Built for Speed

Wooden RC Car Making Kit
COMPONENTS PT. 1
Everything needed to build your Wooden RC Car

Lasercut Wooden Frame

2.6 x 12 mm Screws

Connection Cup

Half Screws

Brushed Motor with Mounting Plate

Major Gear

Drive Shaft

Front Gear Box

Rear Gear Box

Front Steering Cups

Axle Pins

Hex Adapters

3 x 10 mm Screws

Front Axles

Front Lower Suspension Arm

Front Upper Suspension Arm

Rear Lower Suspension Arm

Rear Upper Suspension Arm
The Parts

You’ll be building a 1:12 scale RC car with four wheel drive, suspension, and a sleek wooden frame that’ll turn heads and maybe break necks with its 30 mph top speed.

It can drive forward or backward with a powerful brushed motor and lithium-ion battery, and the two gear boxes and steel drive shafts provide four wheel drive for optimal traction. Each wheel is independently suspended with adorable, little shock absorbers, and the servo motor and adjustable steering rods can fine-tune the steering for tight control.

We’ve also included some extra hardware for any repairs your car may require. Because once you get it going, you’re going to want to test its limits.

And to tame your speed demon, the radio receiver mounted in the car connects to a remote controller powered by four AA batteries.

The Frame

We’ve designed the frame and body of your RC car fully out of wood. You’ll be assembling over 100 parts laser-cut for a perfect fit from 3 mm baltic birch veneer plywood. We’ve also included replacement control arms, the parts most likely to break in case of a crash.

This project takes on average 5 hours to complete

You might also need: wood glue, cotton swabs, needle nose pliers, sandpaper, tape, paint or wood stain, and 4 AA batteries.
CONTROL ARMS
Mounting the legs to the bottom

Top Front Control Arm

Bottom Front Control Arm

Top Rear Control Arm

Bottom Rear Control Arm
1. Pop out the *Suspension Control Arms* one section at a time (Fig 1). As you assemble, use wood glue to bond the parts together permanently for extra strength (Fig 2).

2. Follow the diagram on the left to assemble all control arms. You should have two of each type for a total of eight arms (plus spares). Let glue dry for half an hour.

For the **Top Front** and **Top Rear** control arm, half the piece ends are smaller than the others. Make sure these go on the outside.

**Pro Tip:**
Quickly clean up any glue that squeezes out to prevent the round cutouts from getting blocked. We recommend cotton swabs.
Find the **Front Steering Cups**. Using the **3 x 10 mm Screws** that came with them, attach a **Top Front and Bottom Front Control Arm**. Tighten screws snug, but ensure the arms can pivot easily (Fig 4). Repeat process for the second set.

Repeat the same steps to attach the **Rear Control Arms** to the **Rear Steering Cups** using the same **3 x 10 mm Screws** (Fig 5). Repeat process for the second set.
The Steering Cups have two screw holes to adjust the Camber, the angle of the wheels. We recommend the inside hole for standard tuning.

5 Seat the **Rear Axle** into the **Rear Steering Cup** (Fig 7) and repeat for the second set.

Use the **Front Axles** with the **Front Steering Cups**.

6 Once the threaded end of the **Axle** has been inserted, you'll see a hole near the threads. Slide an **Axle Pin** through this hole. These are essential parts, so be careful they don't slide out and get lost (Fig 8).
Insert the **Hex Adapter** into the tire rim (Fig 9), then carefully place the tire onto the axle so the axle pin inserts into the hex adapter slot. You’ll know it’s in when turning the tire also rotates the axle. Then, use an **Axle Locking Nut** to secure the tire to the axle (Fig 10).

Complete all 4 axles before moving on.
Once again, you’ll be performing the same steps for the front and rear suspension assemblies. We’ll walk you through the rear assembly, then just repeat the process for the front assembly.

1. Place the front of the Rear Gear Box through the A2 wood piece. Seat the axle of one of your rear assemblies into the gear box, lining up the control arm and A2 holes (Fig 12).

2. Slide the 35 x 40 mm Binding Posts through the A2 and control arm holes to join them (Fig 13). Use tape to hold the ends in place, then repeat for the other rear axle assembly (Fig 14).
Make sure the axles are seated in the gear box.
3. Place a small *Wooden Washer* over the top two binding posts (Fig 15), then place *A3 then A4* over the back of the gear box (Fig 16). *NOTE:* For the front assembly, you’ll use two *A5* pieces.

4. Ensure that both axle assemblies have the top control arms on top, then cap the binding posts (Fig 17).

5. Next, insert a new binding post through the bottom hole of a *Shock Absorber*, then stack two wooden washers (Fig 18).
6. Insert the binding post through the holes in the bottom control arms, then screw the cap on to hold it in place (Fig 19, 20).

7. Finally, attach the shock absorber top to the mounting points on A3 and A4 using the Short Binding Post (Fig 21). Repeat process for the second shock absorber.
Pop out the *Car Frame* and both B1 pieces. Line up the holes of the B1 pieces with the rear of the frame, then sit the *Motor* on top (Fig 22).

Screw two *2.6 X 12 mm Screws* through the bottom of the frame into the motor mounting plate (Fig 23, 24).
1. Slide the **Steering Servo** into the **Servo Mount**. Angle it to get the cable through, then slide it the rest of the way (Fig 25, 26).

2. Insert the servo mount into the widest slot of the frame. Line up the grooves, then slide it in completely (Fig 27).

3. Mount **B2** onto the side of the frame in front of the steering servo. Use three **3 x 25 mm Screws & Nuts** to secure the steering servo in place (Fig 28). Use the wrench or pliers to hold the nut while tightening screws.

4. Insert two **4 x 60 mm Screws** through the bottom of the frame. Slide on two **B3** wood pieces, then drop on the **Steering Assembly** (Fig 29, 30).

5. Use two **2.5 X 10 mm Screws** to connect the **Short Rod** to the horn of the steering servo and horn of the steering assembly (Fig 31, 32).
Use the lower of the two mounting points

Connecting Short Rod to Steering Assembly
Lightly attach the nuts of the 4 x 60 mm screws. You’ll remove them later, but this will keep things in place while you work on other areas.

Use two 2.5 X 10 mm Screws to connect the **Steering Rods** to the underside of the steering assembly (Fig 33).

*Take a pit stop and check your work. Does the servo horn turn and cause the steering assembly to pivot? Does the suspension move and bounce appropriately? Do the front two wheels turn freely?*
1 Time to put the big parts together. Slide your **Front Suspension Assembly** onto the front of the frame. It’ll be a tight fit and may require some wiggling to get it in place. Be careful and take your time to avoid breaking anything (Fig 35).
As you’re sliding it on, you’ll need to pass the main axle of the Rear Gear Box through a few components. Find the Major Gear and frame it up against the Motor Mounting Plate (Fig 38). Pass the axle through both the gear and mounting plate until it’s poking out about half an inch (Fig 39).

Now, prepare to slide the Rear Suspension Assembly onto the back of the frame like you did with the front (Fig 38).

Use 2.5 x 10 mm Screws to connect the Steering Rods to the top mounts of the Front Steering Cups (Fig 37).

Place the Motor Mount Bearing over the axle (Fig 39), then place the Connection Cup and Drive Shaft onto the end of the axle (Fig 40). The other end of the drive shaft should slot into the Front Gear Box (Fig 41). Once those are in place, you can finish pushing the rear suspension assembly onto the frame.

There are two Half Screws that will lock the gear and connection cup into the axle. Hold the cup and gear in place, then rotate the tires until the holes line up. Drop in the half screws, then tighten (Fig 42).
Once both suspension assemblies are fully in place, flip the car over and use eight 2.6 x 10 mm Screws to secure the frame to the gear boxes (Fig 43).

Next, pop out B5, the upper frame of the car. Install the switch connected to the Receiver into the middle slot of B5 using the included screws (Fig 44).

The B6 wood spacer will go between B5 and the motor mount plate (Fig 45). Using glue, stick B6 into place on the underside of B5, then flip B5 over and use two 2.6 X 12 mm Screws to attach it to the mounting plate (Fig 46).

Use 2.6 X 10 mm Screws to finish attaching B5 to both Gear Boxes (Fig 47). Finally, replace and tighten the nuts over the Steering Assembly (Fig 48).
HOOKING IT UP
Juicing up your RC car

1. It’s time to hook up the electronics. Use your fingers to plug the cable from the *Steering Servo* into the *Receiver* (Fig 49).

2. Position the receiver opposite the motor on the frame. Once lined up, lightly sand and clean that part of the frame for best adhesion, then stick the receiver in place using the mounting tape (Fig 50, 51).

3. Next, use two *Power Connectors* to connect the motor to the receiver. Red to red, and black to black.
If both tires are pointing in the same direction, but off-center, adjust the **Small Rod** using pliers to straighten. Turning the metal portion of the rod will tune both tires together (Fig 52).

Once you power-up the remote and the car, it will automatically “straighten” the wheel. This is the default position for the wheels.

If both tires are pointing in the same direction, but off-center, adjust the **Small Rod** using pliers to straighten. Turning the metal portion of the rod will tune both tires together (Fig 52).

To adjust individual tires, use pliers to turn the **Steering Rods**. Take it for a short test drive to check alignment. It should drive in a straight line when you’re not steering. Tweek as necessary.
THE TRIM
Giving your buggy a body

1
Insert two C1 tabs into the slots in the front of the car (Fig 54). Mount the Grill, then lock it in place with the Clip (Fig 55).

2
Slide C2 onto the tabs on the left side of the car opposite the servo, then lock it in place with a Clip. (Fig 56)

3
Bridge C3 over the middle of the car, then lock it onto the C2 and B2 tabs (Fig 57).

4
Slide both C4 pieces through the slots on C2 (Fig 58).
5 Slide \textit{C5} through \textit{C3} and both \textit{C4} pieces, then continue through the suspension assembly and grill. This will take some wiggling, but once it’s through, all the pieces will be locked and held steady (Fig 59).

6 Use a tab at the end of \textit{C5} to lock everything in place (Fig 60).
7 Punch out the **Roof** (marked with the artwork) and give it a gentle bend back and forth to make it flexible (Fig 61).

8 Push the roof’s tab through the **Rear Suspension Assembly** slot until edges are flush (Fig 62).

9 Fold in the roof’s sides and slot them onto the **Frame** using **Clips** to secure both sides (Fig 63).
10 Just like the front, mount the **Rear Grill** using **C1** tabs and a **Clip** on the bottom to hold it in place (Fig 64, 65).

11 Slot the **Spoiler** on top of the rear grill and tabs of the rear suspension assembly (Fig 66).

Use two **Clips** to lock it in place.
Finally, to connect the **Battery**, locate the two slots in B5. Feed the Velcro Battery Strap through these slots and use it to tie down the battery when in use. Connect the battery to the Receiver, and power it up for a celebratory joyride.

**Congrats, you’ve finished your car!** Just don’t crash it on your first spin around the block. Cut your teeth in an empty parking lot or field where there are minimal obstacles. It can take a roll and tumble, but a headfirst collision could break your control arms.

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