Booth Multiplier

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Abstract—**This paper discusses about 2 electronics components namely Booth multiplier which is driven by a clock generated by astable multivibrator. The Booth multiplier is an FSM made using Verilog while the multivibrator is made using schematics.**

Keywords—Booth multiplier, astable multivibrator, FSM.

I. Introduction

Analog Circuitry - The astable mode of operation is chosen because the clock is readily generated because neither of the 2 states of timer is stable and the output pulse just toggles between the 2 level thus producing the clocking action. As shown in the Fig 1- we use 2 BJT and 4 resistors from the sky130 PDK. In the figure the formula of the time period is made clear.

Digital Circuitry – The booth multiplier is an improved multiplier circuit through we can avoid addition whenever consecutive 0's and 1's is detected in multiplier. Basically, we inspect last 2 bit of the multiplier at a time. Now if the bits are same 00 or 11 then right shift the partial product, If the bits are 01 then we do an addition and then shift right. If the bits are 10 then we do a subtraction and then shift right. This process significantly reduces the number of addition and subtraction from the conventional method. The steps is made clear in the Fig 2.

Obviously to connect the analog and digital block we will use an ADC and then an DAC block which will be made clear in the final report.
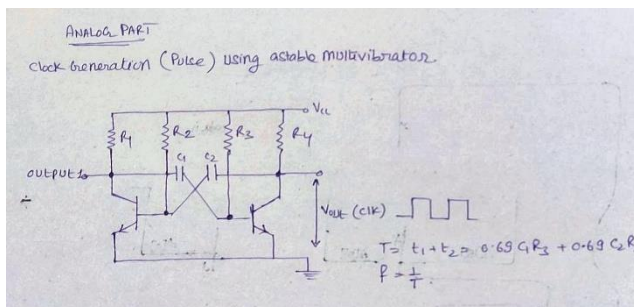
II. Reference Circuit Diagram

Fig 1- Analog Circuitry Astable Multivibrator and Clock Wave and Time Period
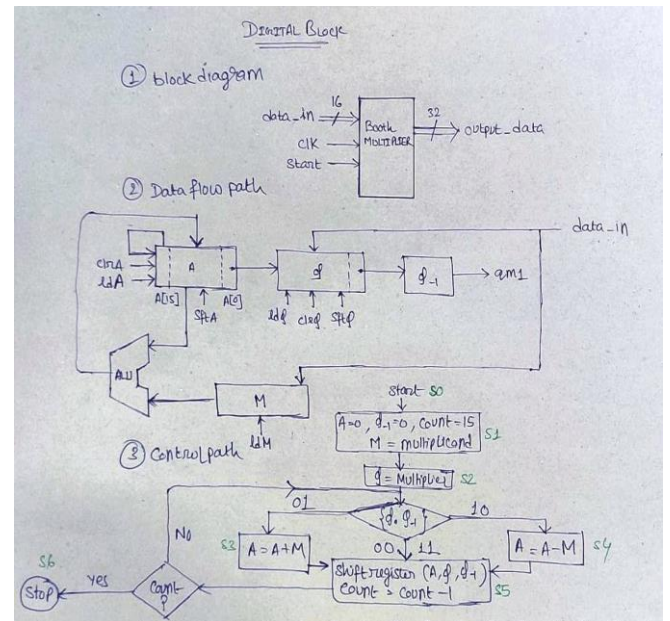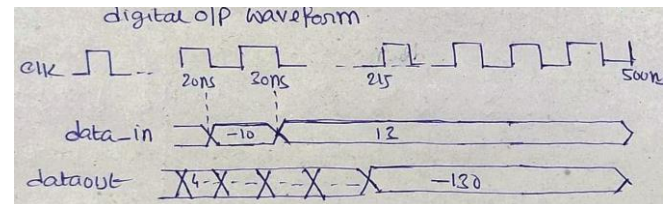

Fig 2- Digital Circuitry Booth Multiplier

Fig 3 – Digital Circuitry Expected Waveform

III. Reference

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