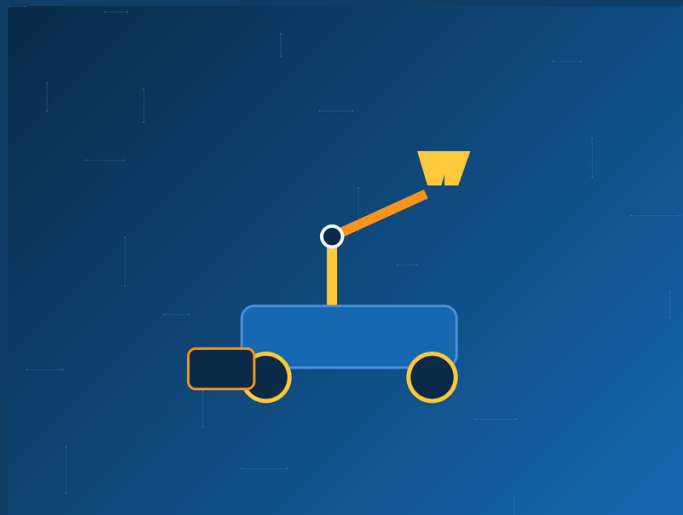


STAGE 2

Remote-Control Robotic Arm Car

The Stage 1 car plus a mechanical arm extension, all controlled from one DPDT switch remote.



Skill level: Advanced

Recommended age: 10+

Hands-on builds: 4

What you'll build

This manual walks through assembling and programming the **Stage 2: Remote-Control Robotic Arm Car** step by step, alongside a full materials list and the original circuit diagram. It's a companion to — not a replacement for — the kit's original build guide, which is linked from the product page for reference.

#	Project	What it teaches
1	Stage 1 platform	Rebuild the Stage 1 chassis and switch wiring — Stage 2 is a direct extension of it.
2	Second switch pair	Wire the second pair of DPDT switches that will control the arm extension independently from the wheels.
3	Arm mount	Attach the arm extension to the chassis and balance its weight against the wheelbase.
4	Complete arm vehicle	Drive the finished vehicle and operate the arm from the same remote box.

Note: Like Stage 1, this kit is switch-controlled with no microcontroller. The arm is a mechanical extension, not a servo-driven arm — its range of motion is set by the physical linkage, not by code.

What's in the box

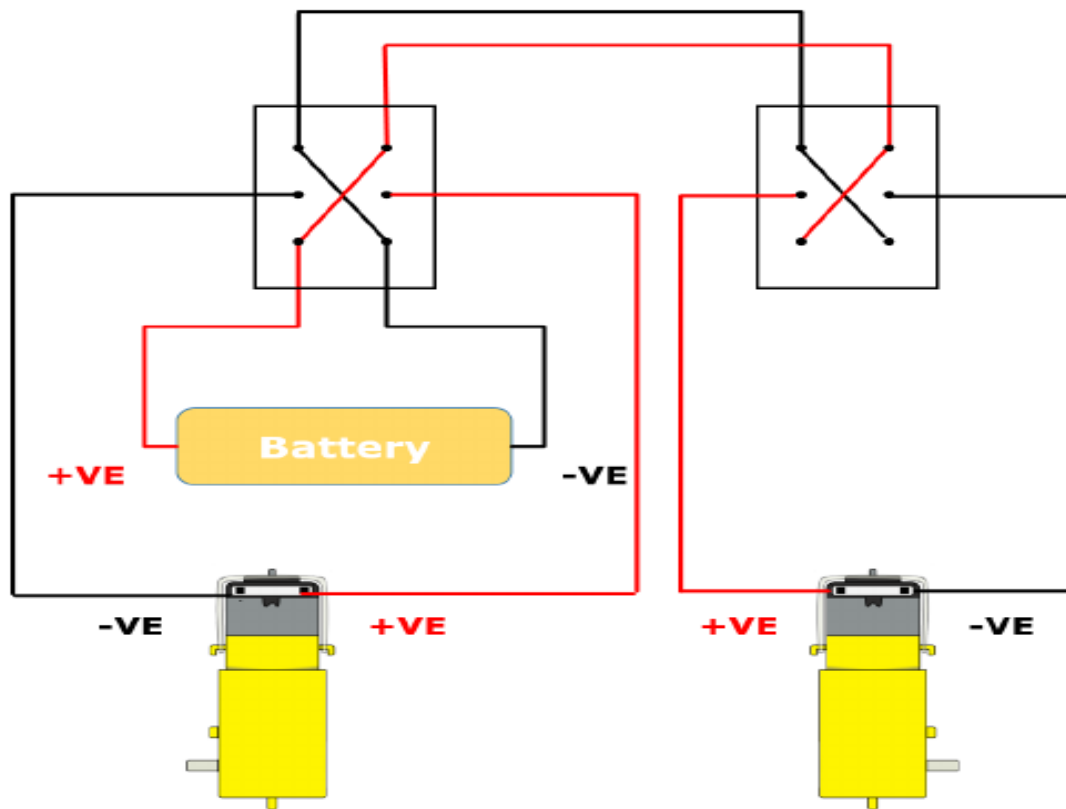
13 line items. Check every part against this list before you start building.

Item	Qty	What it's for
Bot chassis	1	The frame every other part mounts to.
Wheels	2	Fit directly onto the drive motor shafts.
Caster wheel	1	A free-spinning third wheel that balances the chassis.
DPDT switch	4	Two pairs: one pair drives the wheels, the second pair operates the arm.
DPDT remote box	2	Houses the wheel switches and the arm switches.
BO motor	4	Geared DC motors that turn the wheels.
Breadboard	1	A solderless board for testing the wiring before it's final.
8-core wire	3 m	Longer run needed to reach both the wheel and arm switch circuits.
AA battery holder	1	Holds the 4 AA cells that power the circuit.
AA batteries	4	The kit's power source.
LED	8	Used in the practice circuit to visualise current flow.
1K resistor	4	Limits current to the LEDs so they don't burn out.
Arm extension	1	A mechanical arm attachment that mounts on top of the chassis.

Step-by-step build instructions

1	Build the Stage 1 platform first Complete the chassis assembly and wheel-switch wiring exactly as in the Stage 1 manual — this kit builds directly on top of it.
2	Unbox the arm extension Identify its mounting points and the two motor leads that will need their own switch pair.
3	Wire the second switch pair Wire the arm's two DPDT switches using the same +VE/-VE pattern used for the wheels in Stage 1.
4	Mount the second remote box Fit the arm switches into the second remote box (or a second compartment of the same box, depending on your kit).
5	Attach the arm Screw the arm extension to the top of the chassis, keeping its cabling clear of the wheels and caster.
6	Route the arm wiring Run the arm motor's wires back to its DPDT switches, matching polarity exactly as you did for the wheels.
7	Balance test With the arm attached, check the chassis sits level. Add a little ballast at the rear if the front dips under the arm's weight.
8	Test and drive Test the arm's movement on its own first, then test combined driving and arm movement together.

Circuit diagram



Troubleshooting

Symptom	Fix
A motor spins the wrong way	Swap its two wire connections at the driver board or switch.
Nothing powers on	Check battery orientation first, then confirm every switch or connector is fully seated.
Bluetooth won't pair (Stage 3)	Confirm the HC-05's LED is blinking (pairing mode) and try the default PIN, 1234 or 0000.
Pico isn't recognised by your computer	Hold the BOOTSEL button on the Pico while plugging in the USB cable, then release it once connected.
Line follower loses the line on curves (Stage 4)	Lower the sensor height slightly, slow the motor speed, or widen the gap between the two sensors.
Ultrasonic sensor gives erratic readings (Stage 5)	Make sure nothing else is close enough to cause echo interference, and double-check the Trig/Echo pins aren't swapped.

Need more help? Email our STEM instructors or visit the FAQ at streamedutech.com. The original source build guide for this kit (with the manufacturer's own circuit reference) is linked from this kit's product page alongside this manual.