piRover Builds with K2

piRover Build Activity   Rev 1.1

Resources:

Yahboom Instruction Manual

Yahboom Videos

- Build/Install 1
- Build/Install 2
- Build/Install 3

K2 Videos

- piRover – Build 1
- piRover – Build 2
- piRover – Build 3a
- piRover – Build 3b

Task:

Build the Yahboom G1 Tank robot using resources provided by both the manufacturer and the instructor. This is the major project assigned in Sprint 1 of the course and must be completed successfully to continue with future activities.

Review all resource provided and build your piRover using the steps outlined below. Be sure to capture images of your piRover as you complete build sections. These must be shared during the Scrum process reporting completed during following class sessions.

The project is graded on process and product. It's not enough just to build the piRover. You must participate in the team process, discuss, and reflect.
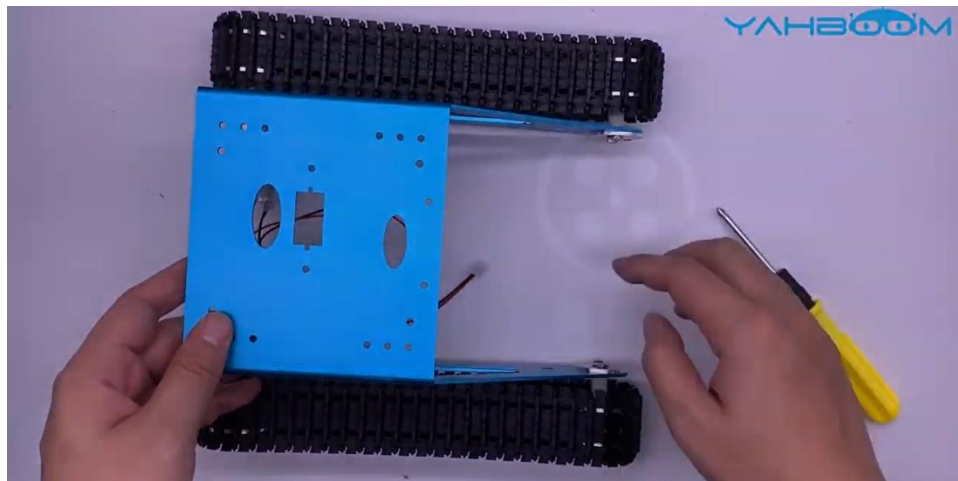
Prior to Build

1. Be sure that you have viewed both the "Unboxing" and the "Website Review" videos. See the links provided in this week's Moodle session.

2. Review both front and back (page 1 and page 2) of the Yahboom Instruction Manual.

3. Locate a good place to work. This is an extensive build and will take significant time. Either find a workspace where your system, components, and tools can stay organized for the duration of the build or have storage containers and locations identified so that when your work is interrupted, the kit can packed and stored until the next build session.

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Build 1

1. Review the Package List on <u>Page 1</u> of the Yahboom Instruction Manual. Note that components are shown along with the required hardware (nuts, screws, spacers, etc.). Be sure to refer to this section as you complete the build. There are multiple sizes of metric screws and standoffs. The packaging often contains extra items, and it can be difficult to identify the required hardware for a specific build step.

2. View the Yahboom <u>Build/Install 1</u> video.

3. View the K2 <u>piRover - Build 1</u> video

4. Complete installation steps 01 through 07 shown on pages 3 and 4 of this document. Be sure you read and follow red note at the top specifying plastic spacers to be used on wheel screws.

5. Once the build is completed, take a picture of the current piRover status. An example image is shown below.
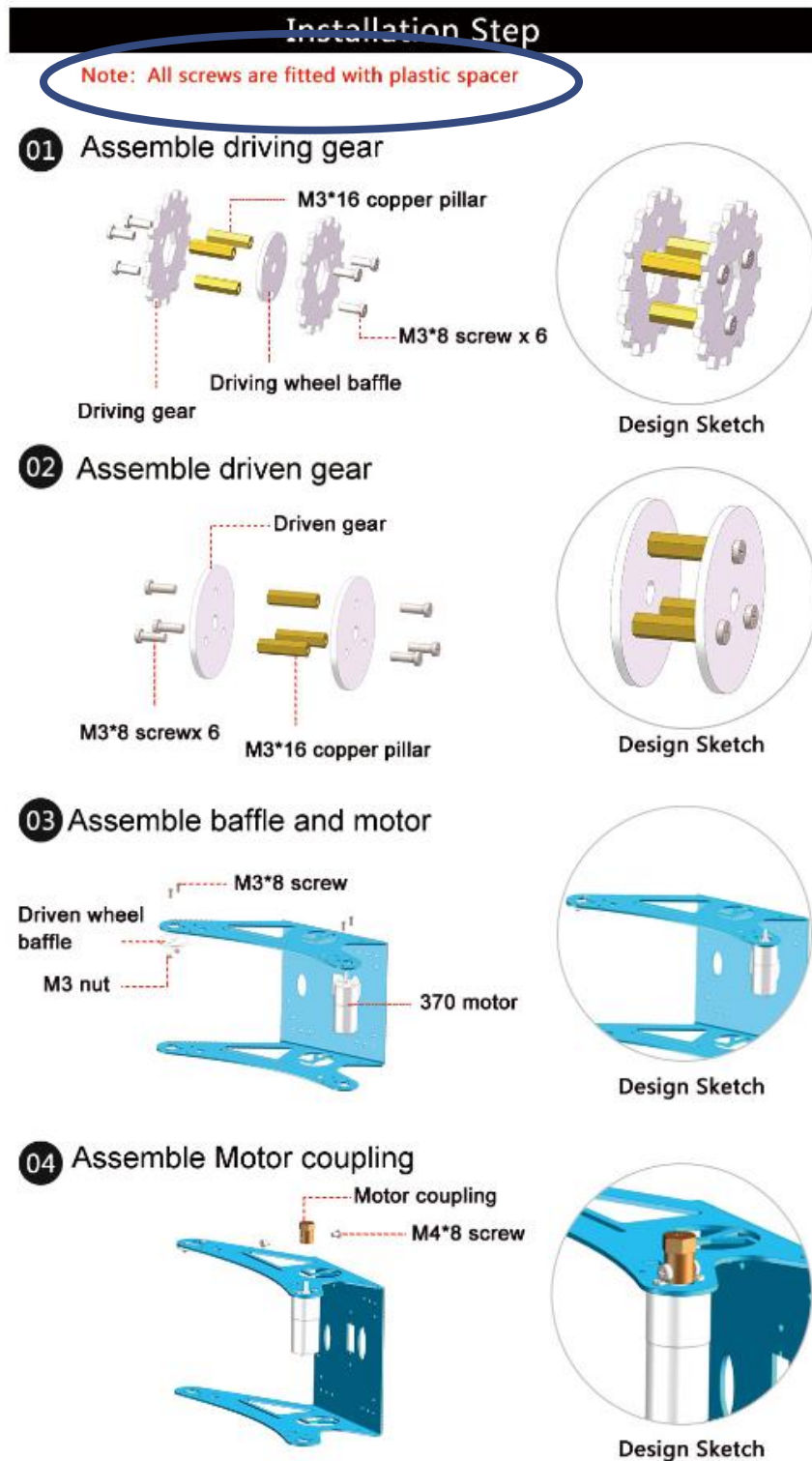

6. Locate the Build Scrum 1 assignment item in Moodle. **Post** your Build 1 image to this link prior to the assigned class session

   📄 Build Scrum 1

7. During the class session, each member will share their Build 1 experience. Reflect on your experience, consider the following, and be prepared to share.

   a. Were you able to locate and use the correct parts?
   b. Were the directions clear and easy to follow?
   c. Which part or parts of the build were difficult or challenging?

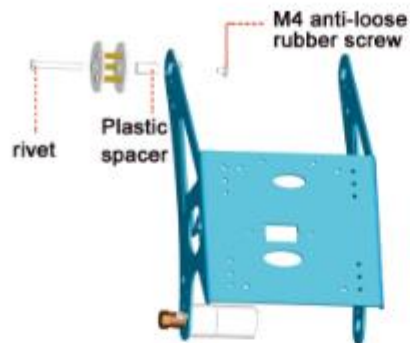d. What would you do differently next time?

Installation Step

Note: All screws are fitted with plastic spacer

01 Assemble driving gear

- M3*16 copper pillar
- M3*8 screw x 6
- Driving wheel baffle
- Driving gear

Design Sketch

02 Assemble driven gear

- Driven gear
- M3*8 screwx 6
- M3*16 copper pillar

Design Sketch

03 Assemble baffle and motor

- M3*8 screw
- Driven wheel baffle
- M3 nut
- 370 motor

Design Sketch

04 Assemble Motor coupling

- Motor coupling
- M4*8 screw

Design Sketch

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4

05 Assemble driven wheel

M4 anti-loose rubber screw

rivet

Plastic spacer

Design Sketch

06 Assemble track

Cover the track around the driven wheel and insert the internal gear of the track into the driven wheel.
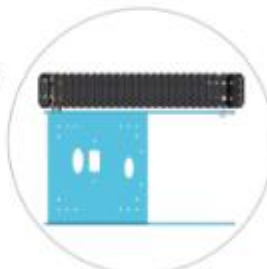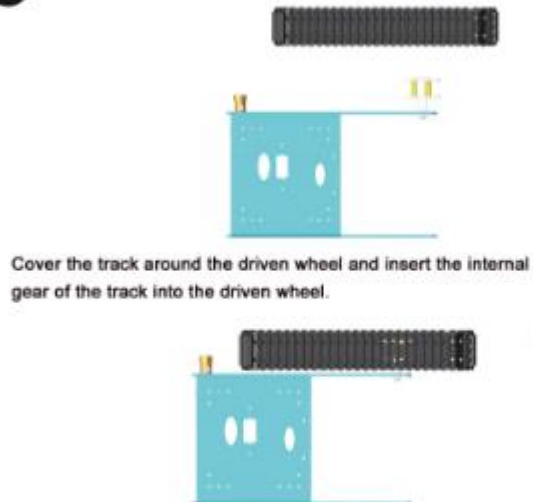
Design Sketch

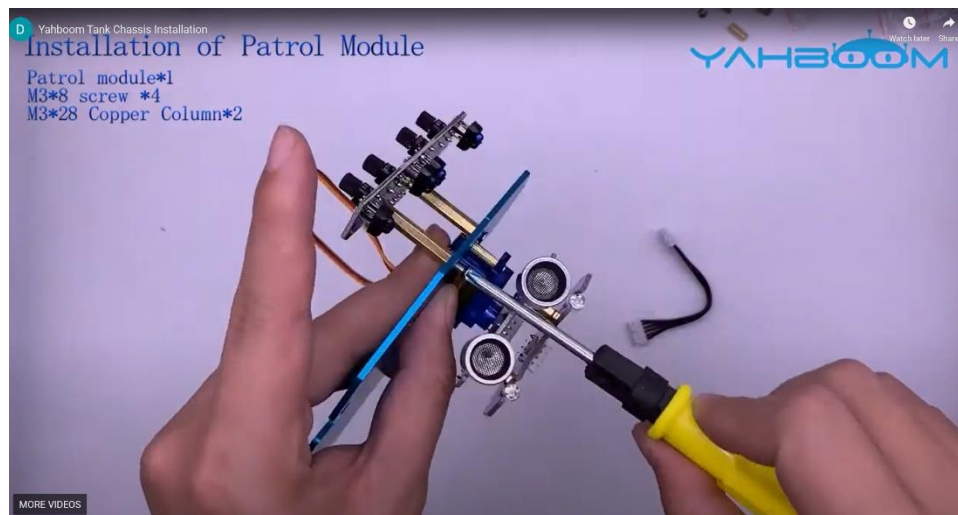**07** Assemble track and driving wheel

M4*8 screw
Driving gear

Design Sketch

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Build 2

1. View the Yahboom [Build/Install 2](#) video.

2. View the K2 [piRover - Build 2](#) video

3. Review the Package List on [Page 1](#) of the Yahboom Instruction Manual. Search kit contents and locate the parts required this build

4. Complete installation steps 08 through 10 shown on pages 6 and 7 of this document.

5. Once the build is completed, take a picture of the current piRover status. An example image is shown below.

6. Locate the Build Scrum 1 assignment item in Moodle. **Post** your Build 1 image to this link prior to the assigned class session

   📄 Build Scrum 1

7. During the class session, each member will share their Build 1 experience. Reflect on your experience, consider the following, and be prepared to share.

   a. Were you able to locate and use the correct parts?
   b. Were the directions clear and easy to follow?
   c. Which part or parts of the build were difficult or challenging?
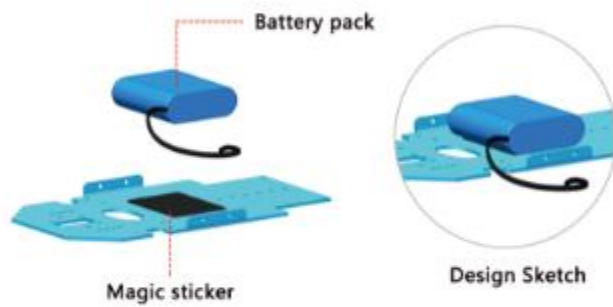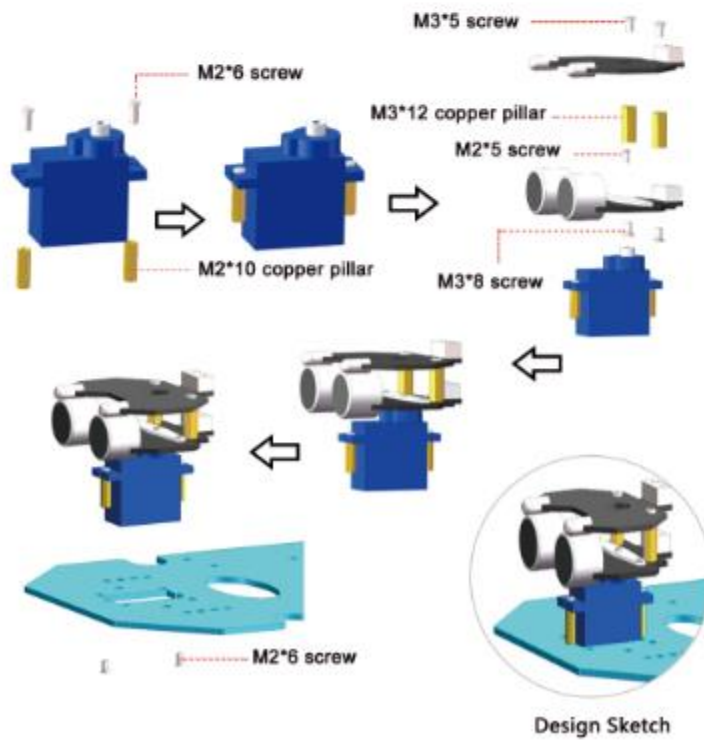   d. What would you do differently next time?

5

08 Assemble battery

Assemble Arduino

M3 nut

M3*8 screw

Design Sketch

Assemble Raspberry pi

Battery pack

Magic sticker

Design Sketch
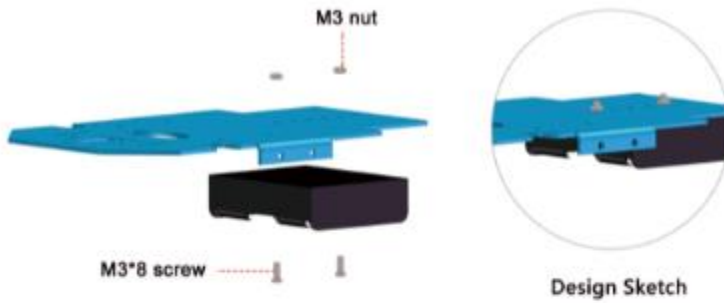
09 Assemble ultrasonic module and servo

M3*5 screw

M2*6 screw

M3*12 copper pillar

M2*5 screw

M2*10 copper pillar

M3*8 screw

M2*6 screw

Design Sketch

6

6

10 Assemble patrol module

M3*8 screw

M3*28 copper pillar

M3*8 screw

Design Sketch
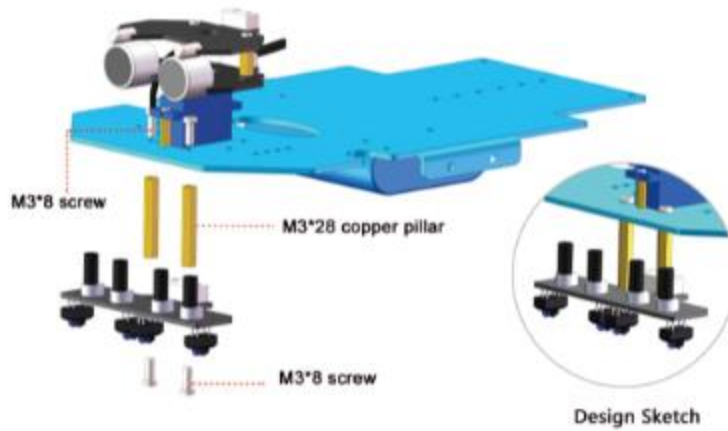
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Build 3a

1. View the Yahboom Build/Install 3 video from the start to 5:25.

2. View the K2 piRover - Build 3a video

3. Review the Package List on Page 1 of the Yahboom Instruction Manual. Search kit contents and locate the parts required this build

4. Complete installation steps 11 through 20 shown on pages 9 through 11 of this document.

5. Once the build is completed, take a picture of the current piRover status. An example image is shown below.

6. Locate the Build Scrum 1 assignment item in Moodle. **Post** your Build 2 image to this link prior to the assigned class session
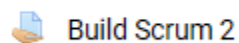
7. During the class session, each member will share their build and reflect on the experience.

Raspberry Pi version
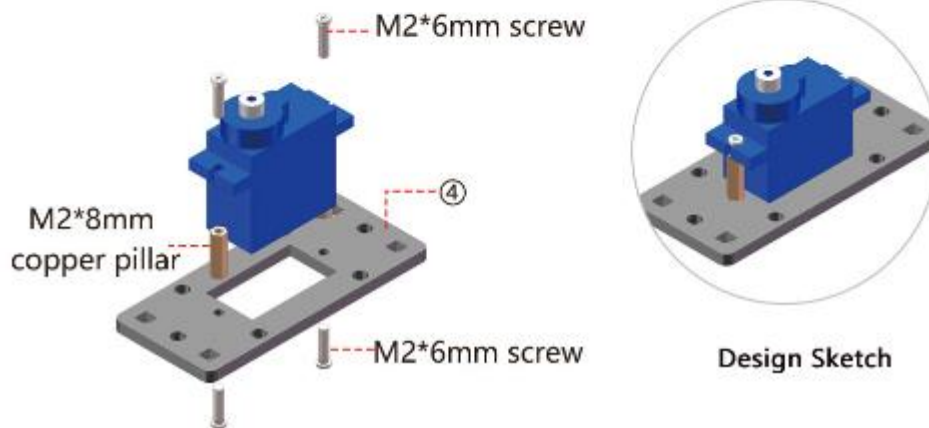
Assemble camera

Acrylic plate introduction

① ② ③ ④
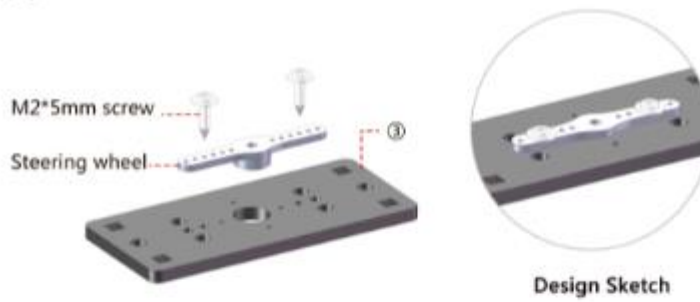
⑤ ⑥ ⑦
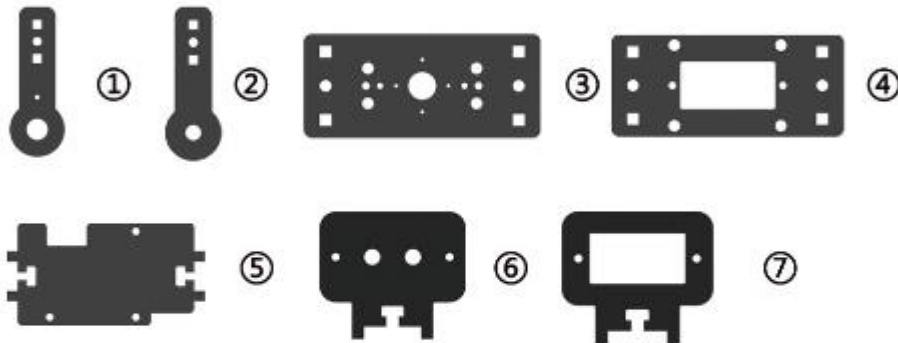
11 Assemble camera vertical servo

M2*6mm screw

M2*8mm copper pillar

④

M2*6mm screw

Design Sketch

8

12 Assemble steering wheel for vertical servo

M2*5mm screw

Steering wheel

③

Design Sketch

13 Assemble camera horizontal servo stand

⑦

⑥

M3 nut

M3*8mm screw

Design Sketch

14 Assemble camera horizontal servo

M2 nut

M2*10mm screw

Design Sketch
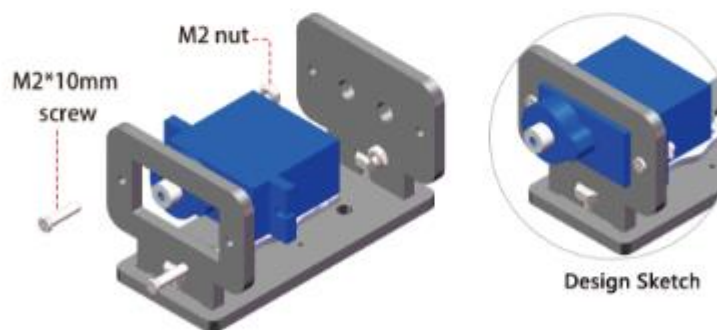
15 Assemble rotating arm

①

M2*8mm tapping screw

Design Sketch
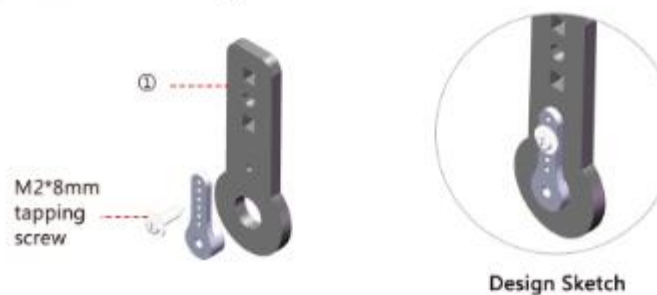
Build 3c

9

16 Assemble camera and plate

M2*6mm screw

⑤

M2*6mm screw

M2*10mm
copper pillar

Design Sketch
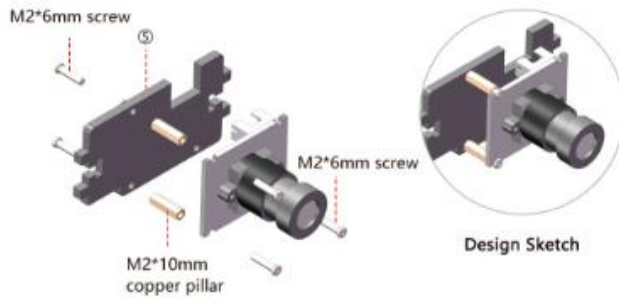
17 Assemble camera plate and rotating arm

M3*8mm screw

②

M3 nut

Design Sketch
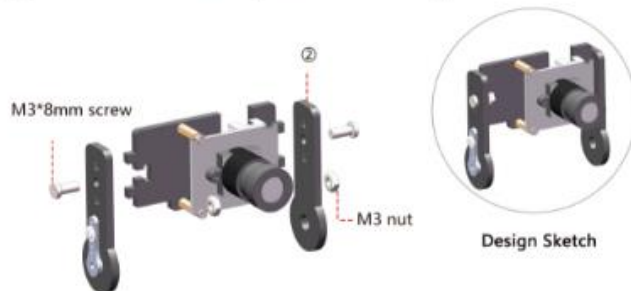
18 Assemble horizontal servo and camera

M5 rivet

M2*5mm screw

M5 rivet

Design Sketch
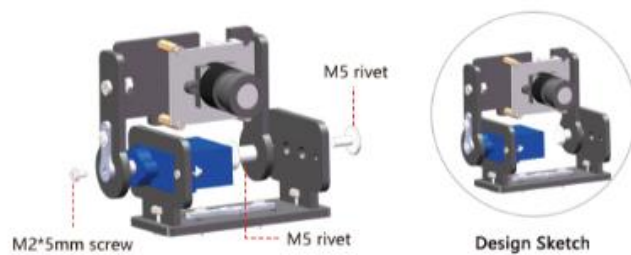
19 Assemble copper pillar for camera platform

M2*5mm screw

M3*8mm screw

M3*28mm
copper pillar

Design Sketch

10

20 Assemble camera

M3*8mm screw

Design Sketch

11
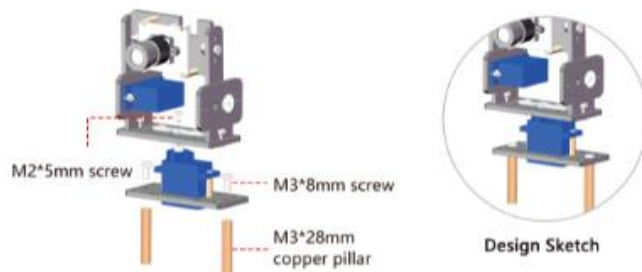
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Build 3b

1. View the Yahboom [Build/Install 3](#) video from the 5:25 to the end.

2. View the K2 [piRover – Build 3b](#) video

3. Review the Package List on [Page 1](#) of the Yahboom Instruction Manual. Search kit contents and locate the parts required this build

4. Complete installation steps 21 through 25 shown on pages 9 through 11 of this document.

5. Once the build is completed, take a picture of the current piRover status. An example image is shown below.
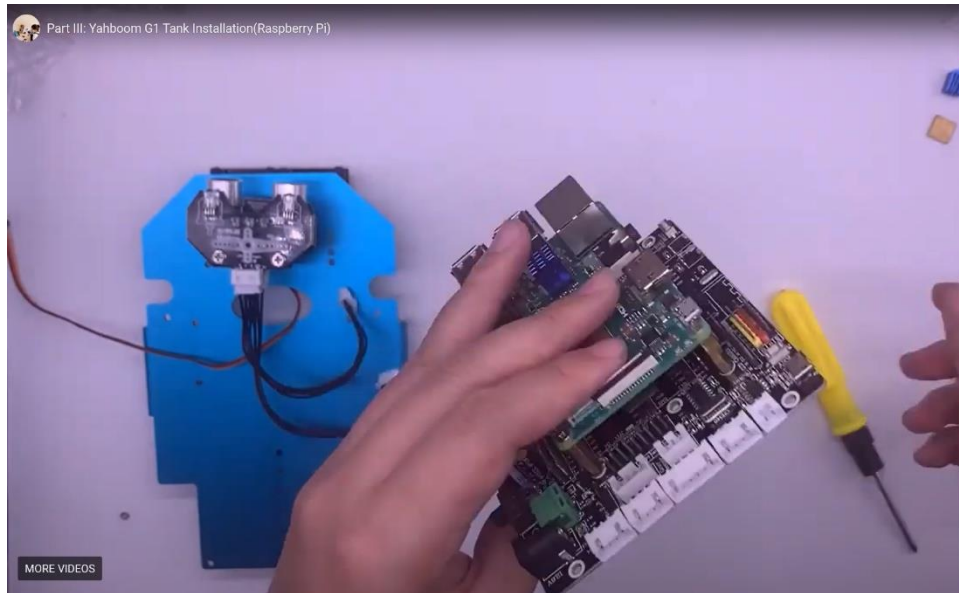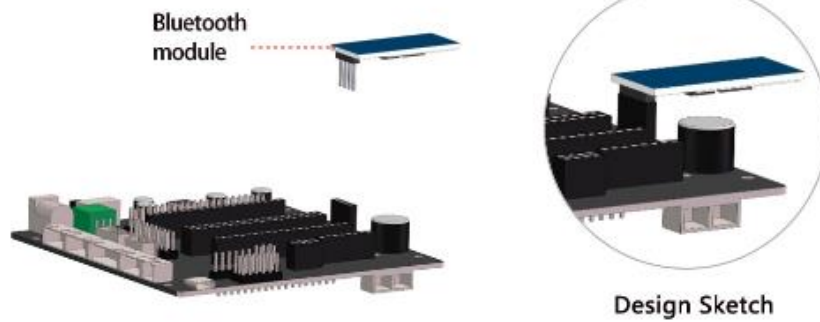

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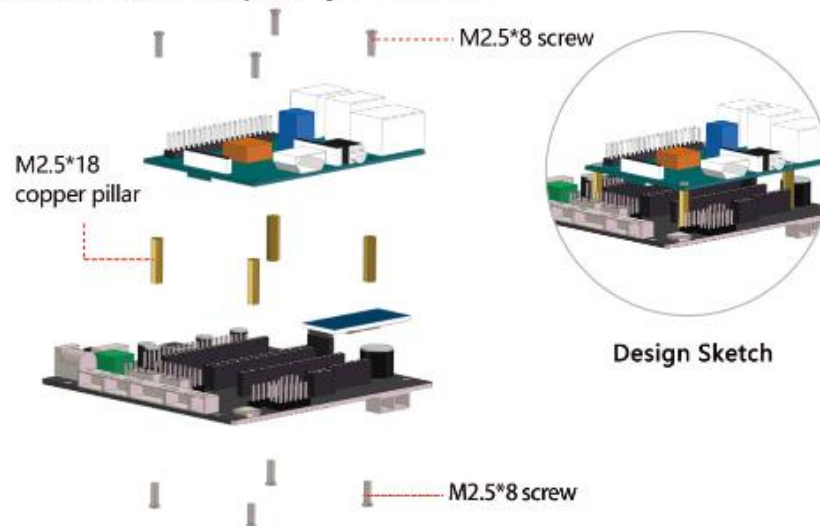
    📄 Build Scrum 2

7. During the class session, each member will share their build and reflect on the experience.

21 Assemble bluetooth module
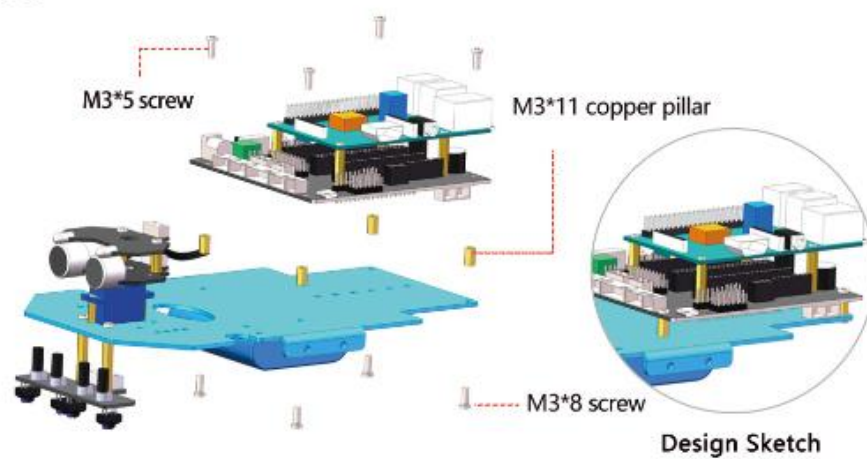
Bluetooth module

Design Sketch

22 Assemble Raspberry Pi board

M2.5*8 screw

M2.5*18 copper pillar

Design Sketch

M2.5*8 screw

23 Assemble main control board

M3*5 screw

M3*11 copper pillar

M3*8 screw

Design Sketch

11

24 Assemble 40 pin cable

40pin cable
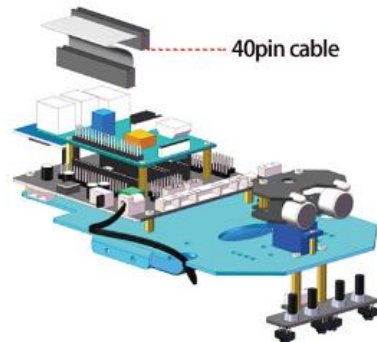
Design Sketch

25 Assemble baseboard

M3*8 screw

Design Sketch

Assessment

This build assignment is an intermediate activity. Build images are submitted and discussed during class periods. Reflection activities are also included during class time. Keep all images and documentation. These will be submitted as part of a final piRover Build document.