**Asynchronous Counter**

**Introduction: 1 min 15 sec**

Hello everyone. My name is Rodsy. Me, along with my teammates Saad, Ashiq and Ahsan will be presenting our combined lab project which is Asynchronous Counter.

So, what is an Asynchronous Counter, you might ask? Asynchronous counters or ripple counters are **those counters which do not operate on simultaneous clocking,** the output changes without the clock input at any time. They consist of Asynchronous Circuits which are a type of sequential circuit. The word Asynchronous means not existing or occurring at the same time. They are those whose output is free from the clock signal. They use flip-flops that don’t have a common clock pulse. They use Toggle or Delay Flipflop, in which the clock pulse ripples over the circuit.

The basic Structure of Asynchronous Counter includes that All Flip-Flops must be in toggle Mode and they must be in Clock Arrangement.

Now, my teammate, Saad will be taking on from here.

**Proposed model: 45 min**

**Experimental setup: 3 min 10 sec**

**Result And Analysis: 1 min 10 sec**

**Conclusion: 2 min**

**Limitations of Asynchronous Counter**

In concluding idea, I would like to say that

Asynchronous counters were connected in series to each other, and clock pulses were not supplied simultaneously to each flip-flop, thus the counter outputs resulted in a delay which was equal to the sum of delays of individual flip-flops.

Although it is easier to design an asynchronous counter, because of its limitations such as delay and speed, we design synchronous counters.

One of the major drawbacks to the use of asynchronous counters is high-frequency applications are limited because of internal propagation delays

Limitations of Asynchronous Counters:

•An extra “re-synchronizing” output flip-flop may be required.

•To count a truncated sequence not equal to 2n, extra feedback logic is required.

•Counting a large number of bits, propagation delay by successive stages may become undesirably large.

•This delay gives them the nickname of “Propagation Counters”.

•Counting errors occur at high clocking frequencies.

•Synchronous Counters are faster and more reliable as they use the same clock signal for all flip-flops.

Concluding remarks

All in all, we can say that Asynchronous Counter takes in binary value and gives us a decimal value based on the clock input supplied to the arrangement's least signal bit flip-flop.