|  |
| --- |
| ***Instructions:***   * ***Submission must contain only original, individual, and current work.*** * ***After completion, save as PDF before submitting.*** |

Objective

|  |
| --- |
| Input and Trigger coupling |

Results/Calculations

Step 2

|  |
| --- |
|  |
| Figure 1: Oscilloscope DC Coupling |

Step 3

|  |
| --- |
|  |
| Figure 2: Oscilloscope AC coupling (bottom) and DC coupling (top) . |

Step 4

|  |
| --- |
| The trigger only works for one voltage, useless at other voltages. |

Step 5

|  |
| --- |
| AC coupling removes the DC offset. |

Conclusion

|  |
| --- |
| Triggers are useful to read fast currents at a certain voltage. |

Objective

|  |
| --- |
| Mystery Signals |

Results/Calculations

Step 2

|  |
| --- |
|  |
| Figure 3: Slower Mystery Waveform |

Step 3

|  |
| --- |
|  |
| Figure 4: Faster Mystery Waveform |

Step 4

Table I: Trigger Coupling, Trigger Level, and Hold-off Time

|  |  |  |  |
| --- | --- | --- | --- |
|  | Trigger coupling mode | Trigger level ( V ) | Hold-off ( s ) |
| Slower signal | DC | 0 | 40 ns |
| Faster signal | AC | 1 | 6 s |

Conclusion

|  |
| --- |
| Coupling, level, and hold-off time can be used to measure and look at difficult signals on the oscilloscope. |

Objective

|  |
| --- |
| Synchronous and asynchronous signals |

Results/Calculations

Step 3

|  |
| --- |
|  |
| Figure 5: Sine and Triangle Wave Superimposed. |

Step 4

|  |
| --- |
| The sine wave shifts left slowly when the frequency is changed to 100000.1 Hz. |

Step 5

|  |
| --- |
| The triangle wave constantly shifts to the right instead. |

Step 6 (Capture 2 plots in XY mode)

|  |  |
| --- | --- |
|  |  |
| Figure 6: Sine and Triangle wave in XY mode. | |
| Purple shape collapses and opens as time goes on. | |

Objective

|  |
| --- |
| Pseudorandom Bit Sequence |

Results/Calculations

Step 2

|  |
| --- |
| No you can’t read it well |

Step 3

|  |
| --- |
|  |
| Figure 7: Bit Sequence Oscilloscope . |
| The holdoff ensures that a minimum amount of time elapses between triggers. It prevents any further triggers. |

Step 4

|  |
| --- |
|  |
| Figure 8: Bit Sequence with Sync Signal. |
| The sync helps stabilize the signal. |

Conclusion

|  |
| --- |
| Hold-offs are useful for reading fast signals. |

Objective

|  |
| --- |
| Generating very fast signals |

Results/Conclusions

Step 3-4

|  |
| --- |
|  |
| Figure 9: Fast Square Wave Oscilloscope. |

Table II : Measured Wave Data

|  |  |
| --- | --- |
|  | Measurement |
| Frequency | 30 MHz |
| Amplitude | .9V |
| Average | 896mV |

Step 5

|  |
| --- |
| The frequency is too fast. Maybe the oscilloscope is displaying the wave based off the average voltage. |

Conclusion

|  |
| --- |
| Oscilloscope needs to use different methods to measure varying waves. |