Team Update 13

General

The Field Compliance Checklist is a new resource that will help ensure a consistent playing field for teams by enabling field staff to confirm that the most critical dimensions and measurements of the INTO THE DEEP Arena comply with minimum tolerance requirements. The tool serves as a quick guided check through tape line locations and measurements, basket heights, AprilTag locations, and submersible structure heights.

All events are expected to meet the minimum compliance requirements. The checklist must be completed once for a single day event, prior to the start of qualification matches. For multi-day events, the checklist must be completed prior to the start of the qualification matches for each day of the multi-day event.

The Field Supervisor is responsible for working with the teams to ensure the field is in the best condition possible for each match played and this new tool will help them validate that the field is within the proper specs. For events that do not staff a Field Supervisor, the checklist is the responsibility of the Head Referee.

This new tool serves as a way for all events to standardize arena element setup and to ensure that teams have a consistent and expected experience at any event they attend.

Competition Manual

Section 9 ARENA

The ARENA is modular and is assembled, used, disassembled, and transported many times during the competition season. It undergoes wear and tear. The ARENA is designed to withstand rigorous play and frequent reassembly. Every effort is made to ensure that ARENAS are consistent from event to event. However, ARENAS are assembled in different venues by different event staff and some small variations occur. For details regarding assembly tolerances, please refer to the ~~ARENA Layout and Marking Diagram~~ Field Compliance Checklist. Successful teams will design ROBOTS that are insensitive to these variations.

Illustrations included in this section are for a general visual understanding of the INTO THE DEEP ARENA, and dimensions included in the manual are nominal. Please refer to the official drawings for exact dimensions~~,~~ ~~tolerances~~, and construction details. The official drawings, CAD models, and drawings for low-cost versions of important elements of the INTO THE DEEP FIELD are posted on the Game and Season page on the *FIRST* website.

Section 11.4.3 SCORING ELEMENT

G408 ***Keep SCORING ELEMENTS in bounds.** A ROBOT may not intentionally eject a SCORING ELEMENT from the FIELD (either directly or by bouncing off a FIELD element or another ROBOT). SCORING ELEMENTS that leave the FIELD are not returned to gameplay except as allowed in rule G431.

Violation: MAJOR FOUL per SCORING ELEMENT.

Examples of SCORING ELEMENTS that leave the FIELD that are not considered intentional removal:

A. SCORING ELEMENTS removed from the FIELD while attempting to score ~~are not a violation of this rule, however, are not returned to the FIELD.~~
B. SCORING ELEMENTS that are removed/dropped by a ROBOT while attempting to collect them from the OBSERVATION ZONE

SCORING ELEMENTS that leave the FIELD are not returned by FIELD STAFF. The DRIVE TEAM may retrieve SCORING ELEMENTS outside of the FIELD and place them back into play via the HUMAN PLAYER as long as no other rules are violated.

Intentional ejection of SCORING ELEMENTS will be determined by the Head REFEREE. If an action is repeated throughout the MATCH, it is likely that a REFEREE may perceive this as intentional.

Section 12.5 Motors and Actuators

- Rule R501 orange box update:

Many legal gearmotors are sold with labeling based on the entire assembly. These motors may be used with or without the provided gearbox, and/or with any other compatible gearbox.

R504 ***Do not modify actuators unless explicitly allowed.** The integral mechanical and electrical system of any motor or servo must not be modified. Motors and servos used on the ROBOT shall not be modified in any way, except as follows:

E. the mounting brackets and/or output shaft/interface (including pinion gears) may be modified to facilitate the physical connection of the motor to the ROBOT and actuated part,
F. the electrical leads may be trimmed to length as necessary and connectors or splices to additional wiring may be added (per R503), and purely electrical enclosures can be substituted with functionally equivalent replacements,
G. servos may be modified as specified by the manufacturer (e.g., re-programming or modification for continuous rotation),
H. minimal labeling may be applied to indicate device purpose, connectivity, functional performance, etc. as long as the team applied label does not obstruct the markings used to identify the device,
I. insulation may be applied to electrical terminals,
J. repairs, provided the original performance and specifications are unchanged, and
K. maintenance recommended by the manufacturer.

Section 12.6 Power Distribution

R613 ***No high voltage allowed except for LEDs.** Any active electrical item that is not an actuator (specified in R501) or power regulation device (specified in R505) is considered a CUSTOM CIRCUIT. CUSTOM CIRCUITS shall not provide regulated output voltages exceeding 5V, except if solely used for powering LEDs, but may pass through unregulated battery voltage.

R619 ***Do not mix and match power on or between power regulation devices.** The following rules must be adhered to when using power on any power regulation device (per R505):

A. other than power used to energize the power regulation device (per R614) no power originating outside the power regulation device may be used on or with devices connected to the power regulation device. The only exceptions are connections intended for communication between devices (RS485/USB/PWM/etc.).

> Example 1: The +5V port on a REV Expansion Hub cannot be used to power devices connected to a REV Control Hub's I2C ports.
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> Example 2: A regulated 5V output provided by a CUSTOM CIRCUIT cannot be used to power an I2C device connected to a REV Control Hub.

B. power originating from ports/connectors on power regulation devices may only be used for devices directly connected to that port/connector. The only exception to this is +5V power from the +5V power port on the REV Control Hub or REV Expansion Hub may be used in conjunction with any Analog, Digital, or I2C port on that device. In addition, the +5V power port may be used to power external devices.

> Example 1: The power provided by Digital Port 0-1 on a REV Control Hub should not be used to power devices connected to I2C Port 0. However, power provided by Digital Port 0-1 can be used to power devices connected to both signal channels N and N+1 on Digital Port 0-1.
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> Example 2: The +5V power can be used to power external devices such as externally powered USB hubs (per **Error! Reference source not found.**).
>
> Example 3: The power provided by multiple servo ports cannot be combined into a single power bus for one or more servos.

C. 6V power provided by the REV Servo Power Module, REV Robotics Servo Hub, or Studica Servo Power Block may only be used for powering servos.

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