FTC New Platform Workshop

presented

By











FTC TEAM #8565

New Platform Setup/Debug

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Robot Controller Setup

Justin Jiang





Overview

- Preparing ZTE Phone for Robot Controller
- Seeing Your Phone in Android Studio
- Running your Code on ZTE Phone for Debugging



Enabling Developer Options

Tap on Build Number/SW Version 7 times and enable Developer options.

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< About phone	(Abo
Icon glossary	Leg
Status Show status of battery, network, and other information.	4G
Legal information	Mo N91
Phone name SAMSUNG-SM-N910V	And
Model number SM-N910V	4.4.
Android version 4.4.4	N91
Baseband version	Ker 3.10
Kernel version 3.10.0 dpi@SWDD5702 #1 Wed Nov 12.02:16:29 KST 2014	SW
Build number	HW

About phone	
Legal inform	nation
4G settings	
Model numl N9130	ber
Android ver 4.4.4	sion
Baseband v N9130B01	ersion
Kernel versi 3.10.28-g1d99 zte-kemel@Zdi	on 36e-00247-g6a6f8a8b roid-SMT
SW Version	05
HW Version	





Enabling USB Debugging

Connect the ZTE Speed to your computer, and allow

USB debugging.





Installing Phone Driver





Seeing Your Phone in Android Studio





Running Your Program

👳 ftc_app-master - [C:\Users\Jerry\Desktop\FTC\ftc_app-ma	ster] - [FtcRobotController]\FtcRobotContr	roller\src\main\java\o	com\qualcomm\ftcrobotcontroller\FtcRobotControllerActivity.java - Android Studio 1.2.2	- 🗆 ×
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Effc app-master	👷 💆 ebug 'FtcRobotController'	Shift+F9	E EtcRohotControllerActivity	
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+ build	Stop	Ctrl+F2	ActionBar();	
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gitignore	🔟 Step Into	F7	Imer();	
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🗐 gradlew	™r Run to <u>C</u> ursor	Alt+F9	Toast toast) {	
gradlew.bat	[™] ∑ Force Run to Cur <u>s</u> or	Ctrl+Alt+F9	st.show(); });	
local.properties	Terame Drop <u>F</u> rame			_
ا README.md	Pause Program			
E settings.gradle	Resume Program	F9		
V External Libraries	Evaluate Expression	Alt+F8		
Android 4.4.2 Google APIs > (C:\Users\Jerry\A)	pp Quick Evaluate Expression	Ctrl+Alt+F8		
	Show Execution Point	Alt+F10		
Android	Toggle Line Breakpoint	Ctrl+F8	ent Log	
ਸ਼ੁੱ 🔲 ZTE N9130 Android 4.4.4 (API 19) 🔻 No Debu	Toggle Method Breakpoint		6:51:09 PM Platform and Plugin Updates: A new version of Android Studio	is available!
	Toggle Temporary Line Breakpoint	Ctrl+Alt+Shift+F8	6:51:06 PM Platform and Plugin Updates: A new version of Android Studio	is available!
ADB logs + Memory + CPU +	Toggle Breakpoint Enabled		3:30:20 PM Gradle build finished in 1m 32s 876ms	
08-22 15:34:02.904 6897-6897/? E,	⁷⁰ Siew Breakpoints	Ctrl+Shift+F8	3:30:47 PM Session <u>'FtcRobotController'</u> : running	
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Gradle build finished in 12s 254ms (3 minutes ago)	2		9482:1 LF*	windows-1252
				- 342



Build Success

Gradle Console FTCRODOTCONTROLLER: preDexDebug UP-TO-DATE :FtcRobotController: dexDebug UP-TO-DATE :FtcRobotController: validateDebugSigning :FtcRobotController: packageDebug UP-TO-DATE :FtcRobotController: zipalignDebug UP-TO-DATE :FtcRobotController: assembleDebug UP-TO-DATE BUILD SUCCESSEUL Total time: 11.483 Becs	₩- ±
	■ Gradle Console windows-1252\$



Choosing Your Device

👳 Choose Device				×
Choose a running device	ce			
Device		Serial Num	ber State	Com
ZTE N9130 Android 4.4.4	(API 19)	3a20a56	Online	Yes
	(5420450	onnie	T CS
 Launch emulator 				•
Android virtual device: Nexus 5 API 22 x86			▼	
—				
Use same device for future launches				
		ок	Cancel	Help
🗁 🐨 💷 External Linraries				



Robot Controller App

First Launch

Active Configuration File:	No current file!
New	
Available files:	0
No files found	
In order to proceed, you must file	create a new
AutoConfigure	0



Robot Controller App

Subsequent launch you may get:

🙍 Applie	cation Installation Failed			
?	Installation failed since the device already has an application with the same package but a different signature. In order to proceed, you have to uninstall the existing application.			
	WARNING: Uninstalling will remove the application data!			
	Do you want to uninstall the existing application?			
	OK Cancel			



Driver Station Setup

Amanda He





Overview

- Installing Driver Station App from Google Play Store
- Connect Gamepad to Driver Station Phone
- Pair Driver Station to Robot Controller
- Driver Station User Interface



Connect with Gamepads

Go to Settings and Choose your Gamepad





Make sure gamepads are on X Mode



Activate Gamepads

Press Start and A at the same time to activate the gamepad for Driver 1, Start and B for Driver 2. The corresponding gamepad icon should light up.





Pair with Robot Controller

Go to 'Settings' and choose 'Pair with Robot Controller'

	GAMEPAD
83.0% User 1 User 2	Gamepad type Logitech F310 Gamepad
Wifi Direct: Ping:	LUGGING
	Log Network Traffic Save network data to logs; this will generate a large volume of logs
	WIFI DIBECT CONFIGURATION
Select Op Mode	Pair with Robot Controller Change the Robot Controller this Driver Station is paired with.
Restart Robot	
About	
Exit	



Successful Connection

	3.0%	o User 1 U	o Jser 2
÷.	Wifi Direct Not Paire		
		Þ	
Select Op N	1ode		





Driver Station UI Overview





Debugging Strategy

Jerry Chen





Overview

- Hardware perspective
- Software perspective



Hardware

- Driver Station side
- Robot Controller and Robot side
- Basic Hardware Debugging Strategy
 - Identify the path to the part that is failing
 - Debug by replacing each part in the path, one by one
 - Repeat until the failing part is found



Driver Station





Robot Controller and Robot





Software

- Telemetry (FTC SDK)
- Writing Log Messages to Logcat
- Upload Logcat File
- Logcat File Size Changing



Telemetry

You can display data of your robot's status (sensor and motor values) on the driver station. (K9TeleOp.java)

telemetry.addData("claw", "claw: " +
String.format("%.2f", clawPosition));

telemetry.addData("left tgt pwr", "left pwr: " +
String.format("%.2f", left));



Writing Log Messages to Logcat

- Use DbgLog.msg("Whatever message")
- Example (FtcRobotControllerActivity.java):

DbgLog.msg("USB Device attached; app restart may be needed");

• This message shows up in the logcat:

08-23 16:38:11.311 927-1105/com.qualcomm.ftcrobotcontroller I/FIRST : USB Device attached; app restart may be needed



Upload Logcat File

1. When you want to save the log, press "Terminal" at the bottom of your Android Studio screen, next to the Android tab.

2. Type "adb logcat -d > logcat.txt" into Terminal.

3. This will create a file named "logcat.txt" in the "ftc_app-master" folder.



Logcat File Size Changing

- The Logcat can only store a limited amount of lines. We can increase it to have more log saved on the phone.
- Find this line of code in "FtcRobotControllerActivity.java":

```
RobotLog.writeLogcatToDisk(this, 4
* 1024);
```

• Change the 4 to the number of megabytes you want.



Find Logcat File on the Phone





Prepare for Matches

Jerry Chen





Overview

- Changing Wi-Fi Channel
- Renaming your Device
- Match Run



Wi-Fi Channels



We can only use the first 11 channels in the U.S. We mostly use channels 1, 6, and 11 because they do not overlap with each other. Part of the reason why we need to turn of all Wi-Fi Hotspots at a tournament is to reduce interference within these 11 channels.

<T5>Team members may be asked by the Event Director to use a specific Wi-Fi Channel on the Event day. It is the intent of this rule that Teams must comply with the request of the Event Director if asked to use a specific Wi-Fi Channel. (Game Manual Part I)



How to Change the Wi-Fi Channel

- 1. Install WifiChannelEditor from the Play Store onto your Robot Controller device. The WifiChannelEditor can only be installed on the ZTE Speed right now.
- 2. Open WifiChannelEditor.
- 3. Select the channel you want from the drop-down.
- 4. Press change.
- 5. Robot Controller Device is the WiFi Direct Group owner which determines the channel
- 6. After changing the channel on Robot Controller Device, you might need to un-pair and re-pair the Driver Station to it



Changing the Wi-Fi Channel





Special app that allows for WiFi Direct channel changing on ZTE Speed phones.



Naming Requirement From Game Manual Part I

<RS02> Each Team MUST "name" their Robot Controller with their official FTC Team number and –RC (e.g. "1234-RC"). Each Team MUST "name" their Driver Station with their official FTC Team number and –DS (e.g. 1234-DS). Spare Android devices should be named with the Team number followed by a hyphen then a letter designation beginning with "B" (e.g. "1234-B-RC", "1234-C-RC")



How to Rename your Device

- 1. Open Settings.
- 2. Go to WiFi and turn it on.
- 3. Click on the 3 dots.
- 4. Click WiFi Direct.
- 5. Click the option to rename your phone.
- 6. The name is automatically set to N9130. Change it to whatever you want.



How to Rename your Device





Match Run

- Using Sports Start
- Procedure
- Advantages



