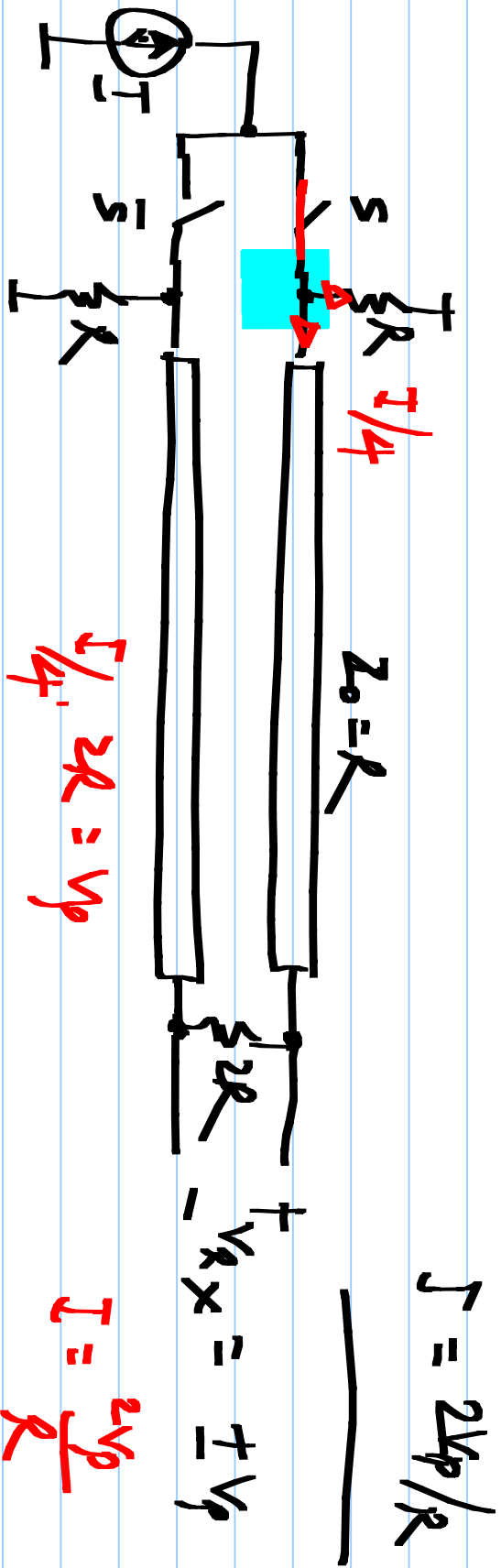
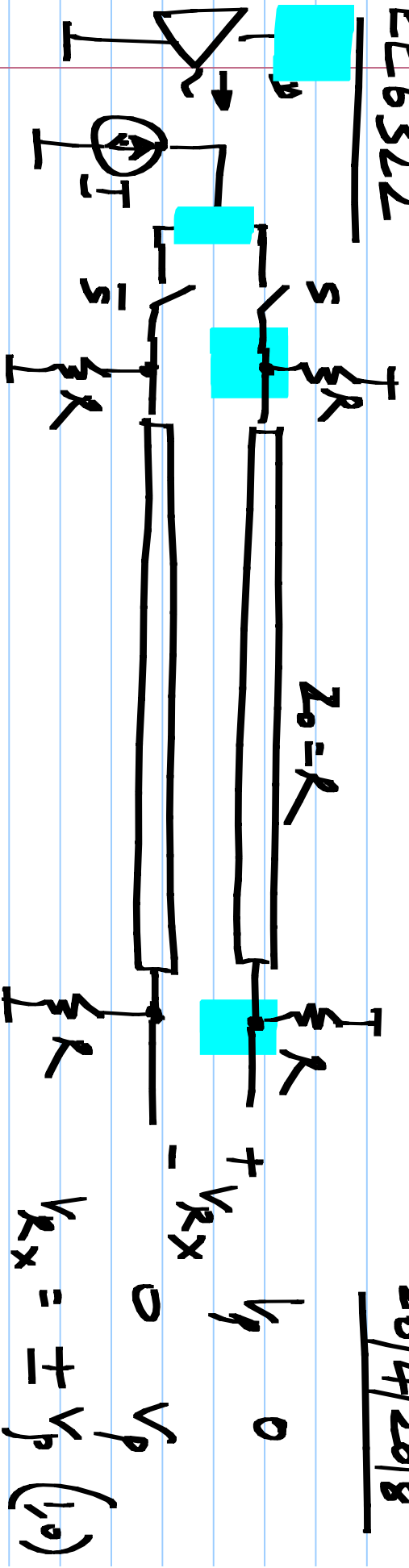
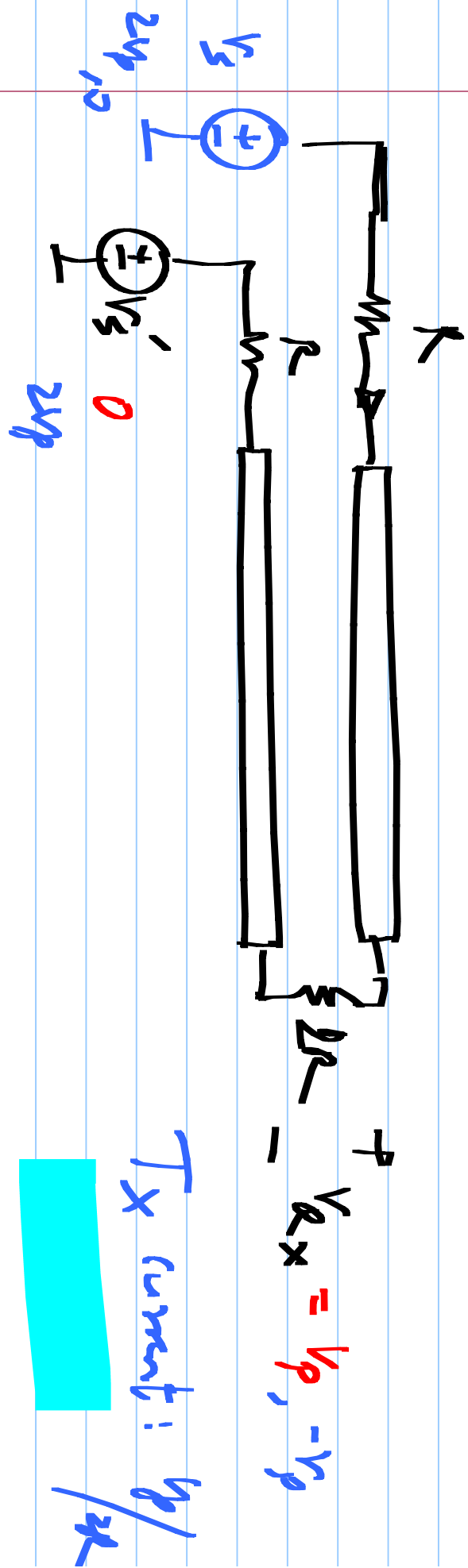
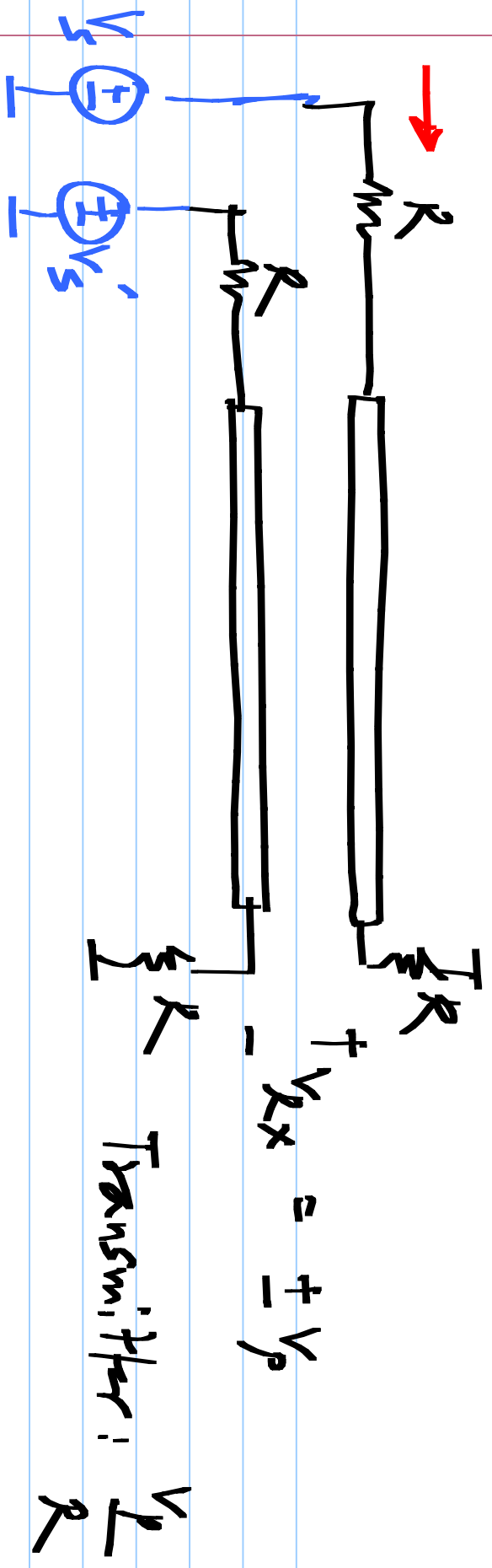


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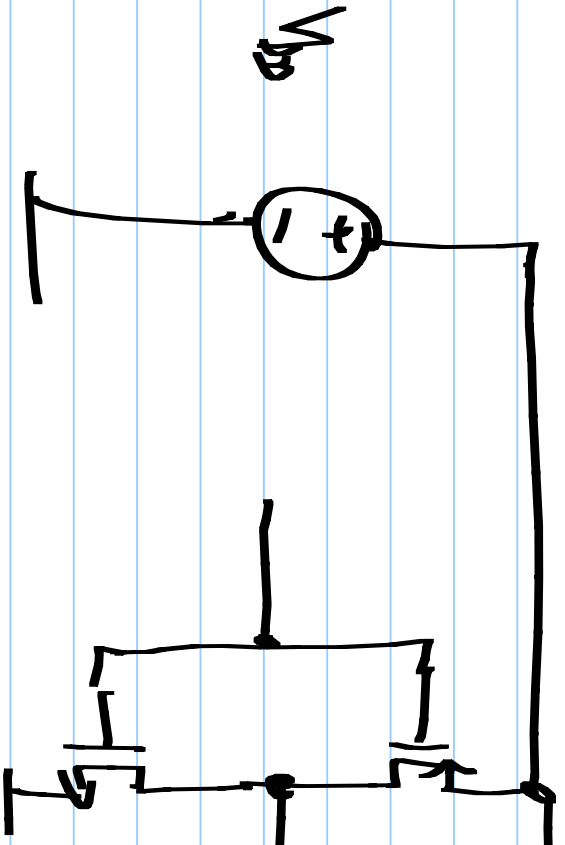


Voltage mode Tx with diff. termination

Tx current (i_{out}) = $\frac{1}{4}$ current with
Current mode Tx

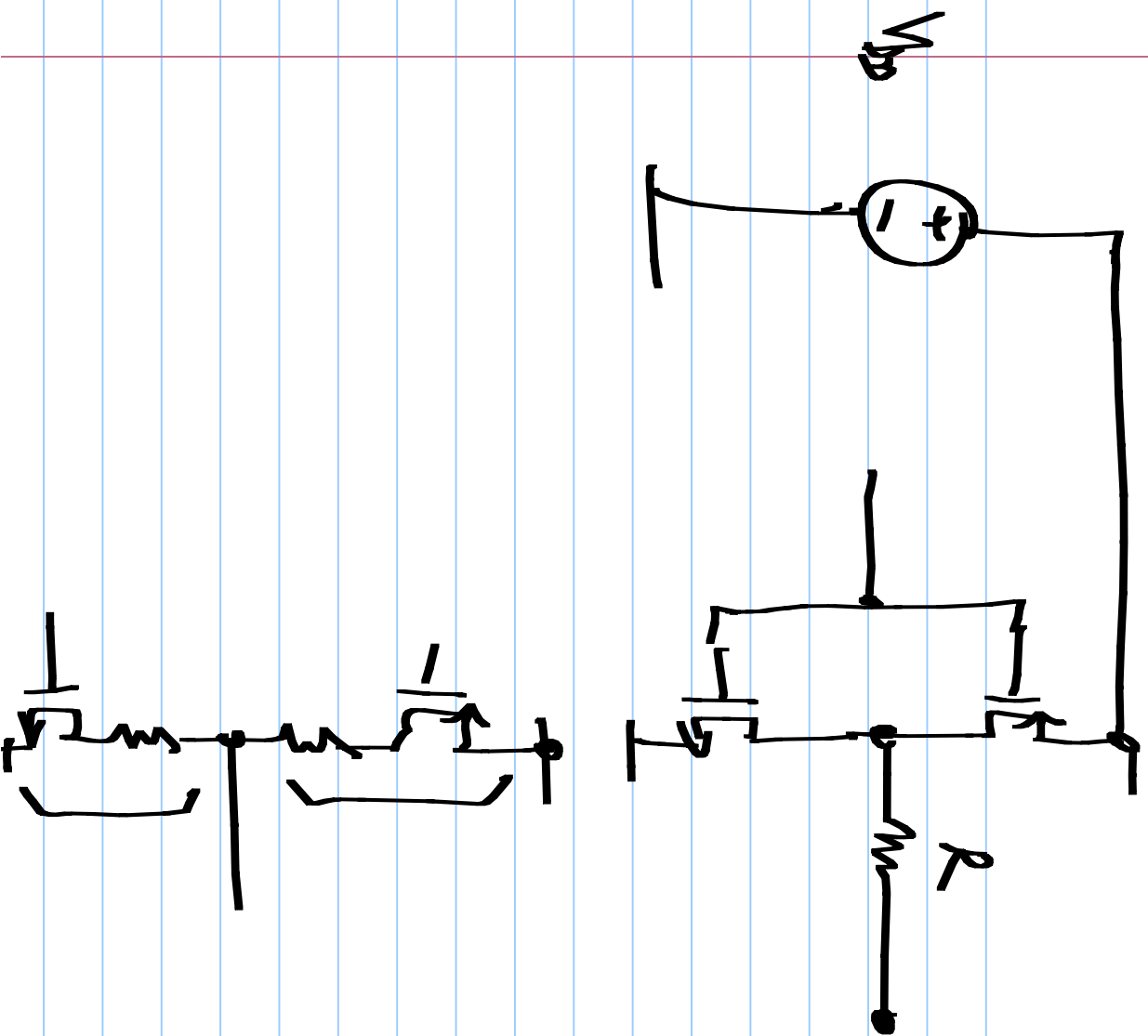
$\sim \frac{1}{2}$ (50% savings)

in practice



(high) (low)
 $R_{pv,p}$ $R_{pv,n}$ } Triode region

PVT dependent

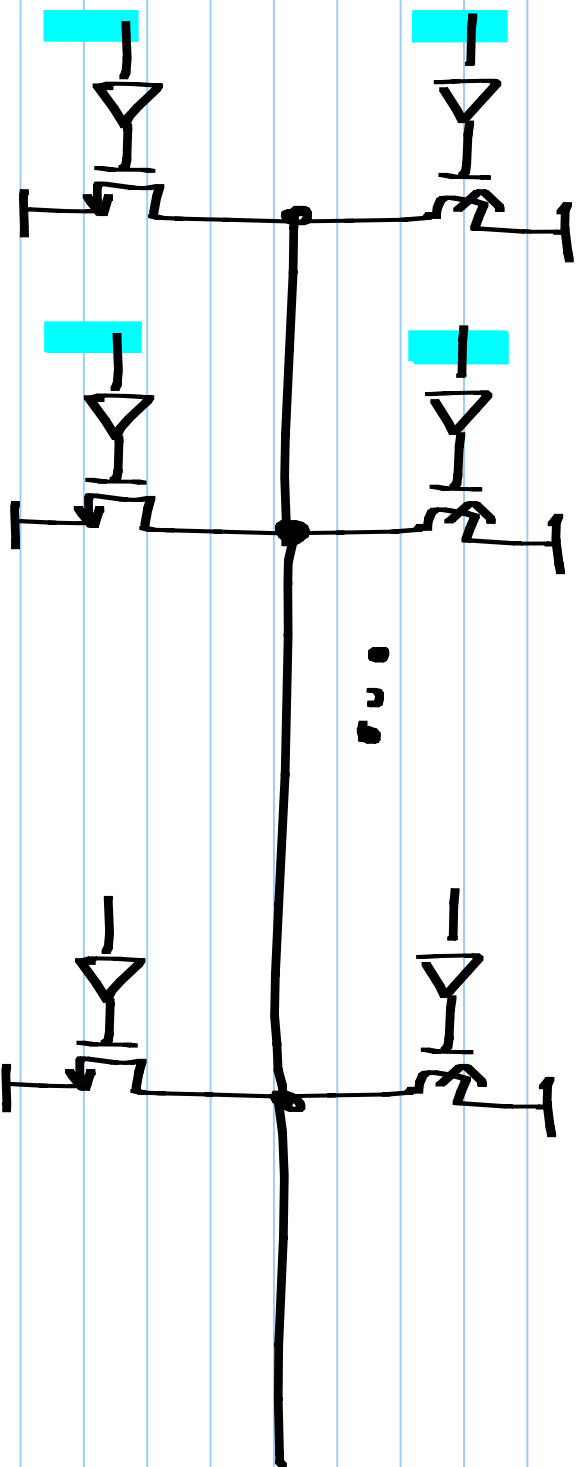


$R_{on}, r_n \ll R$
 Very large devices,
 large parasitic C

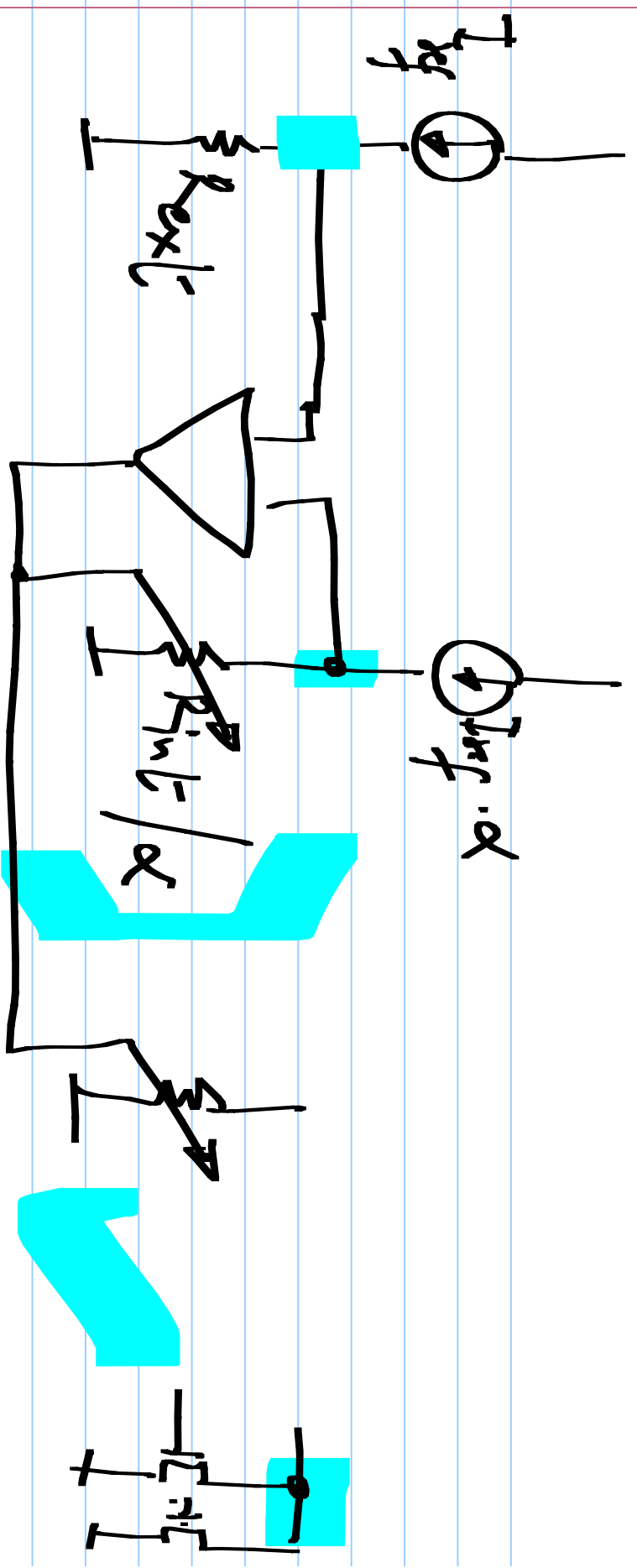
Multiple devices in parallel:

Correct

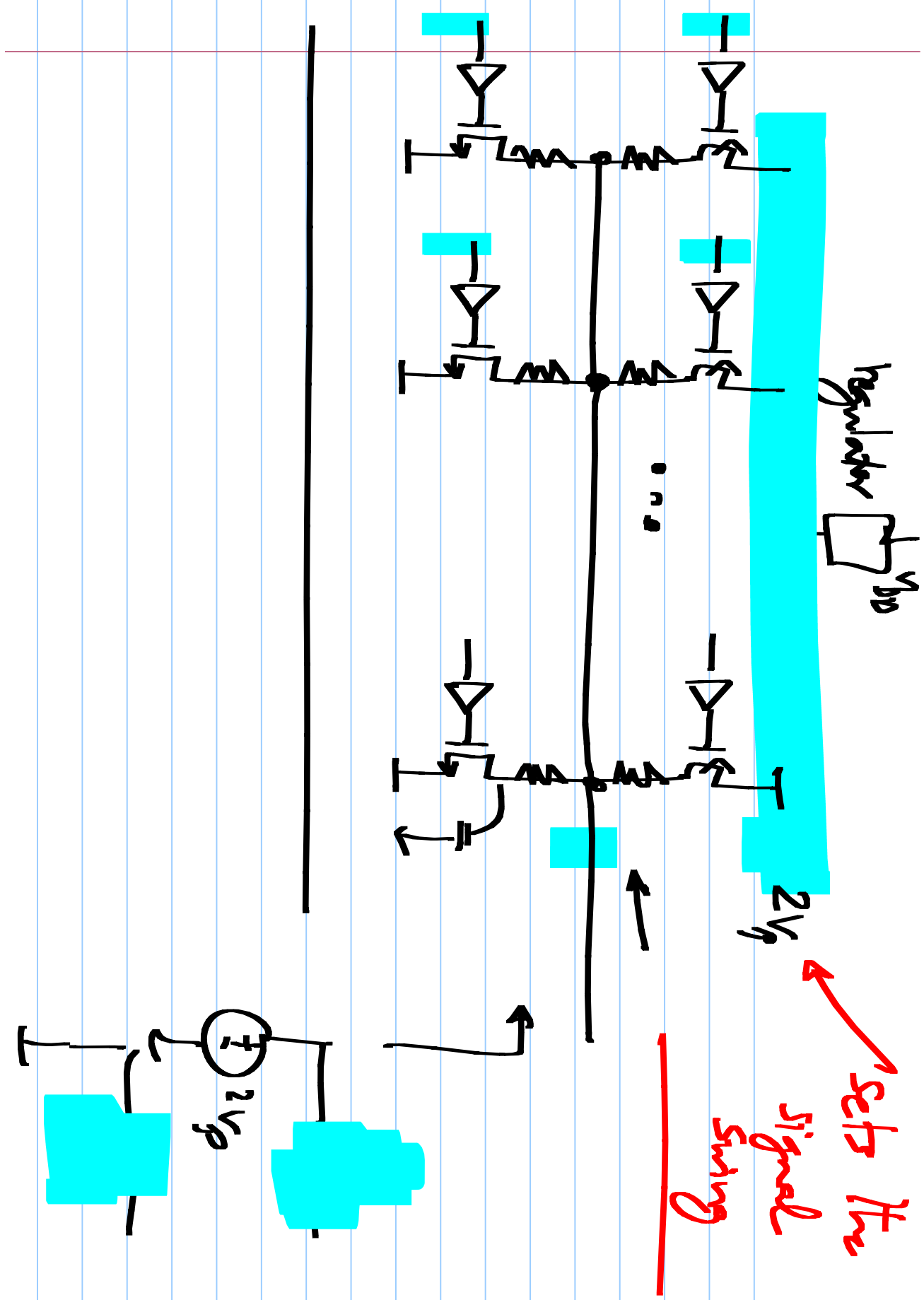
Activate as many as required for λ termination

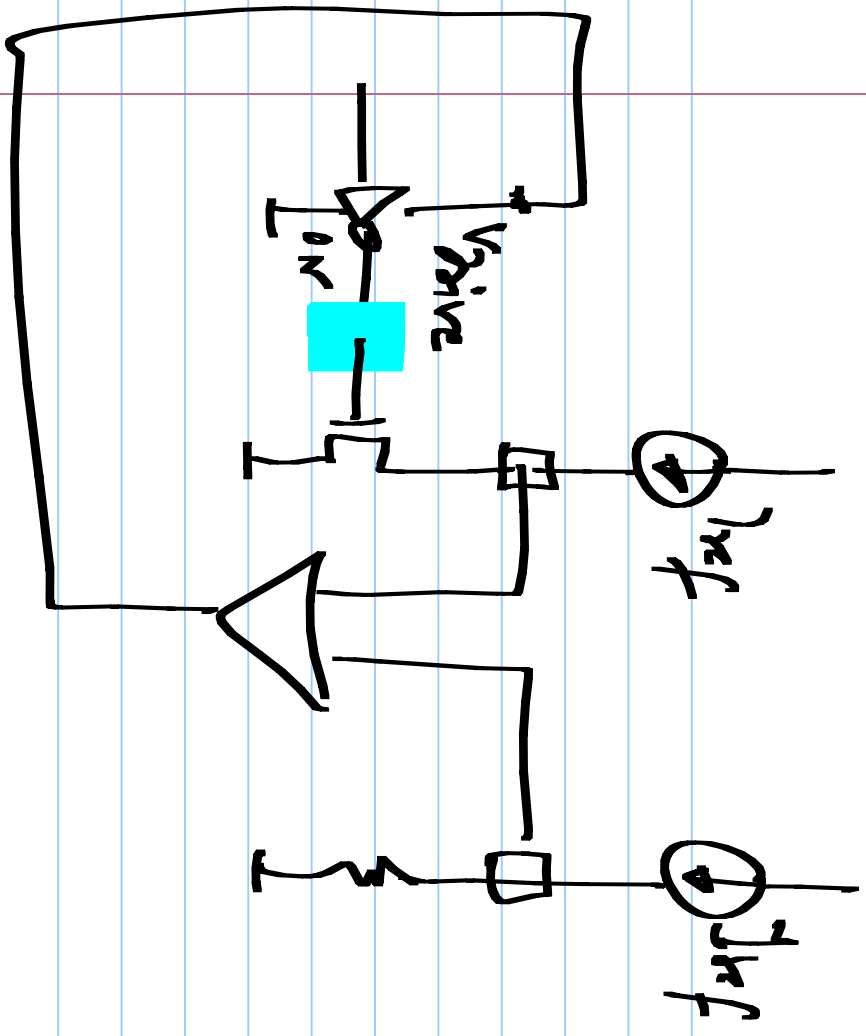


nMOS may be different from # pMOS

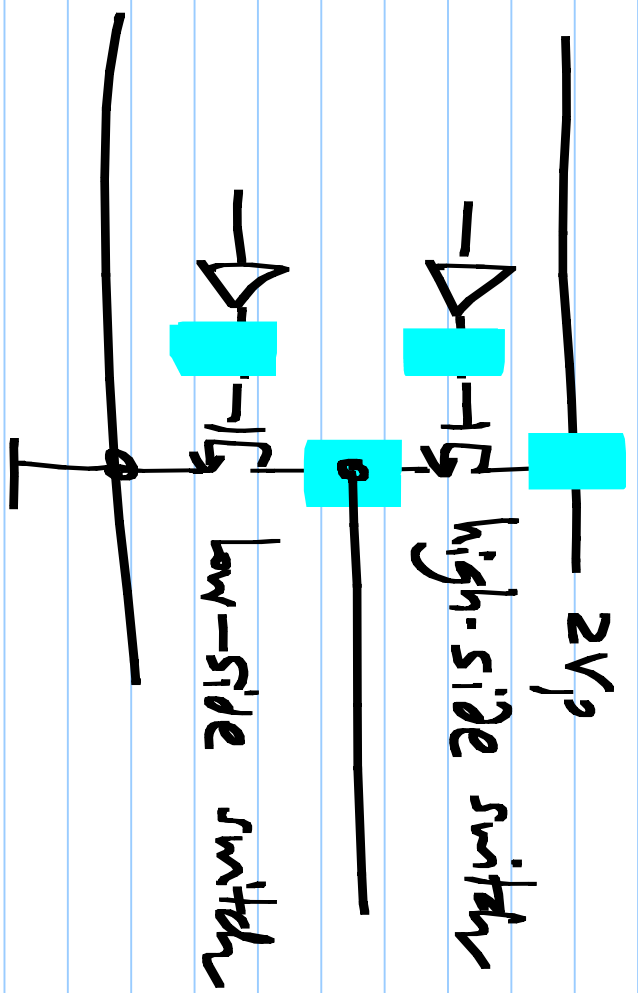


Digitally controlled or
continuously variable





$$2V_p < V_{DD}/2$$



nmos for both high & low side switch

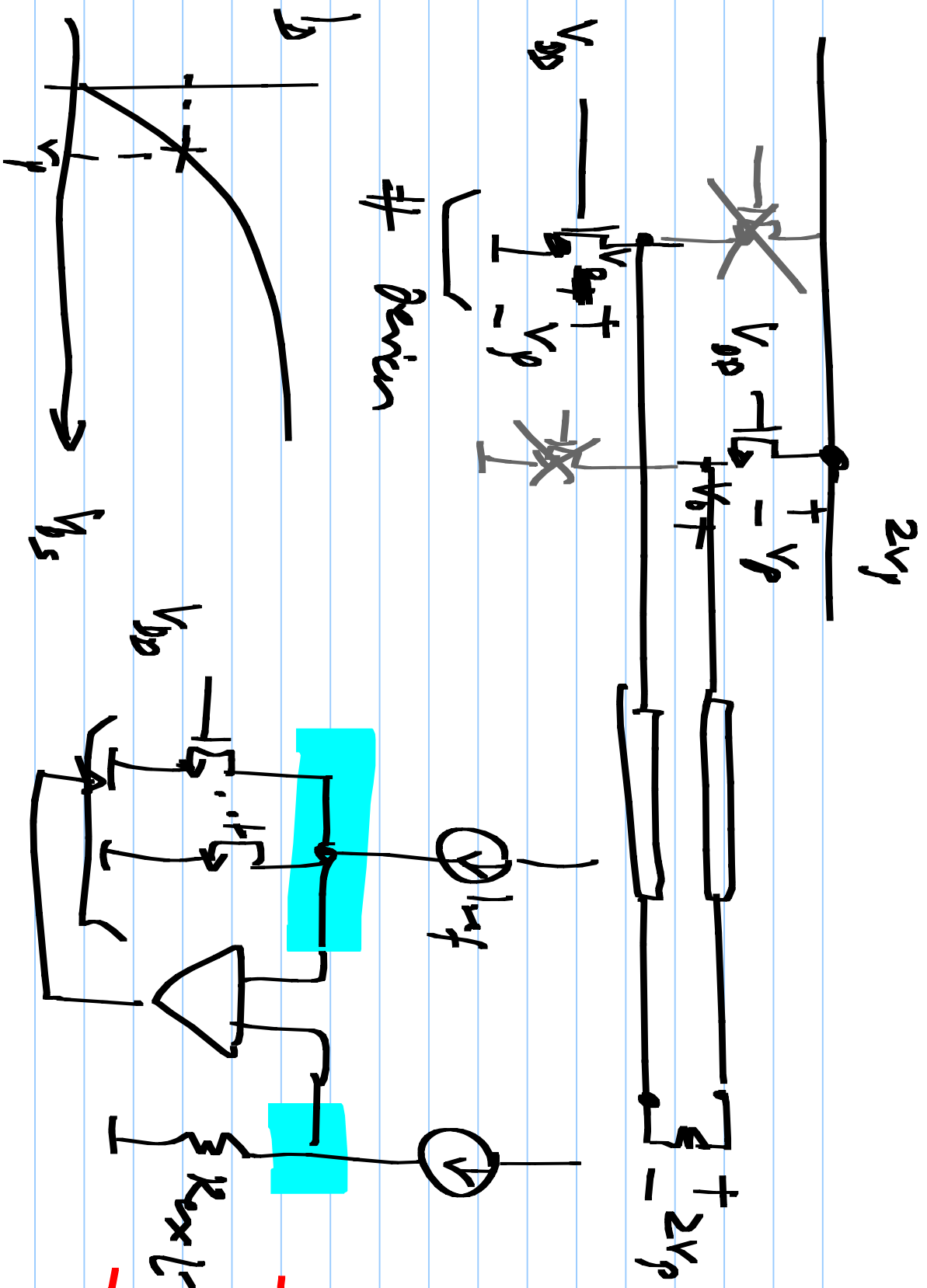
Voltage mode transmitter.

* Control transmit voltage ($2V_p$) and the termination resistance

Transmit voltage \rightarrow Regulator (LDO)

Termination resistance $\left\{ \begin{array}{l} \text{Size (parallel device)} \\ \text{Drainage voltage} \end{array} \right.$

Feedback loops



series

$R_{tail} = V_p$