5 The Tournament

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5.1 Overview

Each 2013 *FIRST* Robotics Competition (FRC) event is played in a tournament format. Each tournament consists of three sets of MATCHES called "Practice MATCHES," "Qualification MATCHES," and "Elimination MATCHES."

The purpose of the Practice MATCHES is to provide each Team with an opportunity to operate its ROBOT on the FIELD prior to the start of the Qualification MATCHES.

The purpose of the Qualification MATCHES is to allow each Team to earn a seeding position that may qualify them for participation in the Elimination MATCHES.

The purpose of the Elimination MATCHES is to determine the event Champions.

Each MATCH is conducted with approximately two (2)-minutes for set up, two minutes and fifteen seconds (2:15) of game play, and one (1)-minute to clear the FIELD. After each MATCH, the ARENA must be cleared of ROBOTS and OPERATOR CONSOLES from the MATCH that just ended. The ROBOTS and OPERATOR CONSOLES for the following MATCH must be placed in position and ready to start before the start of the next MATCH. Event staff will reset the ARENA elements during this time.

5.2 Practice Matches

5.2.1 Schedule

Practice MATCHES are played on the first day of each event. The Practice MATCH schedule is available as soon as possible, but before Practice MATCHES start. Practice MATCHES are randomly assigned and each Team is assigned an equal number of Practice MATCHES. If the number of Teams multiplied by number of Practice MATCHES is not divisible by six, the FMS randomly selects some Teams to play an extra Practice MATCH.

5.2.2 Filler Line

Although Teams may not switch practice times, there will be a designated Filler Line at each event. Teams wanting additional Practice MATCHES may join the Filler Line if the criteria below are met. Teams from the Filler Line will be used on a first come, first served basis to fill empty spots in Practice MATCHES left by other Teams that do not report to Queueing. The number of TEAMS in the Filler Line is dependent upon space at venues. The criteria for joining the Filler Line are as follows:

   A. ROBOTS in the Filler Line must have passed Inspection;
   B. Teams must join the Filler Line with their ROBOT;
   C. Teams may not work on their ROBOT while in the Filler Line;
   D. Teams may not occupy more than one spot in the Filler Line; and
   E. If a Team is queued up for their Practice MATCH, they may not also join the Filler Line.

5.3 Qualification Matches

5.3.1 Schedule

The Qualification MATCH schedule is made available as soon as possible, but no later than 1 hour before Qualification MATCHES are scheduled to begin.

5.3.2 MATCH Assignment

The Field Management System (FMS) assigns each Team two (2) ALLIANCE partners for each Qualification MATCH using a predefined algorithm. The algorithm employs the following criteria, listed in order of priority:

   1. Maximize time between each MATCH played for all Teams
   2. Minimize the number of times a Team plays opposite any Team
   3. Minimize the number of times a Team is allied with any Team
   4. Minimize the use of SURROGATES
   5. Provide even distribution of MATCHES played on Blue and Red ALLIANCE

All Teams are assigned the same number of Qualification MATCHES. If the number of Teams multiplied by number of MATCHES is not divisible by six, the FMS randomly selects some Teams to play an extra MATCH. For the purpose of seeding calculations, those Teams are designated as SURROGATES for the extra MATCH. If a Team plays a MATCH as a SURROGATE, it is indicated on the MATCH schedule, and it is always their third Qualification MATCH. Figure 5-1 details information shown on a MATCH schedule.

The Qualification MATCH schedule indicates ALLIANCE partners and MATCH pairings. It also indicates the ALLIANCE color assignment, "Red" or "Blue," for each MATCH.

Figure 5-1: Sample MATCH Schedule

5.3.3 Qualification Score (QS)

Qualification Points are awarded to each Team at the completion of each Qualification MATCH and are dependent on the final score:

- Each Team on the winning ALLIANCE receives two (2) Qualification Points.
- Each Team on the losing ALLIANCE receives zero (0) Qualification Points.
- In the event of a tied score, all six Teams receive one (1) Qualification Point.

Exceptions to these scenarios are as follows:

- A SURROGATE receives zero (0) Qualification Points.
- A Team is declared a no-show if no member of the TEAM is in the ALLIANCE STATION at the start of the MATCH; a no-show Team is disqualified from that MATCH and receives zero (0) Qualification Points.
- During the Qualification MATCHES, Teams may be individually DISQUALIFIED in a MATCH. A DISQUALIFIED (including via a RED CARD) Team receives zero (0) Qualification Points.

The total number of Qualification Points earned by a Team throughout their Qualification MATCHES is their Qualification Score.

5.3.4 Qualification Seeding

All Teams in attendance are seeded during the Qualification MATCHES. If the number of Teams in attendance is 'n', they are seeded '1' through 'n', with '1' being the highest seeded Team and 'n' being the lowest seeded Team.

The FMS ranks all Teams in decreasing order, using the following sorting criteria:

1st order sort	Qualification Score
2nd order sort	Cumulative sum of AUTO GOAL points
3rd order sort	Cumulative sum of CLIMB points
4th order sort	Cumulative sum of TELEOP GOAL points and FOUL points

5.4 Elimination Matches

At the end of the Qualification MATCHES, the top eight (8) seeded Teams become the ALLIANCE Leads. The top seeded ALLIANCES are designated, in order, ALLIANCE One, ALLIANCE Two, etc., down to ALLIANCE Eight. Using the ALLIANCE selection process described below, each Team chooses two (2) other Teams to join their ALLIANCE.

5.4.1 ALLIANCE Selection Process

Each Team chooses a student Team Representative who will proceed to the ARENA at the designated time (typically before the lunch break on the final day of the event) to represent their Team. The Team Representative from each ALLIANCE Lead is called the ALLIANCE CAPTAIN.

The ALLIANCE selection process consists of two rounds during which each ALLIANCE CAPTAIN invites a Team seeded below them in the standings to join their ALLIANCE. The invited Team must not already have declined an invitation.

Round 1: In descending order (ALLIANCE One to ALLIANCE Eight), each ALLIANCE CAPTAIN invites a single Team. The invited Team Representative steps forward and either accepts or declines the invitation.

If the Team accepts, it is moved into that ALLIANCE. If an invitation from a top eight ALLIANCE to another ALLIANCE Lead is accepted, all lower ALLIANCE Leads are promoted one spot and the next highest seeded unselected Team moves up to become ALLIANCE Eight.

If the Team declines, that Team is not eligible to be picked again and the ALLIANCE CAPTAIN extends another invitation to a different Team. If an invitation from a top eight ALLIANCE to another ALLIANCE Lead is declined, the declining Team may still invite Teams to join their ALLIANCE; however, it cannot accept invitations from other ALLIANCES.

The process continues until ALLIANCE Eight makes a successful invitation.

Round 2: The same method is used for each ALLIANCE CAPTAIN'S second choice except the selection order is reversed, with ALLIANCE Eight picking first and ALLIANCE One picking last. This process results in eight (8) ALLIANCES of three (3) Teams each.

5.4.2 BACKUP TEAMS

Of the remaining eligible Teams, the highest seeded Teams (up to eight) should remain on standby and be ready to play as a BACKUP TEAM. If a ROBOT from any ALLIANCE in an Elimination MATCH becomes inoperable the ALLIANCE CAPTAIN may have the highest seeded BACKUP TEAM still available join the ALLIANCE. The resulting ALLIANCE is then composed of four (4) Teams. The replaced Team remains part of the ALLIANCE for awards but cannot play, even if their ROBOT is repaired.

Each ALLIANCE only has one opportunity to draw from the BACKUP TEAMS. If a second ROBOT from the ALLIANCE becomes inoperable, then the ALLIANCE must play the following MATCHES with only two (2) (or even one(1)) ROBOTS. It is in the best interest of all Teams to construct their ROBOTS to be as robust as possible to

prevent this situation.

5.4.3 Elimination MATCH Bracket

The Elimination MATCHES take place on the afternoon following the completion of the Qualification MATCHES. Elimination MATCHES are played in a bracket format as follows:
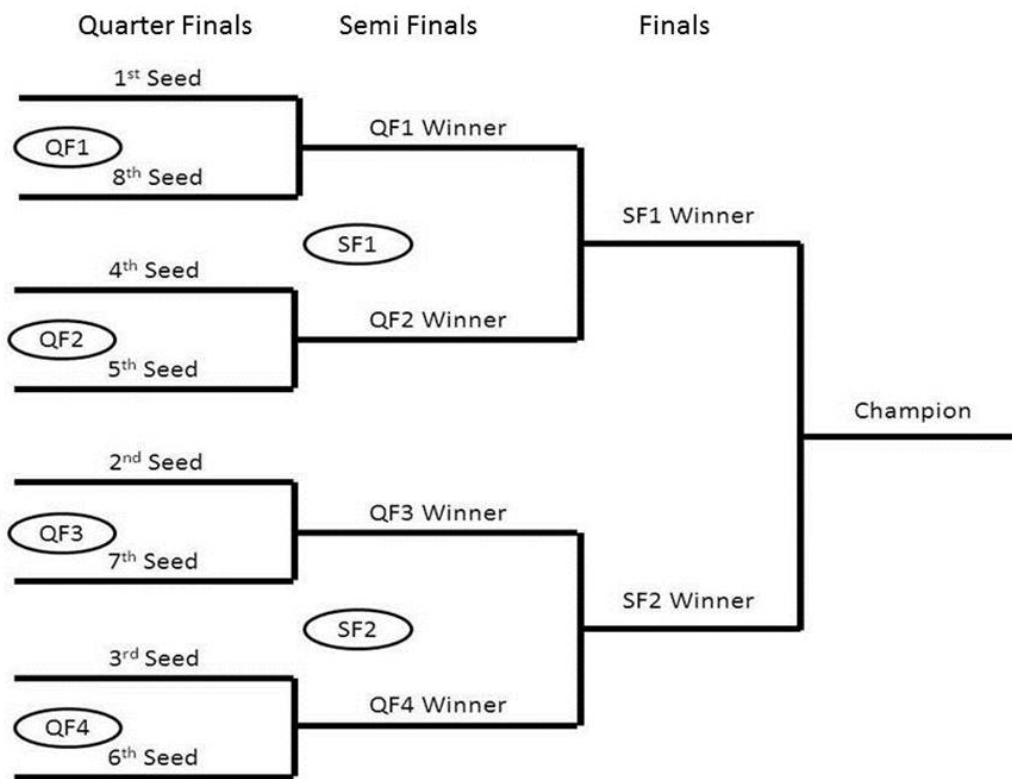
Figure 5-2: Elimination MATCH Bracket

In order to allow time between MATCHES for all ALLIANCES, the order of play is as follows:

QF1-1, QF2-1, QF3-1, QF4-1,

QF1-2, QF2-2, QF3-2, QF4-2,

QF1-3*, QF2-3*, QF3-3*, QF4-3*

Any Quarter-Final replays due to ties*

SF1-1, SF2-1, SF1-2, SF2-2, SF1-3*, SF2-3*

Any Semi-Final replays due to ties*

F-1, F-2, F-3*

Any Final replays due to ties*

(* - if required)

5.4.4 Elimination Scoring

In the Elimination MATCHES, Teams do not earn Qualification Points; they earn a Win, Loss or Tie. Within each series of the Elimination MATCH bracket, the first ALLIANCE to win two MATCHES will advance.

In the case where the MATCH score of each ALLIANCE is equal, the tie is broken by awarding an extra point to the ALLIANCE with (in the following order):

1. highest number of FOUL points awarded (i.e. the ALLIANCE that played the cleaner MATCH)
2. if FOUL points are equal, highest number of AUTO GOAL points
3. if AUTO GOAL points are equal, highest number of CLIMB points

If the criteria above are equal, the MATCH is a Tie and will be replayed if needed.

5.5 Tournament Rules

5.5.1 Safety and Security Rules

5.5.1.1 T01

All event attendees must wear safety glasses while in the ARENA.

5.5.1.2 T02

Wireless ROBOT control is not permitted outside the FIELD or Practice Field. ROBOTS must only be operated by tether when outside the FIELD or Practice Field.

5.5.1.3 T03

ROBOTS must use the provided Practice Field radio for communication if operating wirelessly on the Practice Field.

5.5.1.4 T04

Teams are not allowed to set up their own 802.11a/b/g/n/ac (2.4GHz or 5GHz) wireless communication (e.g. access points or ad-hoc networks) in the venue.

A wireless hot spot created by a cellular device would be considered an access point.

5.5.1.5 T05

No Team or Team member shall interfere or attempt to interfere with any other Team's or FIRST's wireless communication. Except as expressly allowed for purposes of communicating with the Team's own ROBOT on the FIELD or a Practice Field, no Team or Team member shall connect or attempt to connect to any other Team's or FIRST's wireless network.

Violation: Up to and including DISQUALIFICATION of the Team from the event. Legal action may also be pursued based on applicable law.

Teams are encouraged to report suspected wireless security vulnerabilities to the FTA (if at the event) or to *FIRST* via email to frcteams@usfirst.org.

5.5.2 Eligibility and Inspection

At each event, the Lead ROBOT Inspector (LRI) has final authority on the legality of any COMPONENT, MECHANISM, or ROBOT. Inspectors may re-Inspect ROBOTS to ensure compliance with the rules.

ROBOTS are allowed to participate in scheduled Practice MATCHES prior to passing Inspection. However, the FTA, LRI or Head Referee may determine at any time that the ROBOT is unsafe, per Section 3.2.1, and may prohibit further participation in Practice MATCHES until the condition is corrected and the ROBOT passes Inspection.

5.5.2.1 T06

A TEAM is only allowed to participate in a MATCH and receive Qualification Points if their ROBOT has passed Inspection. If it is discovered after the start of the MATCH that a ROBOT did not pass Inspection, the entire ALLIANCE will receive a RED CARD for that MATCH.

5.5.2.2 T07

Any ROBOT construction technique or element that is not in compliance with the ROBOT Rules must be rectified before a ROBOT will be allowed to compete or continue competing. ROBOTS must fully pass Inspection before they will be allowed to compete in Qualification or Elimination MATCHES.

5.5.2.3 T08

At the time of Inspection, the ROBOT must be presented with all MECHANISMS (including all COMPONENTS of each MECHANISM), configurations, and decorations that will be used on the ROBOT during the entire competition event. It is acceptable, however, for a ROBOT to play MATCHES with a subset of the MECHANISMS that were present during Inspection. Only MECHANISMS that were present during the Inspection may be added, removed or reconfigured between MATCHES. If MECHANISMS are changed between MATCHES, the reconfigured ROBOT must still meet all Inspection criteria.

5.5.2.4 T09

The ROBOT Bill of Materials (BOM) must be presented at the time of Inspection.

Teams are encouraged to use the BOM Template posted on the *FIRST* website. Please note that while BOMs must be shown to Inspectors, FRC Teams are not required to submit their BOMs to the Inspectors.

5.5.2.5 T10

If a ROBOT is modified after it has passed Inspection, other than modifications described in T8, that ROBOT must be re-Inspected.

If an observation is made that another Team's ROBOT may be in violation of the ROBOT rules, please approach *FIRST* officials to review the matter in question. This is an area where Gracious Professionalism™ is very important.

5.5.2.6 T11

At events, Teams may only produce FABRICATED ITEMS in the pit areas or provided machine shops, as defined in the [Administrative Manual, Section 4.8, The Pit](#).

5.5.2.7 T12

For the safety of all those involved, Inspections must take place with the ROBOT powered off, pneumatics unpressurized, and springs or other stored energy devices in their lowest potential energy states (i.e. battery removed).

Power and air pressure should only be enabled on the ROBOT during those portions of the Inspection process where it is absolutely required to validate certain system functionality and compliance with specific rules (firmware check, etc.). Inspectors may allow the ROBOT to be powered up beyond the parameters above if both criteria below are met.

A. The ROBOT design requires power or a charged stored energy device in order to confirm that the ROBOT meets volume requirements, and
B. The Team has included safety interlocks that prevent unexpected release of such stored energy.

5.5.3 Referee Interaction

The Head Referee has the ultimate authority in the ARENA during the event, but may receive input from additional sources, e.g. Game Designers, *FIRST* personnel, and technical staff. The Head Referee rulings are final. The Head Referee will not review recorded replays under any circumstances.

5.5.3.1 T13

If a TEAM needs clarification on a ruling or score, one (1) pre-college student from that TEAM should address the Head Referee after the ARENA reset signal (i.e. PLAYER STATION LED strings turn green). A TEAM member signals their desire to speak with the Head Referee by standing in the Red or Blue Question Box, which are located on the floor at each end of the scoring table. Depending on timing, the Head Referee may postpone any requested discussion until the end of the subsequent MATCH.

5.5.4 YELLOW and RED CARDS

The Head Referee may assign a YELLOW or RED CARD as a result of egregious ROBOT or Team member behavior at the ARENA.

A YELLOW or RED CARD is indicated by the Head Referee standing in front of the Team's PLAYER STATION and holding a YELLOW or RED CARD in the air after the completion of the MATCH.

Once a Team receives a YELLOW or RED CARD, its Team number will be colored yellow on the audience screen at

the beginning of all subsequent MATCHES as a reminder to the Team, the Referees, and the audience that they carry a YELLOW CARD.

<div style="background-color: blue; padding: 20px; text-align: center;">
Examples of egregious behavior include, but are not limited to, severe and/or repeated violations of a rule and inappropriate behavior.
</div>

A Team is issued a RED CARD (DISQUALIFICATION) in any subsequent MATCH in which they receive an additional YELLOW CARD. This occurs after the completion of the MATCH.

A RED CARD is indicated by the Head Referee standing in front of the Team's PLAYER STATION and holding a YELLOW CARD and RED CARD in the air simultaneously. The Team will still carry their YELLOW CARD into subsequent MATCHES.

YELLOW CARDS do not carry forward between Qualification MATCHES and Elimination MATCHES (i.e. all Teams move into the Elimination MATCHES with a clean slate).

During the Elimination MATCHES, if a Team receives a RED CARD, the entire ALLIANCE is DISQUALIFIED for that MATCH.

5.5.5 ARENA Reset Rules

5.5.5.1 T14

At the conclusion of a MATCH, TEAMS must remain in their ALLIANCE STATION until the ARENA reset signal is issued, as indicated by the PLAYER STATION LED strings illuminating green.

5.5.5.2 T15

ROBOTS will not be re-enabled after the conclusion of the MATCH, nor will Teams be permitted to tether to the ROBOT.

5.5.5.3 T16

If, in the judgment of the Head Referee, an "ARENA fault" occurs that affects the outcome of the MATCH, the MATCH will be replayed. Example ARENA faults include broken FIELD elements, power failure to a portion of the FIELD, improper activation of the FMS, errors by FIELD personnel, etc.

5.5.6 TIMEOUT and BACKUP TEAM Rules

There are no TIMEOUTS in the Qualification MATCHES. If a ROBOT cannot report for a MATCH, the Lead Queuer should be informed and at least one member of the TEAM should report to the ARENA for the MATCH to avoid

receiving a RED CARD, with the exception of a Team that has not passed Inspection, per Rule T6.

In the Elimination MATCHES, each ALLIANCE will be allotted one (1) TIMEOUT.

During a TIMEOUT, the ARENA Timer will display the time remaining in the TIMEOUT. Both ALLIANCES will enjoy the complete 6-minute window. If an ALLIANCE completes their repairs before the ARENA Timer expires, the ALLIANCE CAPTAIN is encouraged to inform the Head Referee that they are ready to play. If both ALLIANCES are ready to play before the TIMEOUT expires, the next MATCH will start.

During the Elimination MATCHES, if circumstances require an ALLIANCE to play in back-to-back MATCHES, there will be a FIELD TIMEOUT to allow Teams to prepare for the next MATCH.

5.5.6.1 T17

If an ALLIANCE wishes to call a TIMEOUT, they must submit their TIMEOUT coupon to the Head Referee within two (2) minutes of the ARENA reset signal preceding their MATCH.

5.5.6.2 T18

There are no cascading TIMEOUTS. If an ALLIANCE calls a TIMEOUT during a FIELD TIMEOUT, the FIELD TIMEOUT will immediately expire and the ALLIANCE'S TIMEOUT will begin.

> If an ALLIANCE wishes to call a TIMEOUT during a FIELD TIMEOUT, it must still do so within two (2) minutes of the ARENA reset signal preceding their MATCH, per Rule T17.

5.5.6.3 T19

TIMEOUTS are not transferrable between ALLIANCES.

5.5.6.4 T20

If during a TIMEOUT an ALLIANCE CAPTAIN determines that they need to call up a BACKUP ROBOT, they must submit their BACKUP ROBOT coupon to the Head Referee while there is still at least two (2) minutes remaining on the ARENA Timer. After that point, they will not be allowed to utilize the BACKUP ROBOT.

Alternatively, an ALLIANCE CAPTAIN may choose to call up a BACKUP ROBOT without using their TIMEOUT by informing the Head Referee directly within two (2) minutes of the Head Referee issuing the ARENA reset signal preceding their MATCH.

In the case where the ALLIANCE CAPTAIN'S ROBOT is replaced with the BACKUP ROBOT, the ALLIANCE CAPTAIN is allowed in the ALLIANCE STATION as a thirteenth ALLIANCE member so they can serve in an advisory role to their ALLIANCE.

5.5.6.5 T21

An ALLIANCE may request neither a TIMEOUT nor a BACKUP TEAM after an Elimination MATCH is stopped by the Head Referee (e.g. due to an ARENA fault or a safety issue). The sole exception is if the replay is due to an ARENA fault that rendered a ROBOT inoperable.

> If an Elimination MATCH is replayed per T21 the Head Referee has the option of calling a FIELD TIMEOUT.

5.5.7 Measurement

The ARENA will be open for at least one (1) hour prior to the start of Practice MATCHES, during which Teams may survey and/or measure the FIELD. The specific time that the FIELD is open will be communicated to Teams at the event. Teams may bring specific questions or comments to the FTA.

5.5.8 Special Equipment Rules

5.5.8.1 T22

The only equipment that may be brought in to the ALLIANCE STATION are as follows:

A. the OPERATOR CONSOLE,
B. non-powered signaling devices,
C. reasonable decorative items,
D. special clothing and/or equipment required due to a disability
E. devices used solely for the purpose of planning or tracking strategy provided they meet all of the following conditions:
    i. do not connect or attach to the OPERATOR CONSOLE
    ii. do not connect or attach to the FIELD or ARENA
    iii. do not connect or attach to another ALLIANCE member
    iv. do not communicate with anything or anyone outside of the ARENA.
    v. do not include any form of enabled wireless electronic communication (e.g. radios, walkie-talkies, cell phones, Bluetooth communications, Wi-Fi, etc.)
    vi. do not in any way affect the outcome of a MATCH, other than by allowing PLAYERS to plan or track strategy for the purposes of communication of that strategy to other ALLIANCE members.

5.6 Championship Additions

At the 2013 *FIRST* Championship, Teams are split into four (4) Divisions: Archimedes, Curie, Galileo, and Newton. Each Division plays like a Regional Event to produce the Division Champions. Those four (4) ALLIANCES proceed to the Championship Playoffs, on the Einstein FIELD, to determine the 2013 FRC Champions.

The procedures in Sections 5.1 - 5.5 apply during the Championship, with the additions defined below.

5.6.1 Championship Pit Crews

During the Elimination MATCHES, extra Team members may be needed to maintain the ROBOT between MATCHES because of the distance between the FIELD and the pit area. For this reason, each Team is permitted to have three (3) additional "pit crew" members who can also help with needed ROBOT repairs/maintenance.

Only Team members wearing proper badges are allowed on the ARENA floor. *FIRST* will distribute these badges to the ALLIANCE CAPTAINS during the ALLIANCE CAPTAIN meeting, which takes place on the Division FIELDS. These badges will provide the necessary access to the ARENA for pit crew members.

Teams should assume they may be chosen for an ALLIANCE and think about the logistics of badge distribution and set a plan prior to the pairings. It is each ALLIANCE CAPTAIN'S responsibility to get the Team's badges to the pit crew members.

5.6.2 Championship BACKUP ROBOT

If an ALLIANCE has not already used a BACKUP ROBOT, and an ALLIANCE ROBOT becomes inoperable during the Championship Playoffs and cannot continue, the ALLIANCE may request a BACKUP ROBOT. The ALLIANCE CAPTAIN will be presented the option of having one (1) of the three (3) Division Finalist ROBOTS, chosen randomly, from their Division join the ALLIANCE as a BACKUP ROBOT.

If an ALLIANCE has won their Division with a BACKUP ROBOT and moved on to the FRC Championship Playoffs, the BACKUP ROBOT continues to play for the ALLIANCE in the Championship Playoffs.

As noted in Section 5.4.2, the original ALLIANCE shall only have one (1) opportunity to use a BACKUP ROBOT. If the ALLIANCE has already used a BACKUP ROBOT during the Division Elimination MATCHES or the Championship Playoffs, they may not use a second BACKUP ROBOT. If a second ROBOT from the ALLIANCE becomes inoperable during the Championship Playoffs, then the ALLIANCE must play the remaining MATCHES with only two (2) (or even one(1)) ROBOTS.
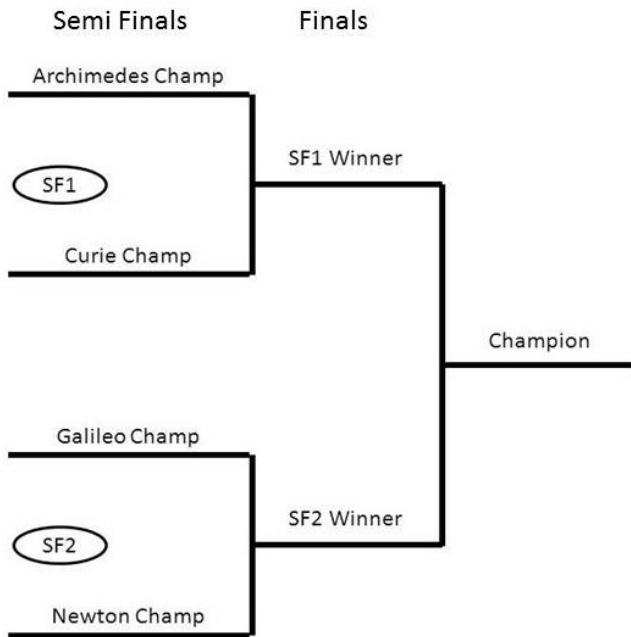
5.6.3 FRC Championship MATCH Bracket

Figure 5-3: Championship Playoff MATCH Bracket

In order to allow time between MATCHES for all ALLIANCES, the order of play is as follows:

SF1-1, SF2-1, SF1-2, SF2-2, SF1-3*, SF2-3*

Any Semi-Final replays due to ties*

F-1, F-2, F-3*

Any Final replays due to ties*

(* - if required)