LED Flasher and Electric Bell with relay

Relays are electromechanical switches. Inside, they are composed by a coil and a metallic part at the top. The metallic part (called common) is normally connected to the contact (1) called normal closed (NC). When the coil is turned on, the small part is attracted and touches the contact (2) called Normal Open or NO.

![Relay Diagram](image)

Relays are useful to many applications (when it’s needed to control and turn on high-powered devices, or when it's better to divide parts of the circuit with different power needs).

A simple and funny electric bell circuit can be made:

In this circuit, the negative pole of the battery (or power supplier) is connected to the coil, the positive pole is connected to the common connector and the remaining connector of the coil goes to the NC connector.

![Bell Circuit Diagram](image)

When the battery is on, the current flows through the short wire and through the coil. Then, the coil creates a magnetic field around it.
The magnetic field pulls the metallic part.

It opens the NC contact, and the coil turns off.

Then the part goes to the original position (due to a spring inside the relay) and turns on the coil again, restarting the cycle.

This way we create something like a cicada. Car horns work like that.

But this cycle repeats very quickly over time. If we want to create a low frequency oscillator, then we must add an electric charge “container”. This container is called capacitor. There are many types of capacitor, we will use the electrolitic.

Foto capacitor
Connecting the capacitor according to the diagram, we can define a larger pause between the two states of the relay. That happens because:

- The battery charges the capacitor and powers the coil, causing the metallic part to move to the NO position, deactivating the circuit that charges the capacitor.

- The capacitor is now charged and instead of the coil simply turn off, the capacitor discharges on the coil, keeping it more time turned on. As the capacitor fully discharges, the coil turns off and the circuit goes back as it was, and the cycle continues.

The discharging time depends on the capacitance (the property of the capacitor related to how much of charge can be contained). It is very analogous to the “size” of the container in Monjolo. Increasing the capacitance, the time between each relay state increases. Try values of capacitance between 100 and 5000 microFarads.

When turning on the circuit, we can listen a tic-tac sound. It is possible to make a Light Flasher, adding a LED according to the figure.
Breadboard suggestion assembly

Photo of the circuit