

# Team Update 02

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## General

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- **Drawing Updates:** The [Field Drawings - FIRST POWER UP specific](#) drawing package has been updated with the following changes:
  - GE-18020 has been updated to include a missing overall length dimension.
  - GE-18060 has been updated to fix a note with an incorrect item number called out.
  - GE-18126 has been updated to fix a note with an incorrect item number called out.
  - GE-18127 has been added. Please note the height of GE-18127 supplied by SolidWorks, Autodesk, and PTC is slightly taller than what is specified in [Section 3.6.2 EXCHANGE](#). We will be working with them to get those models updated.

The [Team Drawings](#) drawing package has been updated with the following changes:

- TE-18008 has been updated to fix BOM item number and part number agreement.
- TE-18007 has been updated to fix BOM item number and part number agreement, and to include changes to the following parts:
  - TE-18007-3 has been updated to correct overall length of part.
  - TE-18007-4 has been updated to correct overall length of part.
  - TE-18007-10 has been updated to correct overall length of part.
  - TE-18007-11 Has been updated to correct overall length of part.

The revisions to the Scale in the Team Drawings correct design mistakes that resulted in differences between the team version of the Scale and the official Scale. The width of the Rung is 1 ft. 1 in. (down from 1 ft. 2 in.), the width of the Tower is 1 ft. 5 in. (down from 1 ft. 6 in.), and the distance from the Rung to the face of the Tower is 8¼ in. (up from 6¼ in.)

While we try to ensure that critical dimensions in the wooden versions of Field elements match their official counterparts, there are always discrepancies caused from using different building materials. However, the discrepancies referenced above were due to design error and may impact Robot design. We apologize, especially if these corrections affect your Robot designs.

- **360° Images:** A link to 360° images of the *FIRST POWER UP* field taken during Field Tour filming is included on the [Game and Season webpage](#).
- **3D CAD Models:** A link to *FIRST POWER UP* DS SolidWorks models is now included on the [Game and Season webpage](#).
- ***FIRST POWER UP* Field images:** A link to field images taken during Field Tour filming is now included on the [Game and Season webpage](#).
- **Crate Construction:** Think you'll be shipping your Robot? The crate specifications are now posted [here](#).

## Rules & Expectations for *FIRST* Robotics Competition Events

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No changes.

## Game and Season Manual

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### Section 3.6.3

Caution, there are **may be** orientations where all three (3) POWER CUBES will not fit in a VAULT column, but if HUMAN PLAYERS place POWER CUBES logo side up they'll fit **with room to spare**.

## Section 3.8 POWER CUBES

Each POWER CUBE weighs  $3\frac{1}{2}$  lbs (~1.6 kg) approximately  $3\frac{1}{4}$  lbs (~1.5 kg). POWER CUBES may be purchased from AndyMark (am-3818 and am-3741), Innovation First (217-6188 and 217-6193), and Rev Robotics (REV-21-1217 and REV-21-1218).

## Section 4.2 Scoring

Points are earned for establishing OWNERSHIP, with additional points earned for each additional second of OWNERSHIP. For example, a team that establishes OWNERSHIP of their SWITCH three (3) seconds after the start of AUTO and maintains OWNERSHIP for five (5) seconds earns two (2) points + ten (10) points, for a total of twelve (12) points.

The MATCH points listed in Table 4-1 for OWNERSHIP during the TELEOP stage are increased if the BOOST POWER UP is played. See Section 4.3 for details on BOOST.

AUTO-RUN and CLIMBING are both evaluated and scored by human REFEREES. Teams are encouraged to make these actions obvious and unambiguous.

## Section 4.3 POWER UPS

An ALLIANCE plays a POWER UP by pressing the corresponding button on the VAULT. Only one (1) instance of the FORCE or BOOST POWER UP can be active at a time. If an ALLIANCE pushes the button for FORCE/BOOST while their other FORCE/BOOST is active, the button press is ignored. The LEVITATE POWER UP can be played at any time during the TELEOP stage.

## Section 7.6 Human Action Rules

### H07.

- 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 planning or tracking strategy,
- F. devices used solely to record gameplay,
- G. non-powered Personal Protective Equipment (examples include, but aren't limited to, gloves, eye protection, and hearing protection)

Items brought to the ARCADE under allowances B-G must 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 ARCADE
- iii. do not connect or attach to another ALLIANCE member (other than items in category G)
- iv. do not communicate with anything or anyone outside of the ARCADE.
- v. do not communicate with the TECHNICIAN
- vi. do not include any form of enabled wireless electronic communication (e.g. radios, walkie-talkies, cell phones, Bluetooth communications, Wi-Fi, etc.)

- vii. do not in any way affect the outcome of a MATCH, other than by allowing the DRIVE TEAM to
  - a. plan or track strategy for the purposes of communication of that strategy to other ALLIANCE members or
  - b. use items allowed per part B to communicate with the ROBOT (provided A02 is not violated).

## Section 8.3 ROBOT Safety & Damage Prevention

### R07.

If the ROBOT includes protrusions that form the “leading edge” of the ROBOT as it drives and the protrusions have a surface area of less than 1 in.<sup>2</sup> (~6 cm<sup>2</sup>), it will invite detailed Inspection. For example, forklifts, lifting arms, or grapples may be carefully inspected for these hazards.

## Section 8.5 BUMPER Rules

*A note about the edit to R24: The original BUMPER ZONE did not leave any tolerance for noodle alignment, wood alignment, fabric folds, etc., if using the BUMPER brackets that shipped with the Drive Base Kit.*

**R24.** BUMPERS must be located entirely within the BUMPER ZONE, which is the volume contained between the floor and a virtual horizontal plane 7 in. (~17 cm) 7½ in. (~19 cm) above the floor in reference to the ROBOT standing normally on a flat floor. BUMPERS do not have to be parallel to the floor.

## Section 8.9 Pneumatic System

### R81.

Any pressure specification such as “working,” “operating,” “proof,” “maximum,” “burst,” etc. may be used to satisfy the requirements of R81.

It is recommended that all pneumatic items be rated by their manufacturers for a working pressure of at least 60 psi (~414 kPa).

