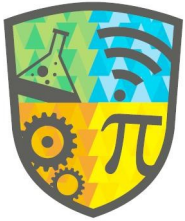


Electric messages

Materials:

- Electric wires
- Battery
- LED (or buzzer)
- Switch
- Paper
- Pencil



Procedure:

1. Design a working circuit incorporating a battery and a LED on paper.
2. Build your working circuit design using a battery, electric wires, and a LED.
3. Add a switch in such a way that it turns the LED on and off.
4. Using International Morse Code, devise a "secret" message to send to another student group.
5. Practice "sending" the message until you are confident the other team will understand your message.

Hint: Press the switch for a short time to show a dot (-), hold it longer to display a dash ().

International Morse Code

- 1 dash = 3 dots.
- The space between parts of the same letter = 1 dot.
- The space between letters = 3 dots.
- The space between words = 7 dots.

A	• —	V	• • • —
B	— • • •	W	• — —
C	— • — •	X	— • • —
D	— • •	Y	— • — —
E	•	Z	— — • •
F	• • — •	.	• — • — • —
G	— — •	,	— — • • — —
H	• • • •	?	• • — — • •
I	• •	/	— • • — •
J	• — — —	@	• — — • — •
K	— • —	1	• — — — —
L	• — • •	2	• • — — —
M	— —	3	• • • — —
N	— •	4	• • • • —
O	— — —	5	• • • • •
P	• — — •	6	— • • • •
Q	— — • —	7	— — • • •
R	• — •	8	— — — • •
S	• • •	9	— — — — •
T	—	0	— — — — —
U	• • —		



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History of Electronic Communications

◆ What Samuel Did

Samuel F. B. Morse, while a professor of arts and design at New York University in 1835, proved that signals could be transmitted by wire. He used pulses of current to deflect an electromagnet, which moved a marker to produce written codes on a strip of paper -the invention of Morse Code. The following year, the device was modified to emboss the paper with dots and dashes. He gave a public demonstration in 1838, but it was not until five years later that Congress -- reflecting public apathy -- funded \$30,000 to construct an experimental telegraph line from Washington to Baltimore, a distance of 40 miles. Six years later, members of Congress witnessed the sending and receiving of messages over part of the telegraph line.

◆ Spreading News

Today, with instant messaging, we can hardly imagine that 150 years ago it might take months for word of the outcome of a presidential election to spread. But Morse's invention tapped into the potential the electronic communication that is so prevalent today. On May 24, 1844 the U.S. Democratic National Convention was held in Baltimore, Maryland. Van Buren seemed the likely choice, but his opponent, James K. Polk, won the nomination. This news was telegraphed immediately to Washington, but skeptics refused to believe it. Only after persons arrived by train from Baltimore to confirm the reports were many convinced of the telegraph's value. Now we've come to trust electronic communication, and to even take it for granted! But...did you know that until 1999, International Morse Code, tapped out on a telegraph key, remained the international standard for long-range maritime communication.



◆ Text Messaging or SMS

Text messaging or SMS (short message service) sends text between cell phones, or from a computer or other handheld device to a cell phone. Why "short?" At present, the longest text message is 160 letters, numbers, or symbols in the Latin alphabet. And, for other alphabets like Chinese, the cap is only 70 characters. Here's how it works: your cell phone continually sends and receives connectivity messages from phone towers. This confirms the "cell" in which you are physically located; cells are usually about 10 square miles. A text message uses the same system through which you receive calls. But, the information is sent/received in either text mode or by PDU (protocol description unit) mode. Sound familiar? Likely Samuel Morse would approve!



International Morse Code Rules

◆ International Morse Code

What is called Morse code today is actually a bit different from what Samuel Morse originally created. In 1848, some changes to the code sequences and to eleven letters were introduced in Germany and are now recognized as the worldwide standard called "International Morse." The code changes a bit over time. For example, the "@" symbol was added in 2004, combining A and C into one character.

◆ Symbol Recognition

By using electric bursts to send messages in Morse Code, information can be sent in a relatively private way. The code may be sent electrically using sound or lights. In this lesson, we'll be using a switch and light apparatus to demonstrate the Morse code system. The use of lights for spelling out messages in Morse code dates back to 1867. With the advent of electric lights in the 1890s, the "blinker light" became an effective tool for signaling.