January 25, 2011

TEAM UPDATE #5

GENERAL NOTICES

No changes.

Section 1 – Introduction

Section 1 – Introduction, Rev C has been updated to include the following edits:

BUMPER – an assembly designed to attach to the exterior of the HOSTBOT and constructed as specified in ***Section ~~3.4~~ 4.3.2, Bumper Rules***.

HANGING – a GAME PIECE is HANGING when it is fully supported by a PEG through its center hole and released by the POSSESSING ROBOT. Once a GAME PIECE has been released by the POSSESSING ROBOT (even momentarily) and is HANGING (e.g. it is fully supported by the PEG), it is considered to be HANGING until the end of the match. If a GAME PIECE on the floor is preventing a GAME PIECE that has been hung on a bottom PEG from becoming fully supported (that is, if the floor GAME PIECE was not there, the hung GAME PIECE would be scored) then that GAME PIECE will still be counted as scored.

MINIBOT – an autonomous vehicle designed and built to perform specific tasks when competing in the 2011 competition *LOGO MOTION*. The MINIBOT must obviously follow a design approach intended to play the 2011 FRC END GAME and must be compliant with all MINIBOT rules defined in ***Section 4.3~~4~~.14.***

Section 2 – The Arena

Section 2 – The Arena, Rev B has been updated to include the following edits:

2.2.8 The PLAYER STATIONS

Attached to the ALLIANCE WALL are three aluminum shelves to support the OPERATOR CONSOLES for the three TEAMS on the ALLIANCE. The support shelf measures approximately 60 inches wide by 12 inches deep. There is a 4-1/2-foot long by two-inch wide strip of Velcro tape (“loop” side) along the center of the support shelf that may be used to secure the OPERATOR CONSOLES to controls the ROBOT. Each setup location includes a competition cable (to provide Ethernet connectivity) that attaches to the Ethernet Port of the OPERATOR CONSOLE. The cable provides communications with the ROBOT.

Once plugged in to the Field Management System via the Ethernet cable provided, the ports that the teams will be able to access on the playing field are as follows:

- TCP 1180: This port is typically used for camera data from the cRIO to the DS when the camera is connected to port 2 on the cRIO. This port is bidirectional on the field.
- UDP 1130: Dashboard-to-Robot control data, directional
- UDP 1140: Robot-to-Dashboard status data, directional
- HTTP 80: Camera connected via switch on the robot, bidirectional
- HTTP 443: Camera connected via switch on the robot, bidirectional

All these ports are open on the playing field, so a team can use them as they wish if they do not employ them as outlined above (i.e. TCP 1180 can be used to pass data back and forth between the robot and the DS if the team chooses not to use the camera on port 2).

Each setup location also includes a power adaptor cable that may be used to power the Classmate laptops that were provided to teams in 2010 and 2011. Emergency Stop (E-Stop) buttons for each TEAM are located on the left end of each PLAYER STATION shelf. ARENA components (including team number displays, competition arena hardware, alliance lights, control hardware cabinets and clock displays) are also located above the PLAYER STATIONS and below the shelf.

Section 3 – The Game

Section 3 – The Game, Rev E has been updated to include the following edits:

<G19> MINIBOTS must remain completely autonomous and move up the POST solely through electric energy provided after the start of DEPLOYMENT by the permitted, unaltered battery and converted to mechanical energy by the permitted unaltered motors (and associated, appropriate circuitry).

<G21> HOSTBOTS may ~~only~~ DEPLOY MINIBOTS only onto their ALLIANCE'S TOWERS and entirely below the DEPLOYMENT LINE.

Section 4 – The Robot

Section 4 – The Robot, Rev E has been updated to include the following edits:

<R14> When a ROBOT is in its STARTING CONFIGURATION, no part of the ROBOT shall extend outside the vertical projection of the FRAME PERIMETER (with the exception of minor protrusions such as bolt heads, fastener ends, rivets, etc).

In Rule <R22> the textbox has been enlarged to show all intended text:

> Please note that this means that FABRICATED ITEMS from ROBOTS entered in previous *FIRST* competitions may not be used on ROBOTS in the 2011 FRC.
>
> Before the formal start of the Robot Build Season, teams are encouraged to think as much as they please about their ROBOTS. They may develop prototypes, create proof-of-concept models, and conduct design exercises. Teams may gather all the raw stock materials and COTS COMPONENTS they want.
>
> Example: A TEAM designs and builds a two-speed shifting transmission during the fall as a training exercise. When designing their competition ROBOT, they utilize all the design principles they learned. To optimize the transmission design for their ROBOT, they improve the transmission gear ratios and reduce the size, and build two new transmissions, and place them on the ROBOT. All parts of this process are permitted activities.
>
> Example: The same TEAM realizes that the transmission designed and built in the fall perfectly fits their need for a transmission to drive the ROBOT arm. They build an exact copy of the transmission from the original design plans, and bolt it to the ROBOT. This would be prohibited, as the transmission – although fabricated during the competition season – was built from detailed designs developed prior to kick-off.
>
> Example: A TEAM developed an omni-directional drive system for the 2010 competition. Over the summer of 2010 they refined and improved the control software (written in C) to add more precision and capabilities. They decided to use a similar system for the 2011 competition. They copied large sections of unmodified code over into the control software of the new ROBOT (also written in C). This would be a violation of the schedule constraint, and would not be allowed.
>
> Example: The same TEAM decides to use the LabView as their software environment for 2011. Following kickoff, they use the previously-developed C code as a reference for the algorithms and calculations required to implement their omni-directional control solution. Because they developed new LabView code as they ported over their algorithms, this would be permitted.
>
> Example: A different team develops a similar solution during the fall, and plans to use the developed software on their competition ROBOT. After completing the software, they post it in a generally accessible public forum and make the code available to all teams. Because they have made their software generally available (per the Blue Box in the definition of COTS, it is considered COTS software and they can use it on their ROBOT.

<R33> Teams may bring a maximum of 30 pounds of custom FABRICATED ITEMS (SPARE PARTS, REPLACEMENT PARTS, and UPGRADE PARTS, plus all WITHHOLDING ALLOWANCE items) to each competition event to be used to repair and/or upgrade their ROBOT at the competition site. All other FABRICATED ITEMS to be used on the ROBOT during the competition shall arrive at the competition venue packed in the shipping crate or lockout bag with the ROBOT.

There are ~~two~~ three exceptions to this rule:

A. the OPERATOR CONSOLE is not included in the incoming parts weight restriction,

B. the MINIBOT is not included in the incoming parts weights restriction, and

C. any competition legal12V batteries and their associated half of the Anderson cable quick connect/disconnect pair (including no more than 12” of cable per leg, the associated cable lugs, connecting bolts, and insulating electrical tape) are not included in the incoming parts weight restriction.

<R45-D> up to four, in any combination, of the BaneBots motors provided in the KOP (acceptable part numbers are M7-RS775-12, M7-RS775-18, M5-RS550-12, M5-RS550-12-B, M5-RS540-12, and M3-RS395-12),

<R46> Items specifically PROHIBITED from use on the ROBOT include:

A. Electric motors and/or servos different from, or in addition to, those listed in the ***2011 KOP Checklist***, with the exception of those specifically permitted by Rule <R45>.

B. Electric solenoid actuators (note: electric solenoid actuators are NOT the same as pneumatic solenoid valves – the latter are permitted, the former are not).

<R60> Solenoid Breakout outputs shall be connected to pneumatic valve solenoids or photoelectric sensors, PN 42EF-D1MNAK-A2 only. No other devices shall be connected to these outputs.

A note about the edit to Rule <R92>:

Unfortunately there was conflicting information distributed to teams via email blast and Team Update. The update to Rule <R92-A> combines the lists sent out into one document. The intent is to make sure that teams aren't penalized for using one list over the other in determining which Tetrix components were legal. Please accept our apologies for the confusion.

Additionally, it has come to our attention that teams have burned out their Tetrix motors by stalling them while directly connected to the battery. Please see the rule change later in this update that allows for two options to help prevent this from occurring. The first allows for changing the fuse in the battery pack to a lower amperage value; the second allows the use of the Tetrix Thermal-Protected DC Motor Power Cable. We encourage teams to consider making use of one or both of these options.

<R92> The following items are the only permitted materials for use on the MINIBOTS:

A. TETRIX components that are not in violation of any other rules (Tetrix components are listed in ***Approved Tetrix Parts*** at www.usfirst.org/frc/competitionmanual),

B. no more than two motors (PN W739083/W739023) and an unlimited number of Tetrix servos),

C. no more than one 12V rechargeable NiMH battery pack identical to those supplied in the FTC kit of parts (PN W739057) except the 20A fuse may be replaced with an equivalent type of lower amperage,

D. No more than one HiTechnic DC motor controllers,

E. No more than one NXT controller with the Bluetooth functionality disabled,

F. Polycarbonate,

G. Polycarbonate glue,

H. Raw aluminum sheet, 90° angle, u-channel, tube, bar, that is not sold in pre-perforated or pre-punched form.

I. rivets,

J. non-metallic rope or cord,

K. wire nuts, solder, and crimps,

L. cable ties,

M. limit switches,

N. no more than two common household light switches,

O. electrical hookup wire,

P. non-slip pad,

Q. PVC or CPVC pipe and fittings,

R. PVC cement or cleaner,

S. Mechanical fasteners (e.g. screws, bolts, etc),

T. Loctite or similar thread-locking product,

U. Rubber bands,

V. Surgical tubing,

W. Electrical tape and shrink tubing,

X. PWM extension cables,

Y. Universal security clips to hold the PWM connectors together,

Z. Hook and loop fastener (may not be used as tape),

AA. Magnets, ~~and~~

BB. NXT compatible sensors and related connectors/cables.

CC. Grease, and

DD. Non-functional decorations.

~~Tetrix components are defined by those that are included in this catalog: http://www.tetrixrobotics.com/Building_System/Downloads/default.aspx?moid=533. To get information about how/where to purchase components, please refer to the ***Where to get more*** document posted at www.usfirst.org/frc/kitofparts.~~

Please note that the Rule <R92> only allows specific Tetrix components. While Tetrix components are a subset of FTC components, it is essential to realize that not all FTC parts are Tetrix parts. As such, not all FTC parts are permitted on the MINIBOT. Please be sure to vet your components against the above list before constructing your MINIBOT.

Use of glues/cements may not be allowed in the pits at tournaments based on site-specific rules.

Please note that the FTC Samantha module is not considered a TETRIX component and is not permitted on the MINIBOT.

<R103> *FIRST* Officials may randomly re-inspect MINIBOTS participating in competition MATCHES to ensure ~~assure~~ compliance with the rules.

Section 5 – The Tournament

No change.

The Kit of Parts

Please note that GAME PIECES are now available for teams to purchase through AndyMark, www.andymark.com.

The ***2011 Kit of Parts Checklist, Rev C***, includes the following edits:

BaneBots motor part numbers have been updated as follows:

- RS395 has become M3-RS395-12,
- RS540 has become M5-RS540-12,
- RS550 has become M5-RS550-12, and
- RS775 has become M7-RS-775-12.

The Kit of Parts website, www.usfirst.org/frc/kitofparts, has been updated to include:

- an updated ***Radio Configuration*** document (to better outline how to configure the radio for team use during development. It also describes the new features and advantages of the new radio, and how different operating modes are used).