

Our project idea is to create a Morse code transmitter and receiver between two Arduino devices. How the device will work is that one user will send a message using Morse code, the other controller will receive the message and convert the signal to plaintext that will be displayed on the LCD screen. The controllers will have the option to encrypt the message for added security.

The major software components of our project are the implementing a timer to keep track of the number of times the user has clicked the button. As well, another major software component that we hope to implement is a function that will transmit and receive signals from our Arduino devices. An additional component would be converting Morse code to text as well as encrypting the signals being sent. Encryption scheme is a XOR cipher with a onetime pad system.

The prototype plan that we hope to follow is experimental and horizontal prototyping. We plan on following this prototype plan because we want to build up our project so that we can continuously test it to ensure we have correctly implemented what we wanted. Through our experimentation, we hope to gain new insight on how we can improve our project by adding new features.

The hardware components we plan on using are the Arduino Uno for our main computing power. We also plan on implementing a short-wave radio receiver and a transmitter, as well as LED's and buttons. If the budget allows the encryption system will be on a separate microcontroller to further secure the system. A toggle switch will allow the user to switch between unencrypted and encrypted modes for transmission.

The challenges that we expect to face are with short wave radio signals and how Arduino will receive them. We also expect to run into challenges with how we will accurately filter out background radio and white noise. Another major challenge would be being able to differentiate between a 'dot' and a 'dash' as well having a reasonable margin of error.