



Name: Allen Ben Philipose

Registration No: 18BIS0043

Subject Code: ECE3029

Slot: L15 + L16 + L29 + L30

Faculty: Dr. Sivakumar R

Lab Assesment – 5

Multiplexing

Aim

Design and analyse the performance of the following pulse code modulation

(i) Frequency Division Multiplexing

(ii) Time division Multiplexing

Abstract

Multiplexing is majorly used for transferring multiple messages at faster by making use of the resources that are available in plenty.

Examining all the types of multiplexing:

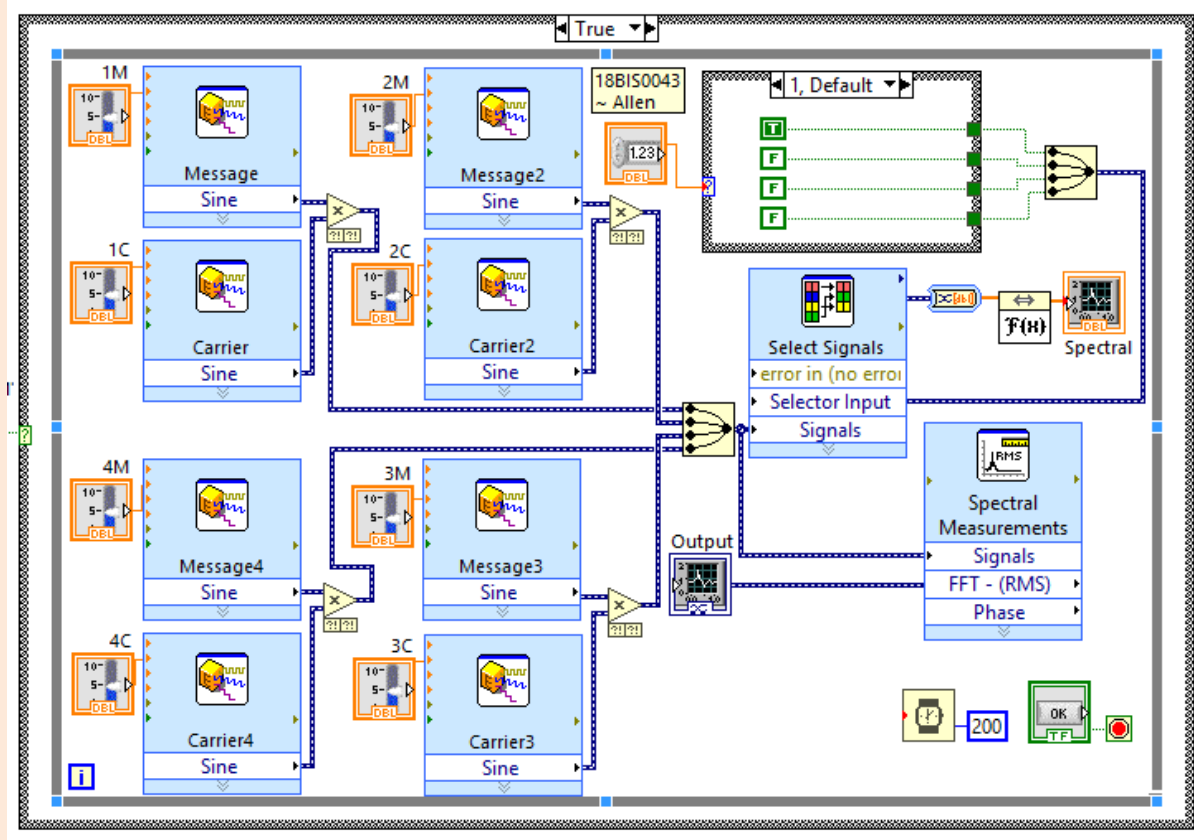
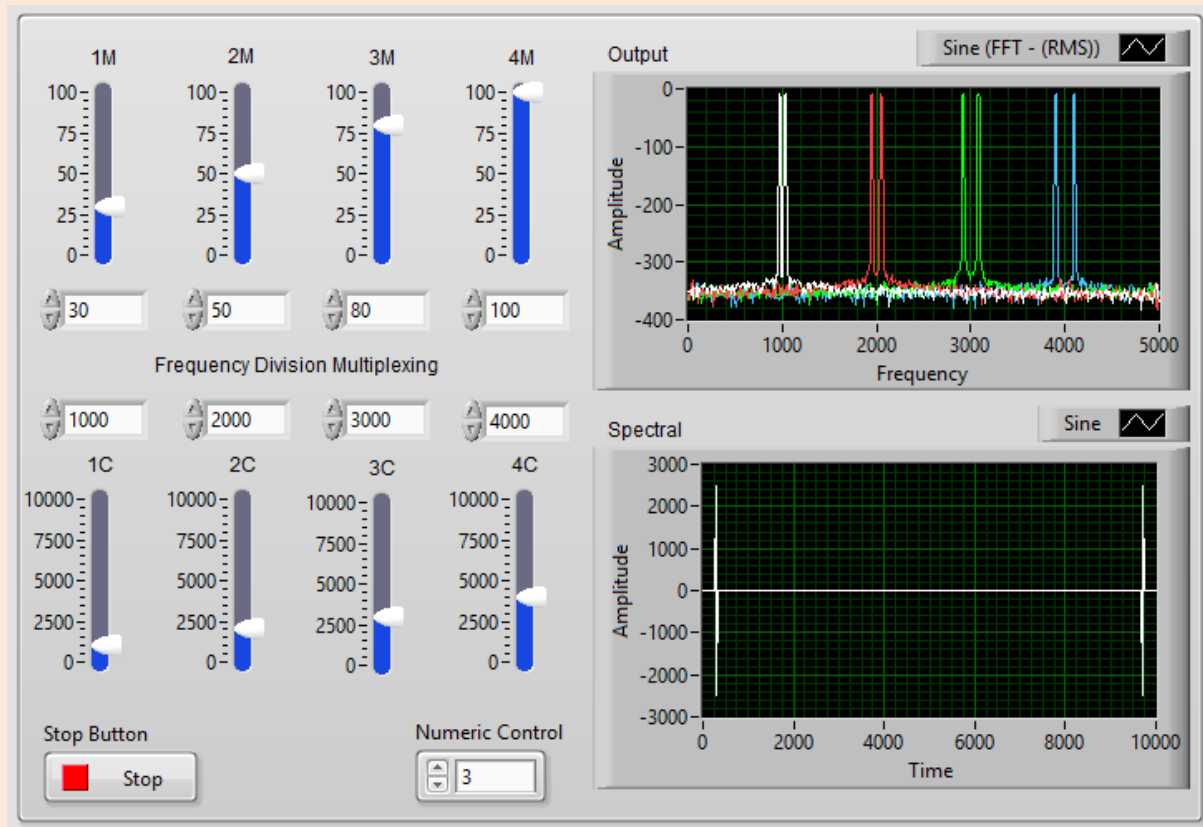
a) Frequency division multiplexing uses the bandwidth given to send multiple messages hence utilising the maximum of the given spectrum

b) Time division multiplexing uses the given time to send multiple signal messages utilising the maximum of the given time

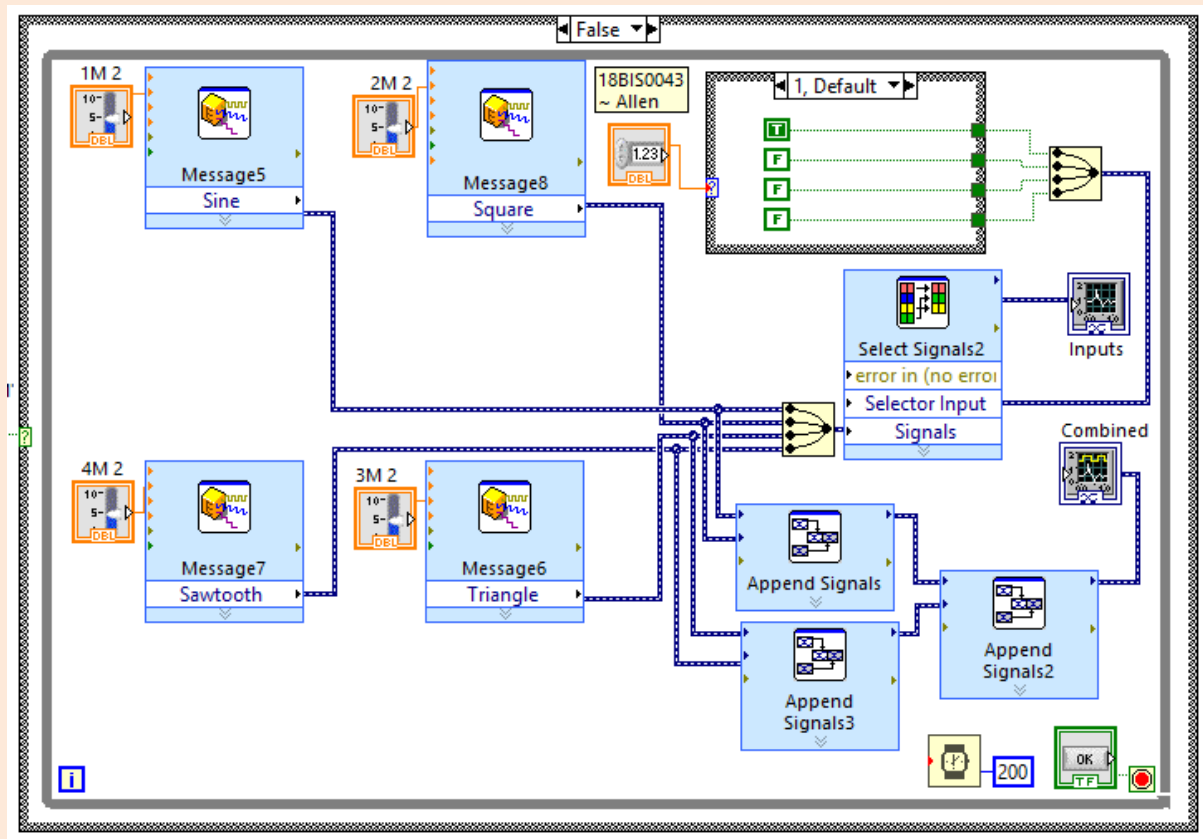
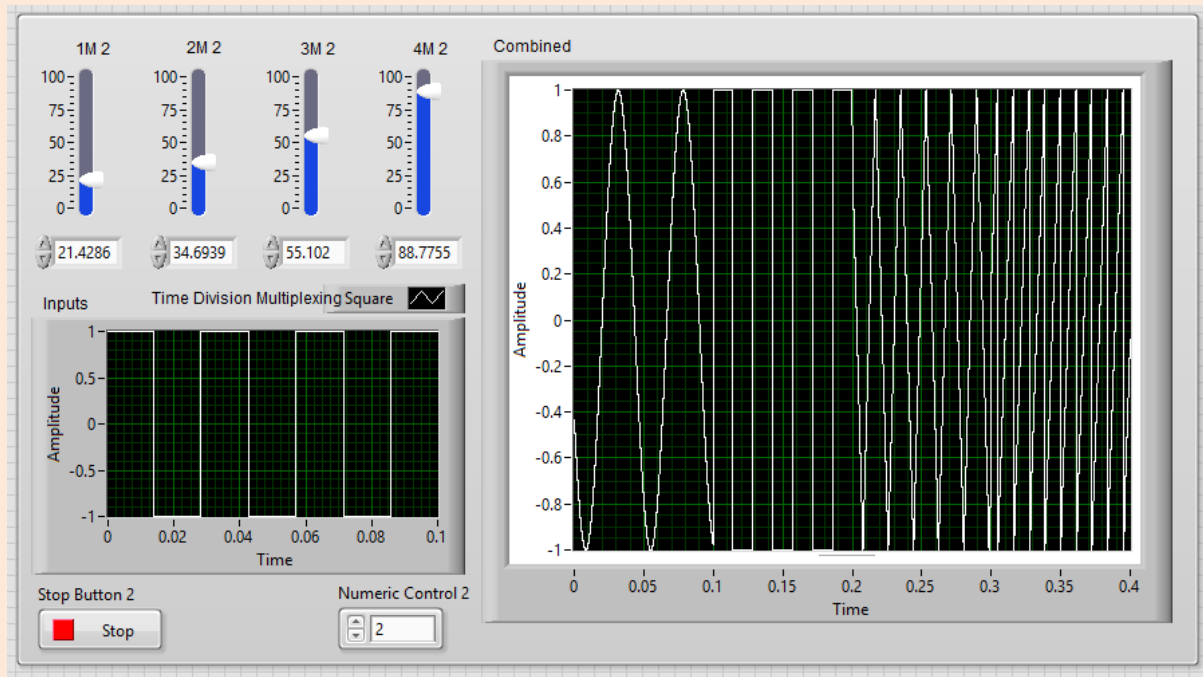
c) Space division multiplexing uses the given space of having multiple physical line connections and tries to accommodate maximum number of connections wires, hence utilising the maximum of the given space

Multiplexing is an essential part of communication and should be used in certain parts of the circuit to maximize the efficiency

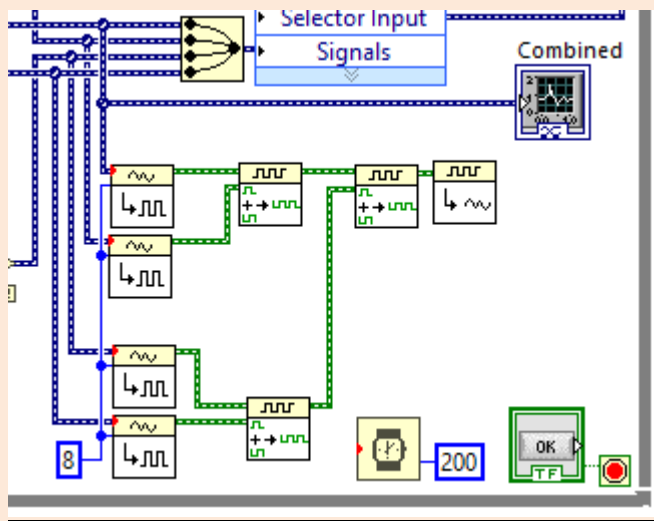
Circuit Diagram – Frequency Division Multiplexing



Circuit Diagram – Time Division Multiplexing



Alternative methods



This was the initial design of appending after converting the given signals to digital form using an ADC and appending the signals, since that is an easier method and using DAC to convert it back to the initial form

Components and Features

- ✓ *Input Slides with digital display for 4 message Frequencies and carrier frequencies at the main setup panel. It also includes a control button and an additional graphing screen to display the signals individually for particular analysis*
- ✓ *This prototype gives the user plenty of control over the input and the desired output and is well cleanly displayed with minimal number of output screens and simple instructions easily understandable for any common worker to work on.*

- ✓ *The stop button can be considered as a switch off to the running loop and will return the program to the initial menu freezing the current output.*
- ✓ *Append signal palette essentially divides the entire time stamp of the graph according to the number of input available and transmit them at equal intervals.*

Result

*In **TDM**, the messages are shown as of different types, and are transmitted at different time stamps at the same graphs.*

*In **FDM**, the messages are multiplied with the carrier waves forming a modulated wave which is converted to its spectrum form and is displayed in the graph using the LabVIEW software*