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Slot: *L15 + L16 + L29 + L30*

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Lab Assesment – 3

Pulse Modulation

<u>*Aim*</u>

To input a message signal in sine wave form and use a carrier wave to make it pulse modulated signal, ready to transmit. Also, demodulate the same, on the receiver end and retain the original message signal – which will be updated later.

<u>*Abstract*</u>

Pulse modulation is done in 3 different methods,

1. Pulse Amplitude Modulation (PAM)

2. Pulse Position Modulation (PPM)

3. Pulse Width Modulation (PWM)

Therefore, this LabVIEW program accepts the amplitude and the frequency of the message wave, the amplitude, duty cycle, phase and frequency of the pulse wave, from the user, for displaying the output.

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.

Circuit Diagram
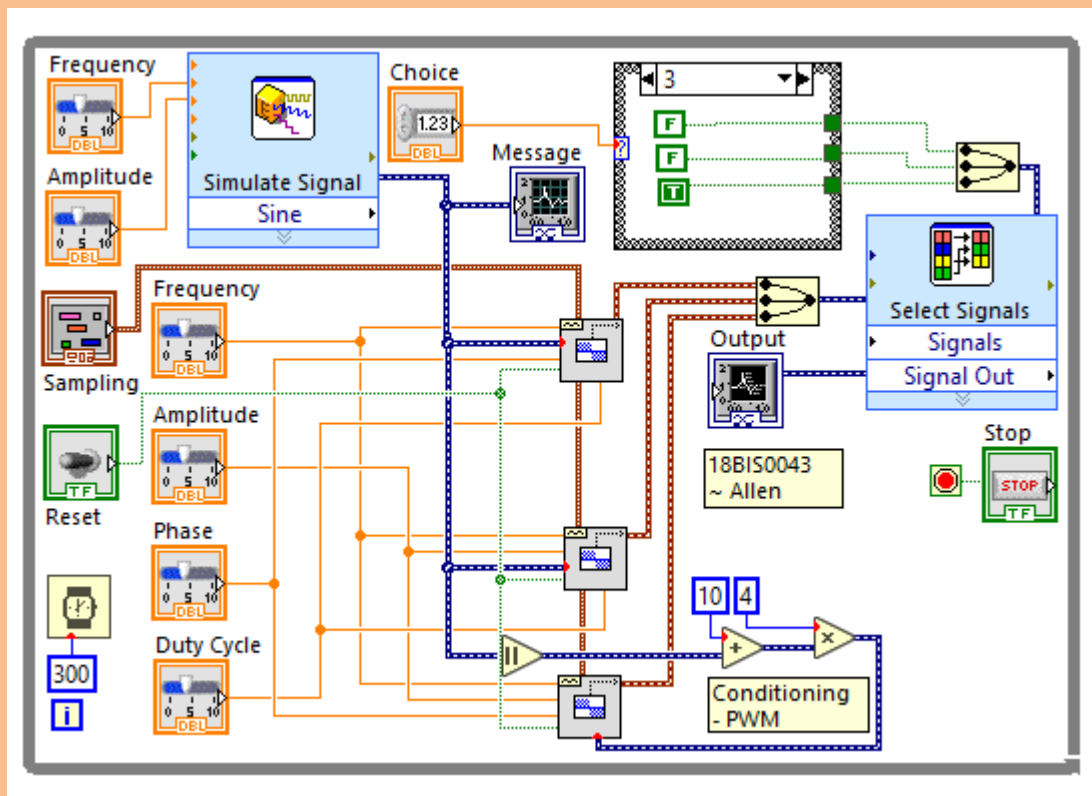
Components

- ✓ *Input Slides with digital display for Message amplitude, Message Frequency, Pulse amplitude, Pulse frequency, Pulse duty cycle and Pulse Phase*

- ✓ *Output screens for showing input and output using multiplexing, for showing the different types of pulse modulations.*

- ✓ *Reset button to clear the memory of square wave generators*

- ✓ *Switch toggle between the different types of modulated waves and a separate screen for the message wave*
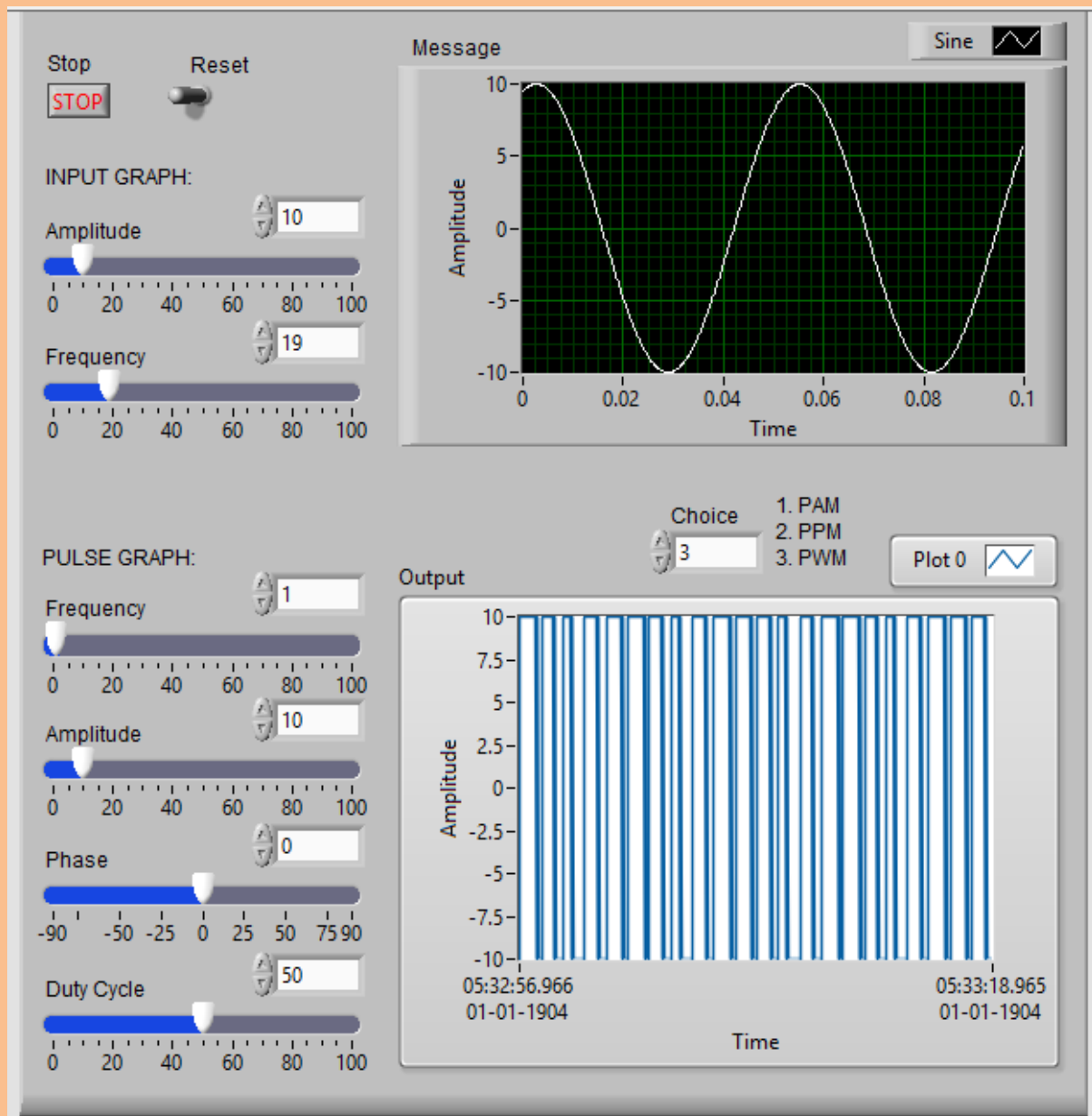
Board Diagram – PAM
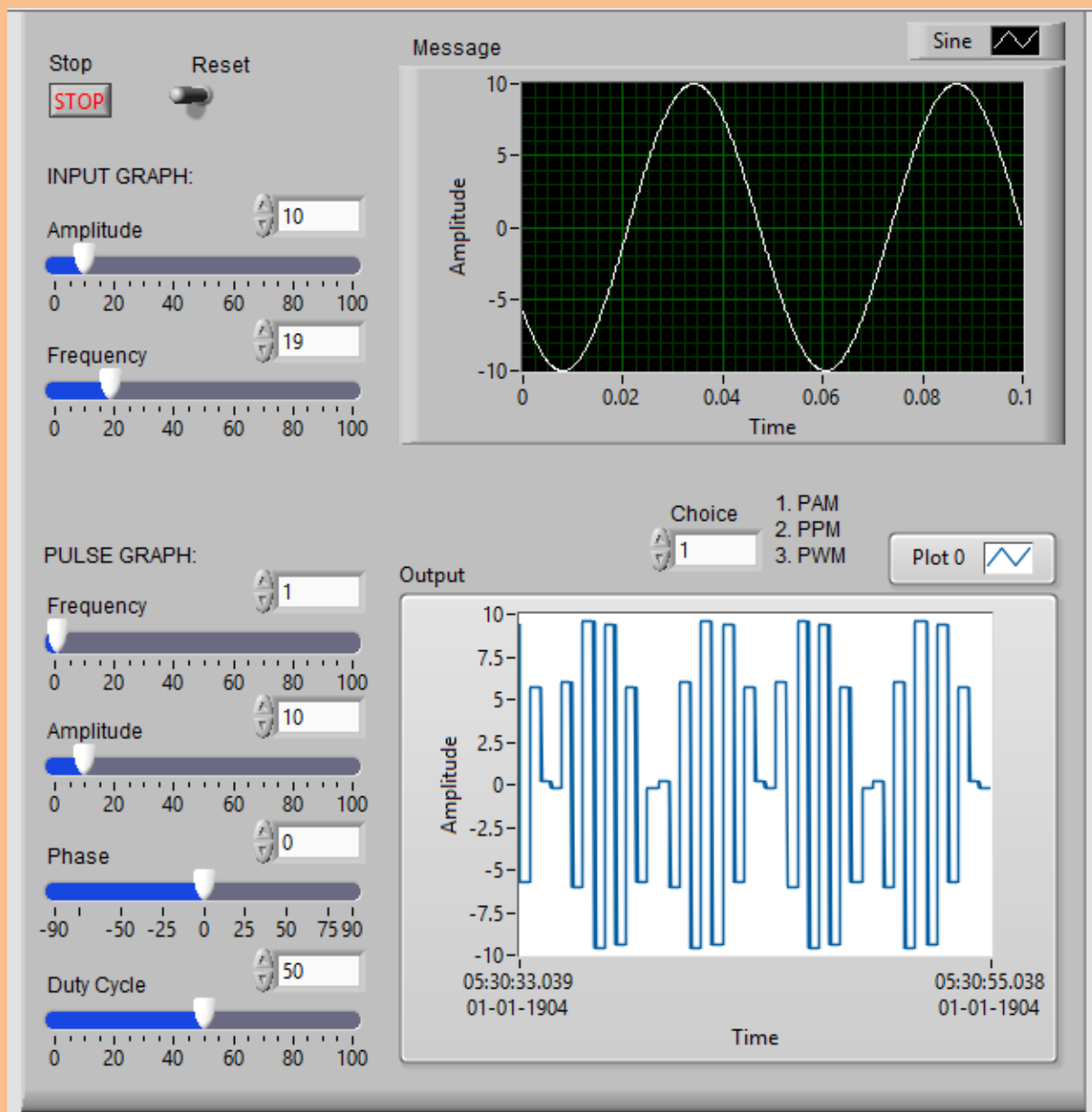
In this diagram, all the slides are working except the amplitude control of the pulse graph. This is deactivated for the internal workings to take over the amplitude control to generate pulse amplitude modulation.

Board Diagram – PPM
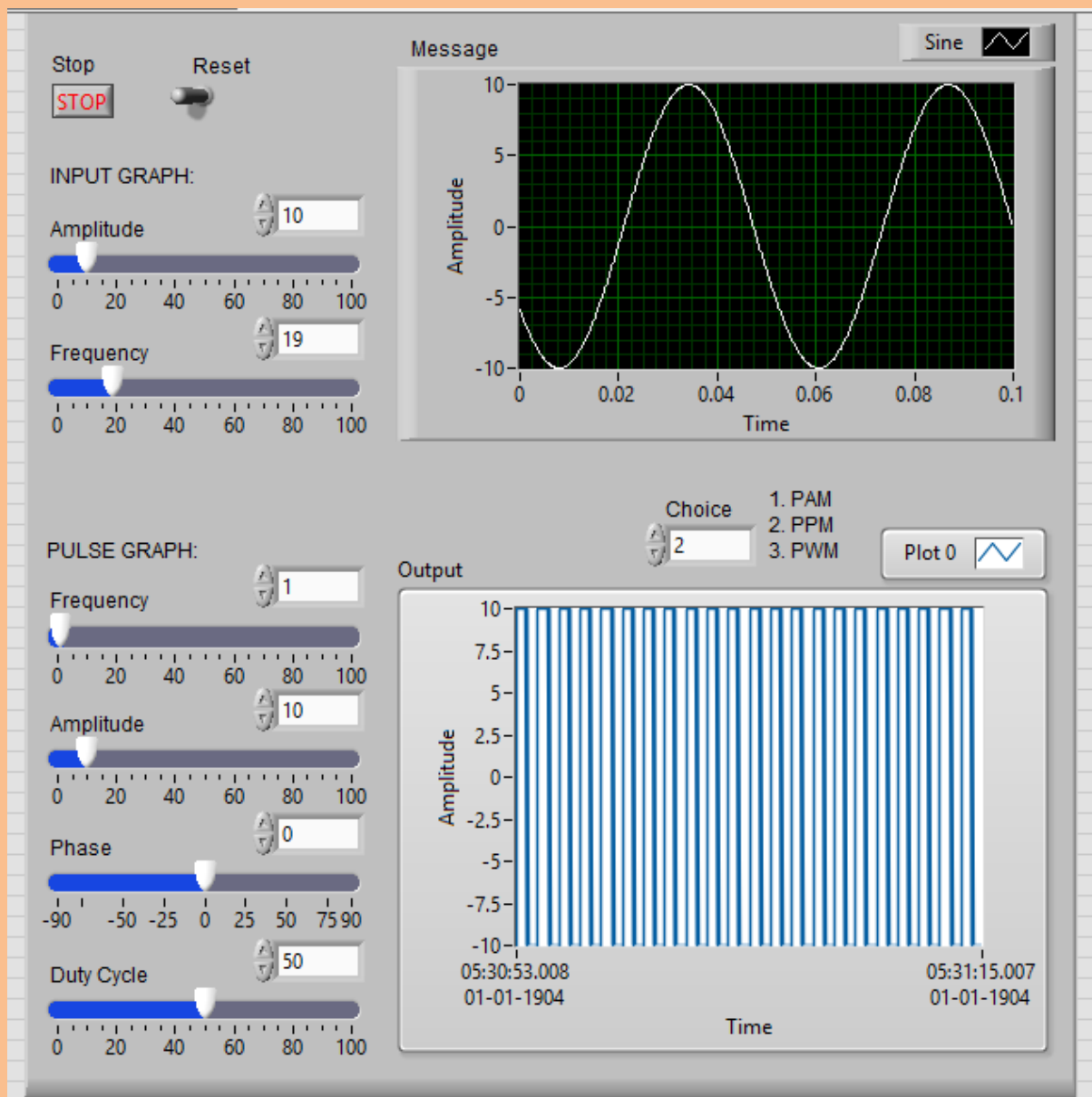
In this diagram, all the slides are working except the phase control of the pulse graph. This is deactivated for the internal workings to take over the phase control to generate pulse position modulation.

Board Diagram – PWM

In this diagram, all the slides are working except the duty cycle control of the pulse graph. This is deactivated for the internal workings to take over the duty cycle control to generate pulse width modulation.

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.

Result

The message signal is modulated using PAM, PPM, PWM on the transmitting end and can be demodulated on the receiver end using LabVIEW software.