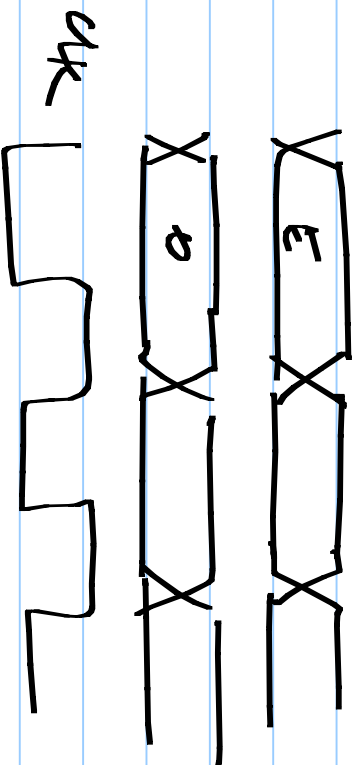
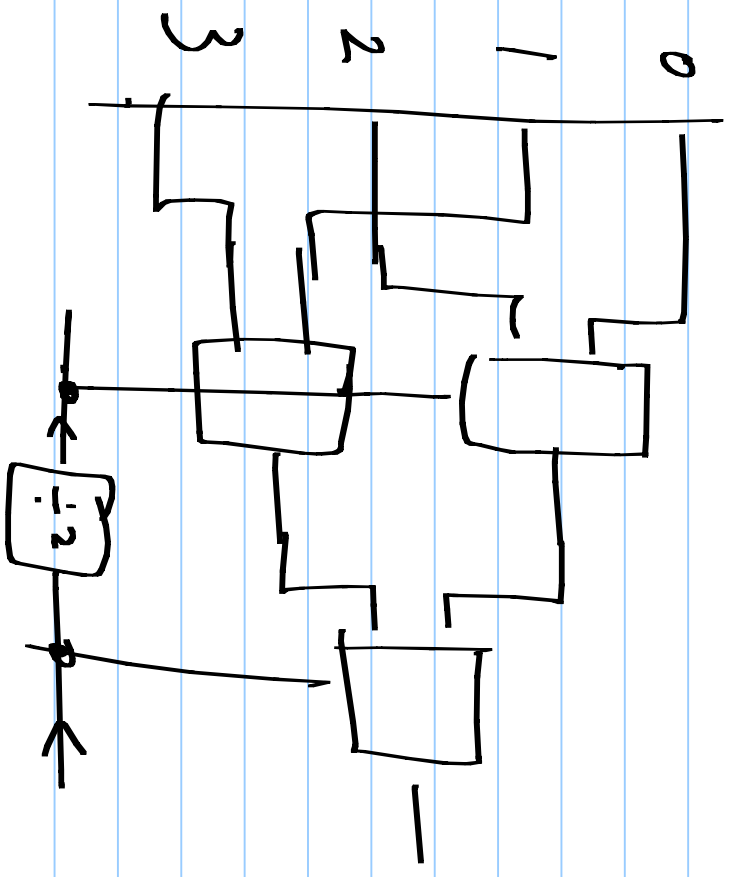
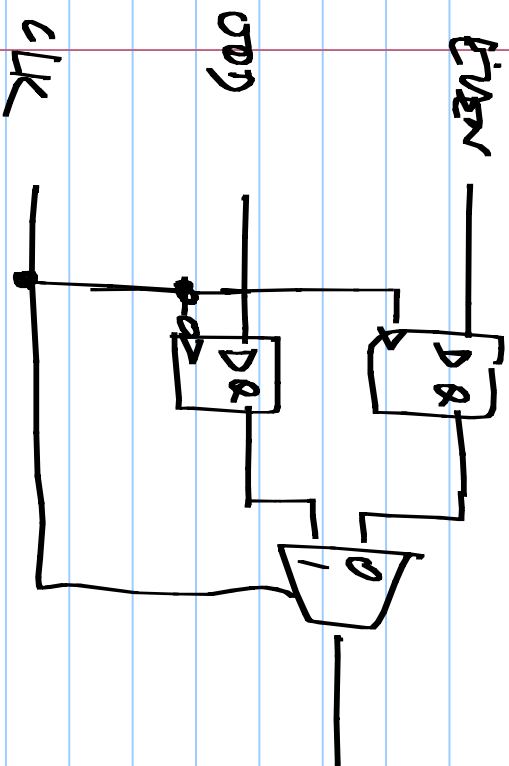
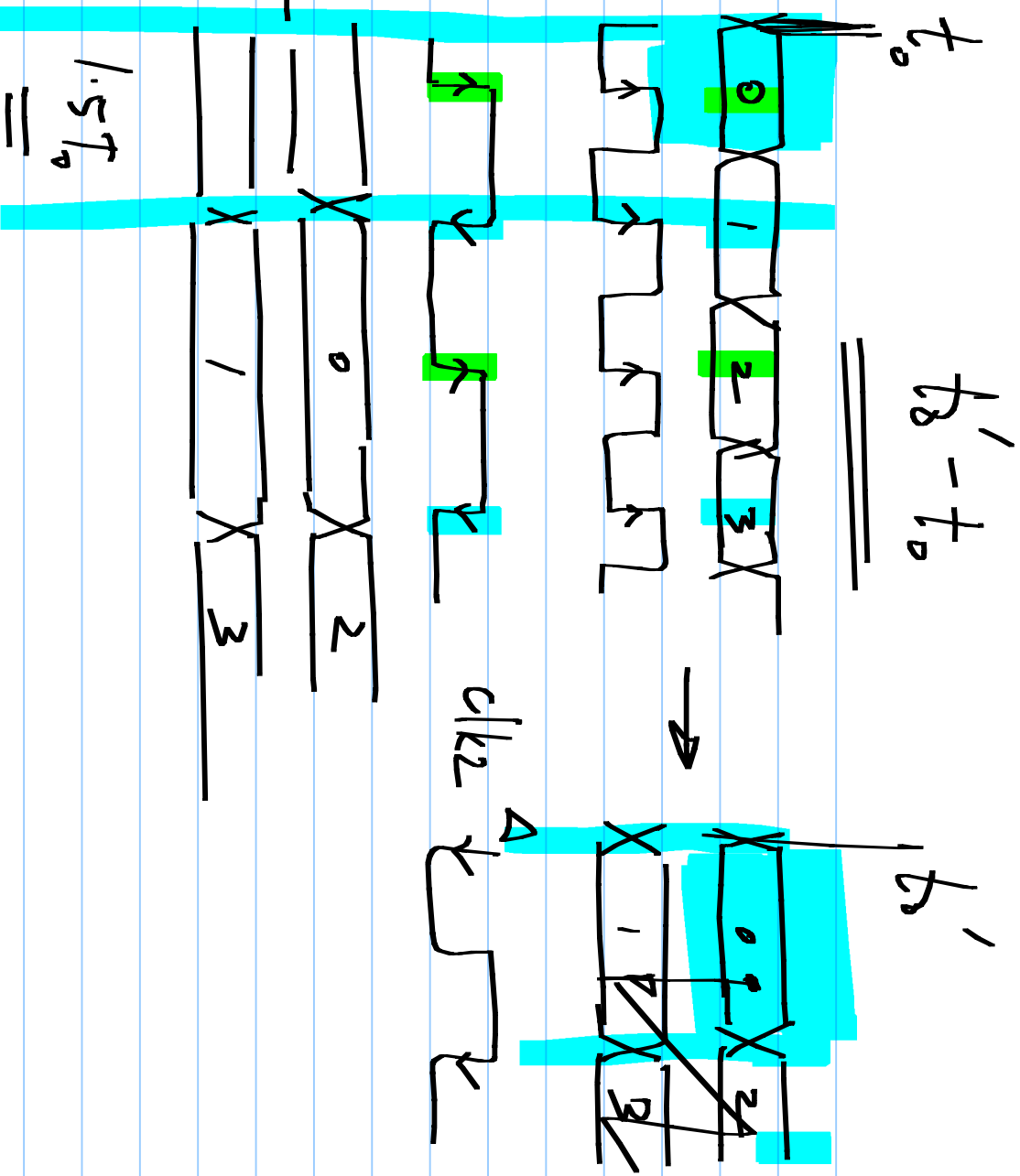
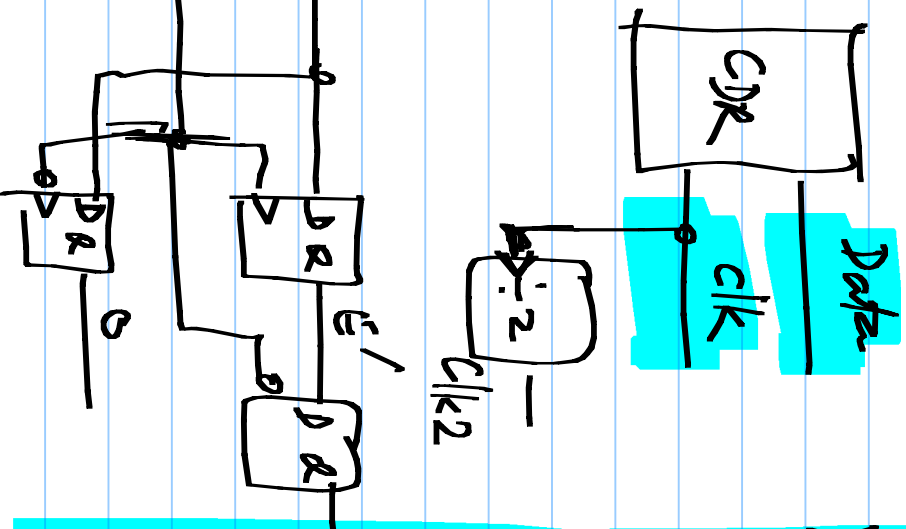


Lecture 28 : Serializer



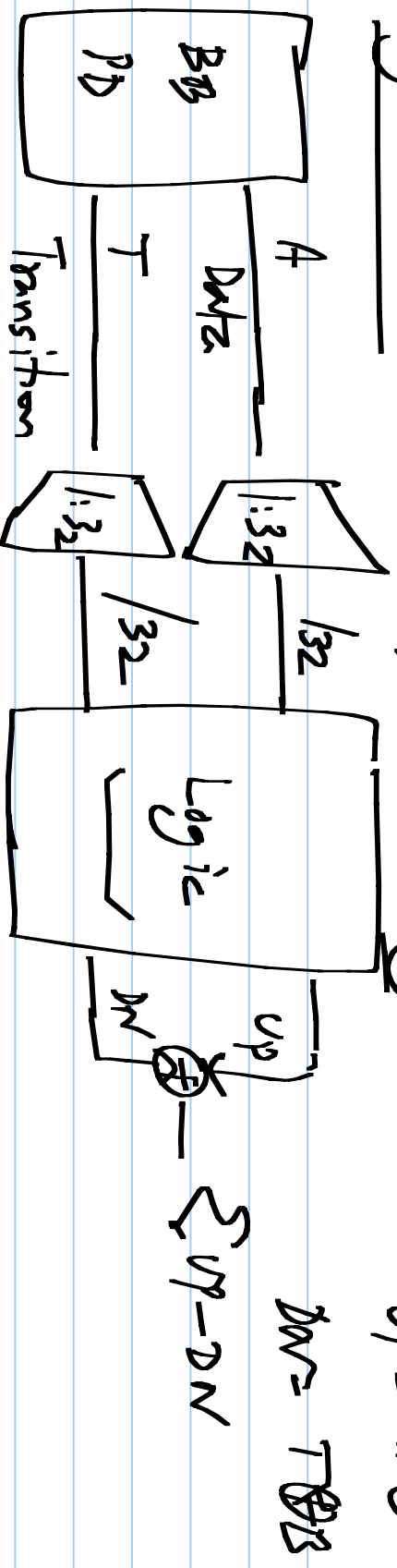
Deserializer



Digital clock

$\swarrow 3/2.5\text{MHz}$ $\textcircled{A} \textcircled{B}$

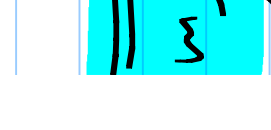
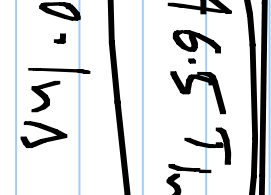
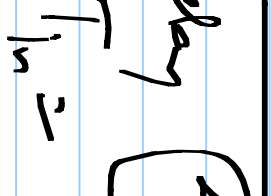
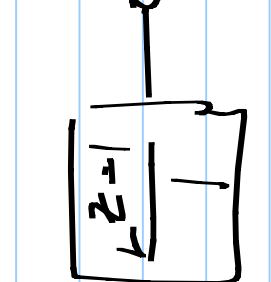
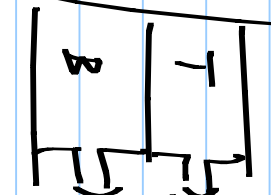
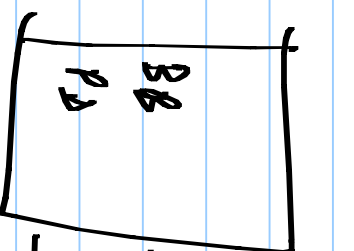
$UP = A \oplus B$



1066/s

delay

3/2.5MHz



$$1.5(T_{in} + 2T_{in} + 4T_{in} + 8T_{in} + 16T_{in})$$

46.5 T_{in}

Delay $T_{in} = 0.1ns$

4.65 μs

$$\cdot \quad () \exp(-j\omega T_1)$$

$$\underbrace{2\pi (10\text{MHz}) 5\text{ns}}_{\text{rad}}$$

$$360 (0.01\text{kHz}) 5\text{ms}$$

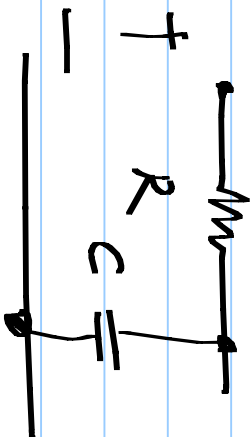
$$= 360 \times 0.05$$

$$\boxed{18^\circ}$$

Digital VDR @ desensitized rate

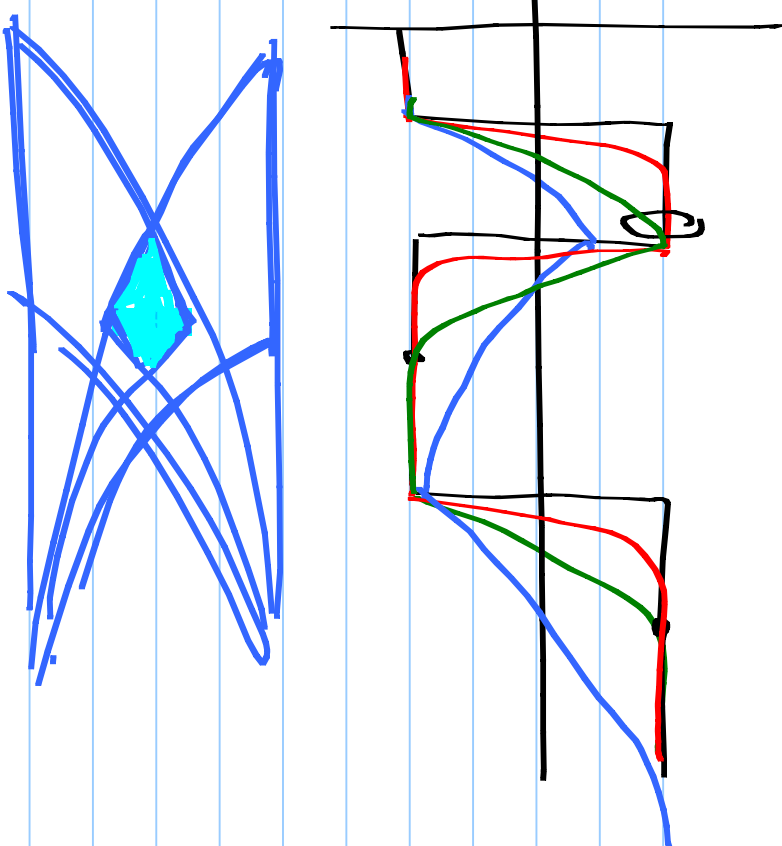
- Delay $\Rightarrow$ Degraded stability

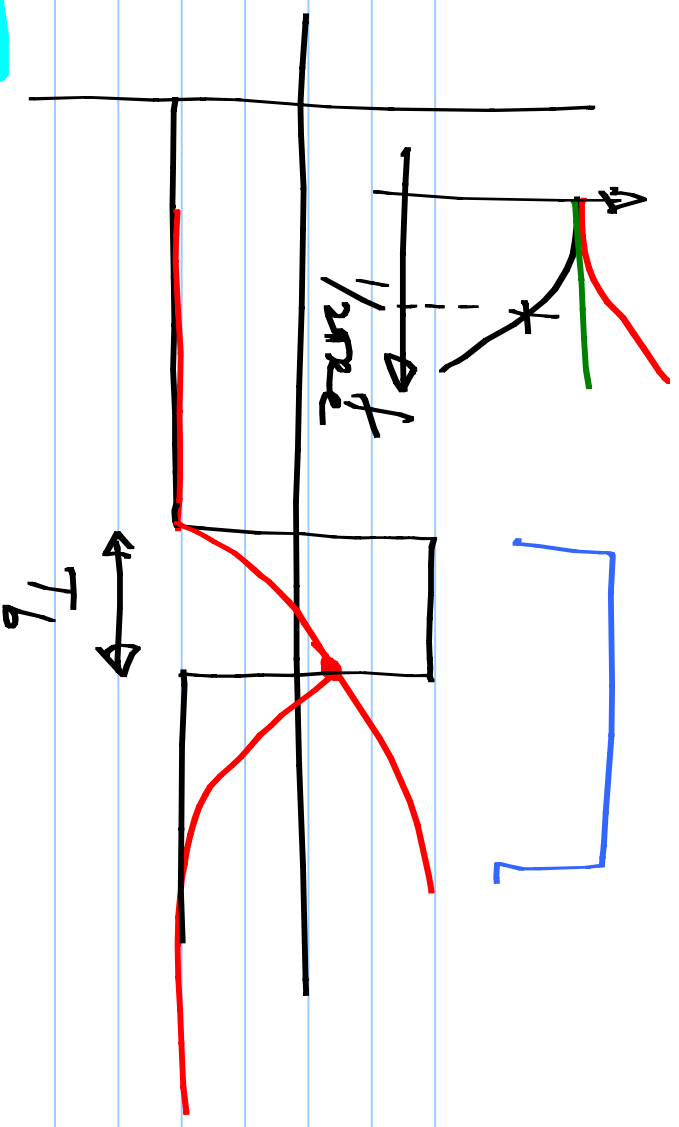
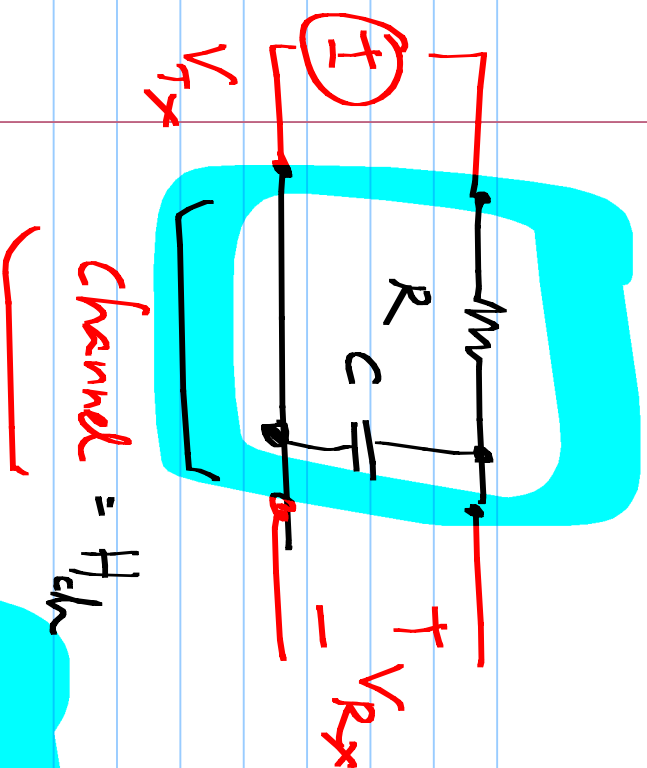
↳ Reduced band width



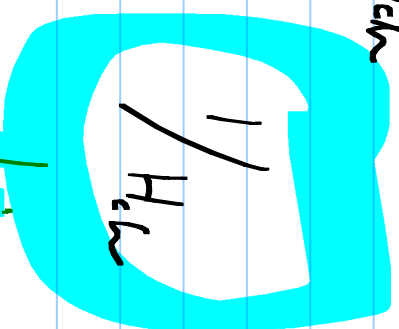
1

$$1 + sCR$$





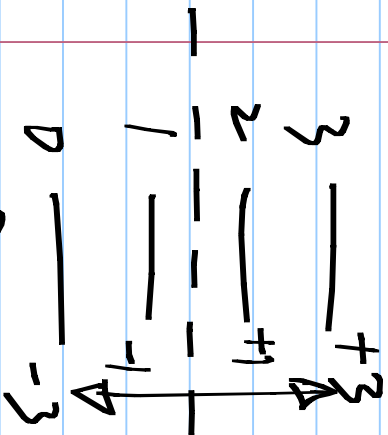
~~X~~ Implement



at the T_x or R_x

derivative

Pulse-amplitude mod - 4

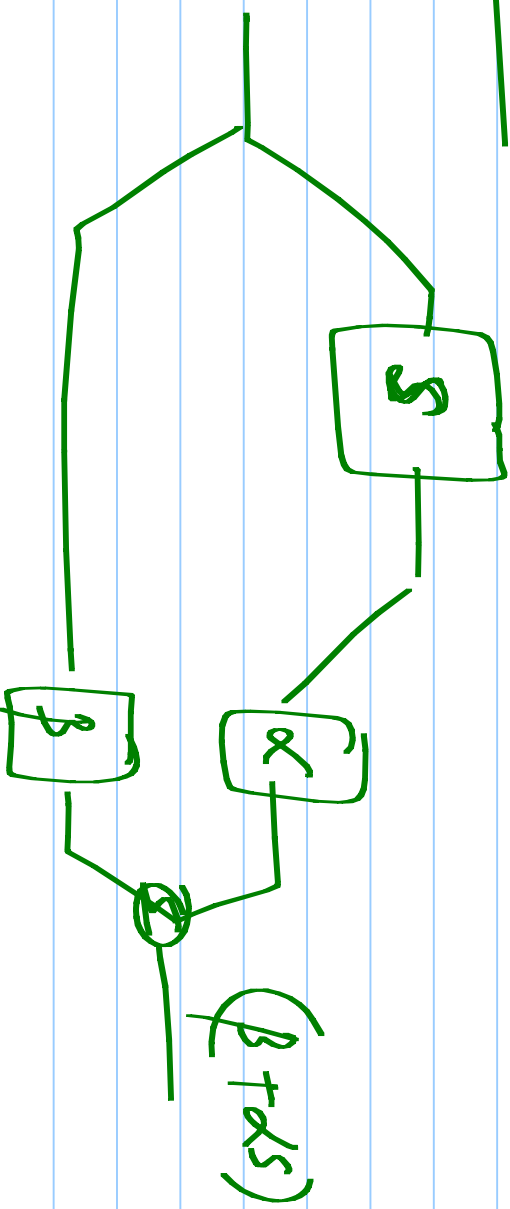


PAM₄

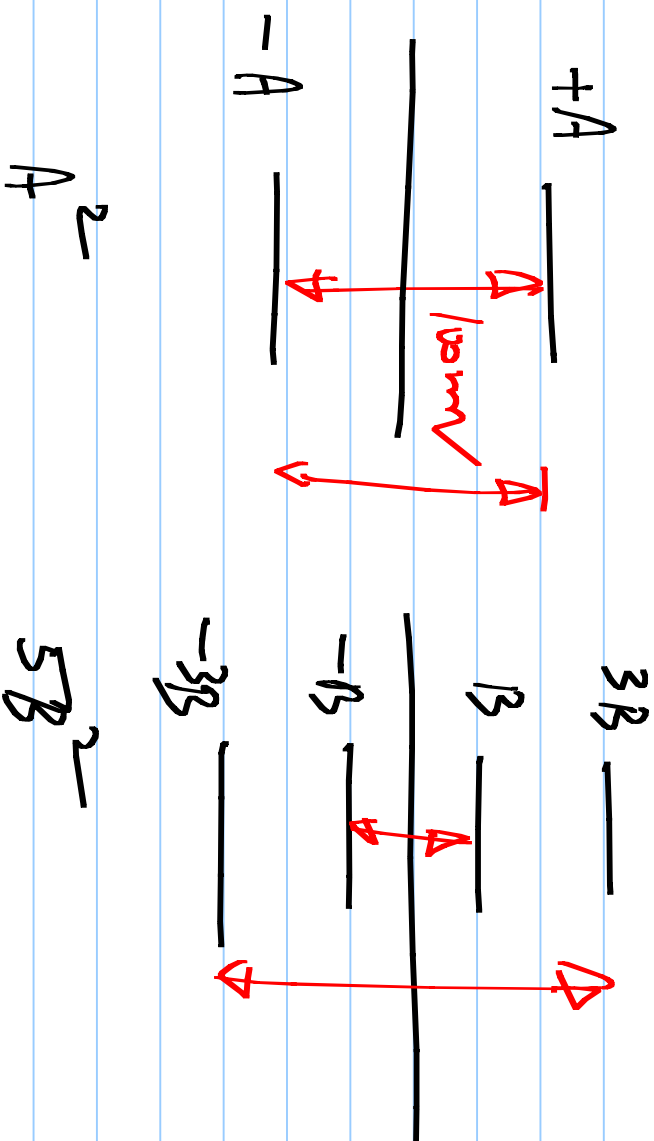
PAM₂

binary signaling @ T_b

4-level signaling @ $2T_b$



$1/T_b$ b/s



$$A^2$$

$$5B^2$$

const. voltage $B = \frac{A}{3}$

$B = \frac{A}{\sqrt{5}}$ const. power