Dit, Dit Dit, Dah, Dah, Dah, Dit, Dit Dit - A Morse Code Assignment

Objective: Gain experience with particle functions, web page construction, and general problem solving, as you implement both the sending and receiving sides of a telegraph.

Overview: In this assignment you will create a web page where you can enter a message. The web page will have a single button, Send. When pressed, the Morse Code version of that message will be heard on your Photon, and 2 LEDs will flash in sync with the sound. Your Photon will also include an SOS button, so in case of an emergency, you can press that button and hear the Morse code for SOS.

Morse Code: Morse Code is an ancient system, invented by Samuel Morse, to transmit messages electronically. A fundamental unit in Morse Code is either a dit or a dah, the same tone, but lasting for different amounts of time. Putting these together, Morse came up with an alphabet:

A = .-
B = -...
C = -.-.
...
Z = ...

where the . represents a dit, and the - a dah.

Note: there are now multiple versions of Morse Code, we will use **the international version**.

Assume that a dit lasts for 1 unit of time. Then a dah will be 3 times as long; the time between dits and dash in a given letter is 1 unit; and the time between the end of one letter and the start of the next is 3 time units. You can play around with the actual unit, but somewhere between 100-500 ms should work.

Circuit: Create a circuit that consists of a red and orange (or any other color) LED; a speaker; and a button. The speaker will be driven by PWM, the red and orange LEDs digitally.

Code: You will need to include a Particle function that can take its argument, a String, and play it (that is, sound the Morse Code equivalent). Think carefully before you sit down to code about how you will organize this. If you have problems, ask if you need help, but **not** before you have spent at least an hour, on your own, trying to figure this out.

Web Page: Create a web page that consists of an input field, and beneath it a button that reads "Send". When the button is pressed, the text in the input field will be sent to your Photon, and heard / seen as Morse Code. Review the notes on how to do this.

A Few Words About Strings: There are actually *3* different Strings in play when you are working in our current environment. There is a C String, a C++ String (the type is string, lowercase s), and a Particle String (capital S, documented here).

For an example of Morse Code in action, check out this exciting film.