

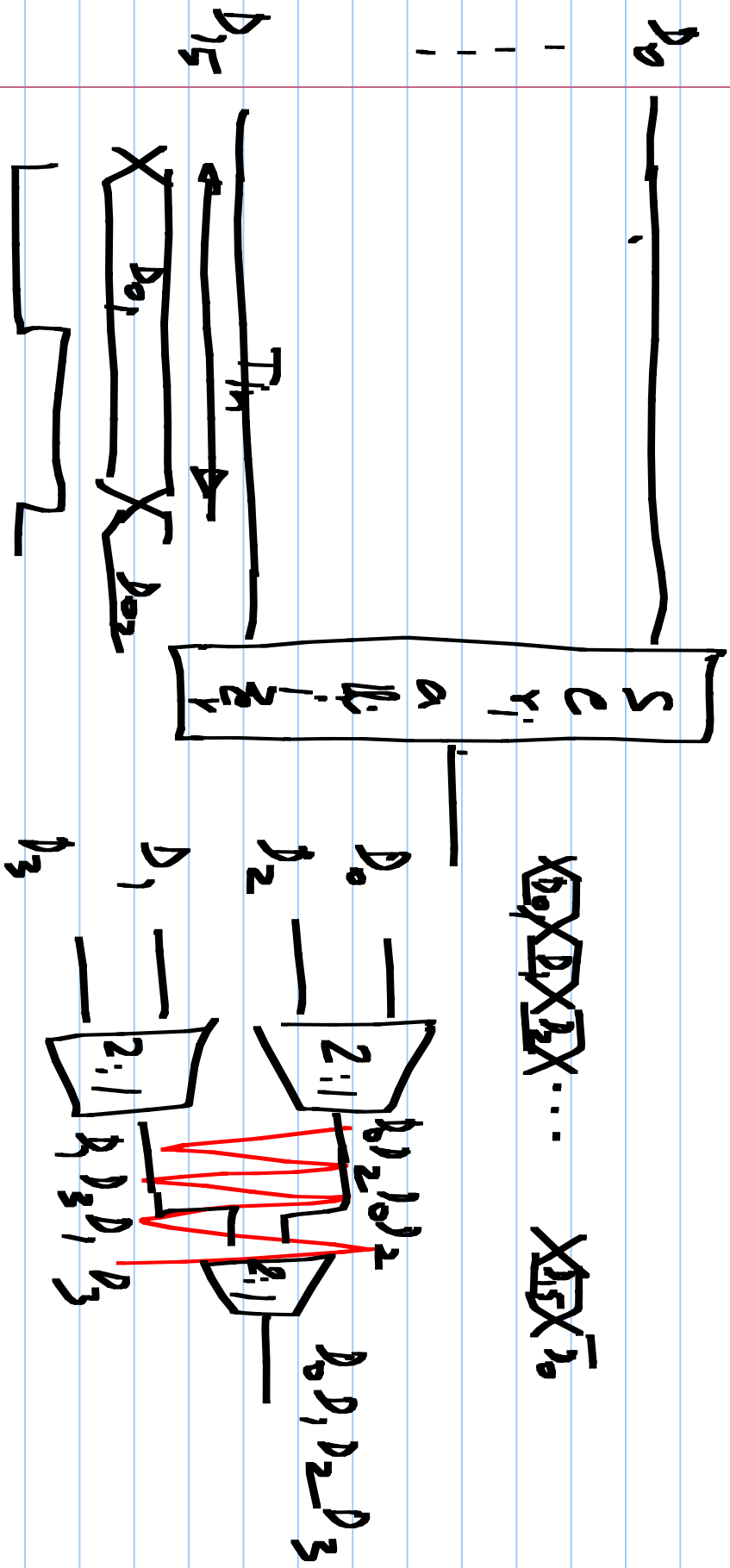
EE6322

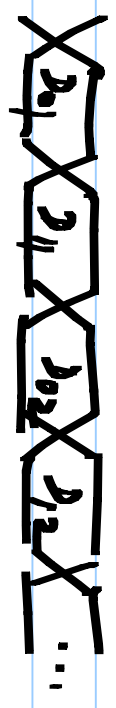
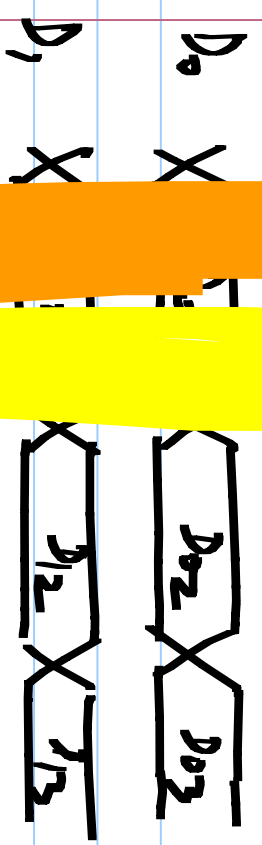
ser Des

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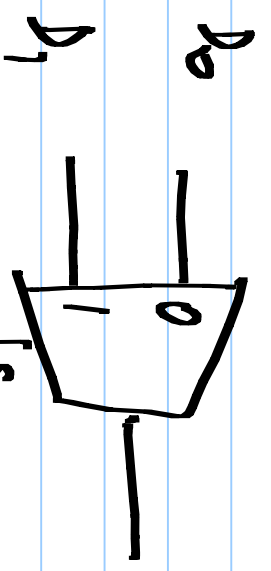
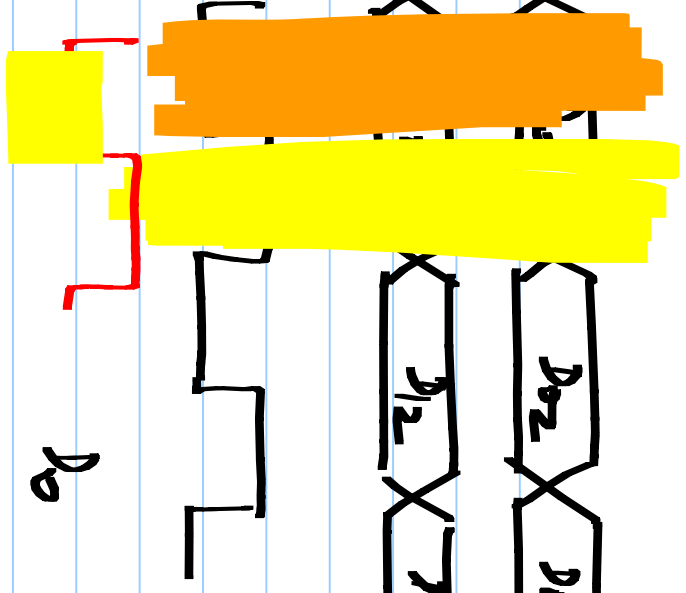
Serializer

Deserializer



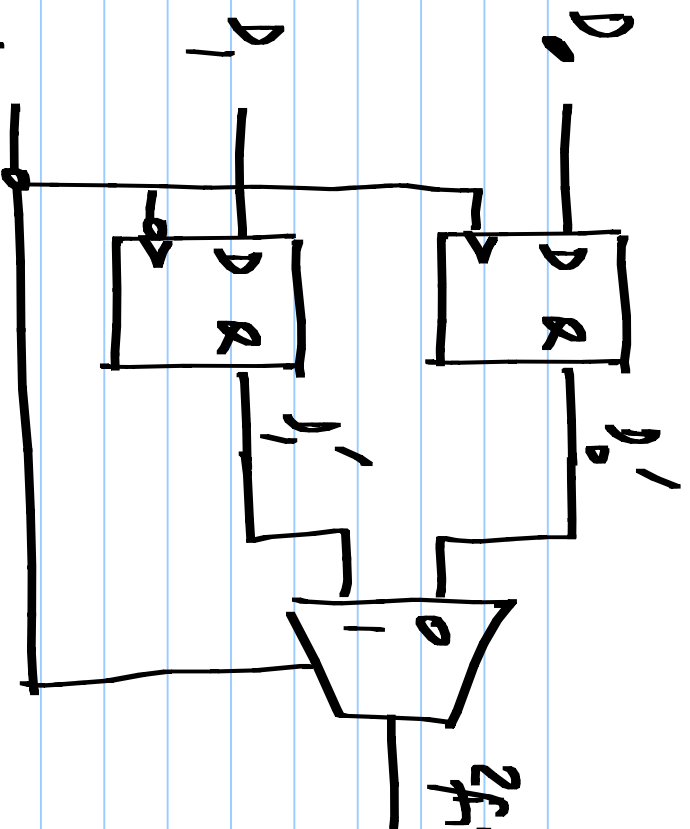


$C_{1n}$



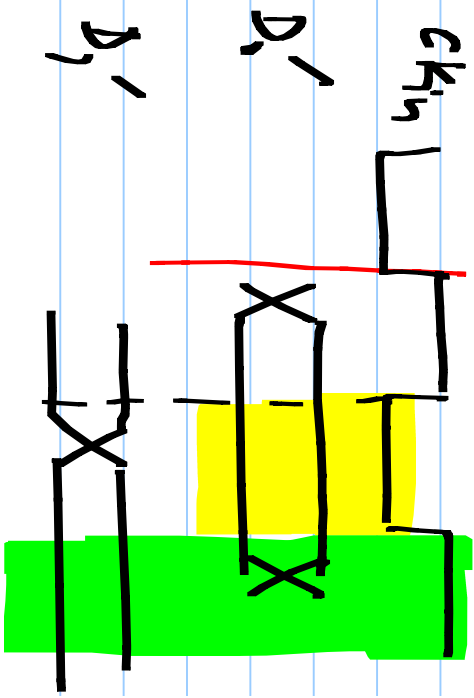
$C_{1n}$

$f_{in}$

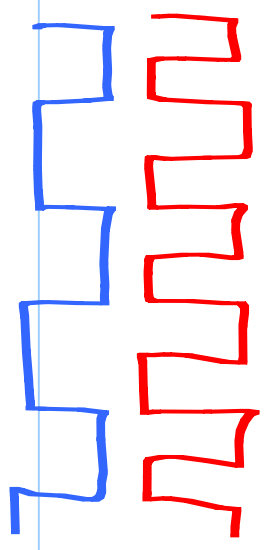


Q  $f_{in}$

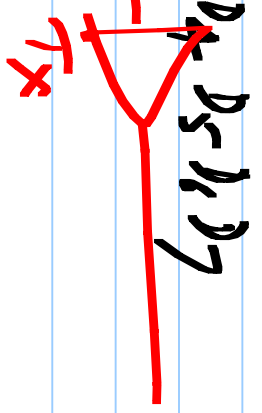
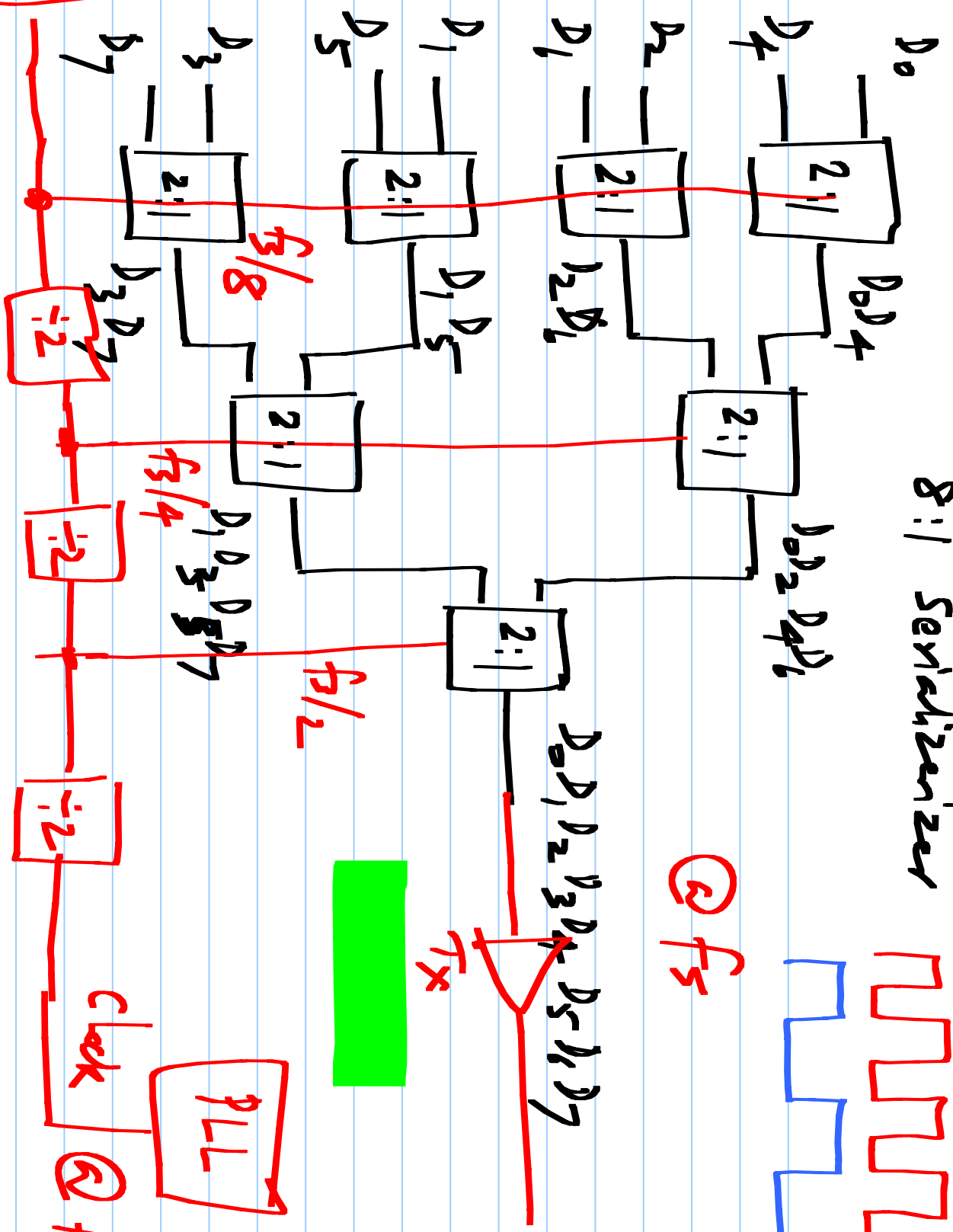
2x Serializer



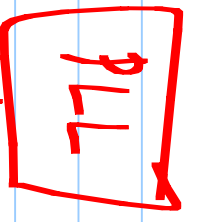
# 8:1 Serializer



$\textcircled{2} f_s$



Clock  $\textcircled{2} f_s$



Serializer: Delays in FF, MUX, dividers.

All stages have to be arranged for robust operation

- setup, hold-time of FF,
  - Avoid glitch @ MUX outputs
-

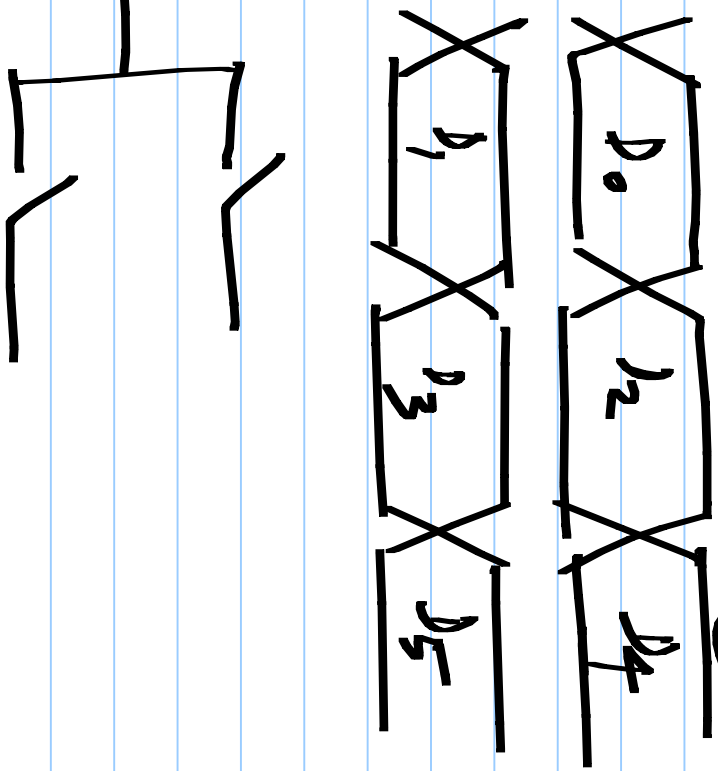
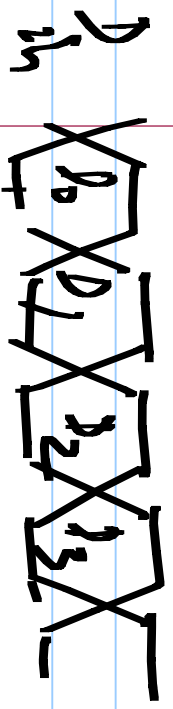
# Deserializer

2:1

N streams

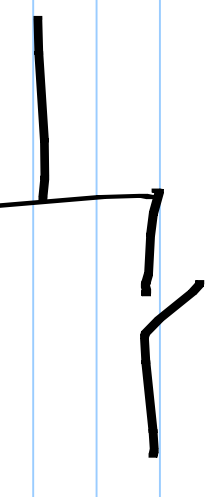
@ f<sub>s/N</sub>

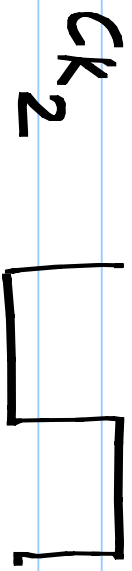
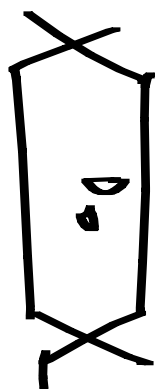
@ f<sub>s</sub>



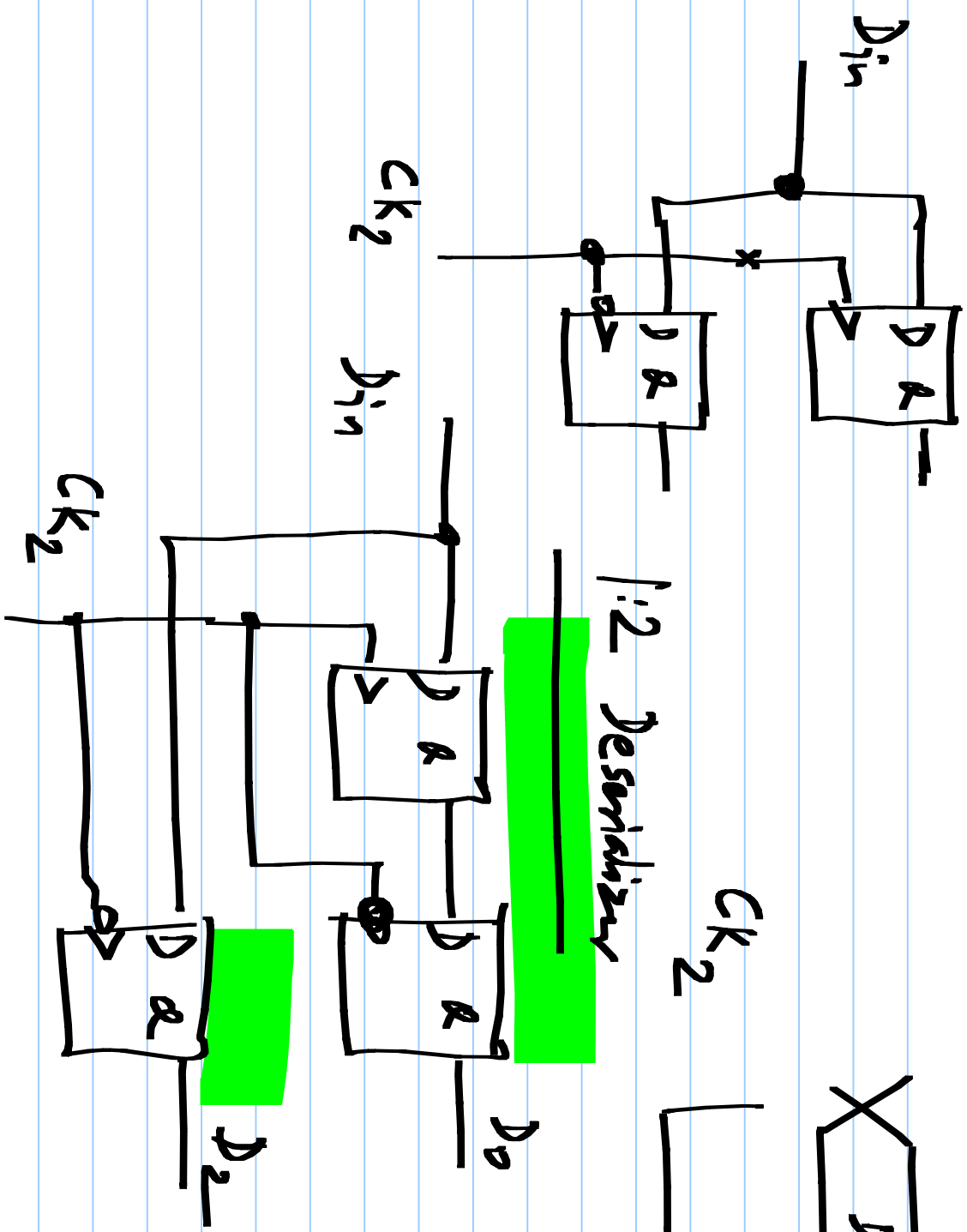
ck

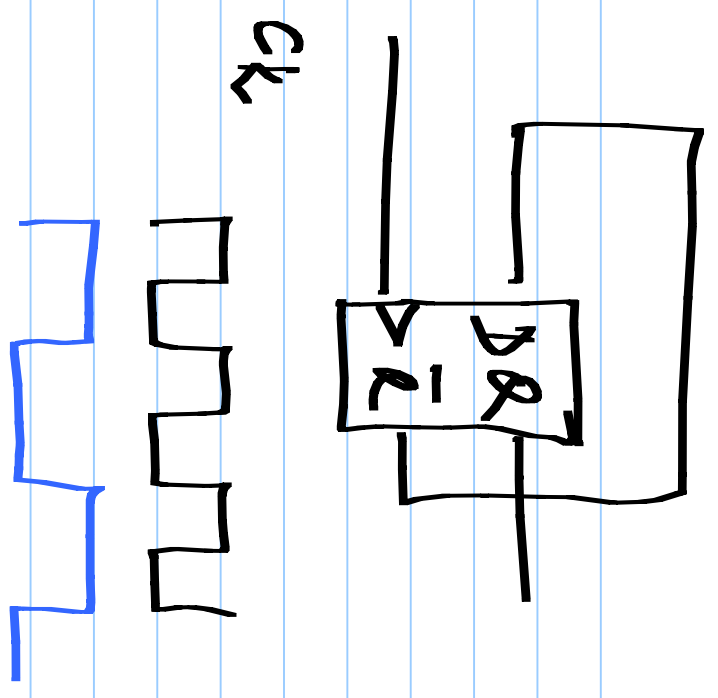
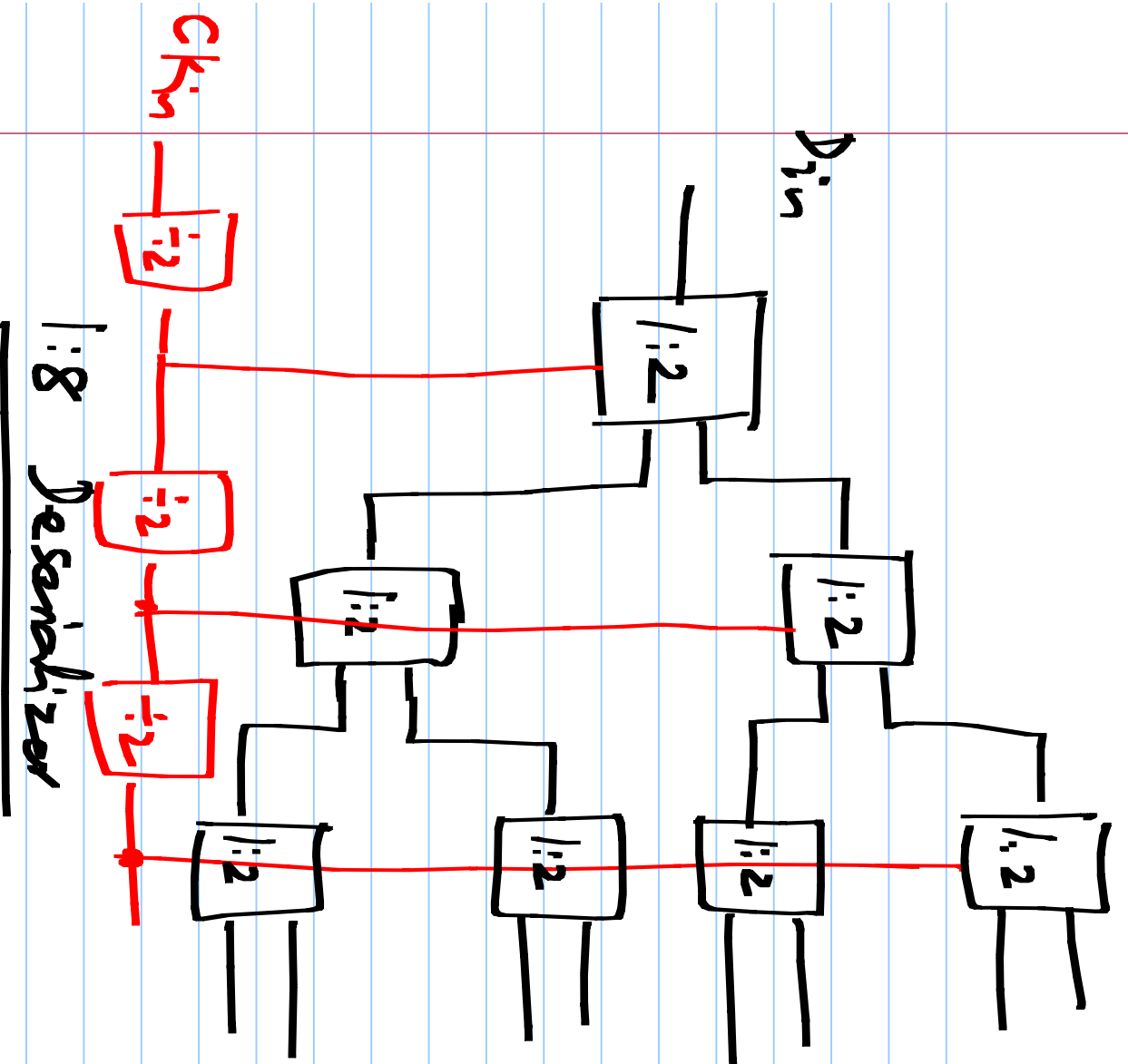
ck<sub>2</sub>



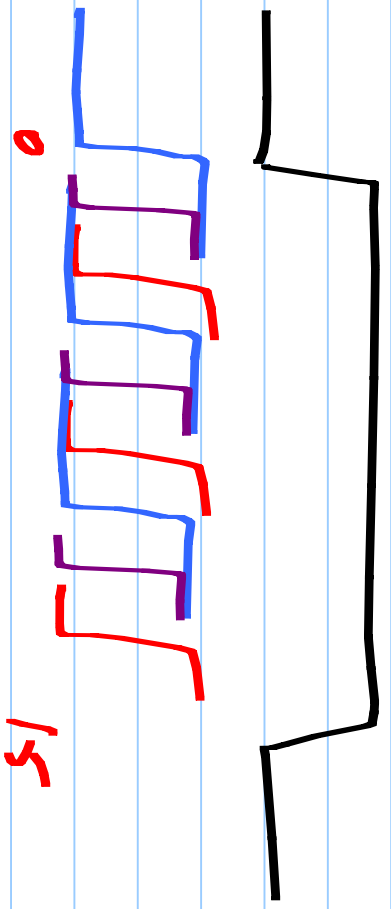
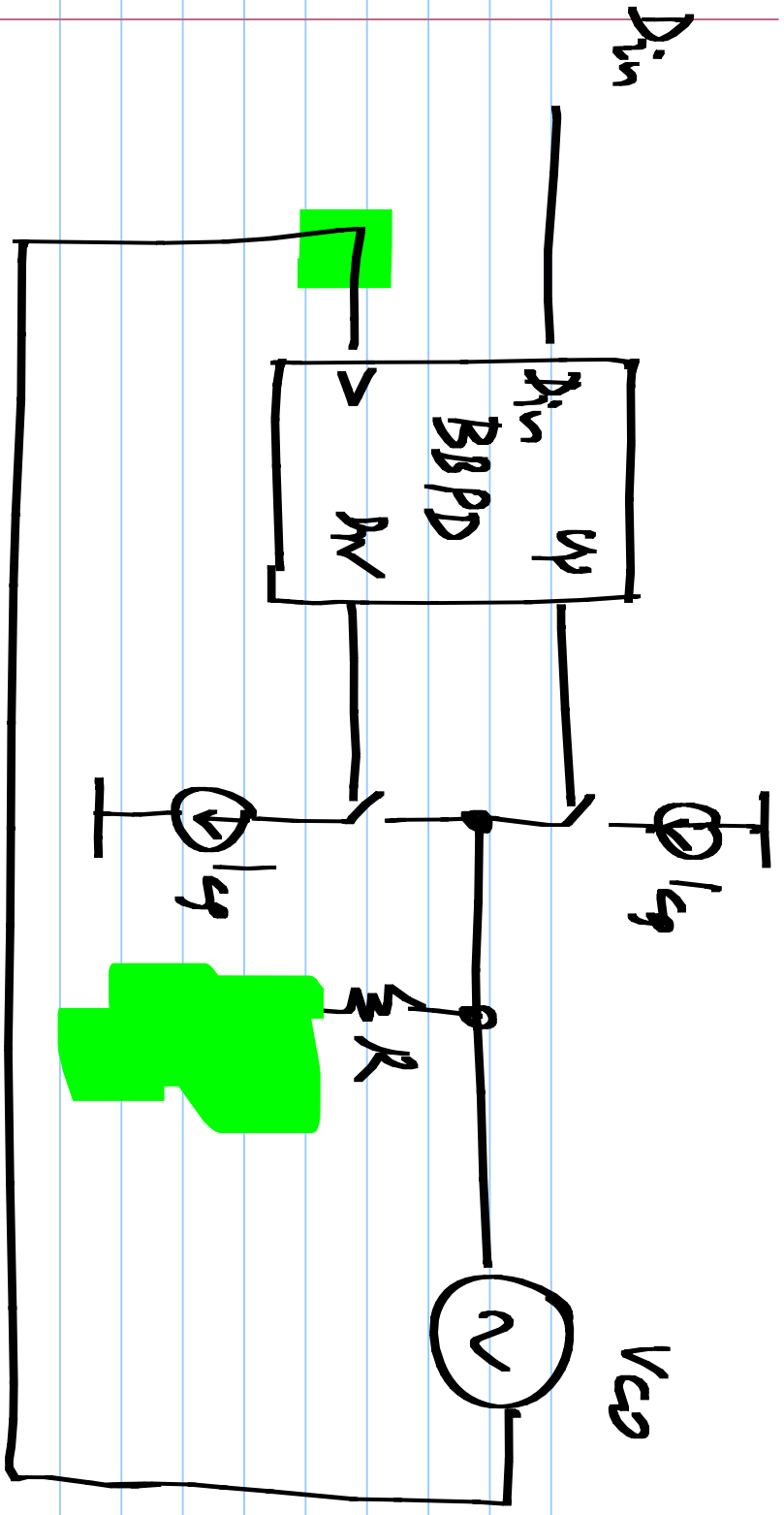


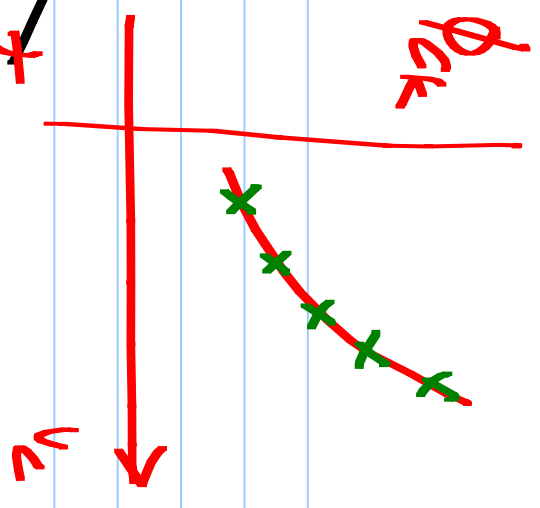
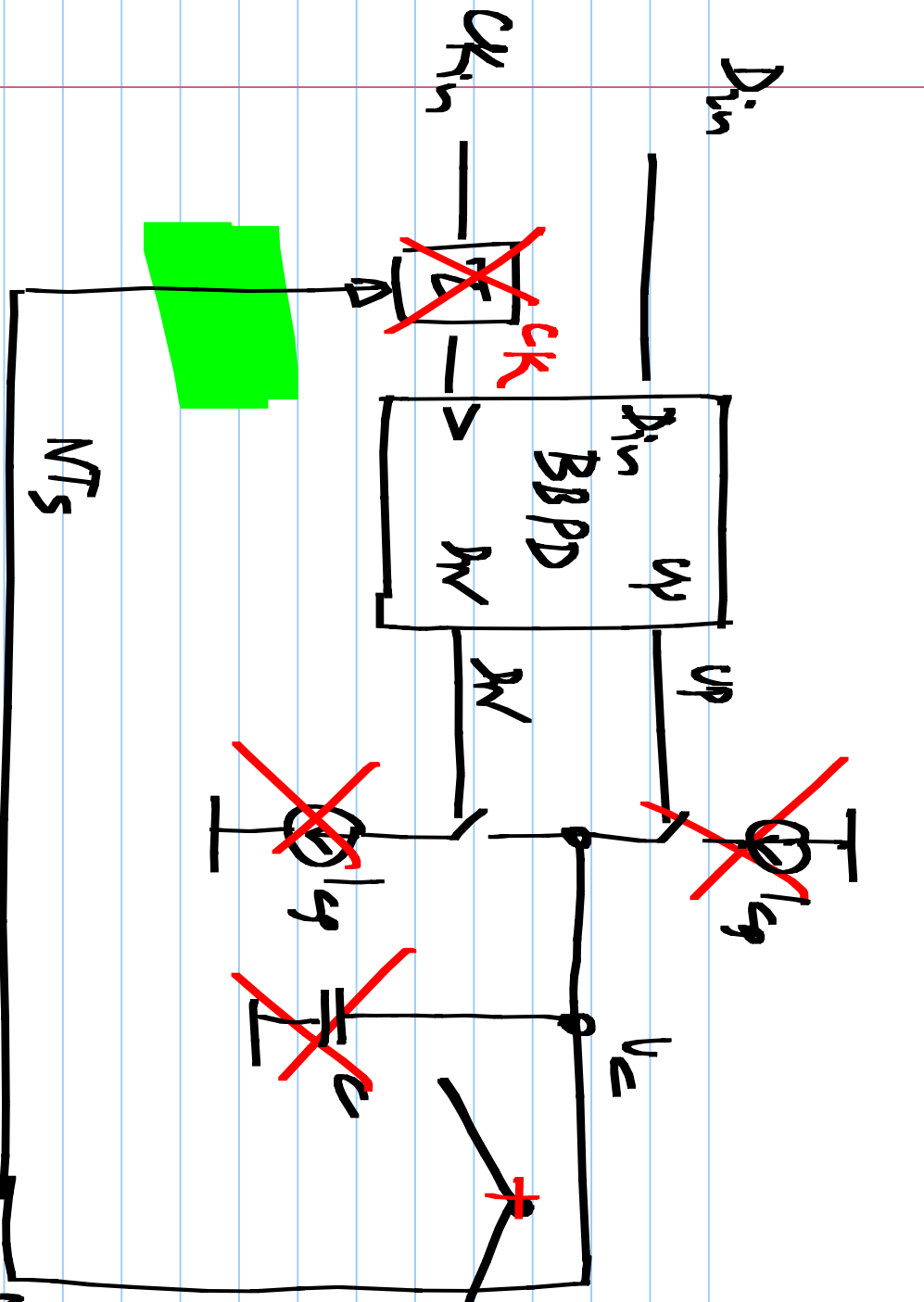
1:2 Deserializing











$$\sum [UP[k] - DN[k]]$$

$$\int_0^T \frac{1}{c} (UP - DN) \cdot dt = \sum_{k=0}^N \left( \frac{1}{c} \right) (UP[k] - DN[k])$$