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## Top Race TR-R1

# Top Race RC Robotic Arm Building Kit - Instruction Manual

Model: TR-R1

## 1. INTRODUCTION

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Thank you for purchasing the Top Race RC Robotic Arm Building Kit, Model TR-R1. This kit provides an engaging and educational experience in mechanical engineering and robotics. Designed with high-quality metal alloy components, this robotic arm offers precise control and robust performance. Please read this manual thoroughly before assembly and operation to ensure safe and optimal use of your new robotic arm.



**Figure 1.1:** The fully assembled Top Race RC Robotic Arm with its remote control. This image showcases the product's complete form, highlighting its blue and black metallic structure and track-based mobility.

## 2. SAFETY INFORMATION

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- **Adult Supervision:** This product contains small parts and requires assembly. Adult supervision is recommended, especially for younger users.
- **Battery Safety:**
  - Use only the specified rechargeable battery (1300 mAh Lipo) and USB charger provided.
  - Do not attempt to charge non-rechargeable batteries.
  - Ensure correct polarity when inserting batteries into the remote control (2 x AAA, not included).
  - Do not mix old and new batteries, or different types of batteries.
  - Remove batteries from the remote control if the product is not used for an extended period.
- **Moving Parts:** Keep fingers, hair, and loose clothing away from moving parts, gears, and the robotic arm's gripper during

operation to prevent injury.

- **Environment:** Operate the robotic arm on flat, clear surfaces. Avoid operating near water, heat sources, or in dusty environments.
- **Intended Use:** This product is designed for recreational and educational purposes. Do not use it to lift heavy objects beyond its capacity or for any unintended applications.

### 3. PACKAGE CONTENTS

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Before beginning assembly, please verify that all components listed below are present in your package.

- 151-piece Robotic Arm Construction Kit (metal alloy and plastic components)
- 1 x Remote Control Unit
- 1 x 1300 mAh Lipo Rechargeable Battery
- 1 x USB Charging Cable
- 2 x Play Balls
- 1 x Instruction Booklet (for assembly)
- Necessary tools for assembly (e.g., small screwdriver, wrench)



**Figure 3.1:** A visual representation of the various accessory parts and components included in the kit, such as nuts, bolts, structural beams, gears, motors, and the gripper mechanism.

## 4. ASSEMBLY

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The Top Race RC Robotic Arm is a DIY build kit. Assembly requires careful attention to detail. Refer to the dedicated instruction booklet included in your package for step-by-step visual guides.

- 1. Unpack Components:** Carefully remove all parts from the packaging and organize them. It is helpful to sort screws, nuts, and structural pieces by size and type.
- 2. Follow Booklet Instructions:** The included instruction booklet contains detailed, picture-based assembly steps. Follow these instructions precisely. Pay close attention to the orientation of each piece.
- 3. Motor and Wiring:** Connect the motors and wiring as indicated in the assembly guide. Ensure all connections are secure and correctly aligned.
- 4. Battery Installation:** Once the main structure is assembled, install the 1300 mAh Lipo battery into its designated compartment.

5. **Remote Control Batteries:** Insert 2 AAA batteries (not included) into the remote control, observing correct polarity.
6. **Initial Check:** After assembly, perform a visual check to ensure all parts are securely fastened and there are no loose connections.



**Figure 4.1:** An exploded diagram illustrating the various parts of the robotic arm and their relative positions before assembly. This view helps in understanding the construction process.

## 5. OPERATING INSTRUCTIONS

### 5.1 Charging the Battery

- Connect the 1300 mAh Lipo battery to the provided USB charging cable.
- Plug the USB cable into a standard USB power adapter (e.g., computer USB port, wall adapter).
- The charging indicator light on the USB cable will show the charging status (refer to the charging cable's specific instructions for light behavior).
- Charging time is approximately 90 minutes for a full charge. Do not overcharge.

## 5.2 Powering On and Pairing

1. Ensure the robotic arm's battery is charged and installed.
2. Turn on the power switch on the robotic arm.
3. Turn on the power switch on the remote control.
4. The robotic arm and remote control should automatically pair. Indicators on both devices will confirm successful pairing (refer to the instruction booklet for specific light patterns).

## 5.3 Remote Control Functions

The remote control features 18 channels for precise control over the robotic arm's movements. The control distance is approximately 70 feet (21 meters).



**Figure 5.1:** This diagram illustrates the various control inputs on the remote control and their corresponding actions on the robotic arm. It shows controls for track movement, arm articulation, cabin rotation, and gripper operation.

- **Left Joystick (Vertical):** Controls the left track for forward and backward movement.
- **Right Joystick (Vertical):** Controls the right track for forward and backward movement.
- **Left Joystick (Horizontal):** Controls the rotation of the main cabin (unlimited rotation).
- **Right Joystick (Horizontal):** Controls the main arm's expansion forward and retraction.
- **Left Shoulder Buttons:** Raise and lower the robotic arm.
- **Right Shoulder Buttons:** Open and close the robot clamp (gripper).
- **Combined Joystick Movement:** Use both joysticks to steer the robotic arm (e.g., push one forward and one backward to turn).

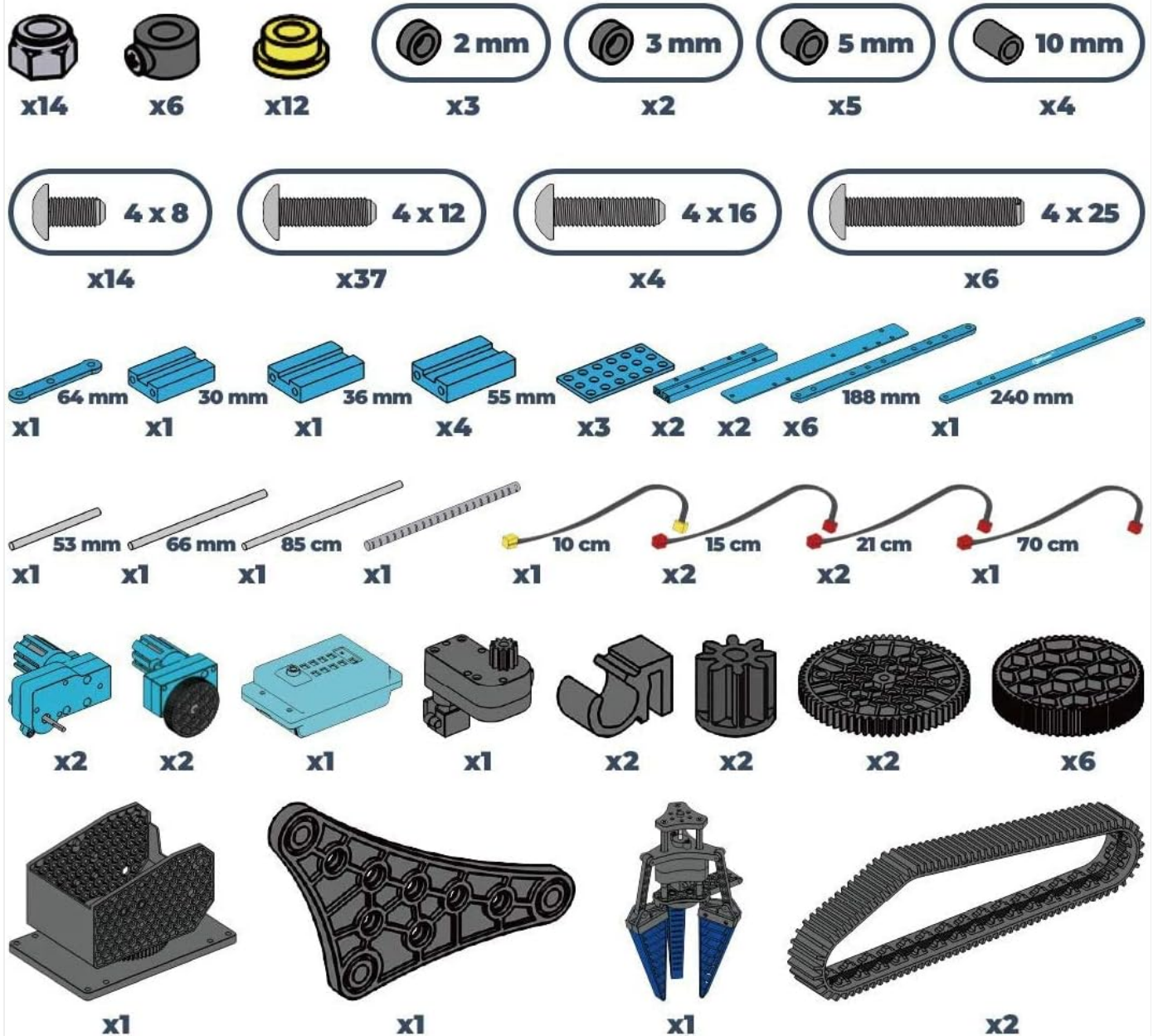


Figure 5.2: A child demonstrating the operation of the robotic arm, using the remote control to pick up a soccer ball. This image highlights the product's interactive playability.



**Figure 5.3:** The robotic arm shown in an extended position, demonstrating its range of motion and the functionality of its gripper. The image captures the arm's ability to reach and manipulate objects.

## 6. MAINTENANCE

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- **Cleaning:** Use a soft, dry cloth to wipe down the robotic arm and remote control. Do not use water or chemical cleaners, as this can damage electronic components.
- **Gear Inspection:** Periodically check the gears for any debris or wear. Clean if necessary.
- **Battery Storage:** If storing the robotic arm for an extended period, remove the Lipo battery from the arm and the AAA batteries from the remote control. Store batteries in a cool, dry place.
- **Screw Tightness:** Over time, some screws may loosen. Periodically check and gently tighten any loose screws to maintain structural integrity.

## 7. TROUBLESHOOTING

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Problem	Possible Cause	Solution
Robotic arm does not power on.	Battery not charged. Battery not connected properly. Power switch off.	Charge the Lipo battery fully. Ensure battery is securely connected. Turn on the power switch on the arm.
Remote control not responding.	AAA batteries low or incorrectly installed. Remote control power switch off. Not paired with robotic arm.	Replace AAA batteries, check polarity. Turn on the power switch on the remote control. Ensure both devices are powered on and within range for pairing.
Arm movements are sluggish or weak.	Low battery on robotic arm. Obstruction in gears or joints.	Recharge the Lipo battery. Inspect and clear any obstructions from gears and joints.
Arm does not move smoothly.	Loose connections or screws. Incorrect assembly of a joint.	Check all connections and tighten any loose screws. Refer to the assembly booklet to verify correct joint construction.

## 8. SPECIFICATIONS

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<b>Model Number:</b>	TR-R1
<b>Brand:</b>	Top Race
<b>Dimensions (L x W x H):</b>	70 x 10.67 x 24 cm (approx. 27.5 x 4.2 x 9.4 inches)
<b>Weight:</b>	2 kg (approx. 4.4 lbs)
<b>Number of Pieces:</b>	151
<b>Main Material:</b>	Aluminum Alloy, Durable Plastic
<b>Control Channels:</b>	18 Channels
<b>Motors:</b>	5 Powerful Motors
<b>Battery (Robotic Arm):</b>	1300 mAh Lipo Rechargeable Battery
<b>Charging Time:</b>	Approx. 90 minutes
<b>Control Distance:</b>	Approx. 70 feet (21 meters)
<b>Remote Control Batteries:</b>	2 x AAA (not included)

## 9. WARRANTY AND SUPPORT

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Top Race products are manufactured to high-quality standards. For any questions, technical support, or warranty inquiries, please contact Top Race customer service.

- **Customer Service:** Refer to the Top Race official website or product packaging for the most current contact information.
- **Online Resources:** Additional support, FAQs, and video tutorials may be available on the Top Race website.



