SpaceRail Level 5.1
SpaceRail is a spectacular marble-run coaster that guarantees high-speed action rides consisting of wild rotations, daring loop-the-loops and spectacular swivel motions. These ball roller coasters are an ultimate challenge for teenagers and adult enthusiasts alike. SpaceRails are available in different sizes and different levels of difficulty.
These pictures show the SpaceRail Level 5.1 from several different viewpoints. This is very helpful to reference during assembly.
## Parts List

### Tools for installation:
- **Pliers**
- **Tape measure or folding ruler**

Use 1 x CR04 battery (not included).
Handle the components with care to prevent them from getting lost.

### Parts List

<table>
<thead>
<tr>
<th>[B1] Base plate</th>
<th>[S1] 391mm</th>
<th>[S2] 300mm</th>
<th>[S3] 200mm</th>
<th>[S4] 159mm</th>
<th>[S5] 65mm</th>
<th>[R1] 32,000mm</th>
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|---------------|------------------|----------------------------------|------------------|-------------------|-----------------------------------|
1. Assembly of base plate
1. Assemble the base plate (12 pieces). Pay attention to a proper seating of the clips and slots (fg. 01).
2. Fasten the base holders (B2 + B3) in the correct positions (fg. 01-2).

2. Assembly of arms
1. Assemble the arms according to fig. 02. Caution: Arm holder A (A2) + arm holder B (A4) are different. 73 arms are needed for the complete setup of “Star Caddie Level 5”.
2. Insert the arm wrench into the arm holder A and turn it by 90 degrees to fix the arm (fg. 03). Note: To modify the angle of the arm, release the fixation first.
3. Attach the arm to the shaft (fg. 04): Insert shaft into the arm holder B and turn the arm wrench by 90 degrees to fix the arm (fg. 04). Note: To modify the angle of the arm, release the fixation first.

3. Assembly of seesaw
Insert 4 x 55mm rail into the holes of the seesaw. Then attach the rail stand to the seesaw (fg. 05).
Assembly of the elevator

1. Insert the 391 mm shaft into the gearbox (fig. 08-1).
2. Slide the elevator (16 pcs) onto the shaft (fig. 08-2). Insert shaft into base (fig. 08-3). Please note the correct direction of rotation.
3. Insert 3 further 391 mm shafts into the exact pre-defined positions on the gearbox (fig. 08-3).
4. Allow the 3 shafts to snap into place (pic. 08-4). Take care that the elevator rings are properly located. See page 8 + 9 for the proper locations of the elevator rings.
5. Insert the 4 shafts into the elevator cover (fig. 08-5). Take care that the shafts are properly located.
6. Now attach 3 rail stands [A6] to the elevator ring (fig. 08-6).

Note: When turning the arm wrench, make sure not to change the right position of the arm.
**Assembly of gear box and base plate**

### Installation of the pendulum and starter kit

1. Connect attachment parts with pendulum (fig. 09), Note: To modify the position of arm holder B, release the nut on fig. 13.
2. Connect attachment parts with starter kit (fig. 10). Note: To modify the position of arm holder B, release the nut on fig. 13.

### Locations of the elevator rings

Elevator (fig. 11): Elevator is shown in a scale of 1:1. Attach the elevator rings to the exact predefined positions (T1, T2, T3).

Attach the 5 clips at the bottom of the gear box to the exact predefined positions of the base plate (fig. 12).

### Installation of gear box, pendulum, and starter kit

Location pendulum and starter kit on base (fig. 13).

Attach pendulum (fig. 09) and starter kit (fig. 10) to the base plate (fig. 13).

Gear box location on base plate (fig. 13).

Attach the 5 clips at the bottom of the gear box to the exact predefined positions of the base plate (fig. 13).

### Positions of arms

Attach the arms to the shafts (fig. 14): Picture shows a scale of 1:1.

Attach the arm to the shafts (see illustration for arm installation on page 63-64).

Attach connecting pieces to shafts (fig. 15-16).

Insert the shafts into the base plate (fig. 13).

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The counterweight position is adjustable on the shaft if the pendulum does not work properly. To modify the position of counterweight, release the nut on fig. 13.
Refer to the assembly of arms (fig. 04)

Attach starter kit (arm holder B) to the shaft and create a slope, so that the steel balls can run smoothly.

Connect rails with the entry of the starter kit and make fine adjustments to slowdown the speed of the steel balls (balls will rebound if too fast). Attach the beak cover to the starter kit as shown in the illustration.

Position for connecting piece B (134mm) [S7]

Position for connecting piece C (90mm) [S8]

Position for connecting piece A (176mm) [S6]
Assembly of rails

Rail assembly steps:
The ball roller coaster provides 3 exits (start) and 5 entries (end). Please note fig. 16-22 and the illustrations on page 2-4 during assembly.

Install rail stands together with the rails (fig. 26).

1. From elevator exit (start) to the junction A entry (end): Install 2 x 61cm rails (fig. 16-1).
2. From the junction A exit (start) to the starter kit entry (end): Install 2 x 117cm rails (fig. 16-2).
3. From starter kit exit (start) to the ball catcher (end): Install 2 x 58cm rails (fig. 16-3).
4. From pendulum tray for steel balls (start) to elevator entry (end): Install 2 x 40cm rails (fig. 16-4).
5. From the junction A exit (start) to the lower elevator entry (end): Install 2 x 270cm rails (fig. 17).
6. From the upper elevator exit (start) to behind the traverse loops: Install 2 x 507cm rails (fig. 18). Caution: Do NOT cut the rails here (section will be continued as shown in fig. 19).

16-1: From elevator exit (start) to junction A entry (end).
16-2: From the junction A exit (start) to the starter kit entry (end).
16-3: From starter kit exit (start) to the ball catcher (end).
16-4: From pendulum tray for steel balls (start) to elevator entry (end).
16: Rail track until junction. Install junction at the very end of the installation procedure.
13: Release arm tube (A3) before mounting the rails.

Connect rails with the entry of the starter kit and make the adjustments to slow down the speed of the steel balls (balls will rebound if too fast).

17: Do NOT cut the rails here (section will be continued as shown in fig. 19).
6b. Fig. 19 shows the continuation of Fig. 18: Continued section starts behind the traverse loops and ends at the lower elevator entry (Fig. 19).

7. From upper elevator exit (start) to the junction B entry (end): install 2 x 235cm rails (Fig. 20-1).

8. From junction B to the upper seesaw: install 2 x 96cm rails (Fig. 20-2).

9. From lower seesaw (start) to the middle elevator entry: install 2 x 80cm rails (Fig. 21-1).

10. From junction B (start) to the middle elevator entry (end): install 2 x 142cm rails (Fig. 22-1).

Correct assembly of seesaw (Fig. 20-3): Insert rail stand at the end of the rail to ensure best seesaw stability.
Installation of rails

Attachment of rails to arms and shafts (f.g. 23 + 24)

Attach rail to arm (f.g. 23)

Adjust and connect the rails. Insert the rail joinings (R2) into the holes at the center of the rails (f.g. 25)

Information about rail stands (f.g. 26)

The distance between the arms should be between 8 to 10cm to ensure best stability. When the distance is larger, rail stands [A6] have to be installed.

Further instructions are shown on the illustration above for diameters of a quad loop (increase diameter with each additional loop).

Installation of a loop

Ensure the steel balls running smoothly (f.g. 28)

The diameter of the outer loop should have twice the diameter of the inner loop

Important information for the assembly of loops (f.g. 29)

Rails have to form a circle that remains in an upright position to ensure the steel balls running smoothly (f.g. 29)

Installation of a loop (f.g. 30)

When mounting loops, the second loop has to be smaller than the first loop to ensure the steel balls running smoothly.

Installation of pendulum tray and junction (f.g. 31-1 + 31-2)

Insert rail stands into the junction (f.g. 31-1)

Cut the rails to the correct length (see enlarged picture on the right)

Insert rails into the pendulum tray (f.g. 31-2)
Assembly of rails

Installation of elevator (entry & exit)

Important information for the assembly of elevator entry and exit (fig. 32)

Steel balls will not run correctly if entry and exit point in the same direction.

Pay attention to a proper installation of the entry and exit (fig. 33)

Install rails as closely as possible to the entry and exit of the elevator to ensure the steel balls running smoothly (fig. 33)

Pay attention to a correct angle of the rails when the steel balls enter the elevator (fig. 34-1, 34-2, 35)

Make sure the steel balls enter the elevator slowly. Otherwise they will rebound and fall off the rails (fig. 34-1)

Steel balls that enter the elevator may rebound and throw back onto the rails after hitting the helix. Pay particular attention here to the correct seating of the rails. Otherwise the steel balls will stop and cannot re-enter the elevator (fig. 34-2)

At the entry all rails must be at right angles to the elevator (fig. 35)

Distance between rails (fig. 36)

Install the rail stand to keep rails parallel (fig. 36)

Curves (fig. 37 + 38)

Curves need to be assembled in a certain angle to prevent steel balls from missing the turn (fig. 37). If steel balls miss the turn, speed has to be reduced right before the curve.

Adjust rails to reduce speed of the steel balls (fig. 38)

All rails must be at right angles to the elevator

Keep rails parallel

Curves need to be assembled in a certain angle

Adjust rails to reduce speed
Construct your own SpaceRail designs

Let the imagination run wild and create your own SpaceRail coasters.

Pictures 1-6 show another alternative example with 6 base plates and the parts from the Level 5.1.
Level 2.1
Rail length 10,000 mm

Level 3.1
Rail length 16,000 mm

Level 4.2
Glow in the Dark
Rail length 26,000 mm

Level 9.1
Rail length 68,000 mm

Glow in the Dark
**Safety Instructions**

This ball roller coaster is NOT A TOY and only suitable for persons 14 years and older.

Always follow exactly the recommendations given in the instructions.

Errors and negligence in operating your ball roller coaster can result in injuries and damage to property. As manufacturers and vendors have no influence on the operation and maintenance of your ball roller coaster, we bring these hazards expressly to your attention but deny all further liability.

Keep away from children. The ball roller coaster contains small parts. Choking hazard.

**Warning:** Sharp edges - watch your fingers.

**Warning:** Do not wrap the rail around your neck, as this could result in suffocation or injury. Strangulation hazard.

Keep the packaging for future reference as it contains important information.

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**Safety Instructions During Operation**

**Moving parts are a constant source of injury. Never touch moving parts.**

**Keep hands, hair, loose clothing and further objects away from moving parts.**

**Persons (including children) with reduced physical, sensory or mental capabilities or lack of experience are not allowed to use this ball roller coaster, unless they are supervised by a person responsible for their safety and able to give professional advice on how the product should be used.**

**Do not bend the shafts and other parts to avoid injury and ensure safe operation.**

**Keep fingers away from the moving elevator to avoid injury.**

**Only use original steel balls to prevent damage of the ball roller coaster.**

**Caution: Violent jamming (stopping) during operation may damage the motor. Do not cumber the elevator.**

**Always store and operate the ball roller coaster at a safe place.**

**Be sure to check battery regularly to ensure a proper operation of the elevator.**

**Check rails regularly for a firm seating and adjust if necessary!**

**Protect the ball roller coaster from heat and sun.**

**Caution: To protect motor from damage and overheating, do not operate the ball roller coaster for more than 5 hours at a time.**

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**Safety Instructions For Batteries**

**Only batteries of the same or equivalent type as recommended are to be used.**

**Exhausted batteries should be removed from the ball roller coaster.**

**Do not dispose batteries in fire - batteries will explode or leak.**

**Battery is to be inserted with the correct polarity.**

**Non-rechargeable batteries are not to be recharged.**

**Remove battery if the ball roller coaster is not to be used for an extended period of time.**

**Be sure to check battery regularly to ensure a proper operation of the elevator.**

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**Disposal Restrictions (WEEE)**

Electrical and electronic equipment should be disposed separately from the household waste. Take your unwanted equipment to your local community collection point. This requirement applies to member countries of the European Union as well as other non-European countries with a separate waste collection system. Never throw batteries into normal household waste, but dispose of discharged batteries at the collection points provided for that purpose (e.g. your local toxic waste disposal centre).

**Recommended Accessories:** 1 x C/LR14 battery 1.5 V

**Inserting the battery:** Use a Phillips screwdriver to open the battery compartment cover. Insert 1 x C/LR14 battery with the correct polarity and replace the battery compartment cover.

**Distributed by:**

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