

Ripcord Generator

Assembly Instructions

The Ripcord Generator provides an exciting way to explore how Michael Faraday's electromagnetic induction works in the generation of electricity. The Ripcord Generator allows students to change variables like magnet configuration, magnet-to-electromagnet distance, and speed. They will see how each variable affects the electric power that is produced.

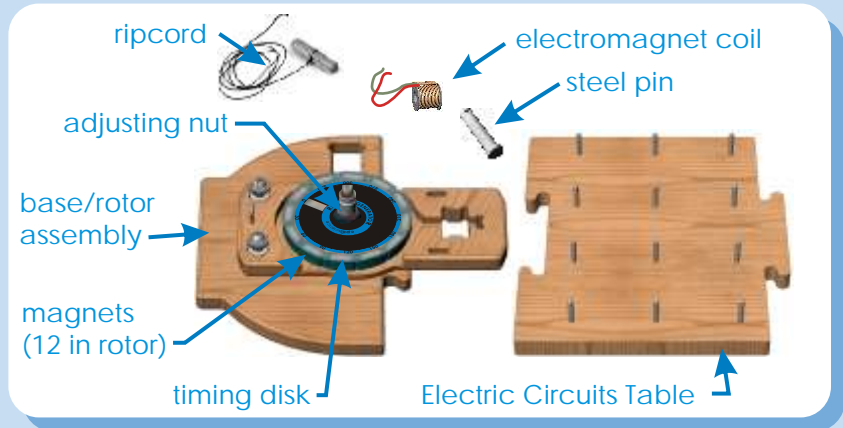
Parts Checklist

The following items are provided with the Ripcord Generator:

- base/rotor assembly
- timing disk
- ripcord
- electromagnet coil
- magnets (12)
- steel pin

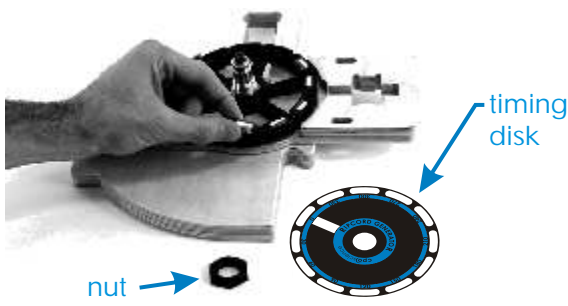
In addition, you will need these items:

- Electric Circuits Table
- timer console with power transformer
- photogate with wires



1. Inserting the magnets

Depending on the activity, up to twelve magnets can be placed into the pockets on the rotor. Be sure to check the orientation of the magnets when you place them into the rotor. Two other parts of the ripcord generator are pictured here: the fastening nut and the timing disk.



2. Attaching the timing disk

The timing disk fits over the spindle of the rotor. The side of the disk with the writing and graphics on it should face upwards.



3. Fastening the nut onto the spindle

Screw the fastening nut onto the spindle until snug.



4. Attaching the generator & circuit board

The Ripcord Generator and the Electric Circuits Table have sides that fit together like a puzzle.

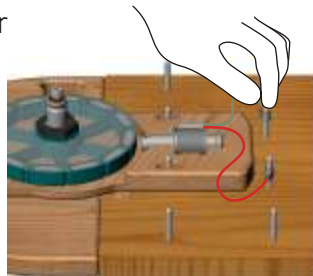


Assembly instructions continue on page 2.

Ripcord Generator

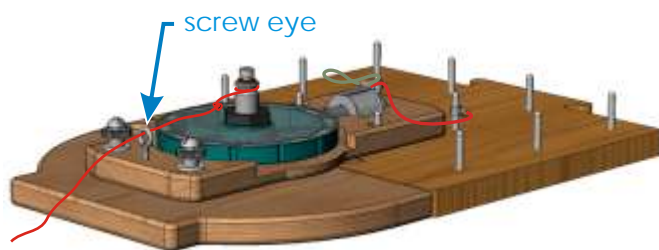
5. Attaching the electromagnet coil

There is a cut-out hole on the base of the rotor assembly for the electromagnet coil. Drop the electromagnet coil into the cut-out hole and slide the wires from the coil over the posts on the Electric Circuits Table. There are small metal hoops on the end of the two wires that fit right over the connector rods.



6. Threading the ripcord

There is a knot at the end of the ripcord. From the bottom side of the Ripcord Generator, thread the knot through the screw eye toward the rotor.



7. Winding the ripcord

Wrap the string around the spindle so that the knot on the string fits into the hole on the side of the spindle.



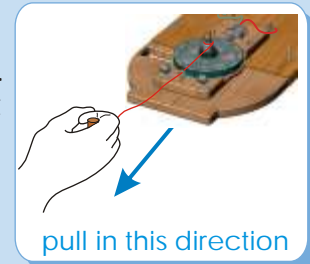
Continue to wind the string around the the spindle. Once the string is securely attached to the spindle, use the timing disk to quickly wind the rest of the string around. Leave about five inches of string at the end to give yourself enough room to pull the ripcord.

8. Pulling the ripcord

Grab the handle securely with one hand. Hold the base of the generator assembly **firmly**. Pull the ripcord with a straight motion, pulling directly away from the spindle.

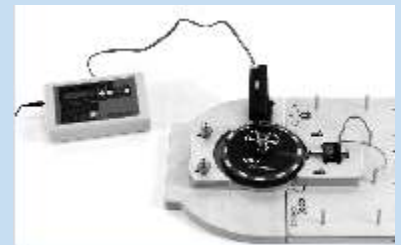
Wear safety glasses.

DO NOT PULL UPWARD!



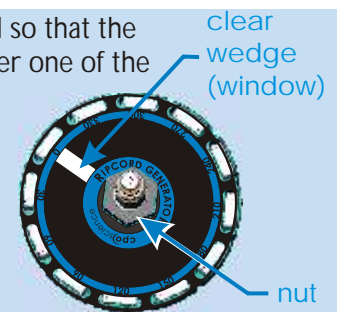
9. Attaching a photogate & timer

Insert a photogate into the cut-out hole in the base, next to the rotor. Connect one end of the phone cord to the photogate, and the other end to the CPO Timer, into the slot marked "A". Turn the timer on and use the mode switch to set the timer to frequency mode.



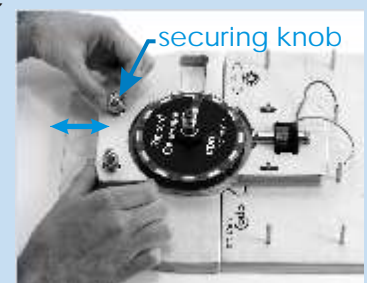
10. Positioning the timing disk

The disk should be positioned so that the clear wedge is not directly over one of the spokes of the rotor. Loosen the nut slightly. While holding the rotor in place, turn the disk so that no spokes are blocking the clear wedge. Then, tighten the fastening nut onto the disk.



11. Adjusting the rotor-to-coil distance

The distance between the rotor and the electromagnet coil can be adjusted by loosening both securing knobs on the base/rotor assembly. Once the securing knobs are loosened, the part of the base/rotor assembly that holds the coil can slide back and forth to adjust the distance.



For activities, refer to the *Physics, A First Course Investigations* manual or *Teacher's Guide*.