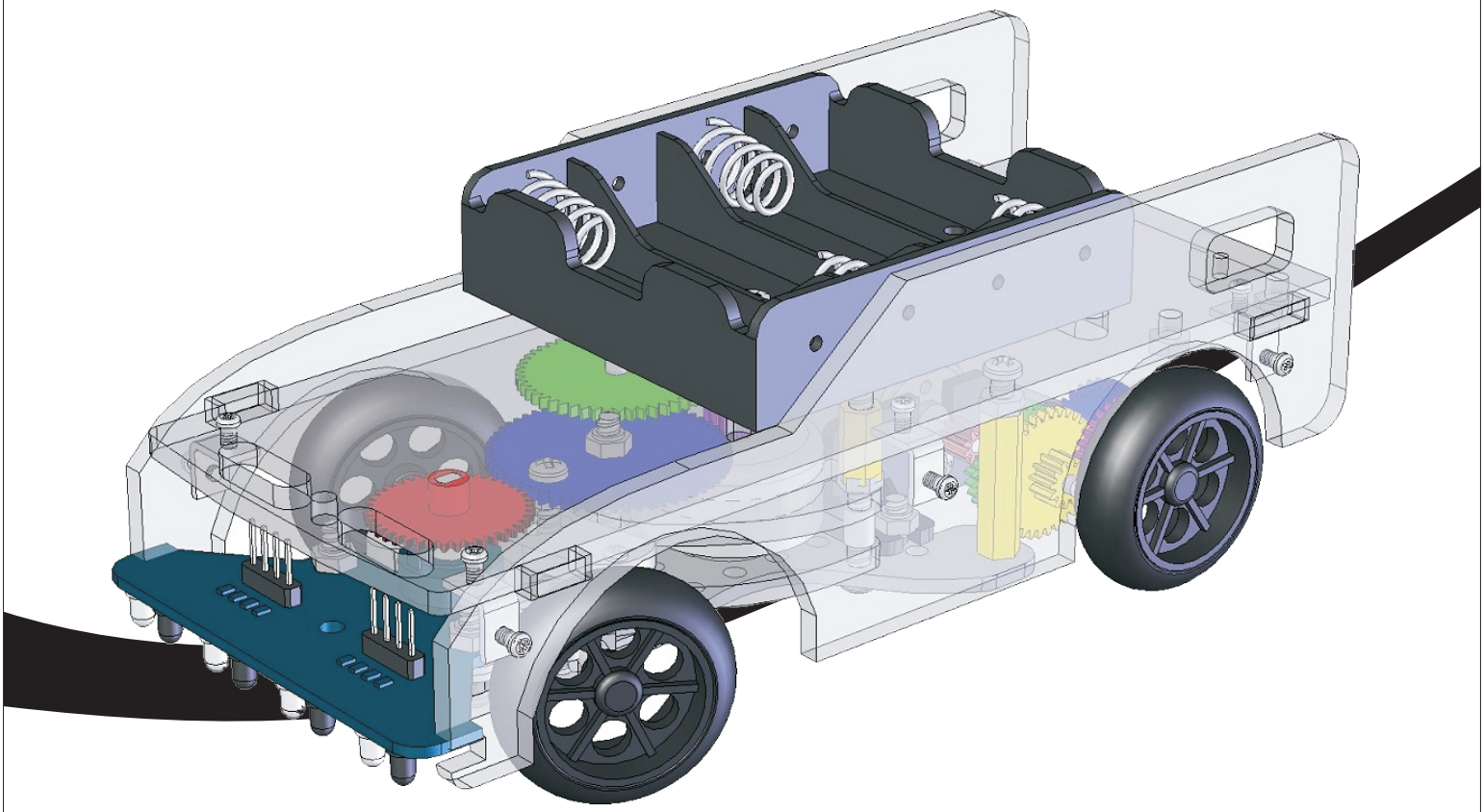
UGV robot chassis

Manual:RS021



Manufacturer:
DAGU Hi-Tech Electronic Co.,LTD
WWW.AREXX.COM.CN

Address:NO.4-107/108 HengXing Street, HengHai Rd, South District, ZhongShan City of GuangDong China
TEL:0760-88811951
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E-mail:info@arexx.com.cn

Product Description

Thank you for selecting the **UGV** robot chassis for your next do-it-your-self project.

Product Features

1. Ackermann steering mechanism with feedback potentiometer.
2. Aluminium chassis with laser cut, transparent acrylic body panels.
3. Gearbox with a choice of 3 different gear ratios- 53:1, 68:1 and 91:1
4. Line following sensor PCB.
5. Range of accessories to expand the chassis's abilities.

Build it now! Realize your dream! Create your next masterpiece!

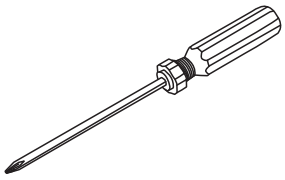
⚠ Warnings:

- Opened packages can not be returned. Please check package contents before opening.
- Read the instructions carefully before assembly.
- Use all tools carefully.
- Small parts are a choking hazard. Keep this kit away from young children and babies during construction and operation.
- Not for children under 8 years. Not to be used by children except under adult supervision.
- Observe the correct polarity of the battery.
- Keep the battery dry at all times.
- Do not mix old and new batteries. Do not mix alkaline, standard (carbon-zinc), or rechargeable (nickel-cadmium) batteries.
- Remove the battery if the kit is not used for a long period of time.

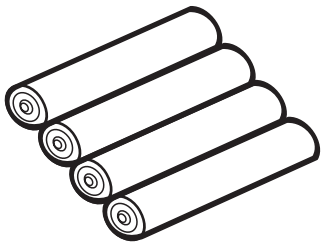
Necessary Tools:

Please read this manual thoroughly before you start assembling the kit. Please follow the assembling instructions exactly to avoid problems. If you work accurately and follow the instructions in this manual exactly, you will quickly assemble a complete UGV chassis.

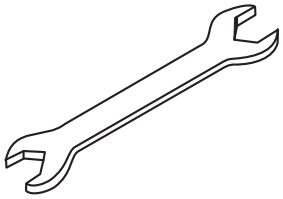
Before you start you must prepare the following tools:



PHILLIPS CREW DRIVER
(included in kit)

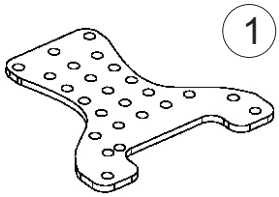
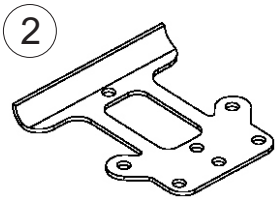
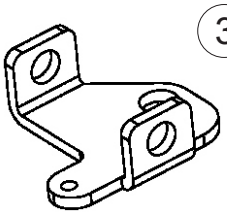
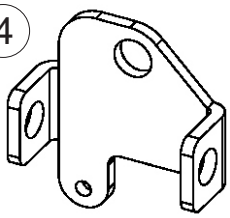
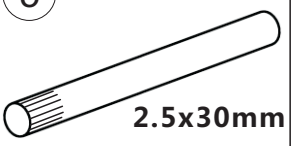
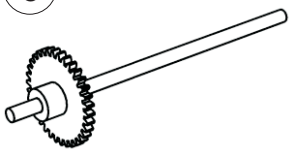
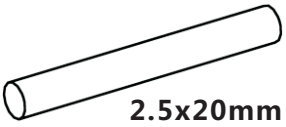
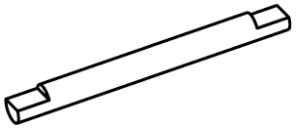
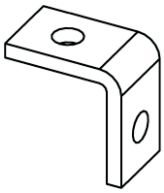
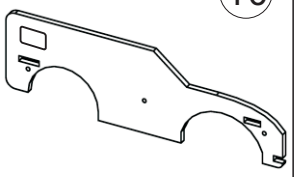
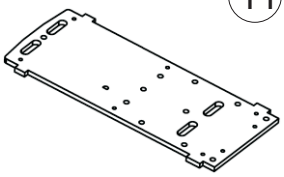
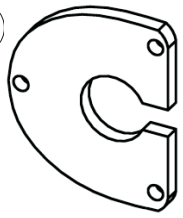
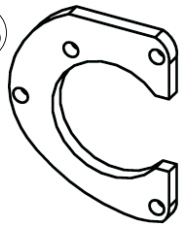
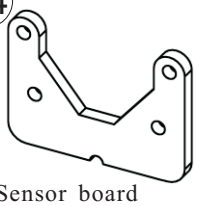
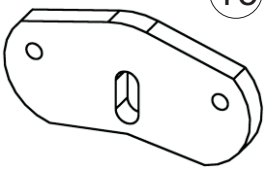
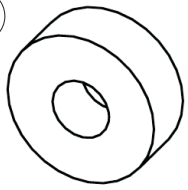
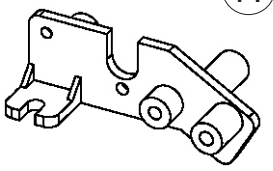
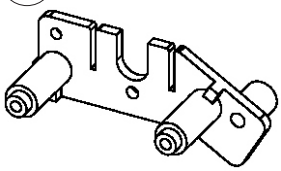
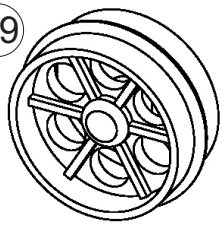
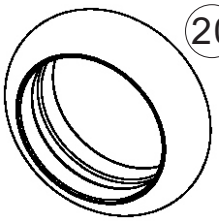
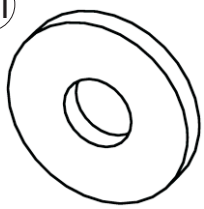
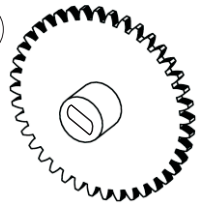
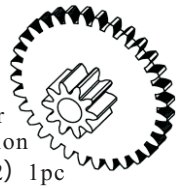
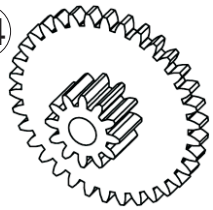
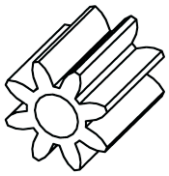
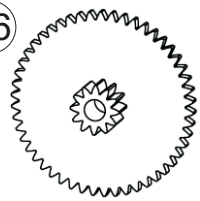
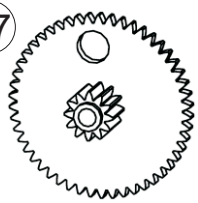
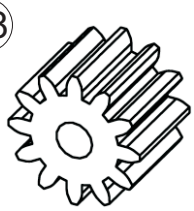
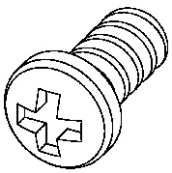
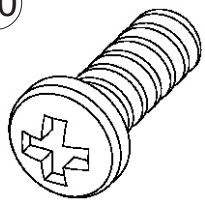
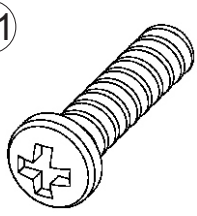
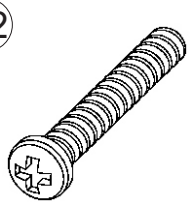
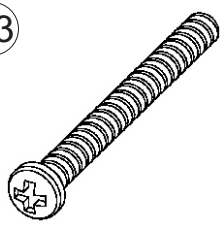
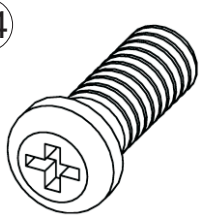
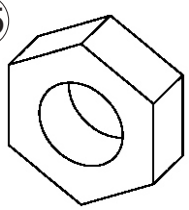


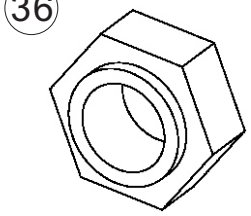
4x AA BATTERY
(not included)

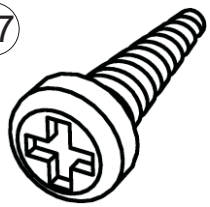


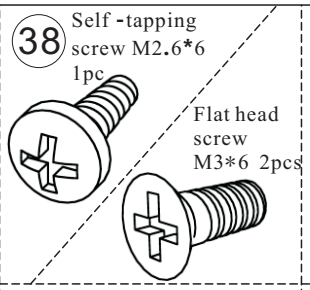
HEX SPANNER
(included in kit)

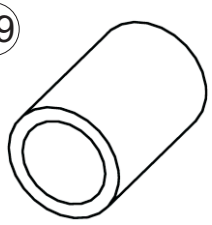
List of components:

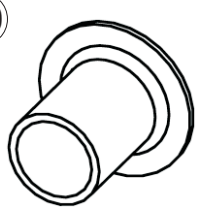
1  Mid Chassis 1pc	2  Front Chassis 1pc	3  Right steering bracket 1pc	4  Left steering bracket 1pc	5  Front wheel shaft 2pc
6  Rear axle 1pc	7  Gear box intermediate shaft 1pc	8  Steering intermediate shaft 1pc	9  90 angle metal mounting bracket 8pcs	10  Body side panel 2pcs
11  Body main panel 1pc	12  Motor holder A 1pc	13  Motor holder B 1pc	14  Sensor board insulator 1pc	15  Steering linkage 1pc
16  Washer thick 2pcs	17  Gearbox left halve 1pc	18  Gearbox right halve 1pc	19  Wheel 4pcs	20  Rubber Tire 4pcs
21  Washer thin 4pcs	22  Flat spur gear with boss (40T+4L) 1pc	23  Flat spur gear with pinion (28T+12) 1pc (30T+12) 1pc (32T+12) 1pc	24  Flat spur gear with pinion (34T+12) 2pcs	25  Pinion gear 8T 1pc / 10T 1pc / 12T 1pc
26  Flat spur gear with pinion (50T+12) 1pc	27  Flat spur gear with pinion (60T+12) 1pc	28  Pinion gear 12T 1pc	29  Screw M3*6 8pcs	30  Screw M3*8 2pcs
31  Screw M3*12 5pcs	32  Screw M3*20 2pcs	33  Screw M3*25 1pc	34  Screw M2*5 16pcs	35  M3 nut 14pcs

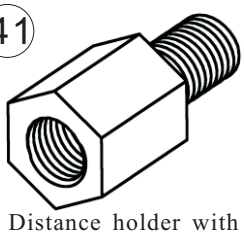

36 M3 nylon Nut 7pcs

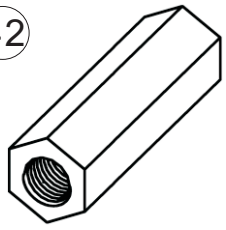

37 Self-tapping screw M2.2*8 1pc

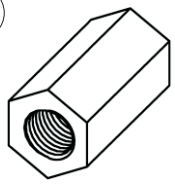


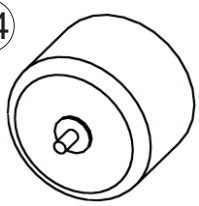

39 Spacer 6pcs

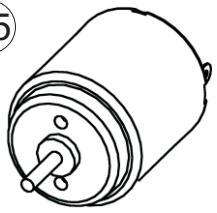

40 Flanged spacer 2pcs


41 Distance holder with screw 8pcs


42 L20 distance holder 2pcs


43 L10 distance holder 2pcs

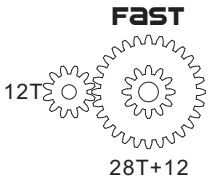

44 Front steering motor 1pc


45 Rear driving motor 1pc

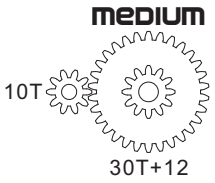
Mechanical assembly Instructions :

CHOOSE YOUR GEARBOX RATIO

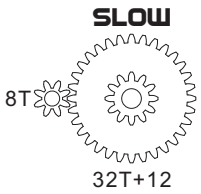
The gear box can be assembled to give 1of 3 different gear ratios. This is done by changing the pinion gear on the motor and the gear that it drives.



The **FAST** setting uses a 12T gear and a 28T+12 gear. The total gearbox ratio is 53:1. This setting is best for high speed challenges on a flat surface without too many sharp turns.



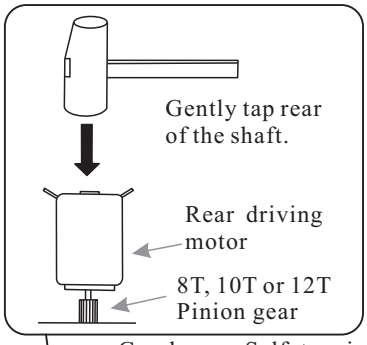
The **MEDIUM** setting uses a 10T gear and a 30T+12 gear. The total gearbox ratio is 68:1. This setting is better when you need more control for sharp turns. More torque allows the car to climb gentle slopes.

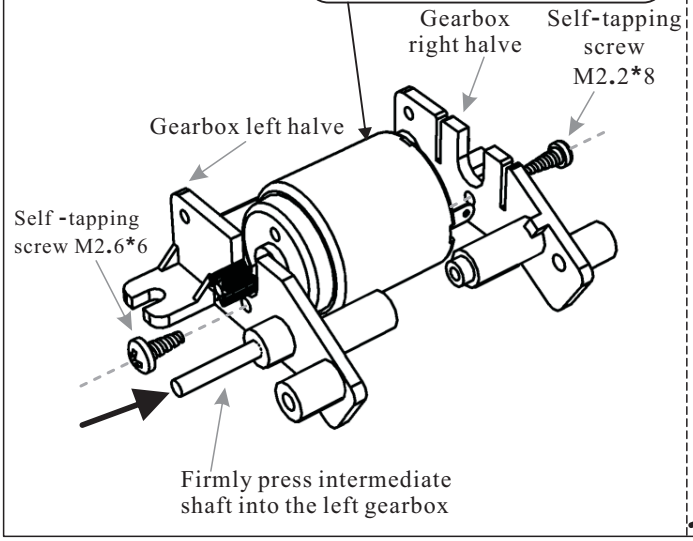


The **SLOW** setting uses an 8T gear and a 32T+12 gear. The total gearbox ratio is 91:1. This setting gives you the best control for sharp turns in tight spaces. It also has the most torque for climbing hills.

Place your gears on the drawings to see what size they are.

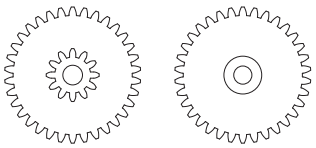
Step1 :

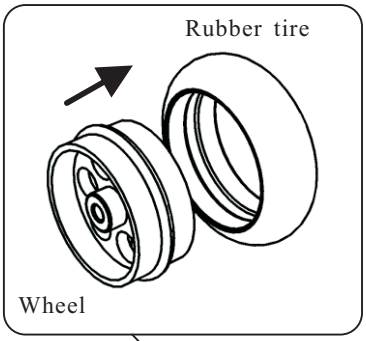


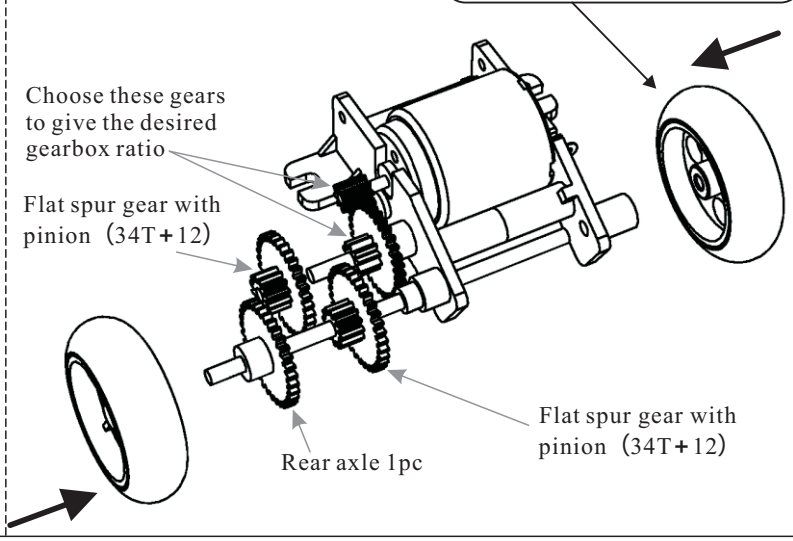


Step2 :

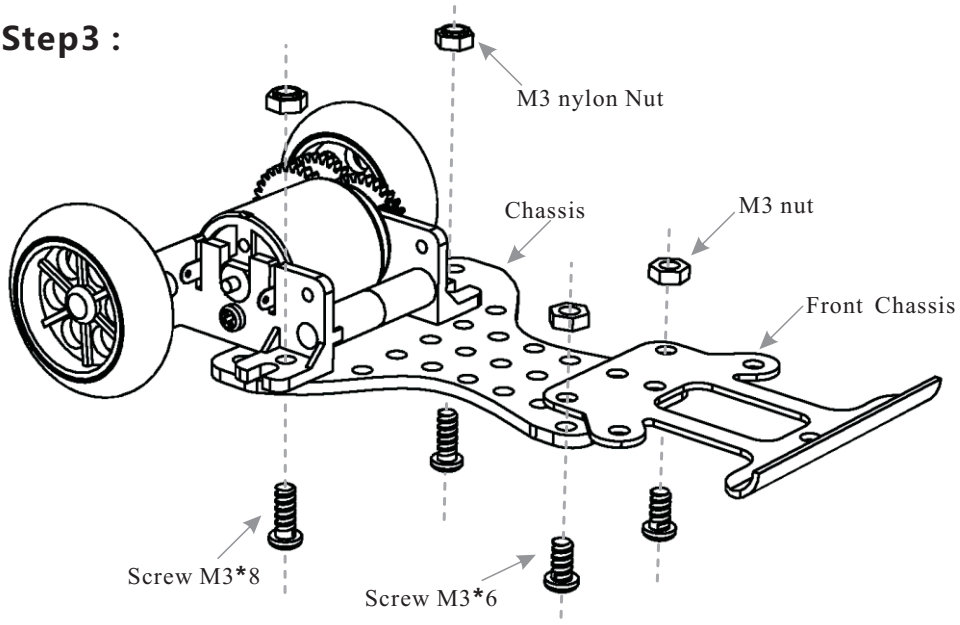
Use the drawings below to check you have the correct gears



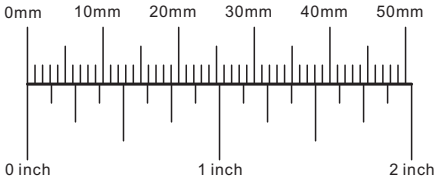




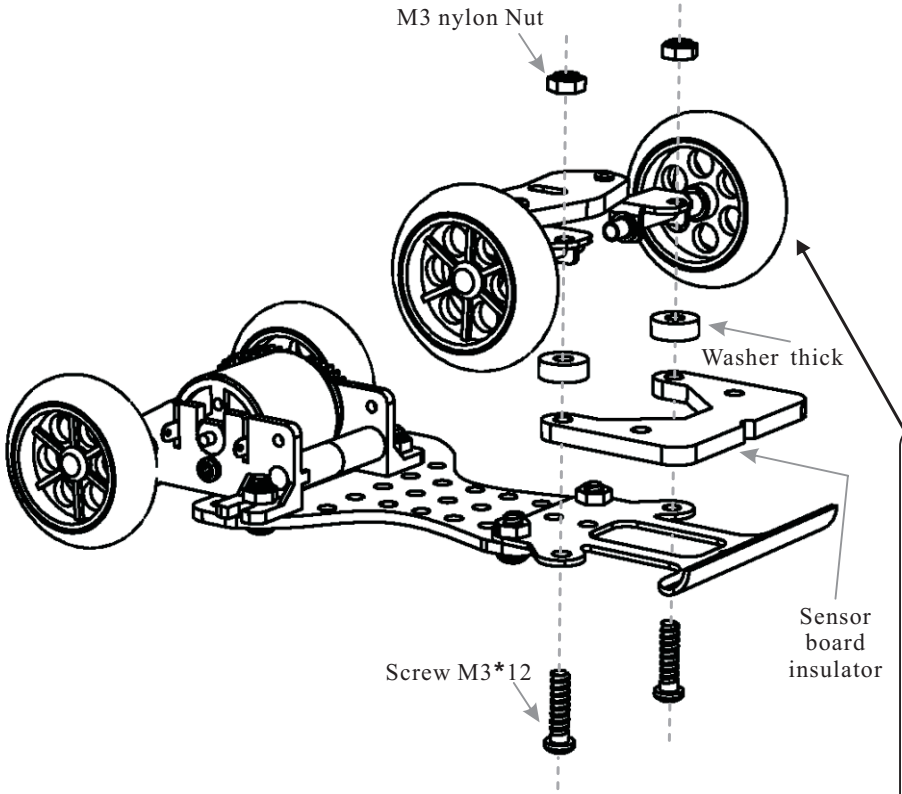
Step3 :

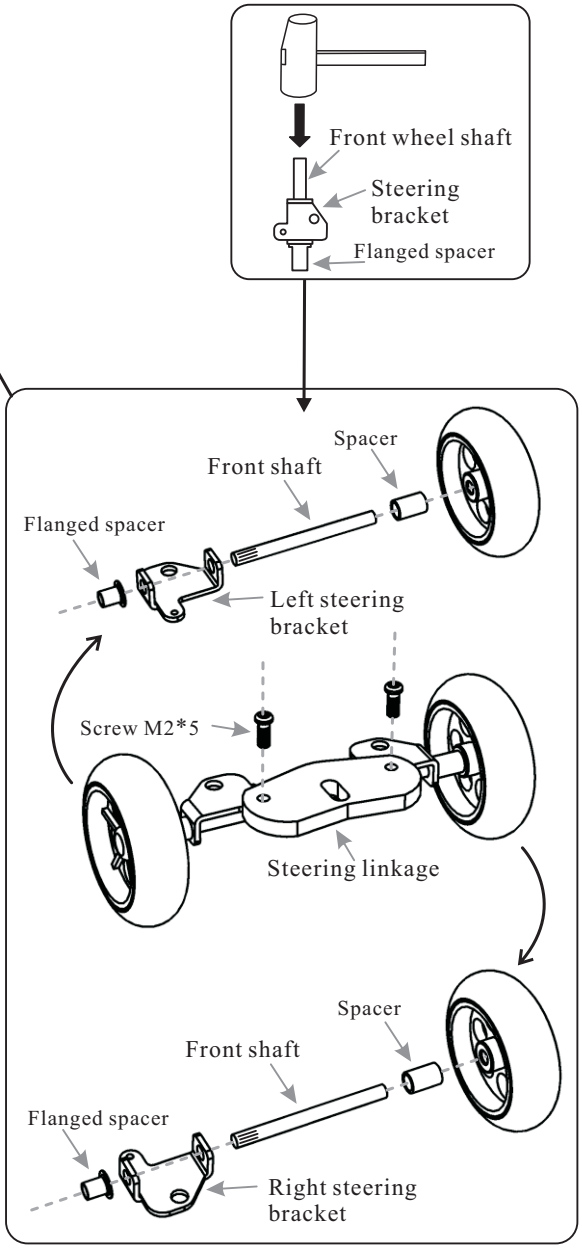


Use the ruler to check the length of your screws and spacers.

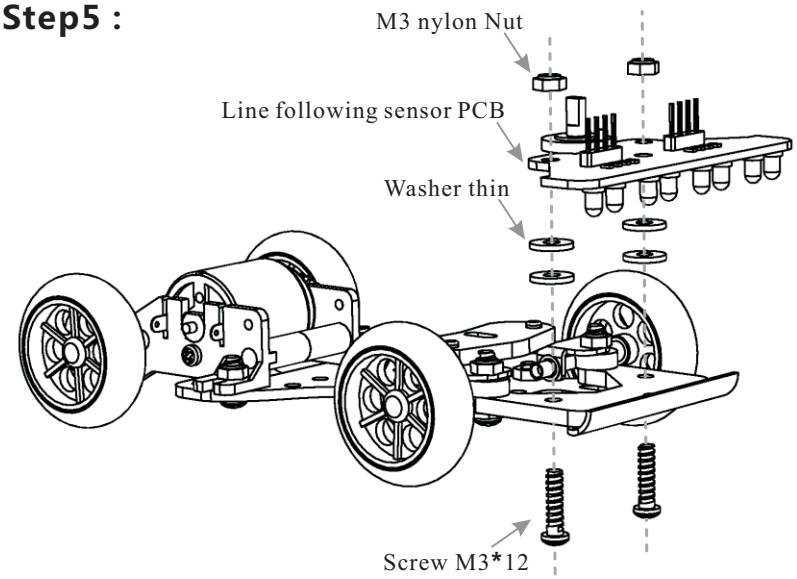


Step4 :

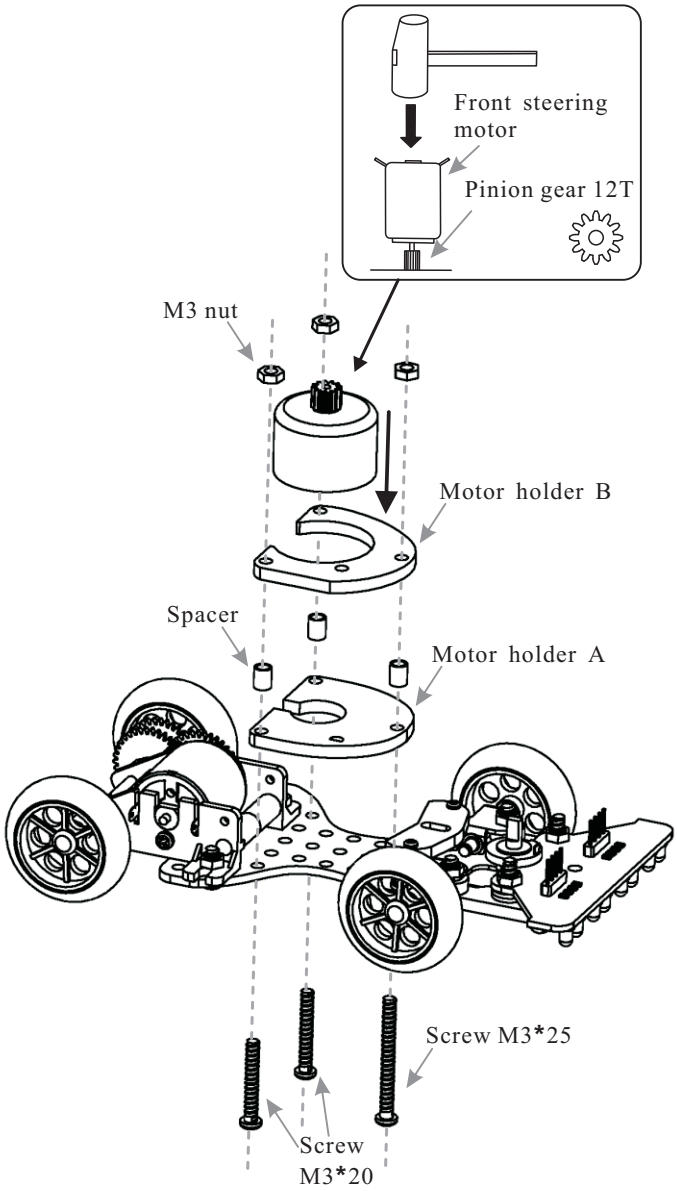




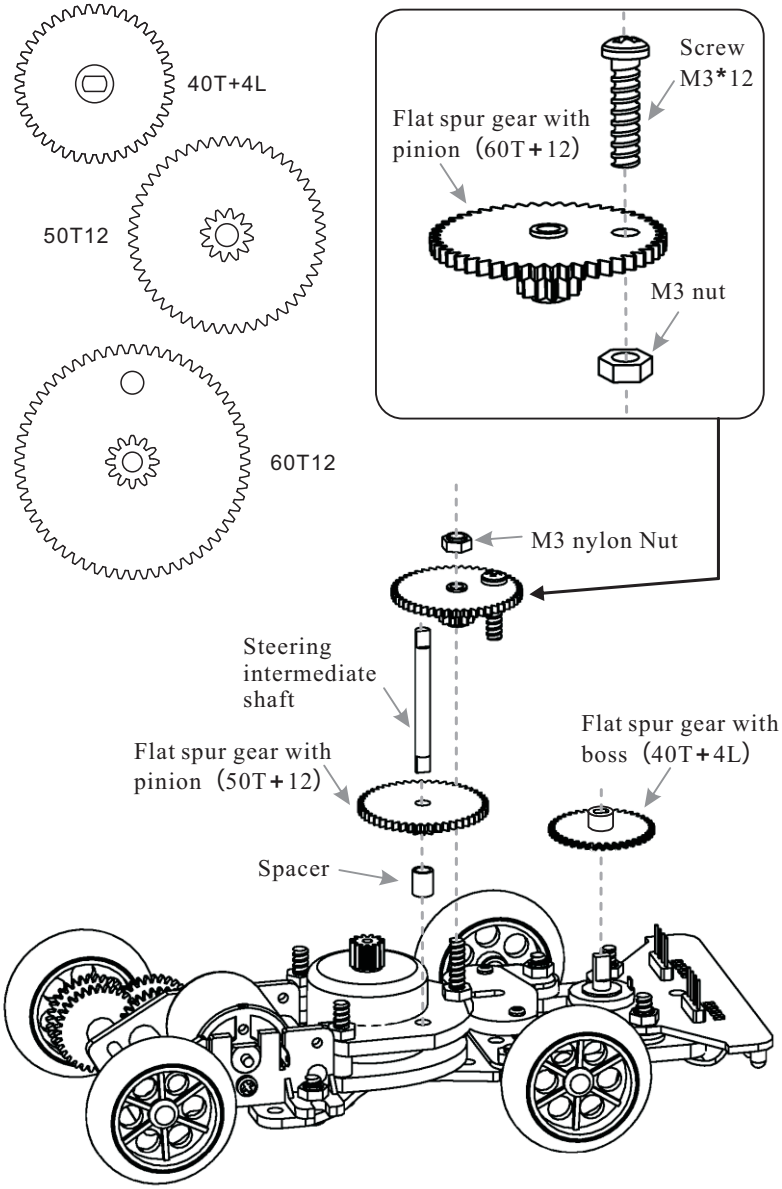
Step5 :



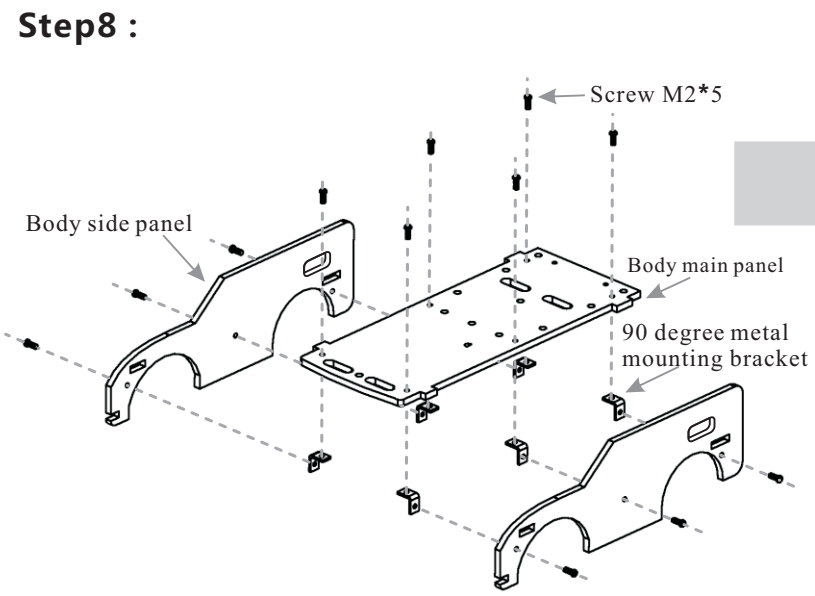
Step6 :

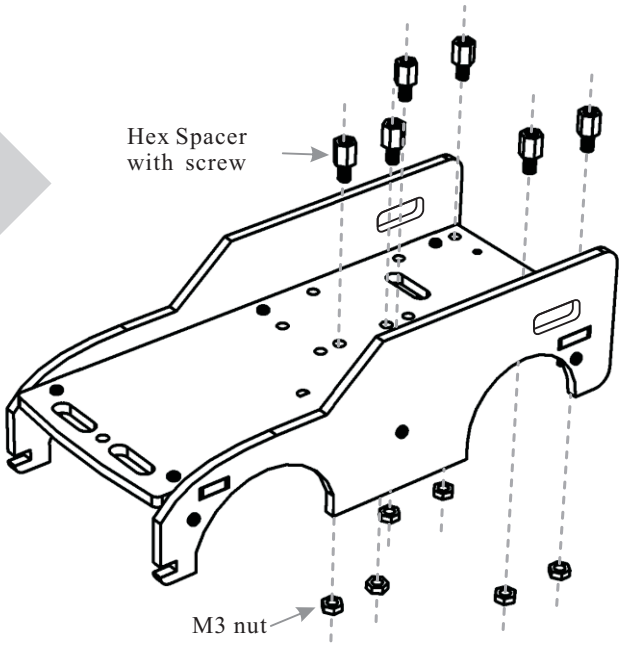


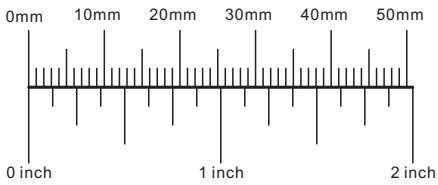
Step7 :



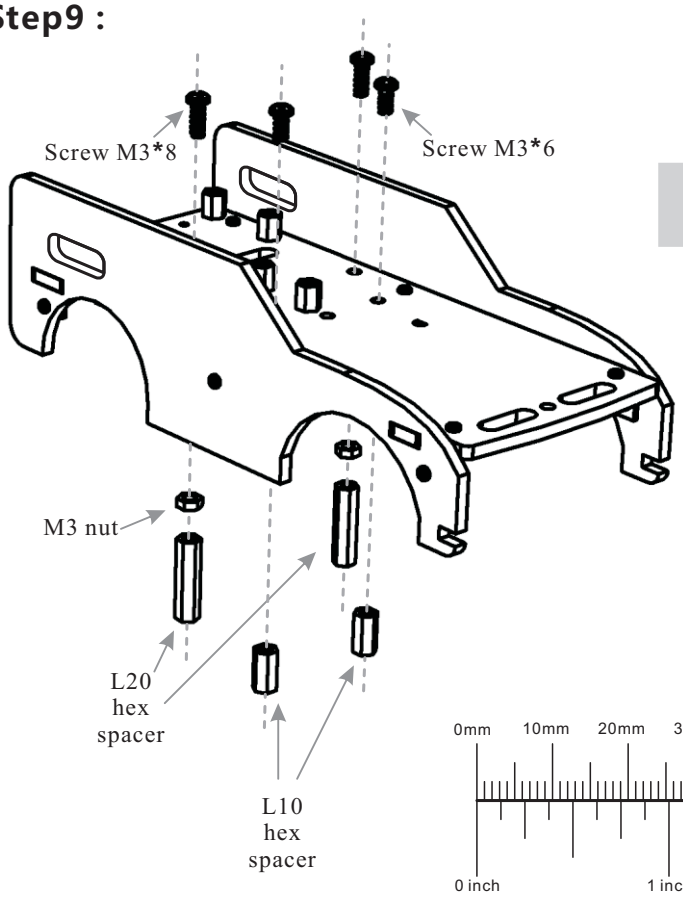
Step8 :

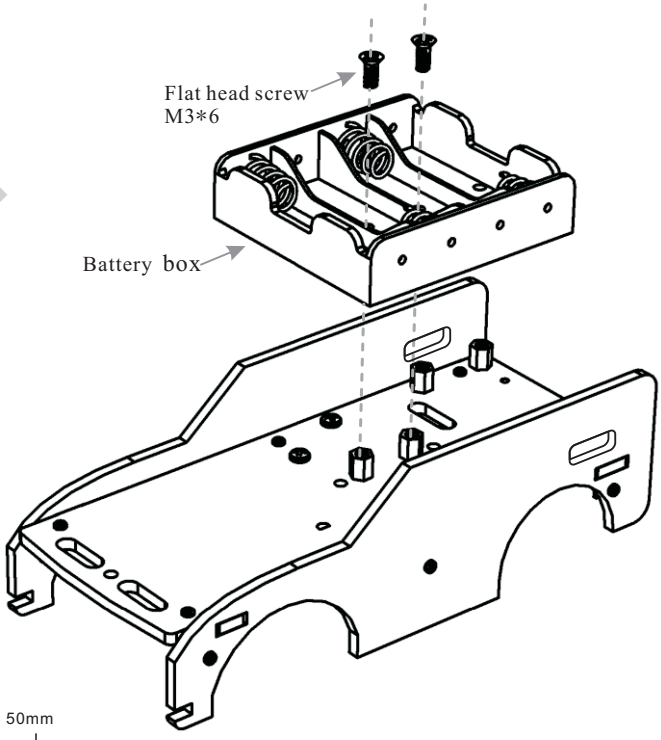




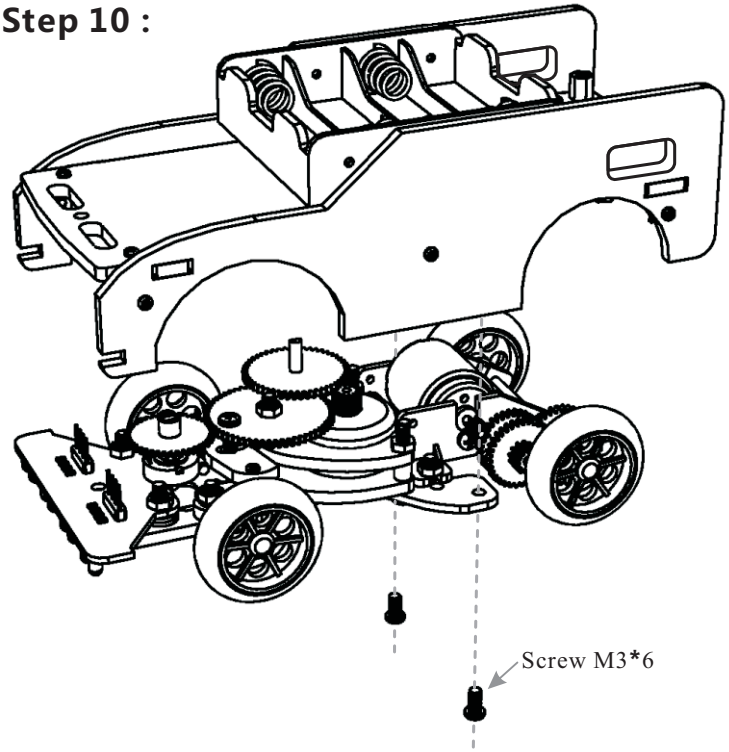


Step9 :



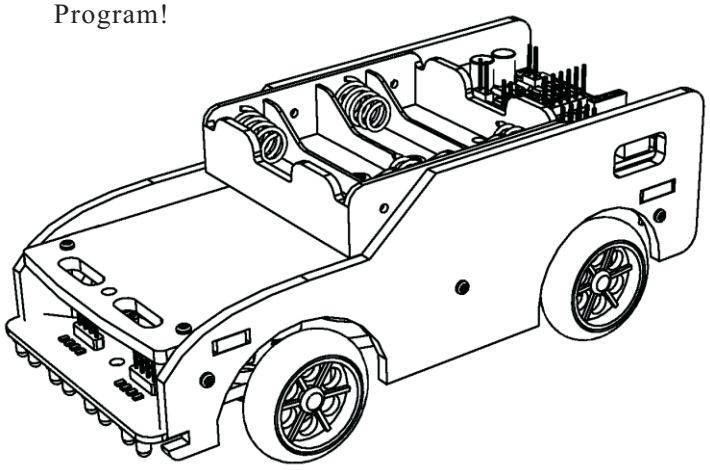


Step 10 :



Finished!

Mount your choice of controller (sold separately).
Connect sensor PCB with supplied cables.
Install 4x AA batteries.
Program!



Using the front sensor PCB:

At the front of the UGV robot car chassis is a sensor PCB that can be used for following lines or detecting edges such as the top of a staircase or the edge of a table. The PCB also includes a feedback potentiometer to report the position of the steering mechanism.

These sensors are all analog sensors. This means that their output is a voltage that varies between 0V and Vcc (3.3V). Connect these outputs to the analog inputs of your controller. Your program can then read the voltage. Using an Arduino compatible controller such as the Micro Magician will return a number between 0 and 1023.

The steering feedback potentiometer should return a value of approximately 512 when the steering is centered. If not then you may have to adjust your steering mechanism so the potentiometer is centered when the wheels are straight.

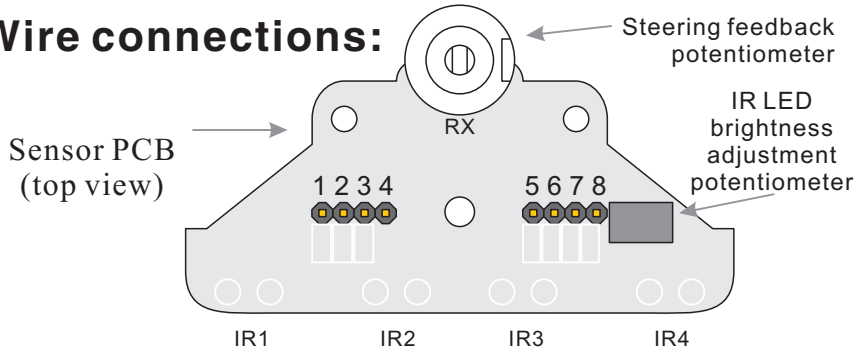
The IR_EN pin turns the IR LEDs on when it is pulled high. The LEDs will turn off again when the pin is pulled low. Adjusting the small potentiometer at the front left of the car will adjust the brightness of the IR LEDs allowing you to adjust the sensitivity of the IR sensors.

When the IR LEDs are ON, each IR sensor should return a low number when there is nothing in front of the sensor. This value is due to the ambient IR in the room. Placing an object such as a piece of paper in front of the sensor will give a very high reading. This value is the ambient light plus light from the IR LEDs reflecting back from the paper.

If your program reads the sensor once with the LEDs on and again with the LEDs off then you will be able to subtract the ambient light value (LEDs off) from the total value(LEDs on) to get a value that is equal to just the light being reflected from the piece of paper. This method will prevent ambient light from confusing your robot car.

The IR LEDs can draw a reasonable amount of power (up to 90mA) so it is best to only turn them on briefly to read the sensors.

Wire connections:



1. IR1 - analog output sensor 1
2. IR2 - analog output sensor 2
3. IR3 - analog output sensor 3
4. IR4 - analog output sensor 4
5. RX - analog output steering
6. IR_EN - enables IR LEDs
7. GND - 0V
8. Vcc - 3.3V