

# FTC New Platform Workshop

presented

By



**FTC TEAM #8565**

# New Platform Setup/Debug

Justin Jiang/Amanda He/Jerry Chen



# Robot Controller Setup

Justin Jiang



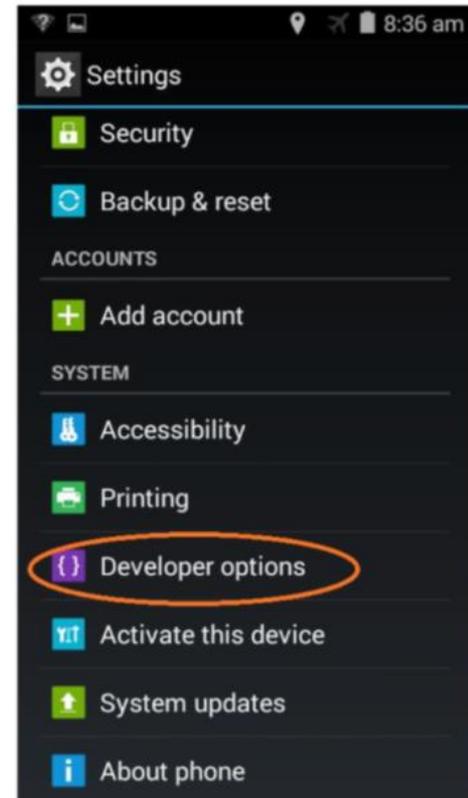
# Overview

- 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.

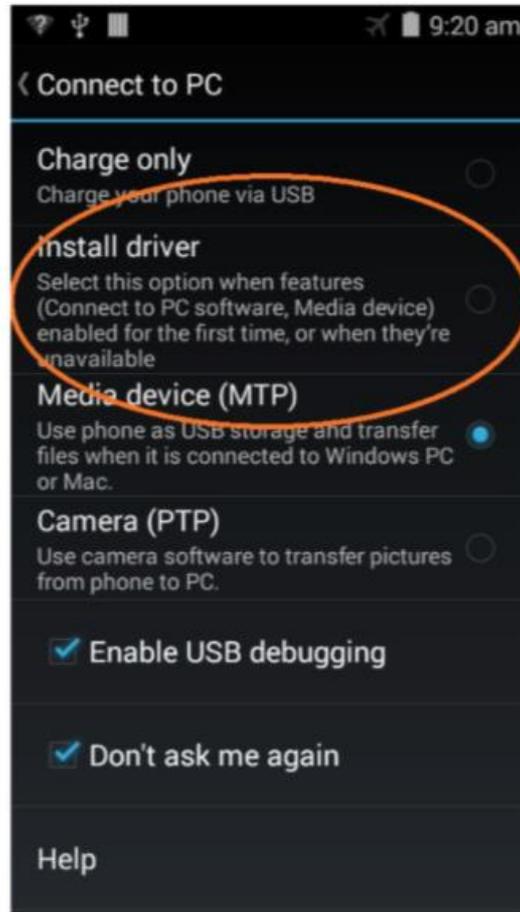


# Enabling USB Debugging

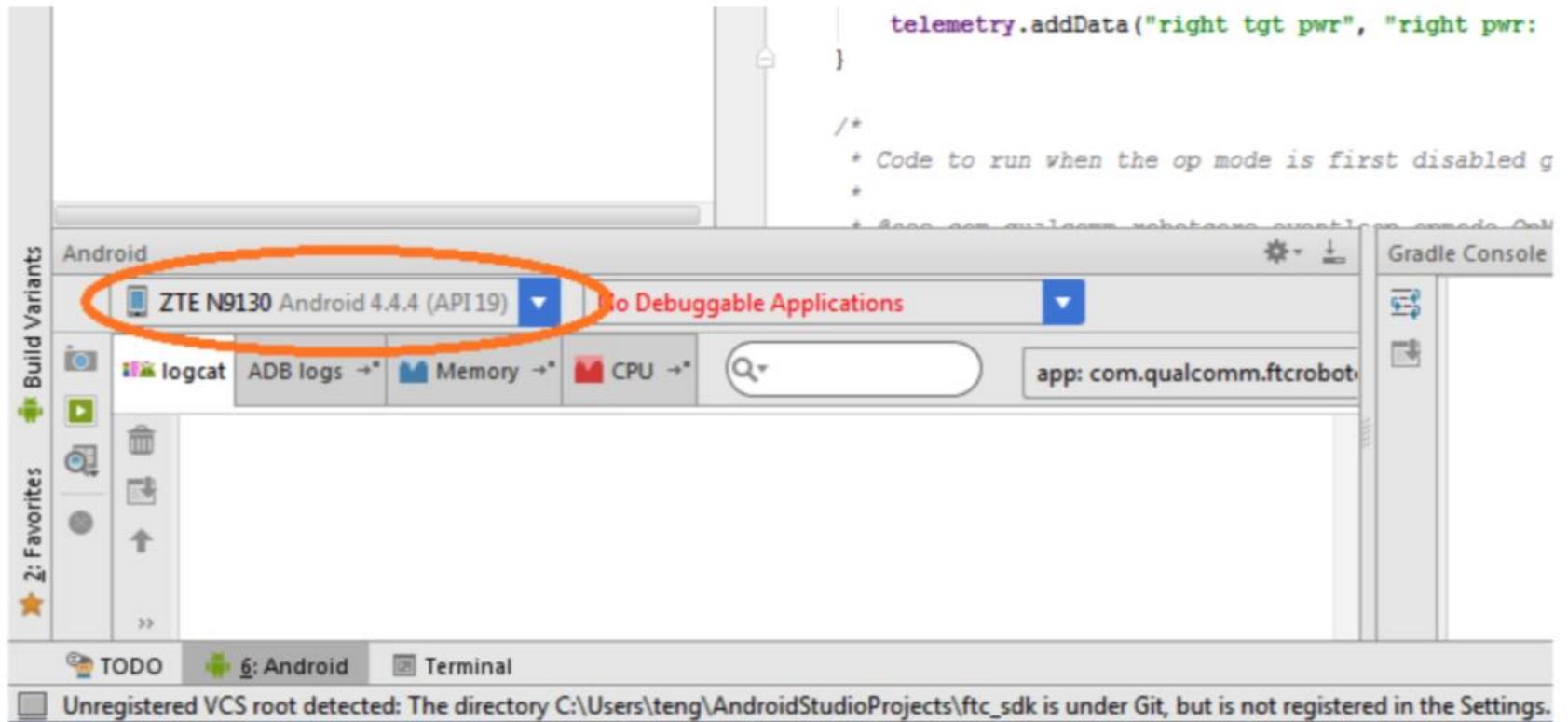
Connect the ZTE Speed to your computer, and allow USB debugging.



# Installing Phone Driver



# Seeing Your Phone in Android Studio



# Running Your Program

The screenshot displays the Android Studio 1.2.2 interface. The 'Run' menu is open, with the 'Run' option highlighted by a blue box. The menu items include: Run 'FtcRobotController' (Shift+F10), Debug 'FtcRobotController' (Shift+F9), Run 'FtcRobotController' with Coverage, Stop (Ctrl+F2), Reloading Changed Classes, Step Over (F8), Force Step Over (Alt+Shift+F8), Step Into (F7), Force Step Into (Alt+Shift+F7), Smart Step Into (Shift+F7), Step Out (Shift+F8), Run to Cursor (Alt+F9), Force Run to Cursor (Ctrl+Alt+F9), Drop Frame, Pause Program, Resume Program (F9), Evaluate Expression... (Alt+F8), Quick Evaluate Expression (Ctrl+Alt+F8), Show Execution Point (Alt+F10), Toggle Line Breakpoint (Ctrl+F8), Toggle Method Breakpoint, Toggle Temporary Line Breakpoint (Ctrl+Alt+Shift+F8), Toggle Breakpoint Enabled, View Breakpoints... (Ctrl+Shift+F8), Get thread dump, and Attach debugger to Android process.

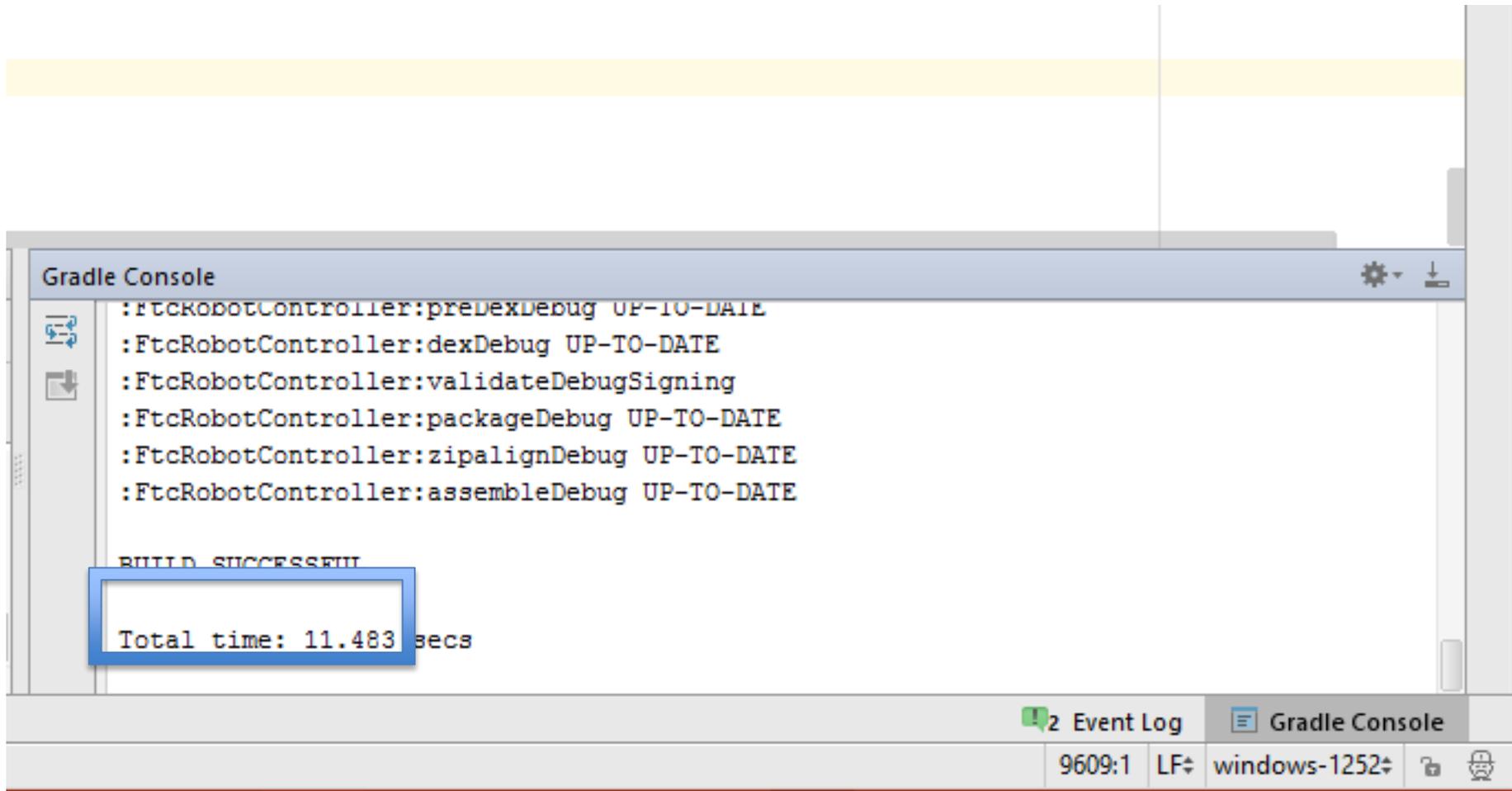
The background shows the 'FtcRobotController' activity code in the editor, with the following visible snippets:

```
buttonBrightensScreen() {  
    ActionBar();  
  
    AbilityListener(isVisible) -> {  
        timer();  
  
        Toast toast() {  
            toast.show(); }  
    }  
}
```

The bottom status bar indicates 'Gradle build finished in 12s 254ms (3 minutes ago)'. The Event Log shows several messages about Android Studio updates and Gradle builds.



# Build Success



```
Gradle Console
:FtcRobotController: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 SUCCESSFUL

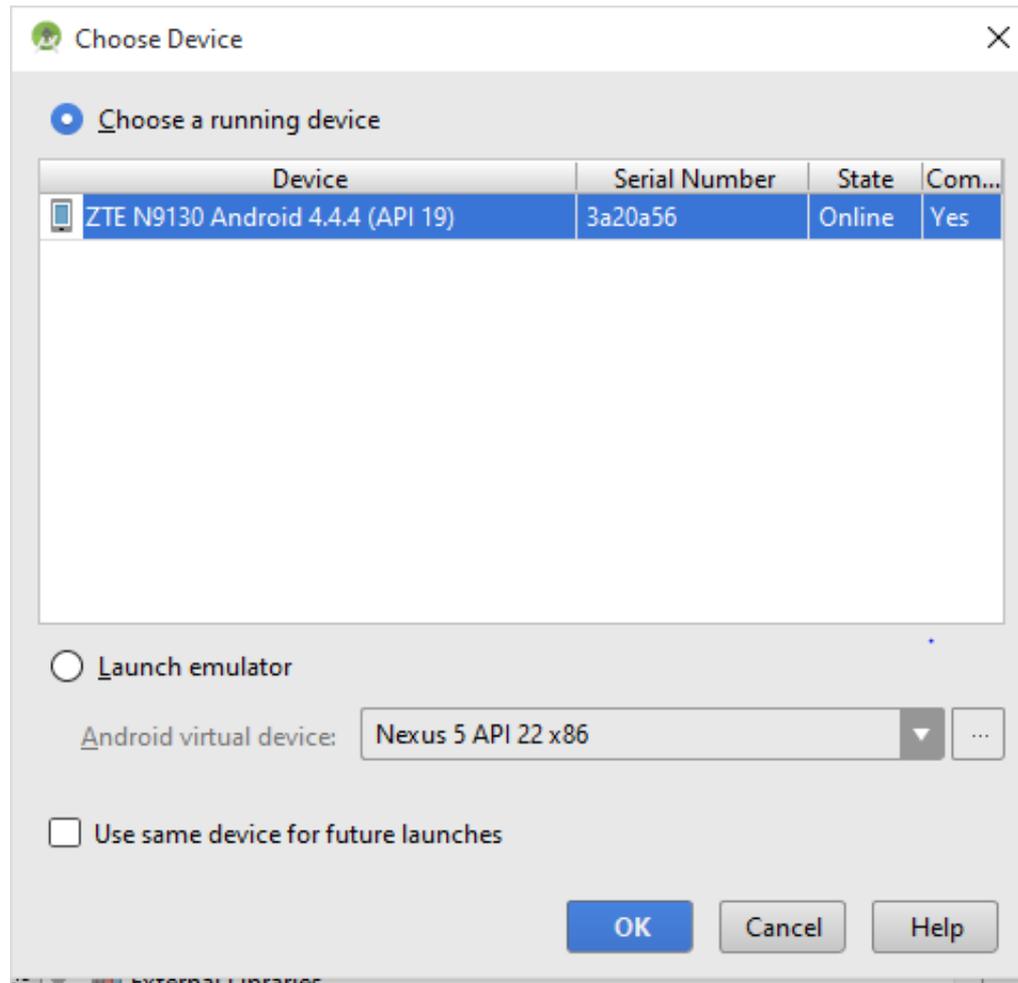
Total time: 11.483 secs
```

2 Event Log | Gradle Console

9609:1 | LF↕ | windows-1252↕ | 🔒 🤖

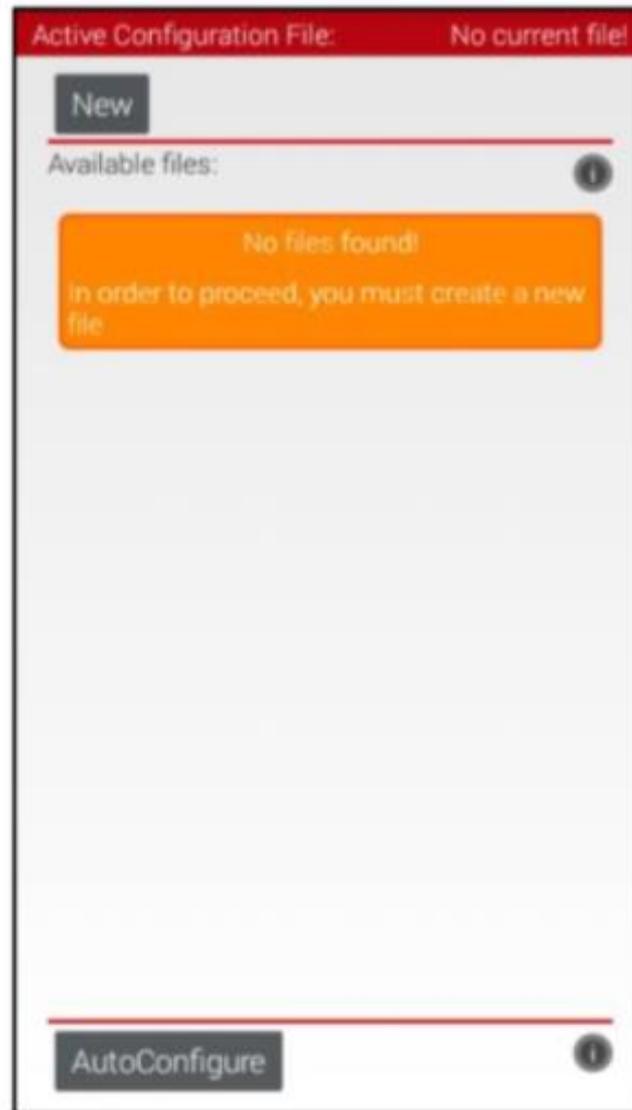


# Choosing Your Device



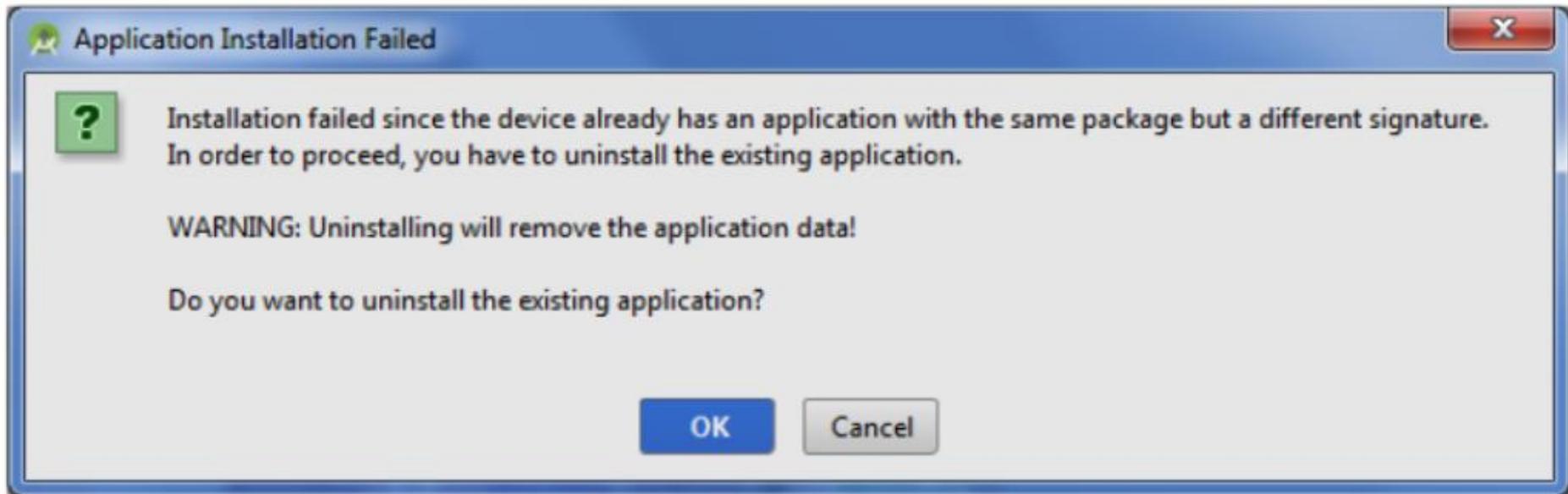
# Robot Controller App

First Launch



# Robot Controller App

Subsequent launch you may get:



# Driver Station Setup

Amanda He



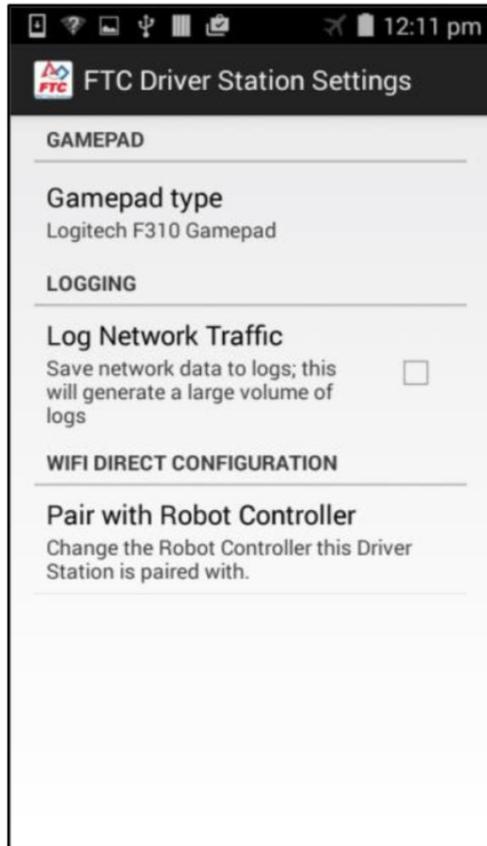
# Overview

- 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

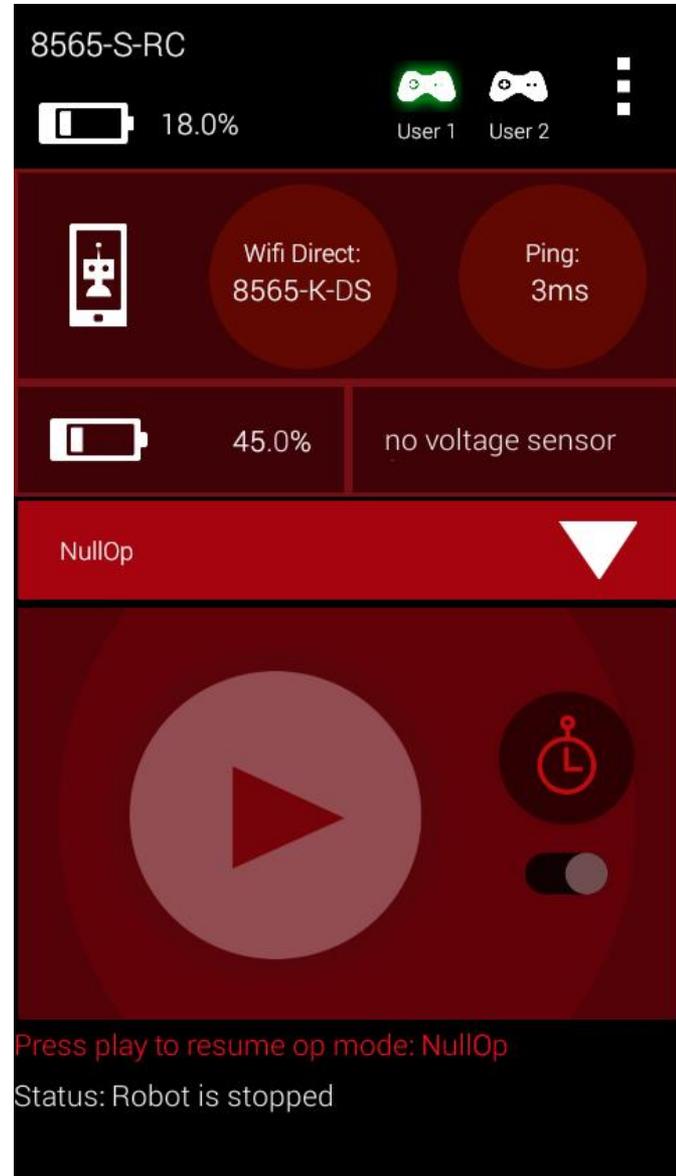


Make sure gamepads are on X Mode



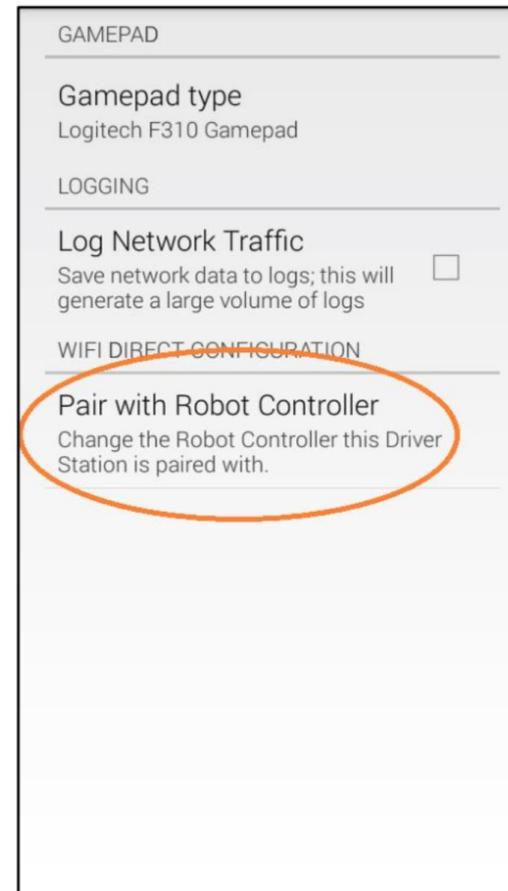
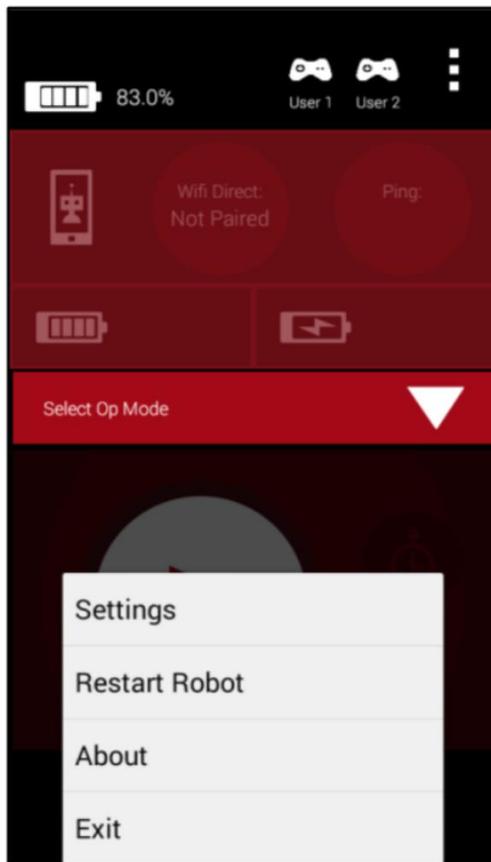
# Activate Gamepads

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.

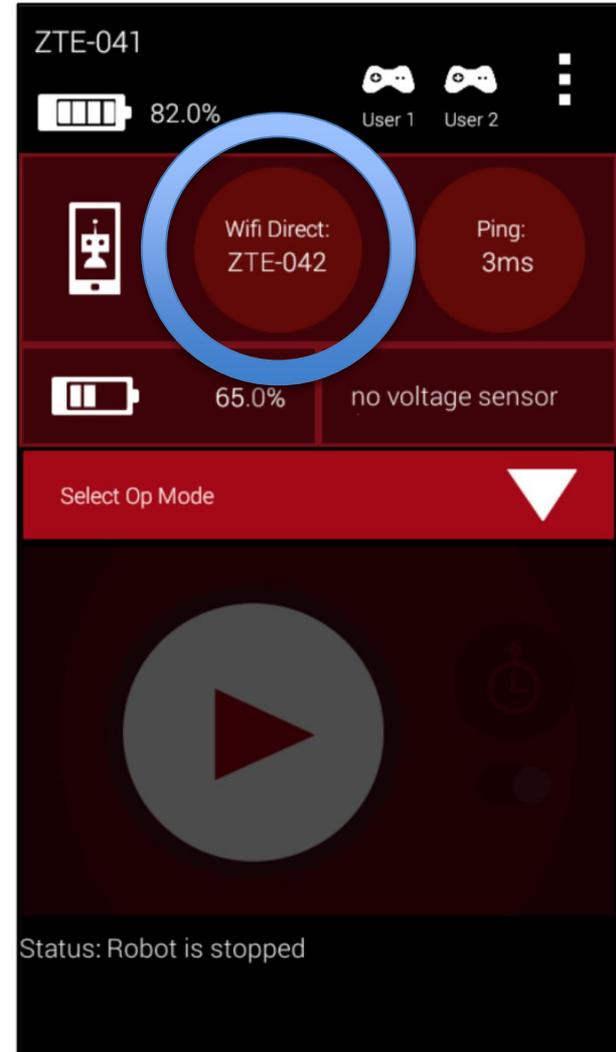
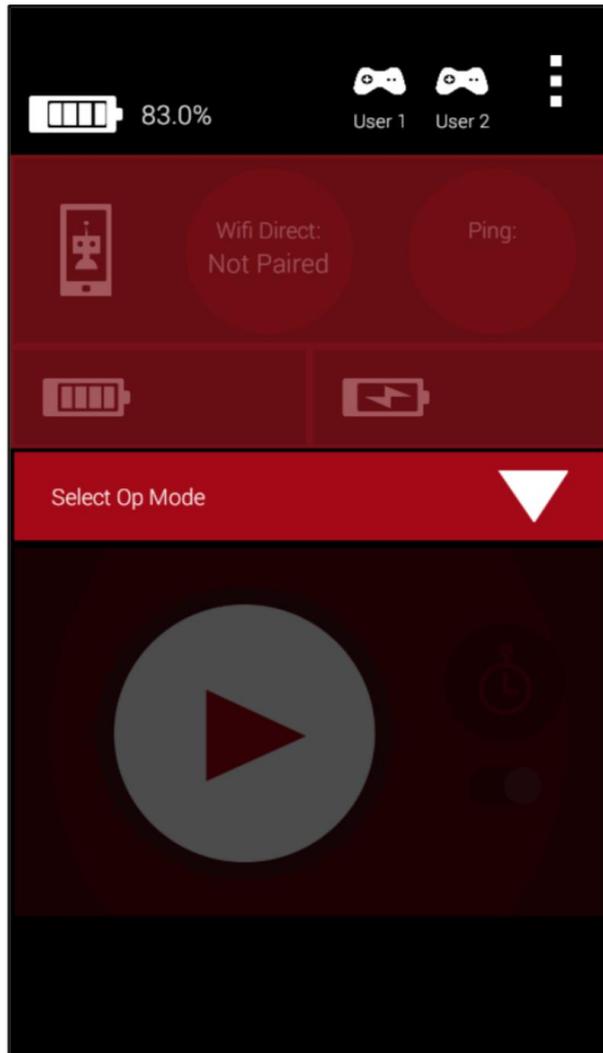


# Pair with Robot Controller

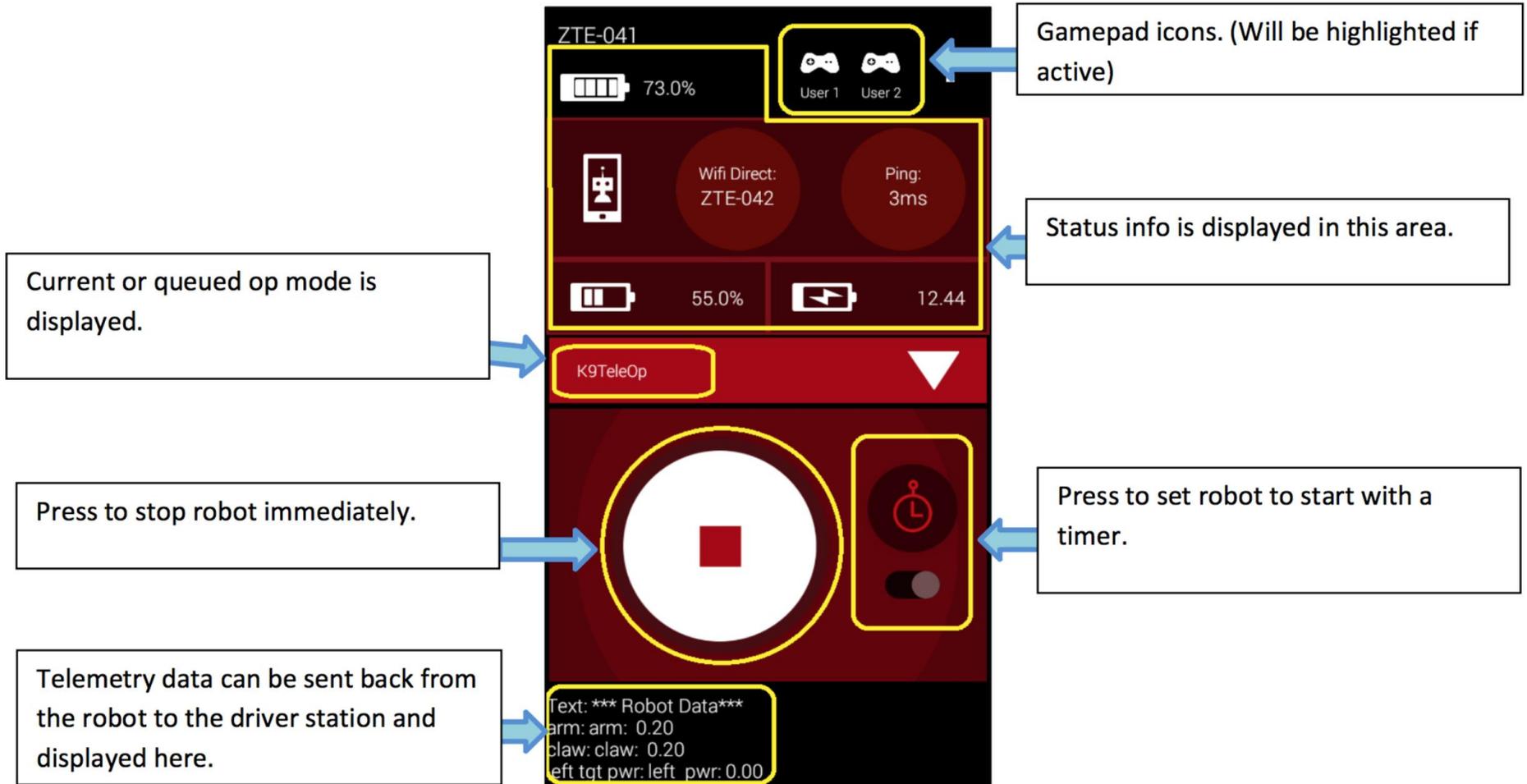
Go to 'Settings' and choose 'Pair with Robot Controller'



# Successful Connection



# Driver Station UI Overview



# Debugging Strategy

Jerry Chen



# Overview

- Hardware perspective
- Software perspective



# Hardware

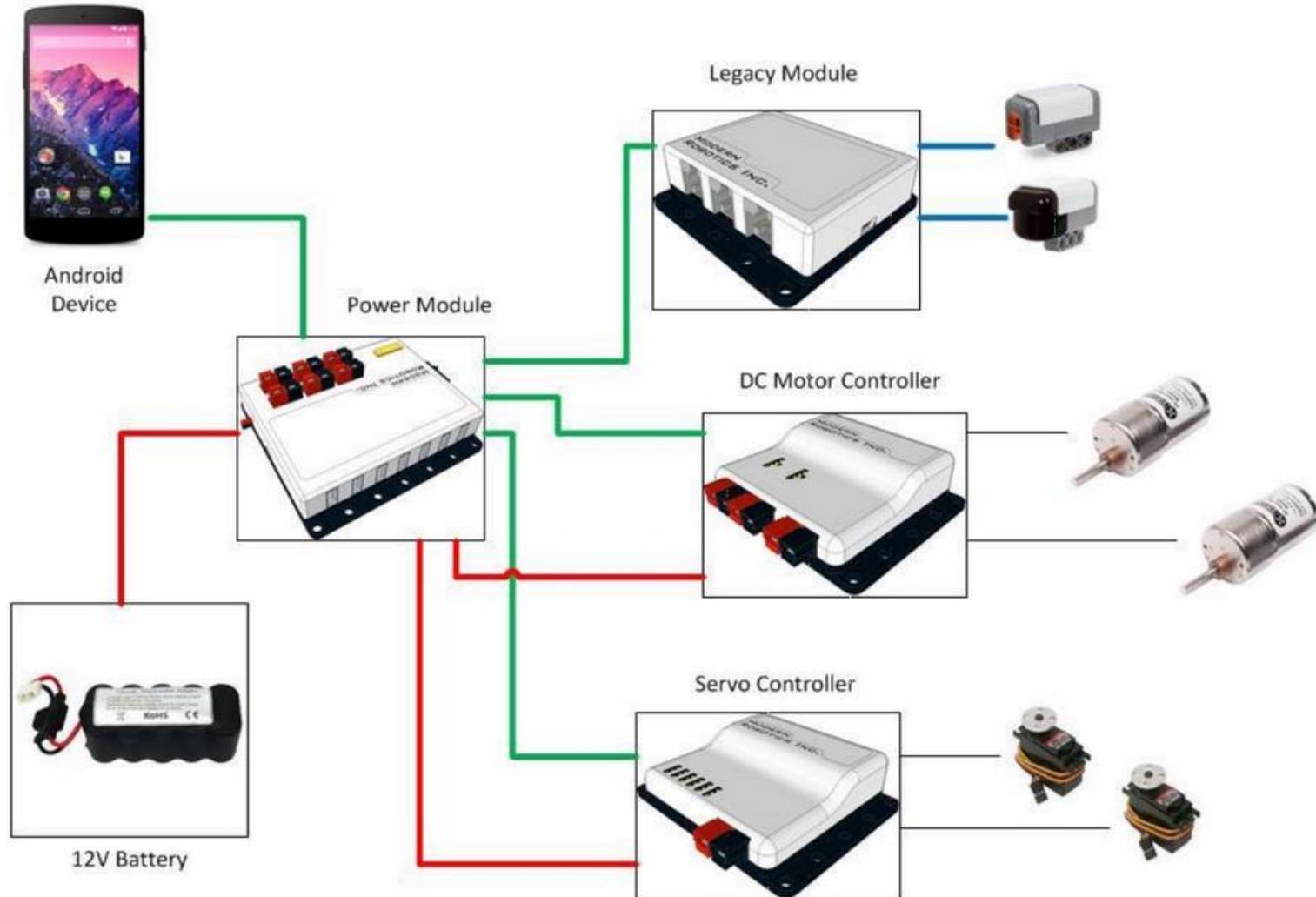
- Driver Station side
- Robot Controller and Robot side
- Basic Hardware Debugging Strategy
  - Identify the path to the part that is failing
  - Debug by replacing each part in the path, one by one
  - Repeat until the failing part is found



# 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

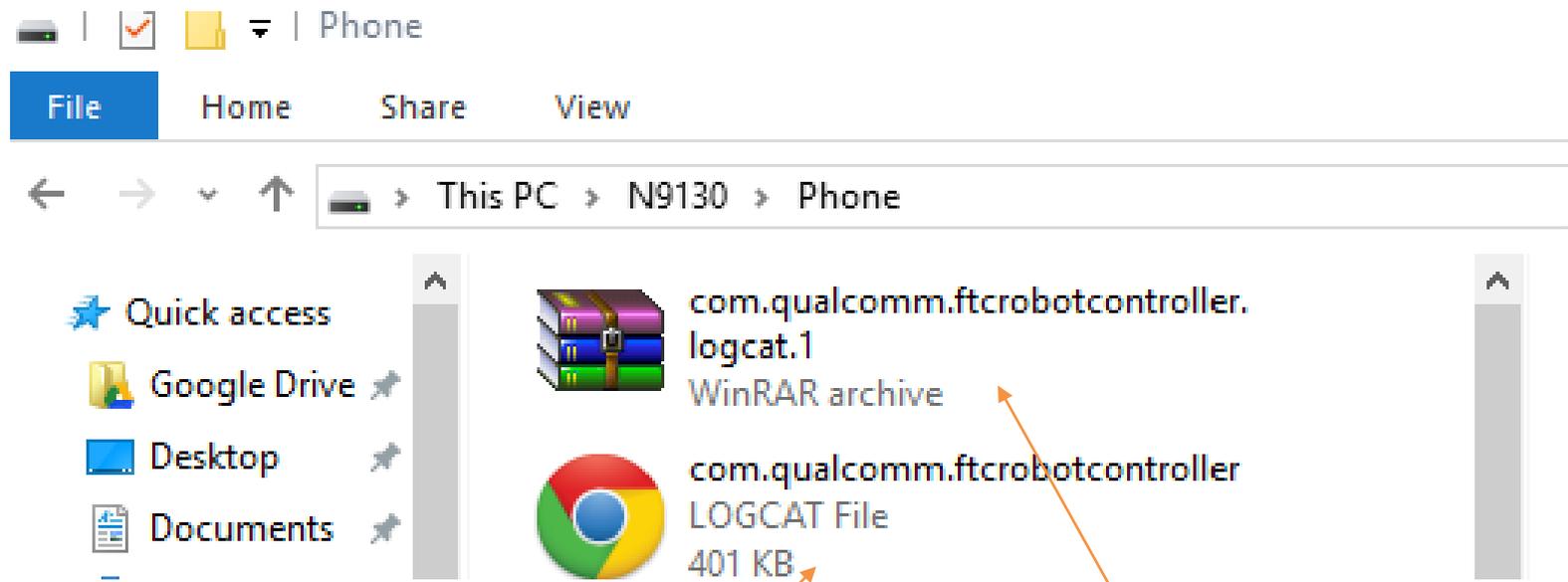
- The Logcat can only store a limited amount of lines. We can increase it to have more log saved on the phone.
- Find this line of code in “FtcRobotControllerActivity.java”:

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

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



# Find Logcat File on the Phone



Current Logcat file

Archived file when limit is reached



# Prepare for Matches

Jerry Chen

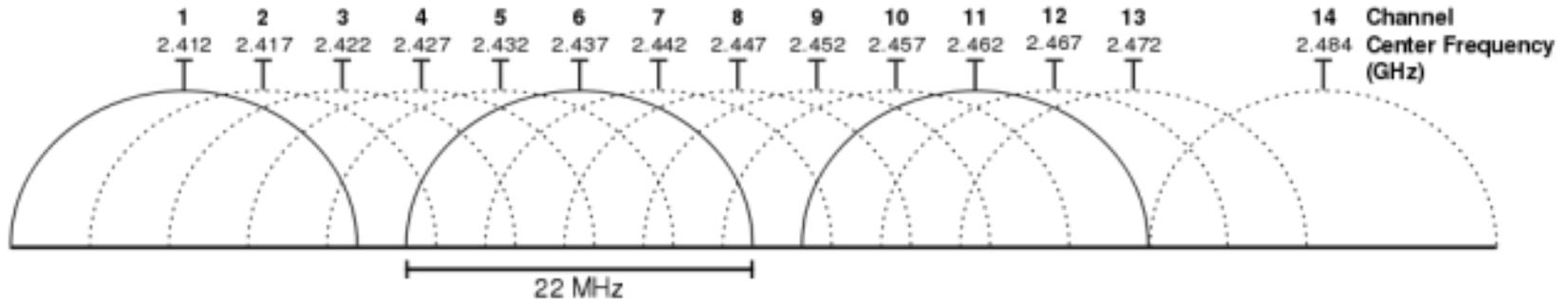


# Overview

- 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 off 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)

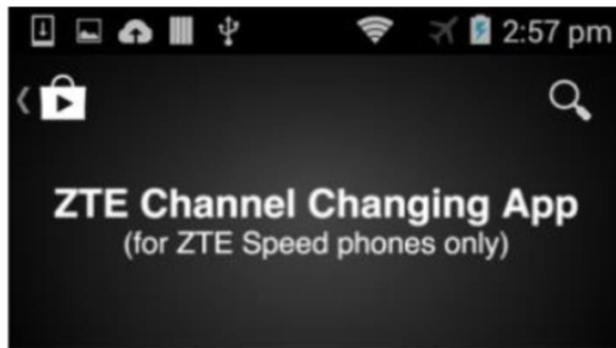


# How to Change the Wi-Fi Channel

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



 WiFi Direct Channel Changing  
FIRST Tech Challenge

INSTALL

10

Downloads

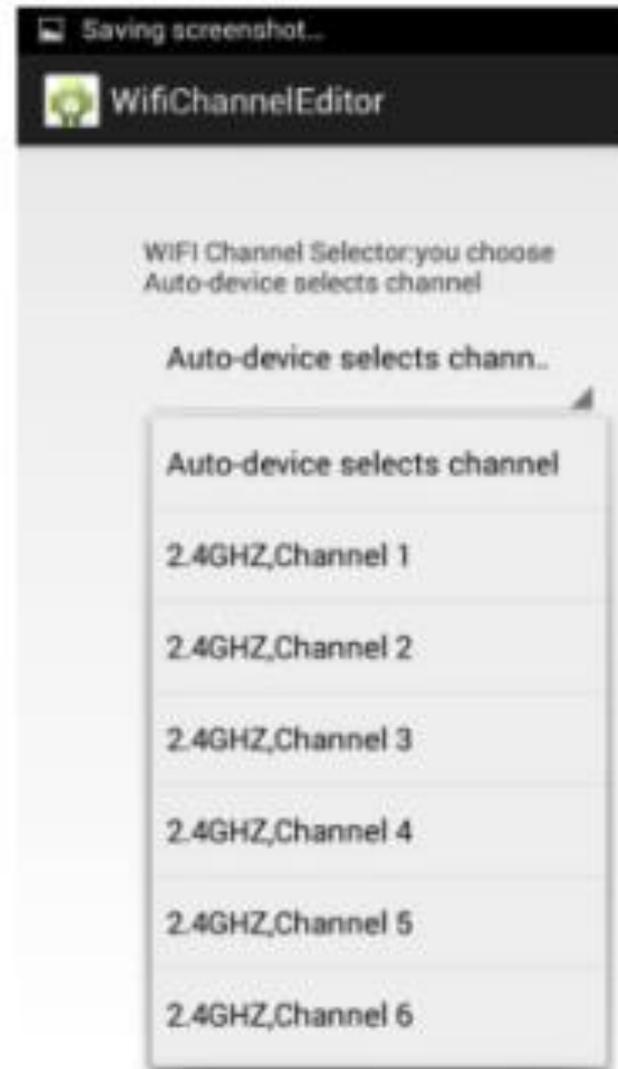


Tools



Similar

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”)

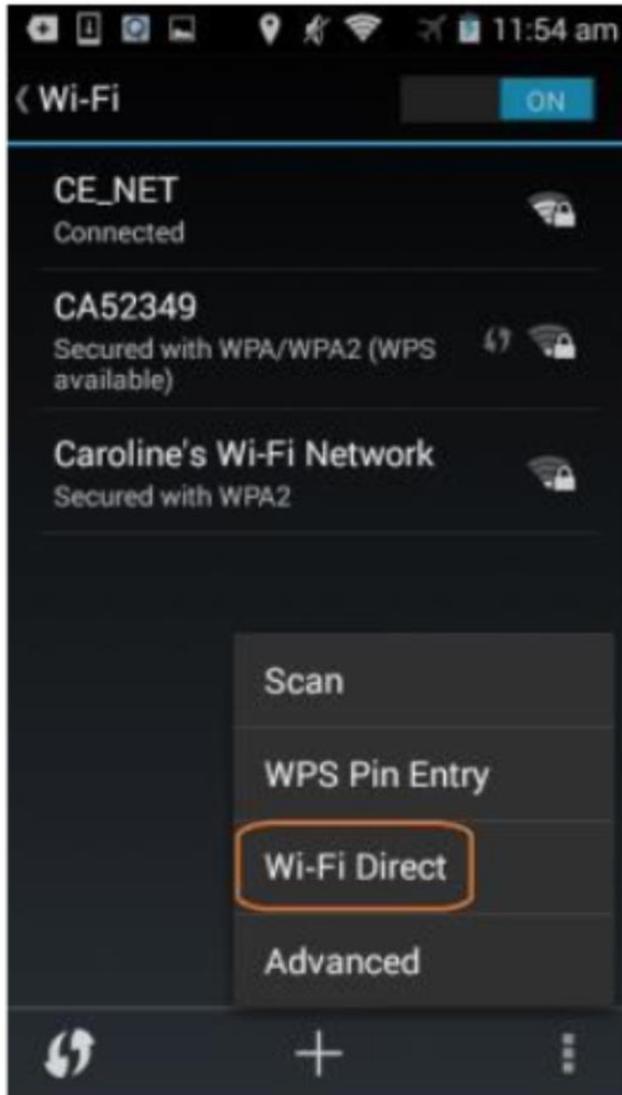


# How to Rename your Device

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.

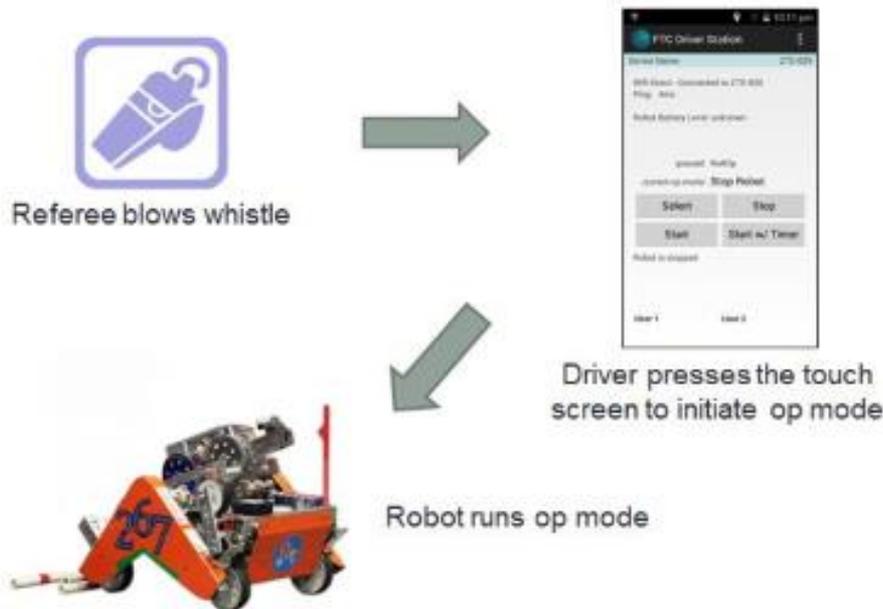


# How to Rename your Device



# Match Run

- Using Sports Start
- Procedure
- Advantages



8565-S-RC

25.0%

User 1 User 2

Wifi Direct: 8565-K-DS

Ping: 2ms

44.0%

no voltage sensor

NullOp

26

1 Start: NullOp started at 2015/08/23 17:29:03  
2 Status: running for 3.3766 seconds

