Engineering a Modern-Day Enigma Machine

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The Enigma machine was used in WWII by the Germans to communicate with their submarines and within their military to send secure messages. It was considered one of the most secure encryption systems at its time, although it was broken by the allies later in the war. The purpose of my project was to create a realistic Enigma machine that is built out of modern day components. My design goals were to make it realistic-looking and function just like the original Enigma, with a few improvements. The plugboard and rotors are the key components of the encryption algorithm. For my plugboard, I installed audio plugs to the front panel and created custom cables to make the connections. I created small boards for the rotors that can be plugged into slots on the Enigma machine which holds the letter mappings for the rotors. I also created a custom keyboard with realistic-looking keys and a wooden box with an Enigma logo to match the real Enigma. It also had some improvements, including an LCD display to show the encrypted message, extra rotors that can be inserted into any slot which makes it more secure, and a backspace key for correcting errors. To test, I encrypted and decrypted several messages with my Enigma, and compared the results to online Enigma simulators. I concluded that my Enigma is functionally equivalent to the original Enigma, and I believe it is more user-friendly due to the improvements I made.

Awards Won:
Fourth Award of $500