SAFETY INFORMATION

WARNING:
This toy is only intended for use by children over the age of 8 years, due to accessible electronic components. Instructions for parents or caregivers are included and shall be followed. Keep packaging and instructions as they contain important information.

WARNING!
Not suitable for children under 3 years. Choking hazard — small parts may be swallowed or inhaled.

Store the experiment material and completed models out of the reach of small children.

Safety for Experiments with Batteries

››› Never perform experiments using household current! The high voltage can be extremely dangerous or fatal!
››› To operate the models, you will need six AAA batteries (1.5-volt, type LR03 or lithium-ion rechargeable batteries), which are not included in the kit.
››› Avoid short circuiting the batteries. A short circuit can cause the wires to overheat and the battery to explode.
››› The supply terminals are not to be short-circuited. A short circuit can cause the wires to overheat and the batteries to explode.
››› Different types of batteries or new and used batteries are not to be mixed.
››› Do not mix old and new batteries.
››› Do not mix alkaline, standard (carbon-zinc), or rechargeable batteries.
››› The batteries are to be inserted with the correct polarity (+ and -). Press them gently into the battery compartment (see page 4). The battery must be inserted by an adult.
››› Non-rechargeable batteries are not to be recharged. They could explode!
››› Batteries are only to be charged by persons of at least 8 years old.
››› Rechargeable batteries are to be removed from the toy before being charged (or they must be charged as described in the instructions).
››› Exhausted batteries are to be removed from the toy (e.g., if no experiments are to be carried out with them for a prolonged period of time).
››› The supply terminals are not to be short-circuited.
››› Dispose of used batteries in accordance with environmental provisions, not in the household trash.
››› Dispose of electrical device / electrical parts separately in accordance with environmental provisions.
››› Be sure not to bring batteries into contact with coins, keys, or other metal objects.
››› Avoid deforming the batteries.
››› Do not expose the toy to extreme heat or long periods of direct sunlight; protect it from heavy, persistent rain and frost.
››› As all of the experiments use batteries, have an adult check the models before use to make sure they are assembled properly. Always operate the motorized models under adult supervision.
››› The toy is not to be connected to more than the recommended number of power supplies. Use only the included battery case. Do not use any power supply other than included battery case.

Notes on Disposal of Electrical and Electronic Components

The electronic components of this product are recyclable. For the sake of the environment, do not throw them into the household trash at the end of their lifespan. They must be delivered to a collection location for electronic waste, as indicated by the following symbol:
Please contact your local authorities for the appropriate disposal location.

FCC Part 15 Statement
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
Warning: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, maybe cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different form that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC RF Exposure Statement
This device complies with FCC RF radiation exposure limits set forth for an uncontrolled environment.

CAN ICES-3 (B)/NMB-3(B) IC Statement
This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de classe B est conforme à la norme NMB-003.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

RF Radiation Exposure Statement
This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance 5 mm between the radiator and all persons.

Déclaration d'exposition aux radiations
Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 5 mm de distance entre la source de rayonnement et toute personne.

EU Declaration of Conformity
Simplified EU Declaration of Conformity
Thames & Kosmos hereby declares that the radio communication unit "Remote-Control Robotics", model number 602405, conforms to Directive 2014/53/EU. The complete text of the EU conformity declaration is available at the following Internet address:
http://thamesandkosmos.com/remotecontrolrobotics/declaration.pdf

REMOTE AND MOTORS

1. Pair the remote and receiver.

(1) Turn on the remote only.
[**O**]: **OFF**
[**I**]: **ON**

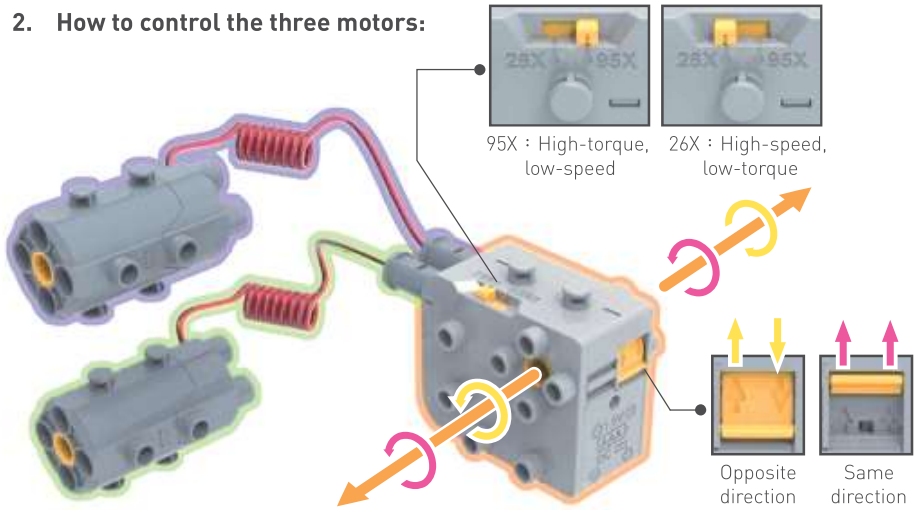
The red light on the remote will flash. That means it is looking for a nearby receiver.

(2) Turn on the receiver.

The receiver's light iwill turn solid, and stay on. The remote's light will turn off.

If the remote and receiver do not pair. Try these steps again, then double check that the batteries were inserted correctly.

2. How to control the three motors:



Push the switch all the way up or all the way down. Use the **peg remover tool** if the switch is too difficult to move with your fingers.

(O)On / (I)Off

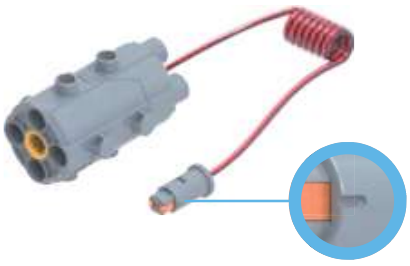
Central Controls (Orange):
Two separate buttons that control the receiver motor.

Button A (Purple):
Two-way button that controls the motor plugged into Port A on the receiver.

Button B (Green):
Two-way button that controls the motor plugged into Port B on the receiver.

Dual-Flat End Plug

Need to change direction? Simply turn the motor's plug 180 degrees and plug it back into the port.

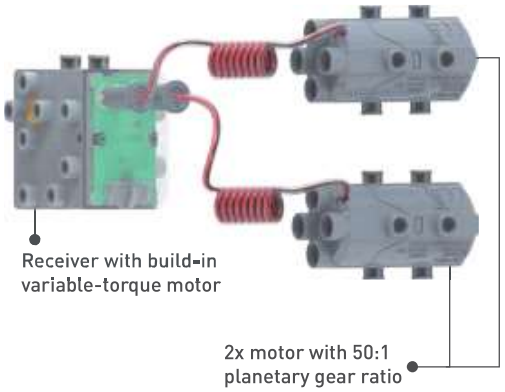


Make sure the groove symbol on the plug matches the picture in the building steps for each model. This keeps your motor spinning the right way!

After the receiver and remote controller are successfully paired, the built-in control chip inside the receiver recognizes when a button is pressed and converts the command into an electrical signal.

The receiver is powered by four AAA batteries (1.5V each) installed inside. These batteries are connected in series to provide a stable 6V DC power supply for both the output ports and the built-in motor.

This 2.4G wireless remote control set includes two additional output ports on the receiver. You can connect up to two powerful planetary gear motors, with 50:1 gear ratios.

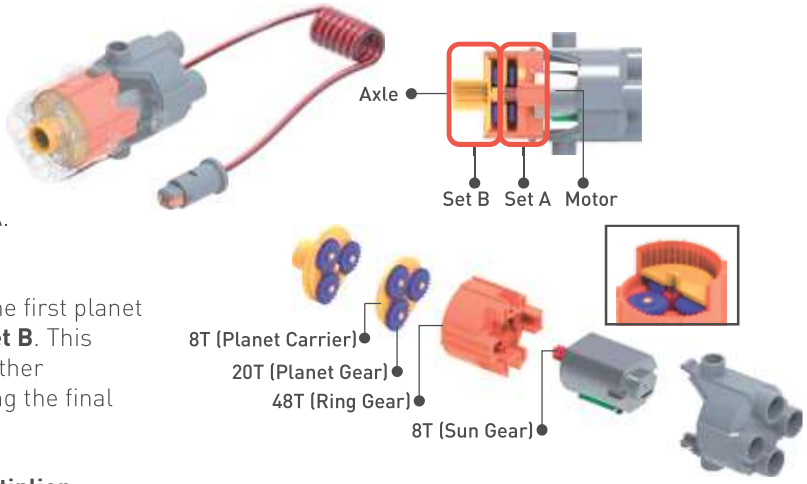


This manual provides step-by-step instructions to build 10 different models that showcase a variety of mechanisms and ways to create movement in robots. Each model can use up to three motors in total (including the motor built into the receiver). Depending on how the motors are installed and connected, the model can move forward, backward, turn, lift, or spin in place. We also encourage you to design your own creations and tag us @thamesandkosmos.

After playing, remember to turn off the power. If the product will not be used for a long time, remove the batteries to prevent battery leakage and possible damage to the circuit board.

Planetary Gear Motor
This motor box utilizes a precision **double-stage** reduction structure, consisting of two gear groups.

The operation begins when the motor drives the 8-toothed sun gear of **Set A**. As the planet gears rotate within the fixed 48T ring gear, the power is condensed and transferred through the first planet carrier directly into the sun gear of **Set B**. This second stage repeats the process, further multiplying the torque before delivering the final output to the external axle.



Gear Ratio Calculation and Final Multiplier
The reduction ratio for a planetary gear set (where the ring gear is fixed) is calculated using the formula:

(**R** + **S**) / **S** (where **R** is the 48T Ring Gear and **S** is the 8T Sun Gear).

- Set A Reduction Ratio: (48 + 8) / 8 = 7
- Set B Reduction Ratio: (48 + 8) / 8 = 7
- Total Gear Ratio: 7 X 7 = 49

Conclusion: The precise total gear ratio of this system is 49:1. This means the internal motor spins 49 times for every 1 full rotation of the output axle. For ease of memory and communication, this is commonly referred to as the "**50x Planetary Gear Motor**."