Problem Statement

This is a course project of Introduction to Communication systems.

Problem statement:

Interstellar: The pilot Cooper has reached the Tesseract and the robot TARS is close to the black hole. TARS wants to send the messages to Cooper using Morse code. Assume that the laws of electro-magnetics work in the same way as on Earth.

Design a digital communication system for TARS and Cooper using BPSK modulation/de-modulation, which incorporates Morse code encoder at the transmitter and the corresponding decoder at the receiver. Note that dot is 1 unit and dash is 3 units. Cooper should be able to decode letters, numbers and words. Plot graphs of letter error rate vs. SNR and word error
rate vs. SNR.

The International Morse Code is given below for your reference :

International Morse Code

1. The length of a dot is one unit.
2. A dash is three units.
3. The space between parts of the same letter is one unit.
4. The space between letters is three units.
5. The space between words is seven units.