIRST Choice, PDV if team opted out, and vouchers used to purchase an item in whole
- R13: Per-item allowance increased to \$500
- R15: Motors can be modified with a filtering capacitor before kickoff (reference blue box in R63)
- **R20: Pre-Inspection un-bag exemption removed.**
- R25: Bumper zone is the same as 2018, however bumpers are allowed to be out of the bumper zone in the HAB.
- R30: Bumpers now only 15 lb
- R31e: Bumpers may have metal (not just aluminum) brackets
- R34: Motors - added NEO, cut back automotive motors to those in the 2019 KoP; no more door lock motors



2019 Changes

- R36: Controllers: added SPARK Max, automation direct relays (and wiring rules for them later)
- R36: Automation Direct Relays allowed (these are single directional and may not be wired together)
- R47: Added PN CB285-120 Main Breaker
- R67: Communication between Robot and operator Console
 - a. TCP/UDP 1250: CTRE Diagnostics Server, bi-directional
 - b. Bandwidth allowed is **now no more than 4 Mbits/second**
- R73o: May put tape inside wireless bridge (but not enlarge a hole)
 - a. You don't need to do this.
 - b. Just mount the radio with adhesive-backed dual lock (provided in KOP) and you'll be fine.
- R84c: Solenoid valves with 1/4" push tube terminals are explicitly legal
- R84l: Allows debris and water filters in pneumatic system
- R86: Only one on-board compressor is allowed (**NO OFF BOARD COMPRESSORS**).
 - a. If there is no compressor, you have no pneumatic system.

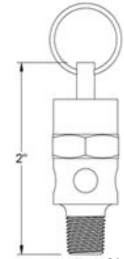


SLRI Recommendations

- Please remember your bag/tag forms. We might not accept digital images this year (still getting clarification).
- Secure pneumatic and battery storage are important to me.
 - a. Tanks should not move. Use the Clippard brackets!
 - b. Batteries should be accessible but secured.
- If you're using a lot of air then consider aluminum tanks.
- Do not clamp your radio; secure it with adhesive-backed dual lock.
- Use a hydraulic crimper to secure terminals.
- McMaster-Carr Pressure Relief Valve 48435K714 is \$5.



Easy-ID Low Voltage Cable
McMaster 9697T1 - T6



Pressure Relief Valve
McMaster 48435K714



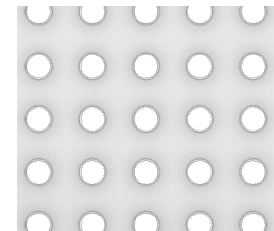
0.89 Gallon Air Tank
lowriderdepot.com



Ultra-Flexible Battery Wire
McMaster-Carr 6948K92



10 Ton Hydraulic Crimper
Amazon.com



Perforated PVC Sheet
McMaster 92985T52



FTA - Field Support

- Update all equipment and systems
 - Windows, DS, RoboRio, PCM, PDP
- Use a dedicated laptop as your OPERATOR CONSOLE
- Configure your OPERATOR CONSOLE
- Limit Bandwidth Usage To only 4 Mbits/second
- Be aware of brownouts and know how much current you draw during various stages (Driving, Climbing, Shooting, etc.) to know how they might affect you.