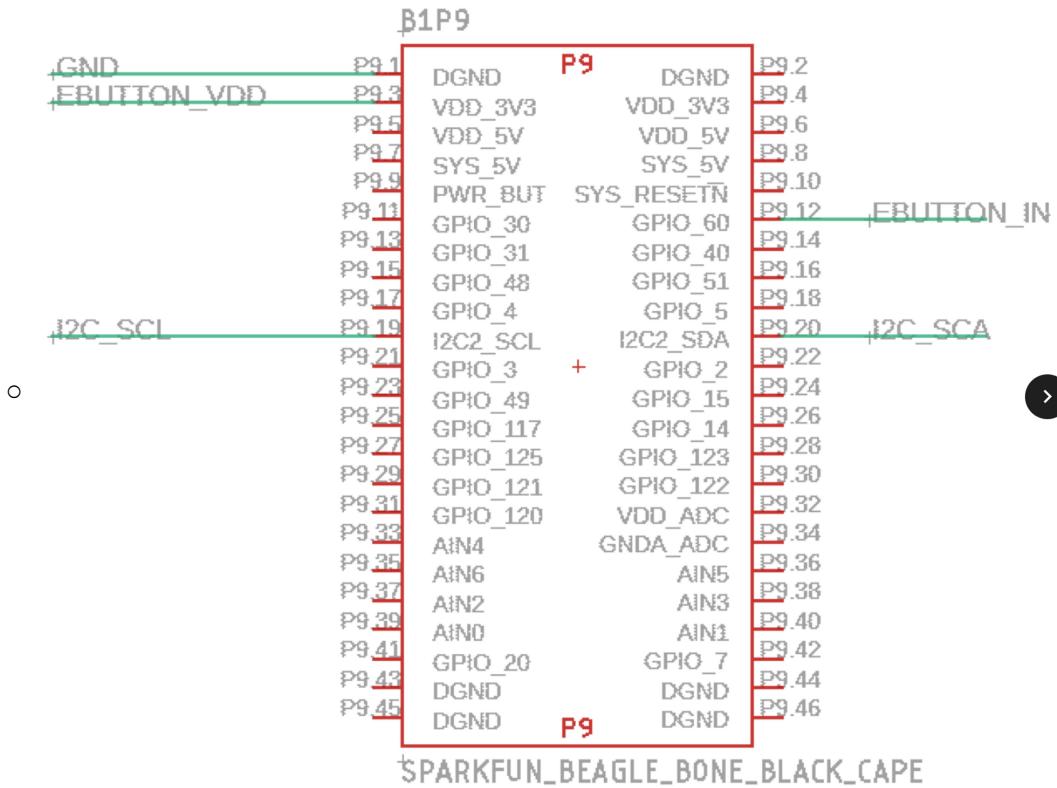


# Instruction to be one with the ML

Sunday, March 26, 2023 11:08 AM

**MAKE SURE THAT ALL THE SOURCE OF POWERS (BBB/Jetson/Adruinos/Golf Cart) ARE OFF!!!!!!!!!!!!!!**

- Making sure that the BBB is connected properly
  - o P9.1 is GND --> GND of Adruinos and E-button\* ( E-button connections are not necessary for the operation of golf cart, the Y button on the xbox controller does the same thing anyway).
  - o MAKE SURE that I2C clock and data are connected to the adruinos.
  - o The wires should all be color coded already.



- Make sure the Camera + Xbox Controller are connected to the Jetson Nano through the USB sticking out of the Jetson box.



- Make sure cables and things are out of the way of any motor movement ( steering/throttling/ braking).

## SUPPLYING POWER TO COMPONENTS:

- The two Arduinos controlling throttle/brake/steering should be connected to a hub like below. Connect the

**USB end of that hub to a 5V battery ( this should supply 5V to both Arduinos). Make sure the buttons on the USB hub is pressed and the blue lights are on.**

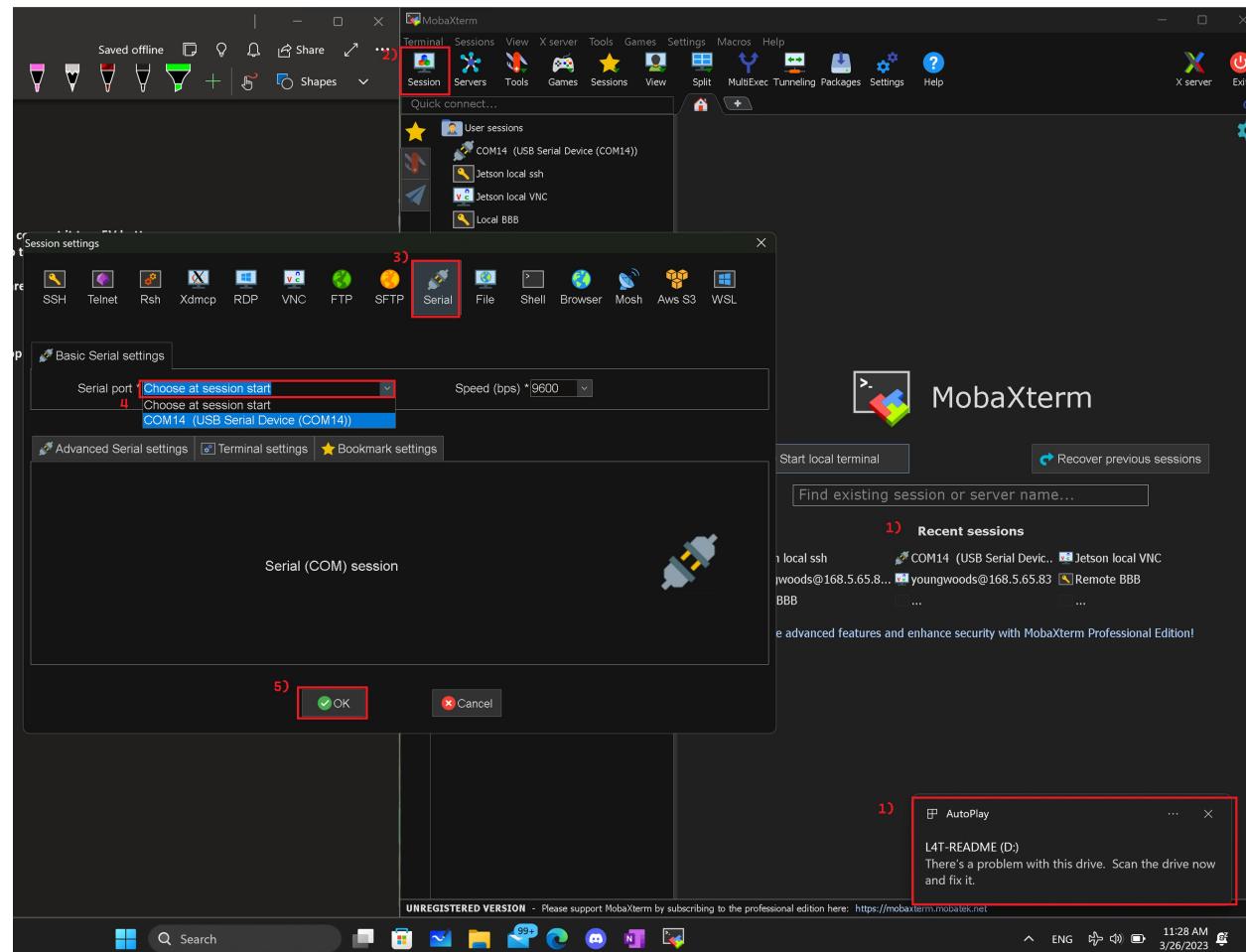


- Supply power to the BBB, find the connection to the BBB and connect it to a 5V battery
- Supply power to the Jetson, find the white USB connection to the Jetson (via GPIO) and connect it to a 5V battery.
- Check that LED on each component(Jetson/ BBB/ Arduinos) are lid up.

#### **CONNECTING TO JETSON FOR TRAINING.**

1. Download mobaXterm if you have not already have it.
2. Connect the USB cable coming out of the Jetson to your laptop USB port.





c. Upon connection you should see:

- 1) The Jetson showing up as L4T-README hard drive on your laptop
- 2) Click on Session to bring up Session settings window
- 3) Click on Serial to bring up Serial Settings
- 4) Click on Serial Port to see the serial Port that Jetson is on (you should see only one and that should be the Jetson one). *If you see multiple, unplug jetson and plug it back in to identify which port is Jetson and connect to that one.*
- 5) Click OK and you should be connected.

```
Ubuntu 18.04.6 LTS youngwoods ttyGS0
youngwoods login: youngwoods
Password:
Last login: Thu Mar 23 19:38:30 CDT 2023 from 192.168.55.100 on pts/0
Welcome to Ubuntu 18.04.6 LTS (GNU/Linux 4.9.201-tegra aarch64)

 * Documentation: https://help.ubuntu.com
 * Management: https://landscape.canonical.com
 * Support: https://ubuntu.com/advantage
This system has been minimized by removing packages and content that are
not required on a system that users do not log into.

d. To restore this content, you can run the 'unminimize' command.

 * Introducing Expanded Security Maintenance for Applications.
 Receive updates to over 25,000 software packages with your
 Ubuntu Pro subscription. Free for personal use.

 https://ubuntu.com/pro

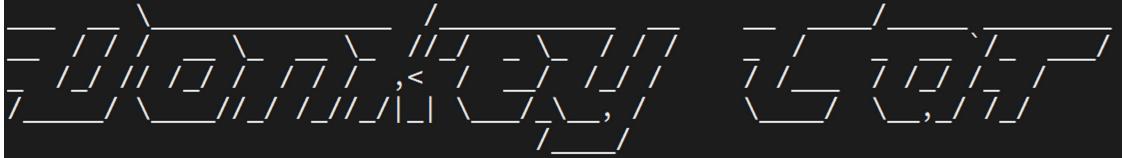
Expanded Security Maintenance for Applications is not enabled.
0 updates can be applied immediately.

46 additional security updates can be applied with ESM Apps.
Learn more about enabling ESM Apps service at https://ubuntu.com/esm

(env) youngwoods@youngwoods:~$
```

- 1) The screen above should pop up and you should login with **youngwoods** login: **youngwoods**
- 2) Password is: **nvidia**
- 3) Hit enter and you are in

```
(env) youngwoods@youngwoods:~$ cd YoungWoodsCar/
(env) youngwoods@youngwoods:~/YoungWoodsCar$ ls
BBB           config.py    ethernet.py  myconfig.py   __pycache__
calibrate.py  data        manage.py   my_joystick.py train.py
cam_test.py   EthernetAPI models     output.txt
(env) youngwoods@youngwoods:~/YoungWoodsCar$ python3 manage.py drive --js
e.
```



- 1) Enter **cd YoungWoodsCar/**
- 2) Enter **ls** to see all the files in **YoungWoodsCar** folder
- 3) Enter **python3 manage.py drive --js** to start driving

```
You can now go to <your hostname.local>:8887 to drive your car.  
You can now move your controller to drive your car.
```

Joystick Controls:

control	action
a_button	toggle_mode
b_button	toggle_manual_recording
x_button	erase_last_N_records
y_button	custom_emergency_stop
right_shoulder	increase_max_throttle
left_shoulder	decrease_max_throttle
M_button	toggle_constant_throttle
Xbox_button	launch_bbb_drive
V_button	read_output_file
R2	enable_ai_launch
left_stick_horz	set_steering
right_stick_vert	set_throttle
right_trigger	set_magnitude
left_trigger	set_magnitude

```
WARNING:donkeycar.parts.controller:/dev/input/js0 is missing  
INFO:donkeycar.vehicle:Starting vehicle at 20 Hz
```

- 1) If success you should see something like that.
- 2) Take note of the grid with control and action stuffs, it describe what the button on the xbox controller will do.

Button A -- Toggle Mode: toggle between Manual <-> Steering Autonomous <-> Full (Steering + Throttling) Autonomous.

Button B - Toggle Manual Recording: toggle to start recording, toggle to stop recording data.

Button X - Erase the last N records: erasing the last 100 records ( not a lot)

Button Y - Custom Emergency: Set throttle to 0 and send in full braking + kill the BBB program

Right/Left Shoulder - Increase/Decrease Max Throttle: Please don't use

Button View Change - Read the terminal output of BBB (very useful to debug the BBB).

Button Xbox - Launch the BBB drive program. Make sure to do this before you can start sending your joy stick command.