

# Unit-Distance Code Generator

Amreen Kaur  
Integrated Sensor Systems  
Indian Institute of Technology  
Telangana, India  
is21mtech14002@iith.ac.in

**Abstract**—This report explains the Mixed Signal Design of a Unit Distance Code Generator. The circuit is made using a 4-bit binary counter and a not gate, the constituents same as a Johnson Counter. It is used to prevent spurious output from electro-mechanical switches and to facilitate error correction in digital communications such as digital terrestrial television and some cable TV systems. Use of one of the many unit-distance codes can minimize errors at symbol transition points while converting analog quantities into digital ones.

**Index Terms**—Johnson Counter, Unit-distance Code, Mixed Signal Design

## I. CIRCUIT DETAILS AND RESULTS

The output of the Johnson Counter instead of being taken from qbar of the counter's last flip flop, it is taken via a CMOS Inverter in order to understand the intricacies of using a Mixed Signal Circuit. As proposed, the circuit shown in fig.1 depicts the circuit schematic. The d-ff's are simulated in Makerchip and used in the schematic. The corresponding outputs of the circuit for the first and second clocks is shown in fig.2 and fig.3. It shows that after the first clock, the first bit of the output changes to 1. The second clock causes the output of the first and second bits to turn 1.

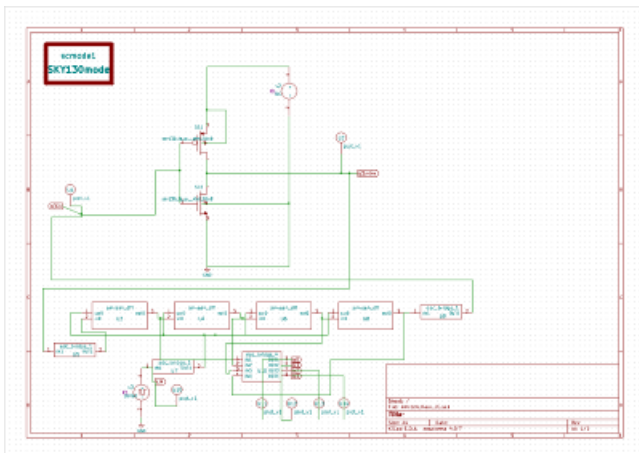


Fig. 1. Schematic of Circuit

## ACKNOWLEDGMENT

I would like to thank Kunal Ghosh Sir, and the VSD Team for organizing such an industry relevant Hackathon and helping throughout so that we can learn from it.

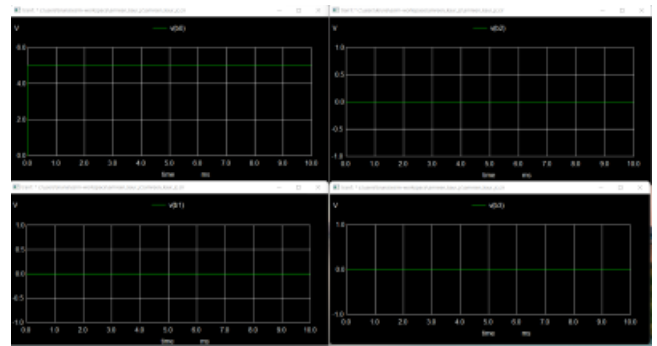


Fig. 2. Outputs after first Clock Pulse

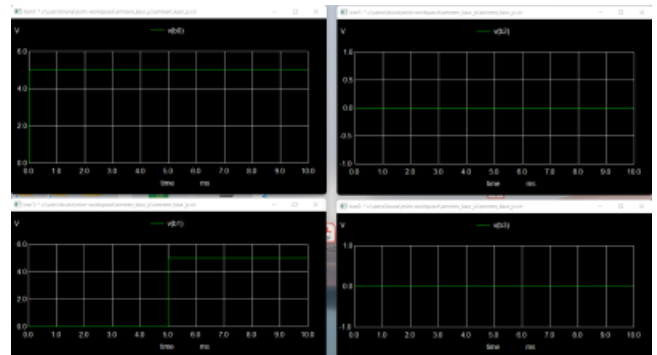


Fig. 3. Outputs after first Clock Pulse