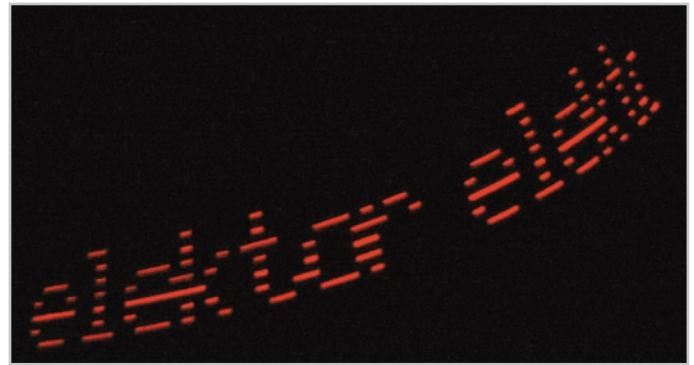
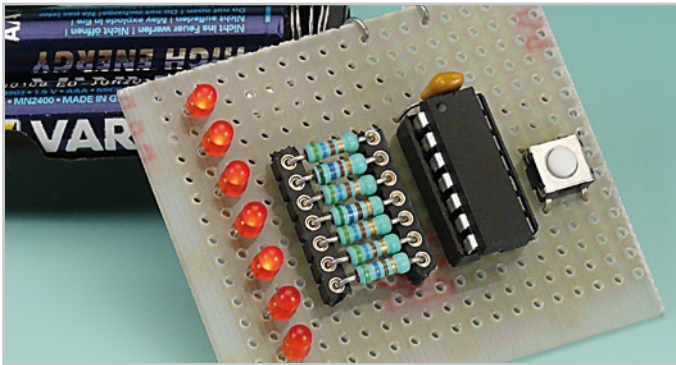


Floating Message



Ludovic Voltz (France)

This project lets you display a message floating in the air using just seven LEDs, a microcontroller, and the movement of your arm. How can that be possible?

The human eye and brain can't resolve a moving object, and the same applies to anything that changes rapidly. It is by exploiting this shortcoming (or capacity, depending on which way you look at it!) that we are able to see videos and all types of footage, clips, visual effects and so on, on the many screens around us. When the images on the screen

appear at a rate of at least 24 per second, humans can no longer make them out as individual images and perceive the result as a moving object. It's this 'persistence of vision' that the author has exploited in creating this project.

The characters of the message to be displayed use a very common 7 line x 5 column character style. The columns are displayed sequentially by the seven LEDs arranged in a column: first column 1, then 2, and so on up to 5. If the LEDs are moved on slightly before displaying the next column, the eye thinks it is seeing

the whole character. The LEDs flash at a frequency of the order of 200 Hz, and so all you have to do is move the circuit around to see the message appear as if it were floating in mid air. Here's a little gadget that will amuse young and old alike on summer evenings.

For simplicity and compactness, this project uses a PIC16F616 microcontroller from Microchip, capable of working off no more than 2 V. This allows the circuit to be powered from two AAA rechargeable batteries (2 x 1.2 V), a good compromise between battery life and the space taken up. What's more, this solu-

tion is environmentally-friendly, as the batteries can be recharged, unlike CR2035 button cells, for example.

The messages are created with the help of an Excel file, where all you have to do is fill in the cells with 0's or 1's according to the character you want to display. This file then directly gives the hex code for the corresponding constant. Naturally, this file is available in the download accompanying this article [1]. Using the circuit is as simple as its operating principle. A brief press of the button starts the sequence for displaying the word. Then all you have to do is synchronise your movements with pressing the button. In order to be able to read

the word properly, it's best to repeat the operation more than once. You can store several words in the PIC's Flash memory (up to the limit of its capacity, of course). To move on to the next word, you must press the button for at least 0.6 s. The reproduction will be clearer if the background lighting is low.

(080441-1)

Internet Link

[1] www.elektor.com/080441

