



What to Expect at Your First FTC Tournament

Eric Grajales

Mike Nicolai

September 17, 2011



Welcome



- Purpose: This presentation is intended to inform teams as to what they may expect when attending their first event in terms of the inspection process and getting ready to compete.
- Things we will cover:
 - Things to know before your first event.
 - Samantha overview (competition control system).
 - Inspection process overview (h/w & s/w).
 - Tips and tricks (best practices).
- This presentation is meant more for rookie teams, but contains information to benefit veteran teams as well.
- Presentation material available at the FL FIRST website ([Team Resources](#))
- Please ask questions as you have them.

Software basics



- Two different programming platforms are provided in the FTC kit:
 - ROBOTC – Classical C programming.
 - LabVIEW – Drag and drop programming.
- Two Different programming environments and experiences, but same results.
- Each have their own firmware that needs to be uploaded to the NXT (included with programming environment, but watch for updates).
- Each has a specific programming template which teams must start with and add their custom code to (comes with the programming environment).
- Each provides facilities for manipulating files (upload/download/delete) on the NXT, controlling the robot (like in a match) and flashing the NXT with new firmware
- Make sure you use this seasons software (programming environment, firmware, and templates).

Preparing your NXT.



There are a few “Must Dos” to ready your NXT for competition:

- All NXT modules need to be upgraded to the latest respective firmware (LabVIEW or ROBOTC).
- Your NXT name is your robot’s identity. You must set it to your 4 digit team number (i.e. 0123). If a team has more than one NXT, append a letter (i.e. 0123A). Naming the NXT is done through a utility in your programming environment.
- Adjust the Sleep Setting on your NXT so it doesn’t fall asleep on the job (minimum of 30 minutes recommended). This is done from your NXT.
- Optional: Recommend to turn off your NXT Blue Tooth capability at the competition. This is done from your NXT.

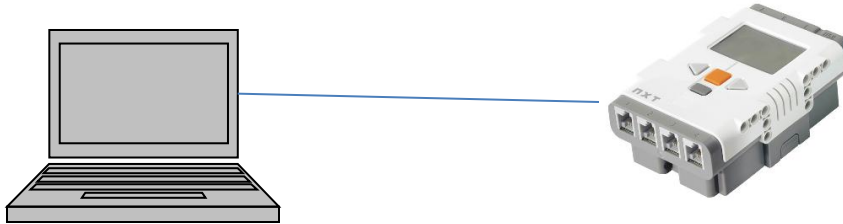
Software inspection checks for these items.

Samantha



- A new 802.11 based control system which augments (almost replaces) the NXT Bluetooth connectivity.
- Intended to be more reliable and responsive than the native NXT Bluetooth solution.
- Samantha is only used for controlling the robot via the Field Control System (FCS) which will be used at each competition.
- Programming, downloading, and debug via Samantha is supported with RobotC Version 3.0+

- USB direct connect



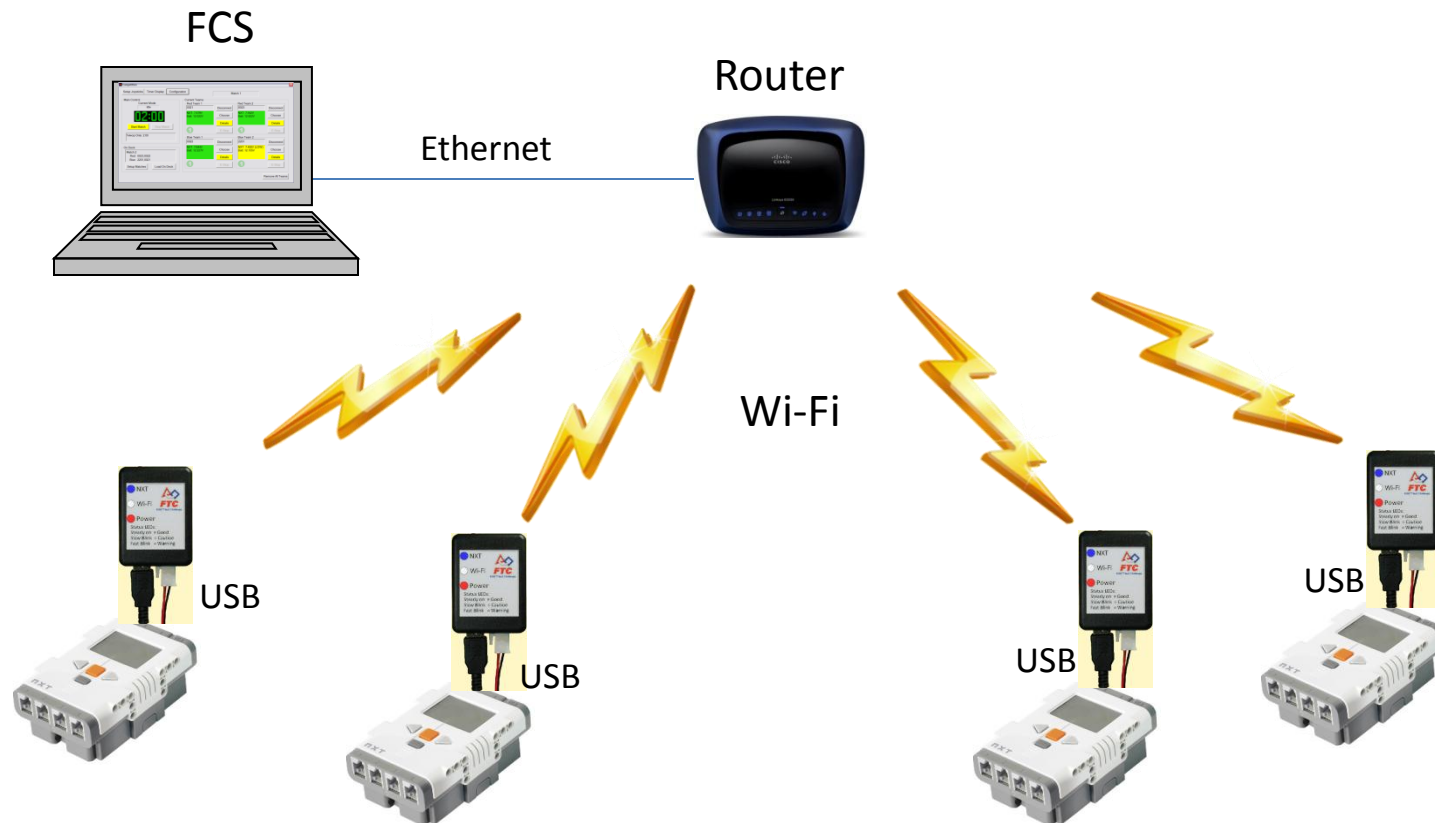
- Bluetooth



- Samantha (RobotC Only)

FCS Competition Connectivity

FCS <--> Router <--> Samantha <--> NXT



Things to know about the Samantha Module



- There is a button on the Samantha module that you must press at certain times. Make sure you can get to it.
- There is a USB connector (Female-A) on the Samantha module which you must access during software inspection.
- You may wish to direct connect your NXT to your laptop for programming during a competition. You must unplug Samantha from the NXT to do this and reconnect it before your next match.
- Samantha has 3 LED lights that give lots of information. Make sure they are easily viewed.

Conclusion:

**DON'T BURY YOUR SAMANTHA
MODULE INSIDE YOUR BOT!**

More things about Samantha



- You can use Samantha right out of the box, but will require some home network reconfiguration.
- OR
- You can use Samantha with your existing home network (as is), but will require some Samantha reconfiguration.
 - If you modify the Samantha configuration for your home network, you will need to change it back in order to use it in the pit area at an event.
 - You can do all your development without ever using Samantha, HOWEVER, you MUST use Samantha at the competitions.
 - **Recommend testing your Samantha well in advance of your first event to insure that it works!!!!**

Samantha Resources



Resources available to you at the FIRST website:

- Online documentation
- Samantha Help (Forums)
- Problem reporting / enhancement request system
- Samantha Telecom recording



2011 Field Control System (FCS)



- There will be a competition field network (secure) and a pit area network (unsecure). Your Samantha module (robot) will be able to operate on either network.
- There will be one central FCS station controlling all robots on the competition field. This year you can leave your laptop in your pit if you wish.
- Your Samantha module must have a network password installed in order to connect to the competition field network. This password will be installed as part of s/w inspection.
- Teams may connect their laptops and Samantha modules to the pit area network (pit area) and control their robot using their own copy of FCS (no password required).



2011 Field Control System (FCS)



- Alternately, teams can still use Bluetooth in the pit if they want to modify and test their code. However, it is recommended to turn off Bluetooth on the NXT during a match.
- Teams can also direct connect via USB instead of using NXT Bluetooth or the FCS while in the pit. This will allow teams to modify their programs and file system.
- You can have the FCS display your teams logo during the match. **VERY COOL!!!!** Just create a gif image file and load on your NXT (see FCS instructions for details).

At the Contest



LOTS TO DO!!! – Typical schedule

- Arrival and Check in (~ 7:30 AM)
- Setup your Pit area
- H/W inspection
- S/W inspection
- Judges Interview
- Practice Matches
- Opening ceremony (~ 10:30 AM)
- Qualifying matches (lunch)
- Elimination matches
- Awards and closing.



**Lots to do in
3 hours!!!**

Helps to
Be Organized
And Stay **Focused**



Software Inspection



Objectives:

- Insure that the NXT is configured properly for competition.
- Configure Samantha for the competition field.
- Insure that the robot works as expected.
- Insure that the team's drivers and coach know the match process.

Two parts of s/w inspection:

- Configuration check
- Field test

S/W inspection sheet available in the game manual.

Software Inspection



NXT/Samantha configuration check:

- NXT Firmware version OK?
- Proper team number configured?
- Sleep timer 30 minutes or greater?
- Install competition field network keys.
- Connects to the FCS?

Field test.

- Does the bot behave?
 - Waits, moves, stops, and pauses.
- Does the drive team behave?
 - Knows Where/when to queue for match?
 - Knows how to setup on the field?
 - Know their signals (ready, need help, etc)?
 - Know what to do at end of match?

Hardware Inspection



Each team will get the sole attention of a hardware inspector for 15-30 minutes. They will check to insure that the robot meets all the robot rules stated in the “BOWLED Over!” game manual.

- Teams must provide a Bill Of Materials (BOM) containing all <R5>c type parts. These are the “allowed” non Tetrix / Lego / HiTechnic parts on the bot. A sample BOM is provided in the game manual.

Hardware Inspection



- Teams have access to the same inspection sheet that will be used by the inspectors. Make sure to do a self inspection before the event and fix all issues found. The hardware inspection sheet is provided in the game manual.
- Not all h/w inspectors are created equal. Two inspectors may catch different things or have different opinions as to what is a sharp edge. Play it safe and be thorough and conservative when possible (i.e. leave no doubt!!!).
- Don't forget your flag holder and team number of the prescribed size.

Inspection Wrap-up



- Teams must meet ALL software rules to pass software inspection.
- Teams must meet ALL hardware rules to pass hardware inspection.
- You cannot compete until you pass both inspections.
- Make passing your inspections a priority.

Tips and Best Practices



- Make sure your bot is ready well before the event.
- Do your own inspections BEFORE the event.
 - Have several students do a h/w and s/w inspection and fix any issues they find.
 - Have a mentor do a final inspection (inspection challenge).
- Pack in advance and Don't forget anything (including your laptop and robot code).
- Put your team number on everything: tools, batteries, chargers, laptops, NXT, cables, and even the kids.
- Make sure to charge all your batteries before the event (laptop, NXT, and Tetrax).

Tips and Best Practices



- Bring a “loose” copy of your code (USB thumb drive, CD-ROM, etc).
- Get to the event early (extra time is your friend)!!!
- Plan ahead for meals. Lunch can generally be purchased from the event organizers.
- Bring an extra power strip. An open Receptacle is often hard to find (let alone two)

Tips and Best Practices



Big fan of checklist:

- Create and use checklists.
 - “Take to the event” checklist.
 - Pre-match checklist.
 - Post-match checklist.

Pre-Match Checklist:

- Turn on NXT
- Turn on Tetrax
- Select Appropriate Auto Program
- etc

Post-Match Checklist:

- Return all field elements (Flag, balls, etc)
- Check for loose cables, parts, etc
- Turn off NXT and battery
- Test battery charge
- etc

Tips and Best Practices



Have a robot cart.

- Serves as a convenient work platform.
- Prevents students from having to carry the bot (less risk to students and robot).
- Place to carry emergency tools, parts, and batteries.
- Suggest inflatable wheels on your cart (less vibration, no scratching of gym floors).
- “Deluxe model” - 12V battery and inverter for on board charging TETRIX batteries and laptops.
- “A cool robot ride” - Ground effects lighting would be a fun project for the kids and add some excitement and showmanship.

Resource Links



- FIRST FTC programming page (ROBOTC and LabVIEW):
 - <http://usfirst.org/roboticsprograms/ftc/programming>
- Samantha documentation and resources:
 - <http://usfirst.org/roboticsprograms/ftc/samantha-resources>
- Samantha Forums
 - <http://ftcforum.usfirst.org/>



Have a Fun Time!!!



Thank you for attending this presentation.

Good luck this season and I hope to see everyone at the FIRST FTC 2012 World Championship in St. Louis!!!

Eric Grajales and Mike Nicolai