

Programming in FTC with Android Studio: Intro to Programming

Presented by FTC #8668 Error 404: Team Name Not Found



Hello and welcome to this workshop introducing programming in FTC presented by Error 404: Team Name Not Found. My name is Andrew and I will be presenting today.

So this workshop assumes that you already have Android Studio fully setup and ready to go. If your computer is not ready to go, then we've got some San Jac laptops that you can borrow with Android Studio and the code you will need ready to go on them.

And then I'd like to thank San Jac for hosting us once again. We really appreciate their having us back year after year.

Agenda

- Phone Setup
- Electronics Overview
- Hardware Configuration
- Creating and Running an Autonomous OpMode

The agenda.

As you can see for yourself, I will walk through setting up your robot controller and driver's station.

Then we will do a brief overview of the electronics we can use.

After that we will create config files on our phones.

And finally we will hopefully get the chance to make the robots run around some.

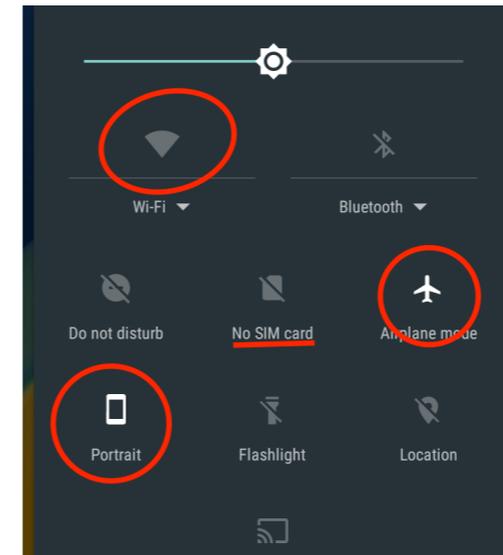
Phone Setup

ERR-44

I'm going to go over properly configuring your phones.

Phone Setup - Settings

- Turn ON airplane mode



According to the FTC Challenge Rules, “The Driver Station and Robot Controller must be set to airplane mode, and Bluetooth must be turned off.” For any of you fact-checkers, that’s from Part 1, Section 8.3.4, <RS07> of the 2018-19 FTC Challenge Rules. So you want to make sure that when you are using your phones to run the robot you have airplane mode on and bluetooth turned off.

NEXT

Removing the SIM Card prevents the phone from ever doing anything naughty and also stops some additional background processes that can use up battery.

NEXT

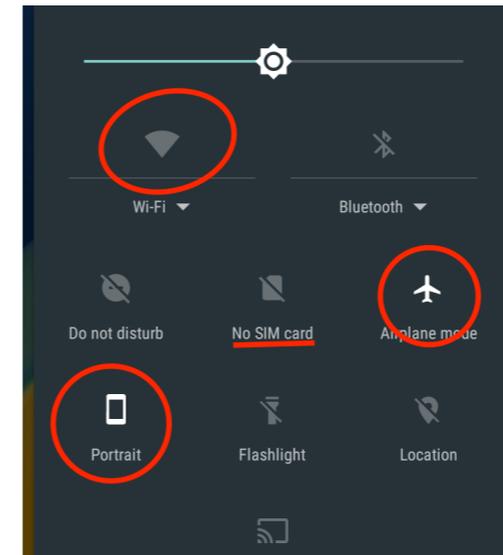
Turning Auto-rotate off prevents the screen from changing orientations. The screen changing orientations can negatively affect the FTC Driver and Control Apps’ performance.

NEXT

And turning on the wifi allows for the phones to use WiFi Direct. Don’t connect to a network, just turn the wifi on.

Phone Setup - Settings

- Turn ON airplane mode
- Remove SIM Card



This is optional. But removing the SIM Card for sure prevents the phone from doing anything with its cellular radio. Doing this also minimally helps battery life.

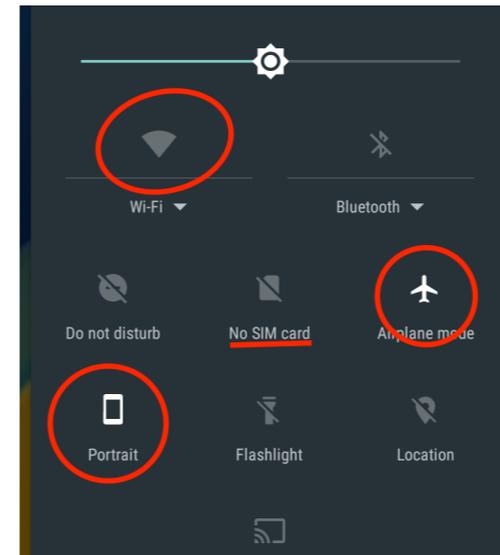
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Phone Setup - Settings

- Turn ON airplane mode
- Remove SIM Card
- Turn OFF auto-rotate



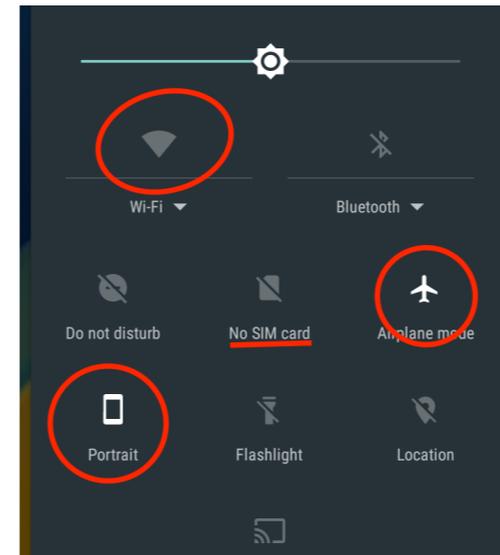
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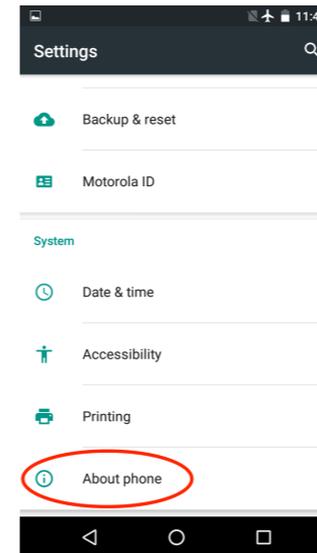
- Turn ON airplane mode
- Remove SIM Card
- Turn OFF auto-rotate
- Turn ON wifi



And turning on the wifi allows for the phones to use WiFi Direct. Don't connect to a network, just turn the wifi on.

Phone Setup - Settings

- Turn on Developer Mode



The next step is Activating “Developer Mode.” This varies from phone to phone (for the Moto 2nd Gen, tap “About Phone” ***NEXT*** and then tap the Build Number section about six times to activate developer mode). You can google “whatever phone type you have” and “developer mode” and you should find how to activate that.

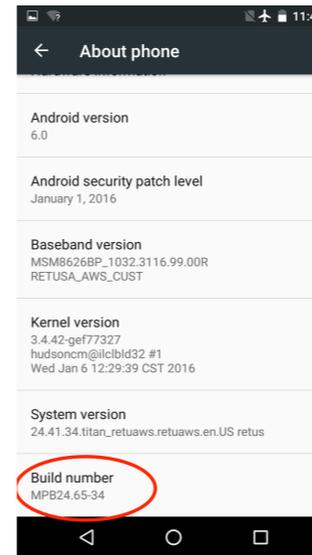
Once you’ve turned on Developer Mode, in settings, there should be a new option called developer options or something like that. Tap that. In the Developer Options you should see, among others, USB Debugging and Stay Awake. Turn both of those on.

Turning on USB Debugging is what is going to allow you to download and run programs from Android Studio.

Turning on Stay Awake will prevent the phones from going to sleep by themselves, so long as they are plugged into power (which they will be when plugged into the robot.) This will prevent your phones from falling asleep mid-run.

Phone Setup - Settings

- Turn on Developer Mode



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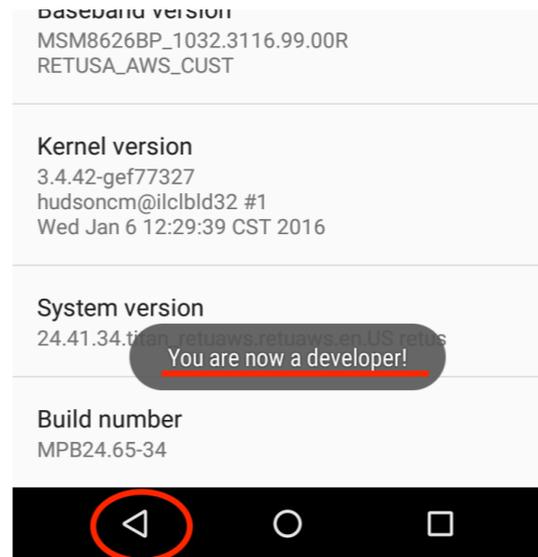
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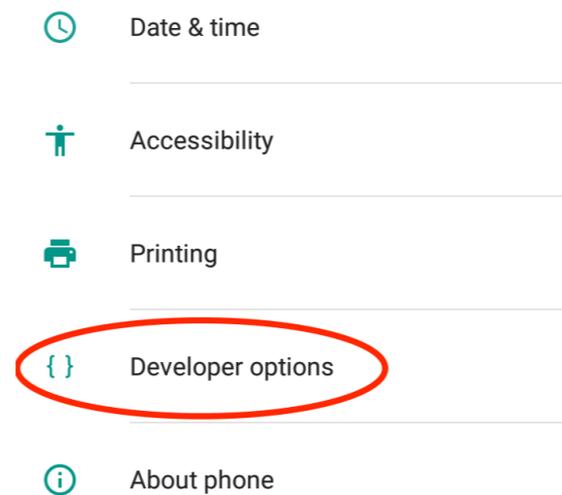
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Phone Setup - Settings

- Turn on Developer Mode
- In Developer Options:



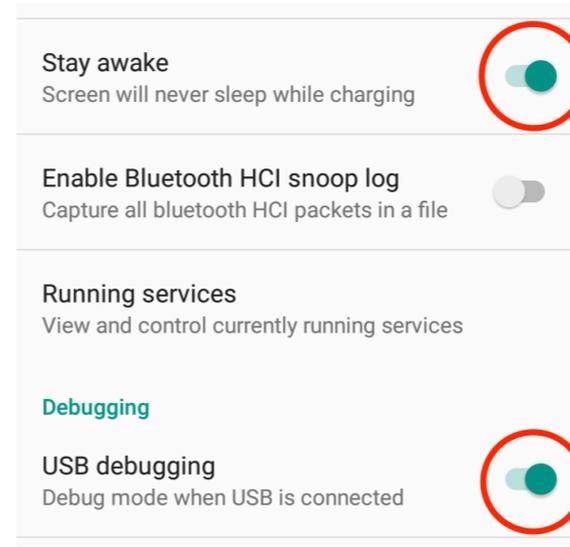
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Phone Setup - Settings

- Turn on Developer Mode
- In Developer Options:
 - Turn ON USB Debugging

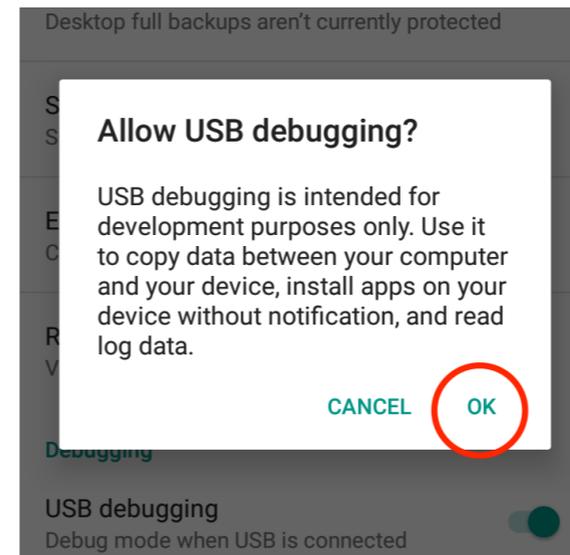


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Phone Setup - Settings

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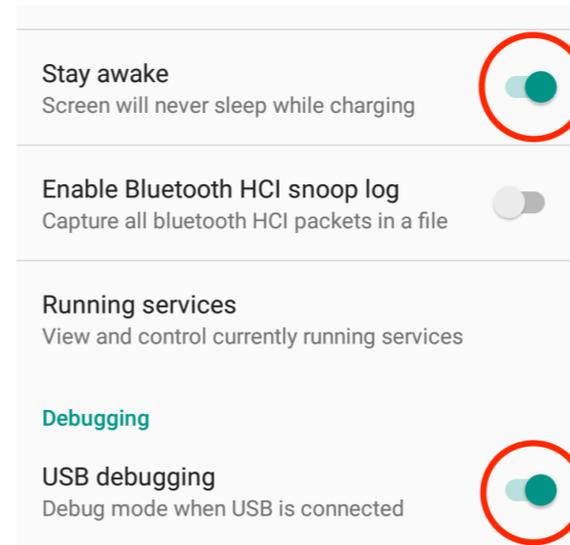
When you flip USB Debugging on, the phone will ask for configuration to which you will say yes, I want to do this. The USB Debugging feature is what is going to allow you to download and run programs on the phones from Android Studio.

NEXT

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Phone Setup - Settings

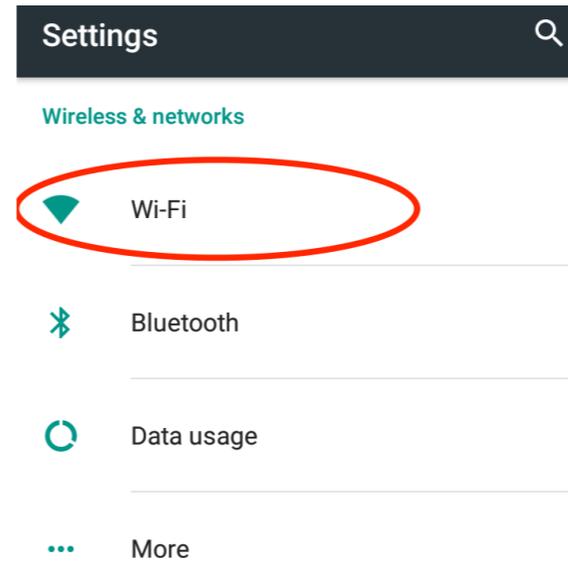
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Turning on Stay Awake will prevent the phones from going to sleep by themselves, so long as they are plugged into power (which they will be when plugged into the robot.) This will prevent your phones from falling asleep mid-run.

Phone Setup - Wifi Direct

- In Advanced WiFi Settings:



Next you're going to go to the advanced wifi settings.

You get to the advanced wifi settings by going to the normal wifi settings. ***NEXT*** Somewhere in there there should be a menu that lets you enter advanced settings. On the Moto 2nd Gen, it's three small dots near the top.

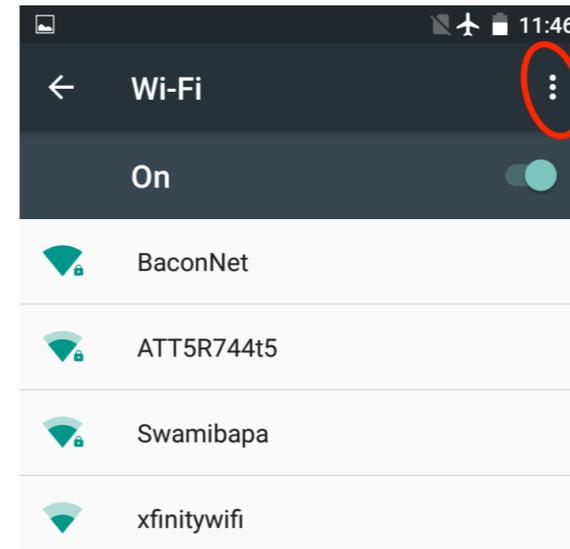
Here is where the phones' paths are going to diverge some. In configuration for Wifi Direct, you're going to give each phone a different name. Per the FTC Challenge Rules (Part 1, Section 8.3.4, RS01, 2018-19 Challenge Rules), both phones must use the naming nomenclature of Team Number-RC or DS depending on the phone's intended role (Robot Controller: RC and Driver's Station: DS). Ex: 8668-RC or 8668-DS.

Now back out of wifi direct to the advanced wifi pane.

Tip: Use tape and a marker to label the backs of each phone with RC or DS. It helps a lot!

Phone Setup - Wifi Direct

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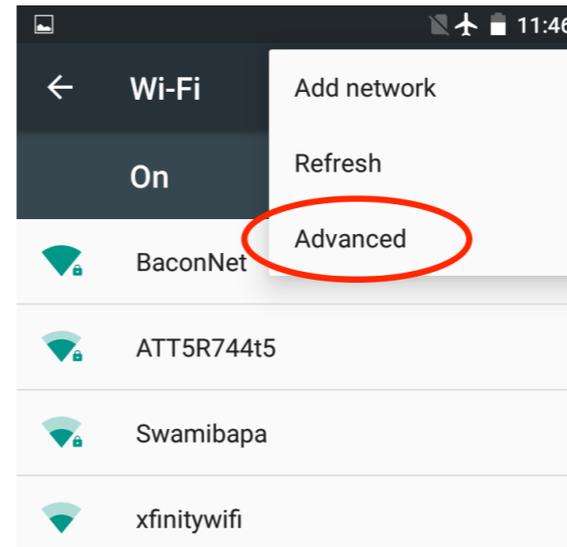
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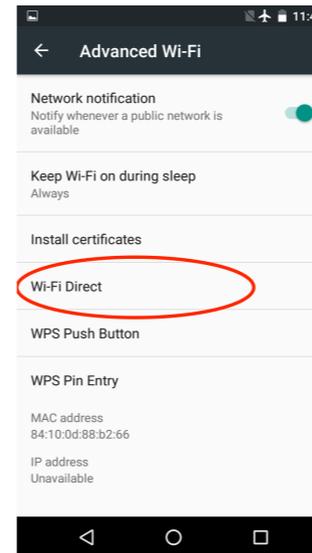


Tap Advanced

NEXT

Phone Setup - Wifi Direct

- In Advanced WiFi Settings:
 - Find the WiFi Direct page



Tap WiFi Direct.

NEXT

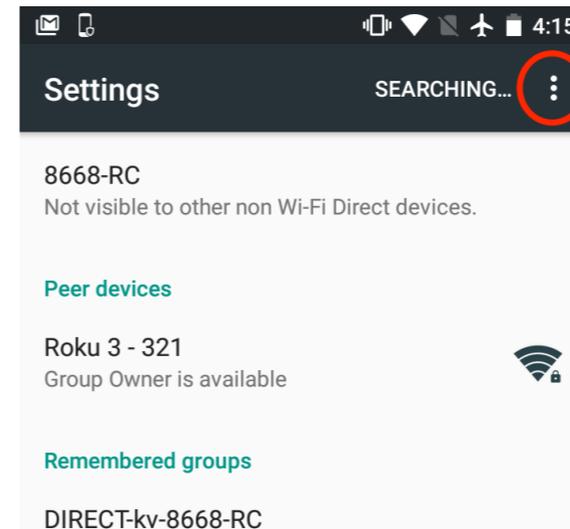
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Phone Setup - Wifi Direct

- In Advanced WiFi Settings:
 - Find the WiFi Direct page
 - Hit the “Configure Device” button



Tap the three dots in the top-right corner ***NEXT*** and hit “Configure Device”

NEXT

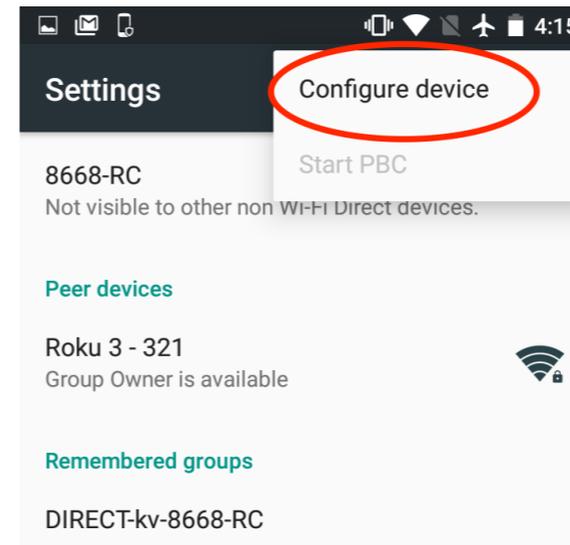
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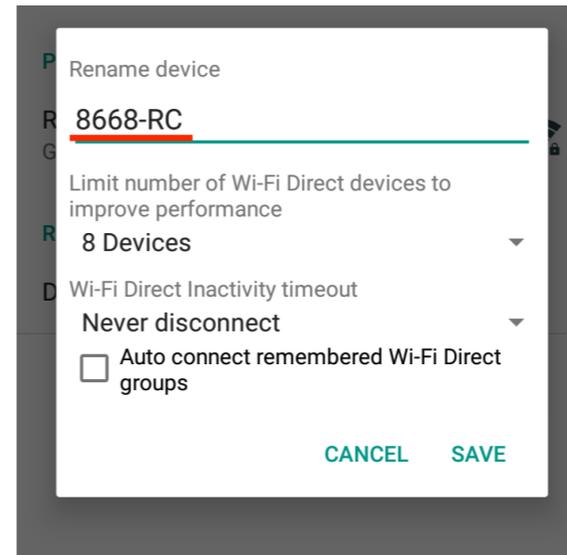
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Phone Setup - Wifi Direct

- In Advanced WiFi Settings:

- Find the WiFi Direct page
- Hit the “Configure Device” button
 - Rename each phone “team#-RC” and “team#-DS” respectively



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Just so you know, you don't have to name the phones this way for them to work. Say if you don't have a team number yet then obviously you can't use one in naming the phones. You can call them whatever you want, however both phones need to be named properly according to the FIRST naming convention by meet 1. Otherwise you will fail your inspection.

NEXT

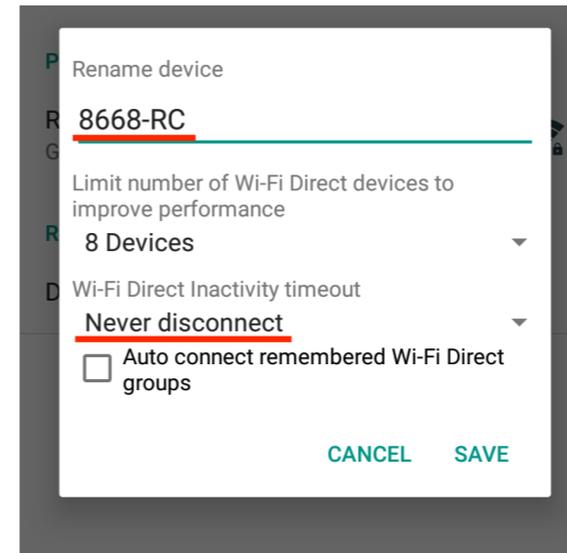
Now back out of wifi direct to the advanced wifi pane.

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Phone Setup - Wifi Direct

- In Advanced WiFi Settings:

- Find the WiFi Direct page
- Hit the “Configure Device” button
 - Rename each phone “team#-RC” and “team#-DS” respectively
 - Change the WiFi Direct Inactivity timeout on both phones to “Never Disconnect”



Change the WiFi Direct Inactivity Timeout option to “Never Disconnect.” This makes sure that the controllers won’t disconnect during a match...theoretically at least. Anyone of you who’s done a rookie year will know that that isn’t necessarily the case.

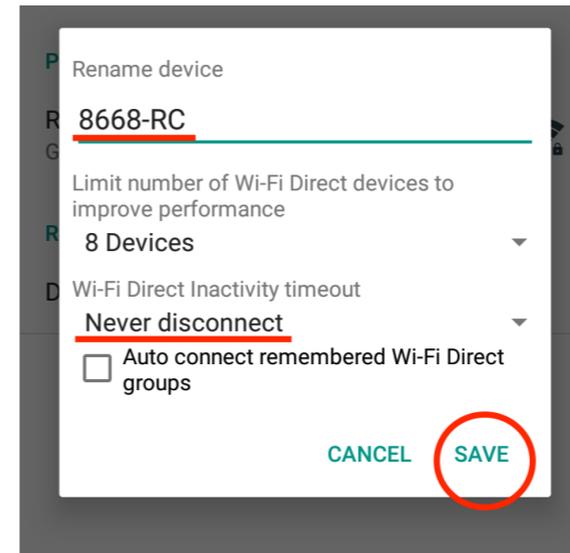
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Phone Setup - Wifi Direct

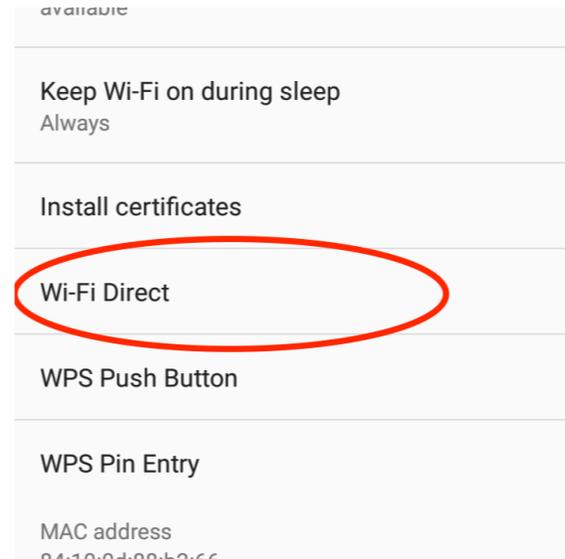
- In Advanced WiFi Settings:
 - Find the WiFi Direct page
 - Hit the “Configure Device” button
 - Rename each phone “team#-RC” and “team#-DS” respectively
 - Change the WiFi Direct Inactivity timeout on both phones to “Never Disconnect”
- Save configuration and back out to the Advanced WiFi Settings page



Now Save and back out of wifi direct to the advanced wifi pane.

Phone Setup - Wifi Direct

- Click WiFi Direct again to go back in



Now you're going to go back in to the WiFi Direct section ***NEXT*** and you should see that each phone now sees the other phone under the heading of "Peer Devices." Once you see that each phone is seeing the other, on one phone tap the peer device and it should send an invitation to connect to the other phone. Accept the invitation and the phones should connect.

NOTE: There are some additional rules for specific phones:

For the ZTE Speed ONLY: The Robot Controller must have the FTC "Wi-Fi Direct Channel-Changing" app installed. (Per FTC Challenge Rules Part 1, Section 8.3.4, <RS08>)

Also, per Part 1, Section 4.4, <T6> of the 2018-19 Challenge Rules, team members may be asked by the Event Director at FTC events to use a specific WiFi Channel on their supported Android Devices (the Robot Controller and Driver's Station). This rule DOES NOT apply to the Motorola-G 2nd Gen. (you may have to explain this to your robot inspectors)

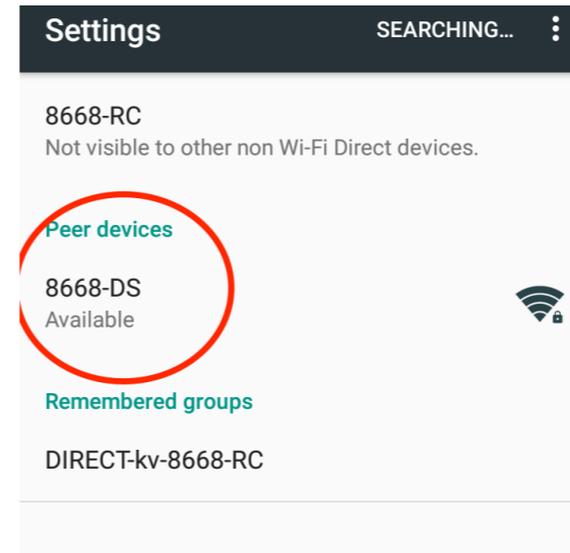
The next step is to navigate to the system updates pane and check for any available updates. You want the most recent version the phone can handle. If you're using older phones then they might not be able to use the most recent system release. For example, the Galaxy S5 can only handle up to version 5.1 and the ZTE Speed can only do through 4.4. SO just be aware of your particular phone's software limitations

In order to check for any system updates, you will need to connect the phones to a wifi network. Be sure to forget that network as soon as the updates are done' otherwise the phone will try to reconnect to that wifi on its own = bad.

Next is adjusting the brightness settings. Find the brightness settings on your phone and Turn off adaptive brightness, set the brightness to around 60% (a good medium between battery consumption and visibility), and set the "auto-sleep" function to its maximum time value (max is often "Never Sleep" or something ridiculous like "30

Phone Setup - Wifi Direct

- Click WiFi Direct again to go back in
- Connect to Other Phone Via “Peer Devices”



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Is anyone here using ZTEs?

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Phone Setup - Wifi Direct

- Click WiFi Direct again to go back in
- Connect to Other Phone Via “Peer Devices”
- Check System Updates — Go up to Android 6 (Marshmallow)



The next step is to navigate to the system updates pane and check for any available updates. You want the most recent version up to Android 6 that the phone can handle. If you're using older phones then they might not be able to go all the way up to 6. For example, the Galaxy S5 can only handle up to version 5.1 and the ZTE Speed can only do through 4.4. So just be aware of your particular phone's software limitations. Also be aware of the FTC SDK's compatibility limitations. There is no notes in the 4.0 documentation about compatibility with Android 7 and the 3.7 release notes said that there was interim support for Android 7, but not complete support. So going off the documentation, right now, the most recent FTC SDK release (4.0) is fully compatible with Android 6 or before. Anything after 6, do at your own risk.

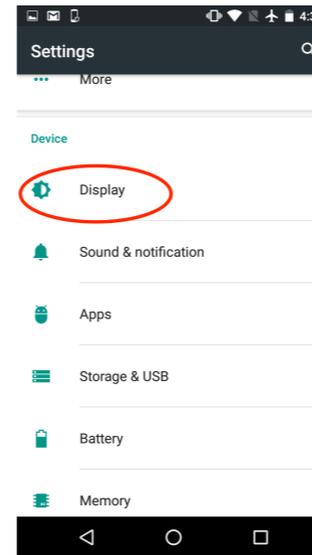
In order to check for any system updates on the phone, you will need to connect the phones to a wifi network. Be sure to tell the phone to forget that network as soon as the updates are done otherwise the phone will try to reconnect to that wifi on its own and that will disconnect WiFi Direct and all kinds of bad. Keep in mind that the phones can't use WiFi Direct and be connected to a WiFi Network at the same time. So if you are connected to a network, you'll be getting a bunch of windows asking about WiFi Direct. So after you've done everything you need to with the WiFi, just forget the network.

NEXT

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Phone Setup - Wifi Direct

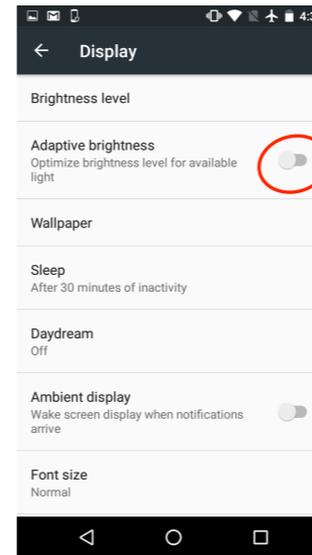
- Click WiFi Direct again to go back in
- Connect to Other Phone Via “Peer Devices”
- Check System Updates — Need Most Recent
- In Brightness Settings:



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Phone Setup - Wifi Direct

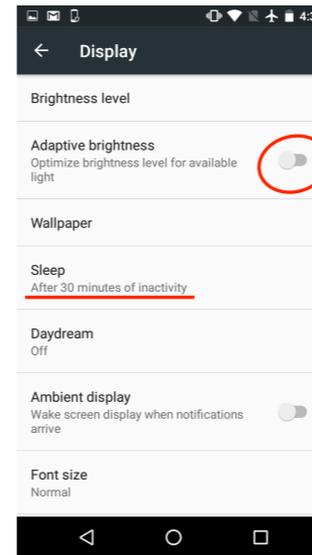
- Click WiFi Direct again to go back in
- Connect to Other Phone Via “Peer Devices”
- Check System Updates — Need Most Recent
- In Brightness Settings:
 - Turn OFF “Adaptive Brightness”



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Phone Setup - Wifi Direct

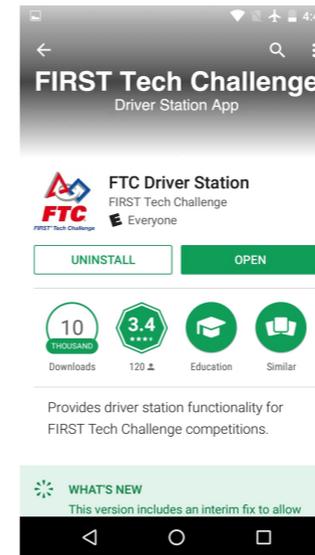
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- Check System Updates — Need Most Recent
- In Brightness Settings:
 - Turn OFF “Adaptive Brightness”
 - Set the “Sleep” function to the maximum value



and set the “auto-sleep” function to its maximum time value (max is often “Never Sleep” or something ridiculous like “30 minutes”).

Phone Setup - Driver's Station App

- Download Driver's Station App onto Driver's Station phone via the Google Play Store



To download the Driver's Station app to the Driver's Station phone just download it from off the Play Store. You just have to make sure that the app version matches the SDK version you have.

To get the Driver's Station app from off the Play Store you'll have to obviously connect to a wifi networks, so just make sure you forget that network as soon as you're done. Search FTC Driver Station in the app store and it should come up. ***NEXT*** Double check that the app version matches the release version of the FTC SDK SDK you downloaded (ftc_app-3.7) and imported into Android Studio earlier. If the versions match, then you are good to go. If they don't match then there is a second way to instal the app with terminal, but I don't recommend that route unless you really like playing around in terminal. Usually the best way is to update the SDK that you're using. FIRST is pretty good about keeping the most recent SDK release concurrent with the most recent app version.

Phone Setup - Driver's Station App

- Download Driver's Station App onto Driver's Station phone via the Google Play Store

- Check Version

Challenge robotics competition:

<http://ftcforum.usfirst.org/forumdisplay.php?156-FTC-Technology>

E Everyone
[Learn More](#)

Version 3.7	Updated on Mar 21, 2018
Downloads 10,000+ downloads	Offered by FIRST Tech Challenge

Double check that the app version matches the release version of the FTC SDK version you are using. ***NEXT*** If the versions match, then you are good to go. If they don't match then there is a second way to instal the app with terminal, but I don't recommend that route unless you really like playing around in terminal. Usually the best way is to update the SDK that you're using. FIRST is pretty good about keeping the most recent SDK release concurrent with the most recent app version.

Phone Setup - Driver's Station App

- Download Driver's Station App onto Driver's Station phone via the Google Play Store

- Check Version
- Make Sure App Version Matches SDK Version

Challenge robotics competition:

<http://ftcforum.usfirst.org/forumdisplay.php?156-FTC-Technology>

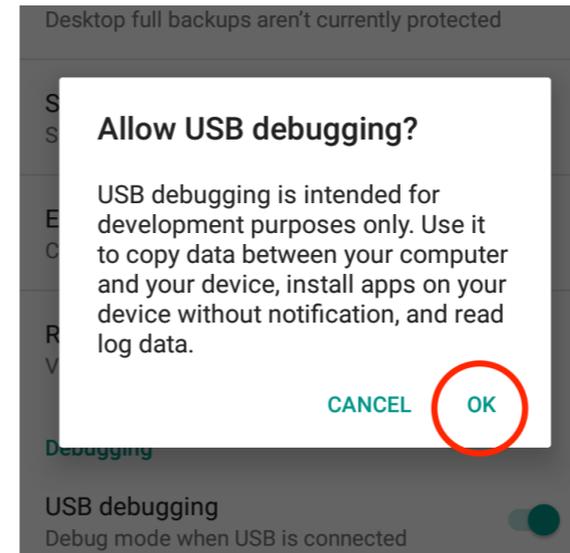
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Phone Setup - Connecting for the First Time

- On phone, allow USB Debugging from that computer



The first time you connect a phone to the computer a window will pop up on the phone that asks if you want to allow USB Debugging for this computer. If this computer is going to be constantly downloading files to the phone, go ahead and check the “Always Allow” box and then hit “OK”

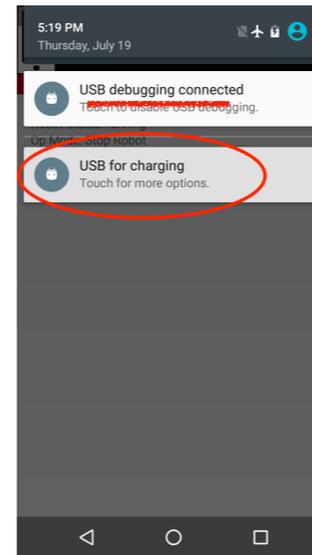
NEXT

The Status Bar should show that the phone is connected to a usb device. Click on the icon and a list will come up called “Use USB for” with the default to “Charging Only.” Change to “Transfer Files (MTP)”

Again, keep in mind that I am using a Motorola-G 2nd Gen phone, and that other phones may vary in technicalities, but the same basic operations are still the same.

Phone Setup - Connect to Computer

- On phone, allow USB Debugging from that computer



The Status Bar should show that the phone is connected to a usb device.

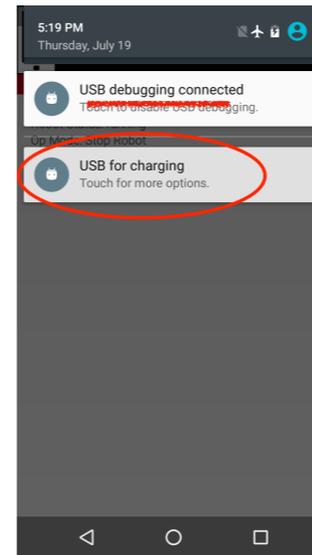
NEXT

Click on the icon and a list will come up called "Use USB for" with the default to "Charging Only." Change to "Transfer Files (MTP)"

Again, keep in mind that I am using a Motorola-G 2nd Gen phone, and that other phones may vary in technicalities, but the same basic operations are still the same.

Phone Setup - Connect to Computer

- On phone, allow USB Debugging from that computer
- Open Status Bar and open “Use USB for” menu

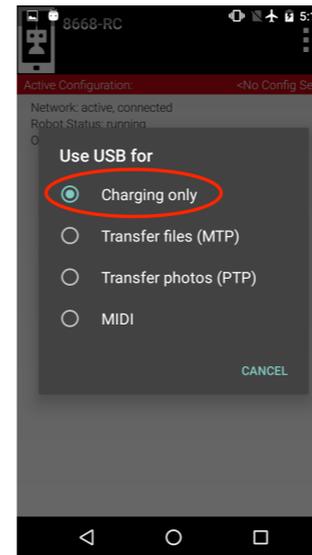


Now Click on the button titled “USB for Charging” on the status bar and a list will come up called “Use USB for” with the default to “Charging Only.” Change to “Transfer Files (MTP)”

Again, keep in mind that I am using a Motorola-G 2nd Gen phone, and that other phones may vary in technicalities, but the same basic operations are still the same.

Phone Setup - Connect to Computer

- On phone, allow USB Debugging from that computer
- Open Status Bar and open “Use USB for” menu

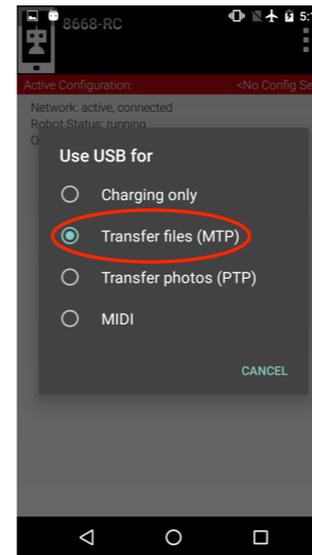


Click on the icon and a list will come up called “Use USB for” with the default to “Charging Only.” ***NEXT***
Change to “Transfer Files (MTP)”

Again, keep in mind that I am using a Motorola-G 2nd Gen phone, and that other phones may vary in technicalities, but the same basic operations are still the same.

Phone Setup - Connect to Computer

- On phone allow USB Debugging from that computer
- Open Status Bar and open “Use USB for” menu
- Select “Transfer Files (MTP)”



Change to “Transfer Files (MTP)”

Again, keep in mind that I am using a Motorola-G 2nd Gen phone, and that other phones may vary in technicalities, but the same basic operations are still the same.

Phone Setup - Robot Controller - Installation

- Install the FTC Robot Controller app onto the Robot Controller Phone



The final step for setting up the phones is to install the Robot Controller app onto the Robot Controller phone. ***NEXT*** To do this you have to actually have a full app (a program) ready to download on Android Studio. There are actually example programs in the FtcRobotController folder of the FTC SDK that we imported so you should be able to use one of those.

Once you have your program ready, hit the green play button in the top menu.

Once your phone appears on the device screen, hit ok and the download is initiated.

Android Studio automatically installs the Robot Controller app and downloads the program you selected.

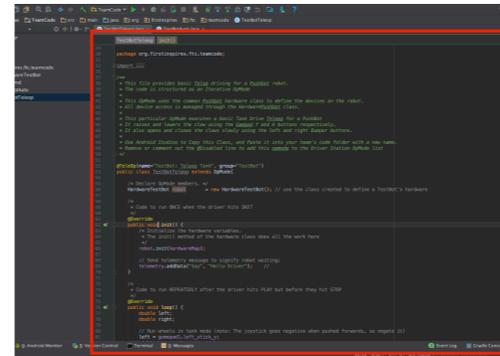
The final thing is to pair the phones in the apps. You should have already paired the Driver's Station and Robot Controller in the settings of the respective phones, and now you need to pair them in the apps. On the Driver's Station, open the menu in the top right, go to settings, and go to "Connect with Robot Controller." You should see the Robot Controller appear on the list of available devices. Select the Robot Controller to pair. An invitation to pair will appear on the Robot Controller Screen. Accept that and the two should connect for good.

Once paired, the Driver's Station should display the battery for both the Robot Controller and the Driver's Station phones and should show under network the name of the Robot Controller phone.

Congratulations, you now have two FTC-ready phones!

Phone Setup - Robot Controller - Installation

- Install the FTC Robot Controller app onto the Robot Controller Phone
 - Requires a ready-to-download app



To do this you have to actually have a full app (a program) ready to download on Android Studio.

NEXT

Connect the Robot Controller to the computer.

Once you have your program ready, hit the green play button in the top menu.

Once your phone appears on the device screen, hit ok and the download is initiated.

Android Studio automatically installs the Robot Controller app and downloads the program you selected.

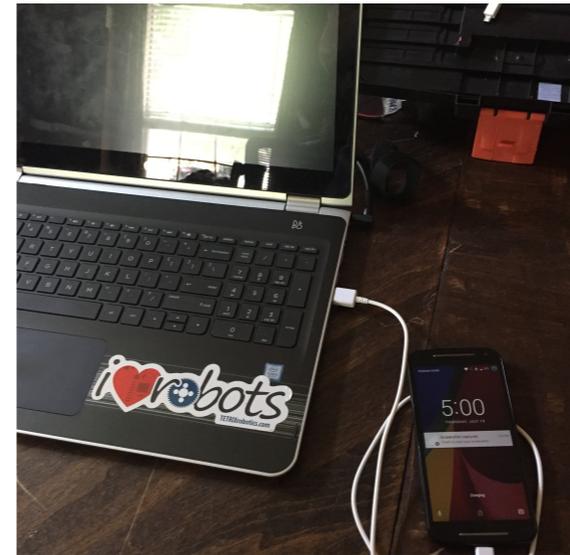
The final thing is to pair the phones in the apps. You should have already paired the Driver's Station and Robot Controller in the settings of the respective phones, and now you need to pair them in the apps. On the Driver's Station, open the menu in the top right, go to settings, and go to "Connect with Robot Controller." You should see the Robot Controller appear on the list of available devices. Select the Robot Controller to pair. An invitation to pair will appear on the Robot Controller Screen. Accept that and the two should connect for good.

Once paired, the Driver's Station should display the battery for both the Robot Controller and the Driver's Station phones and should show under network the name of the Robot Controller phone.

Congratulations, you now have two FTC-ready phones!

Phone Setup - Robot Controller - Installation

- Install the FTC Robot Controller app onto the Robot Controller Phone
 - Requires a ready-to-download app
 - Connect Robot Controller to computer



Connect the Robot Controller to the computer.

NEXT

Allow USB Debugging on the phone.

Once you have your program ready, hit the green play button in the top menu.

Once your phone appears on the device screen, hit ok and the download is initiated.

Android Studio automatically installs the Robot Controller app and downloads the program you selected.

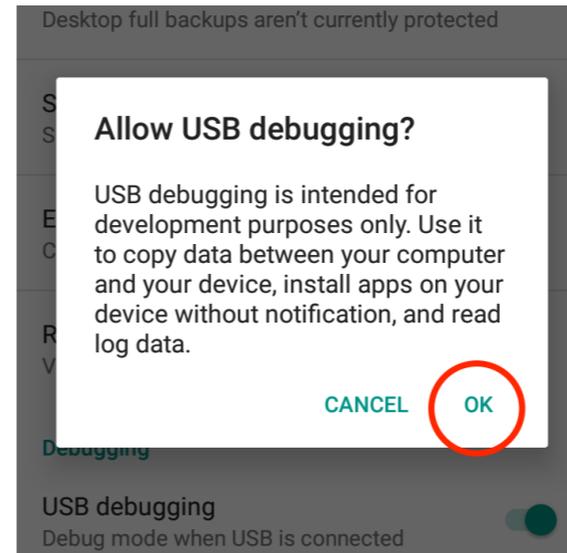
The final thing is to pair the phones in the apps. You should have already paired the Driver's Station and Robot Controller in the settings of the respective phones, and now you need to pair them in the apps. On the Driver's Station, open the menu in the top right, go to settings, and go to "Connect with Robot Controller." You should see the Robot Controller appear on the list of available devices. Select the Robot Controller to pair. An invitation to pair will appear on the Robot Controller Screen. Accept that and the two should connect for good.

Once paired, the Driver's Station should display the battery for both the Robot Controller and the Driver's Station phones and should show under network the name of the Robot Controller phone.

Congratulations, you now have two FTC-ready phones!

Phone Setup - Robot Controller - Installation

- Install the FTC Robot Controller app onto the Robot Controller Phone
 - Requires a ready-to-download app
 - Connect Robot Controller to computer
 - Always allow USB Debugging from that computer



Allow USB Debugging on the phone (if needed).

NEXT

Once you have your program ready, hit the green play button in the top menu.

Once your phone appears on the device screen, hit ok and the download is initiated.

Android Studio automatically installs the Robot Controller app and downloads the program you selected.

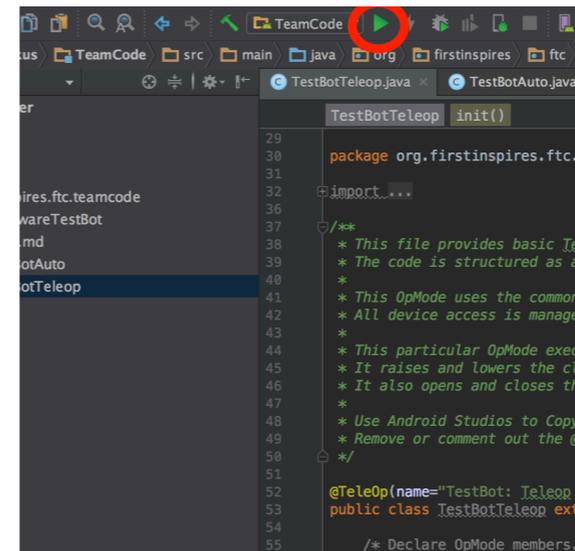
The final thing is to pair the phones in the apps. You should have already paired the Driver's Station and Robot Controller in the settings of the respective phones, and now you need to pair them in the apps. On the Driver's Station, open the menu in the top right, go to settings, and go to "Connect with Robot Controller." You should see the Robot Controller appear on the list of available devices. Select the Robot Controller to pair. An invitation to pair will appear on the Robot Controller Screen. Accept that and the two should connect for good.

Once paired, the Driver's Station should display the battery for both the Robot Controller and the Driver's Station phones and should show under network the name of the Robot Controller phone.

Congratulations, you now have two FTC-ready phones!

Phone Setup - Robot Controller - Installation

- Install the FTC Robot Controller app onto the Robot Controller Phone
 - Requires a ready-to-download app
 - Connect Robot Controller to computer
 - Always allow USB Debugging from that computer
 - Download app to Robot Controller



Once you have your program ready, hit the green play button in the top menu.

NEXT

Once your phone appears on the device screen, hit ok and the download is initiated.

Android Studio automatically installs the Robot Controller app and downloads the program you selected.

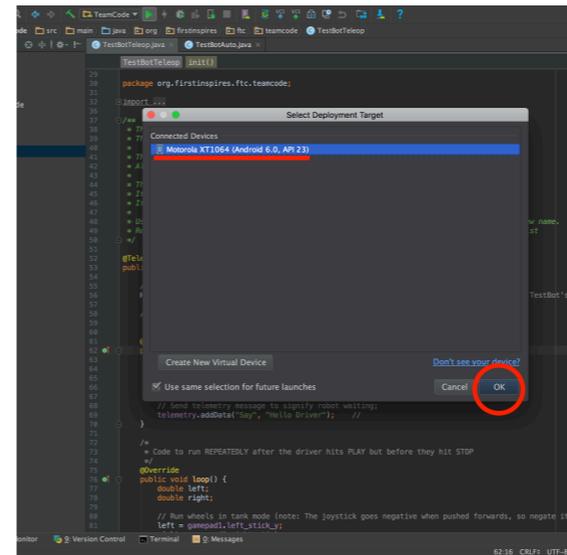
The final thing is to pair the phones in the apps. You should have already paired the Driver's Station and Robot Controller in the settings of the respective phones, and now you need to pair them in the apps. On the Driver's Station, open the menu in the top right, go to settings, and go to "Connect with Robot Controller." You should see the Robot Controller appear on the list of available devices. Select the Robot Controller to pair. An invitation to pair will appear on the Robot Controller Screen. Accept that and the two should connect for good.

Once paired, the Driver's Station should display the battery for both the Robot Controller and the Driver's Station phones and should show under network the name of the Robot Controller phone.

Congratulations, you now have two FTC-ready phones!

Phone Setup - Robot Controller - Installation

- Install the FTC Robot Controller app onto the Robot Controller Phone
 - Requires a ready-to-download app
 - Connect Robot Controller to computer
 - Always allow USB Debugging from that computer
 - Download app to Robot Controller



Once your phone appears on the device screen, hit ok and the download is initiated.

Android Studio automatically installs the Robot Controller app and downloads the program you selected.

NEXT

Once the download is complete, the Robot Controller App will launch.

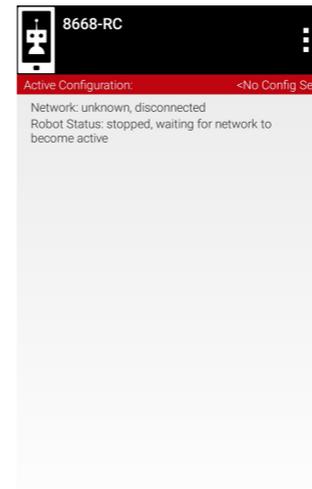
The final thing is to pair the phones in the apps. You should have already paired the Driver's Station and Robot Controller in the settings of the respective phones, and now you need to pair them in the apps. On the Driver's Station, open the menu in the top right, go to settings, and go to "Connect with Robot Controller." You should see the Robot Controller appear on the list of available devices. Select the Robot Controller to pair. An invitation to pair will appear on the Robot Controller Screen. Accept that and the two should connect for good.

Once paired, the Driver's Station should display the battery for both the Robot Controller and the Driver's Station phones and should show under network the name of the Robot Controller phone.

Congratulations, you now have two FTC-ready phones!

Phone Setup - Robot Controller - Installation

- Install the FTC Robot Controller app onto the Robot Controller Phone
 - Requires a ready-to-download app
 - Connect Robot Controller to computer
 - Always allow USB Debugging from that computer
 - Download app to Robot Controller
 - App will auto-launch as soon as APK is downloaded
- TIP: Use tape and a marker to label the backs of each phone with RC or DS. It helps a lot!



Once the download is complete, the Robot Controller App will launch.

A Tip is to mark each phone with tape and a marker with their designated role (Driver's Station or Robot Controller). It helps a lot to just be able to look at the back of the phone rather than launch the app.

NEXT

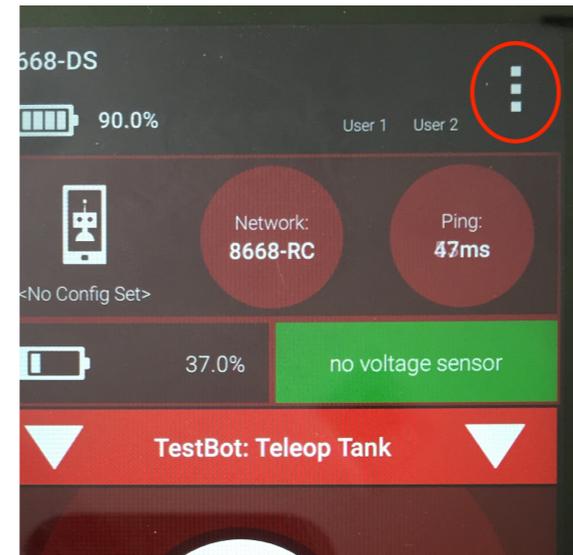
The final thing is to pair the phones *in* the apps. You should have already paired the Driver's Station and Robot Controller in the settings of the respective phones, and now you need to pair them in the apps. On the Driver's Station, open the menu in the top right, go to settings, and go to "Connect with Robot Controller." You should see the Robot Controller appear on the list of available devices. Select the Robot Controller to pair. An invitation to pair will appear on the Robot Controller Screen. Accept that and the two should connect for good.

Once paired, the Driver's Station should display the battery for both the Robot Controller and the Driver's Station phones and should show under network the name of the Robot Controller phone.

Congratulations, you now have two FTC-ready phones!

Phone Setup - Robot Controller - Installation

- Pair the Robot Controller and Driver's Station in apps



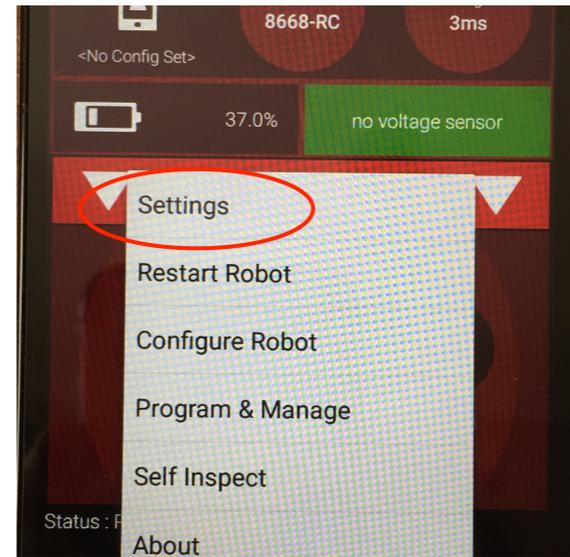
The final thing is to pair the phones in the apps. You should have already paired the Driver's Station and Robot Controller in the settings of the respective phones, and now you need to pair them in the apps. On the Driver's Station, open the menu in the top right, ***NEXT*** go to settings, and go to "Connect with Robot Controller." You should see the Robot Controller appear on the list of available devices. Select the Robot Controller to pair. An invitation to pair will appear on the Robot Controller Screen. Accept that and the two should connect for good.

Once paired, the Driver's Station should display the battery for both the Robot Controller and the Driver's Station phones and should show under network the name of the Robot Controller phone.

Congratulations, you now have two FTC-ready phones!

Phone Setup - Robot Controller - Installation

- Pair the Robot Controller and Driver's Station in apps
 - Open Settings in Driver's Station



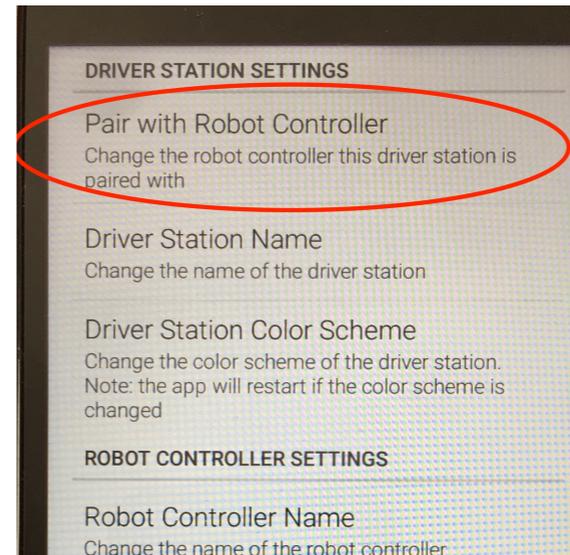
go to settings, ***NEXT*** and go to “Connect with Robot Controller.” You should see the Robot Controller appear on the list of available devices. Select the Robot Controller to pair. An invitation to pair will appear on the Robot Controller Screen. Accept that and the two should connect for good.

Once paired, the Driver's Station should display the battery for both the Robot Controller and the Driver's Station phones and should show under network the name of the Robot Controller phone.

Congratulations, you now have two FTC-ready phones!

Phone Setup - Robot Controller - Installation

- Pair the Robot Controller and Driver's Station in apps
 - Open Settings in Driver's Station
 - Click "Pair with Robot Controller"



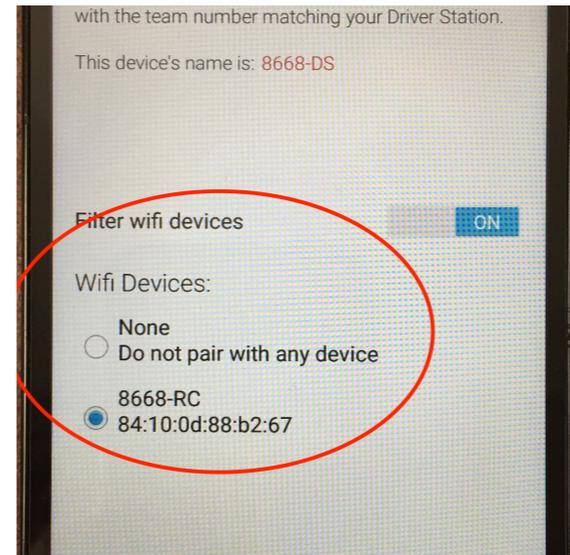
and go to "Pair with Robot Controller." ***NEXT*** You should see the Robot Controller appear on the list of available devices. Select the Robot Controller to pair. An invitation to pair will appear on the Robot Controller Screen. Accept that and the two should connect for good.

Once paired, the Driver's Station should display the battery for both the Robot Controller and the Driver's Station phones and should show under network the name of the Robot Controller phone.

Congratulations, you now have two FTC-ready phones!

Phone Setup - Robot Controller - Installation

- Pair the Robot Controller and Driver's Station in apps
 - Open Settings in Driver's Station
 - Click "Pair with Robot Controller"
 - Select Complimentary Robot Controller



You should see the Robot Controller appear on the list of available devices. Select the Robot Controller to pair. An invitation to pair will appear on the Robot Controller Screen. Accept that and the two should connect for good.

Once paired, the Driver's Station should display the battery for both the Robot Controller and the Driver's Station phones and should show under network the name of the Robot Controller phone.

Does anyone have any questions?

Phones/Electronics

Now I'm going to transition to the more non-robotics electronics.