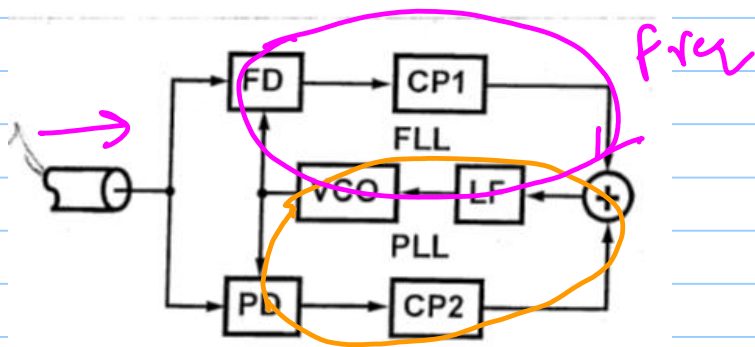


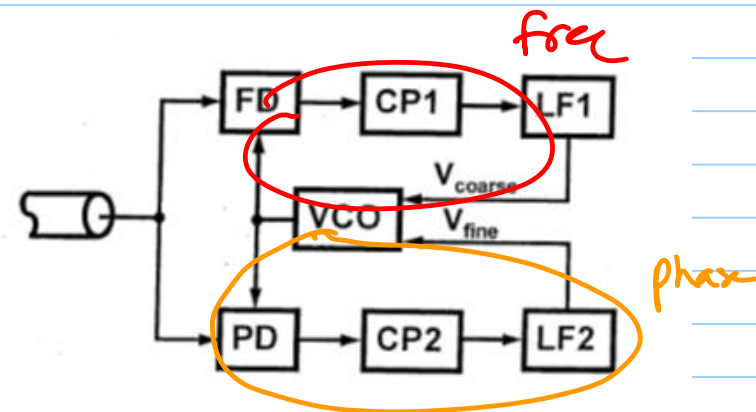
ELE 504 - Lecture 27

Note Title

12/5/2016

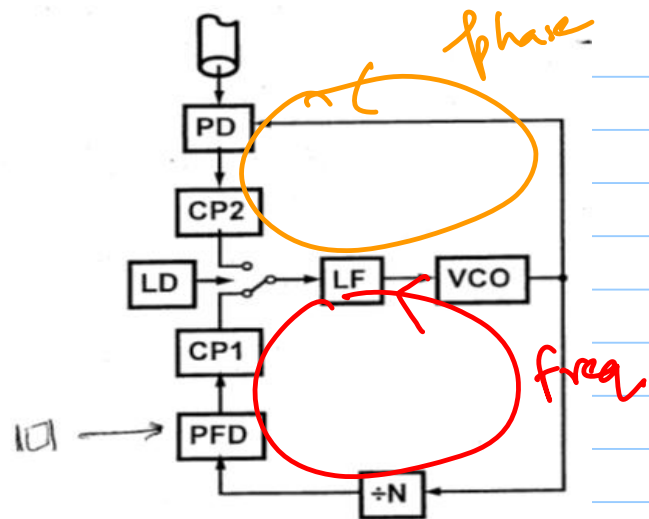


FLL + PLL with Shared Loop-Filter

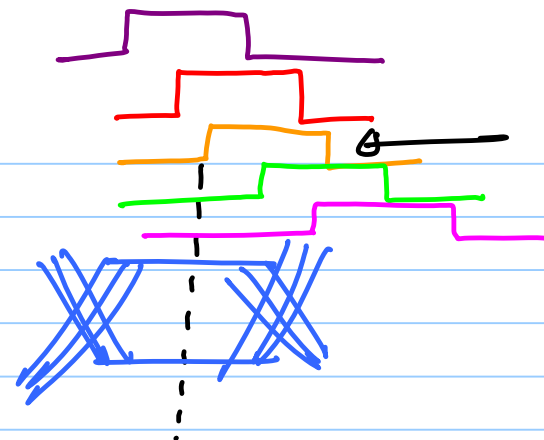
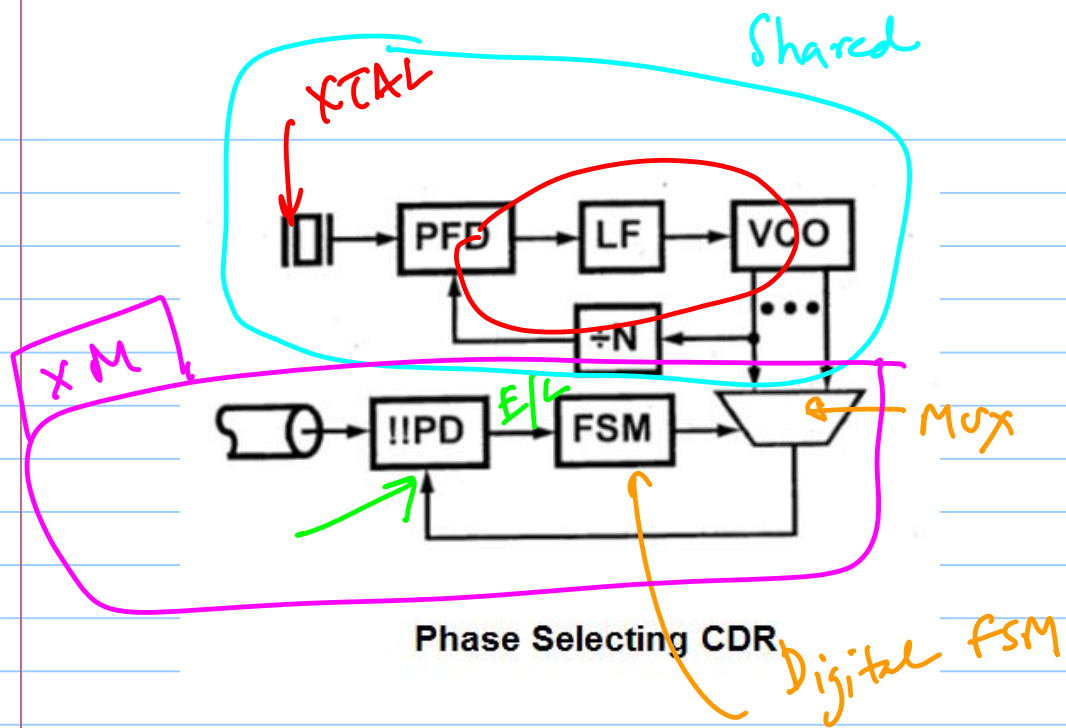


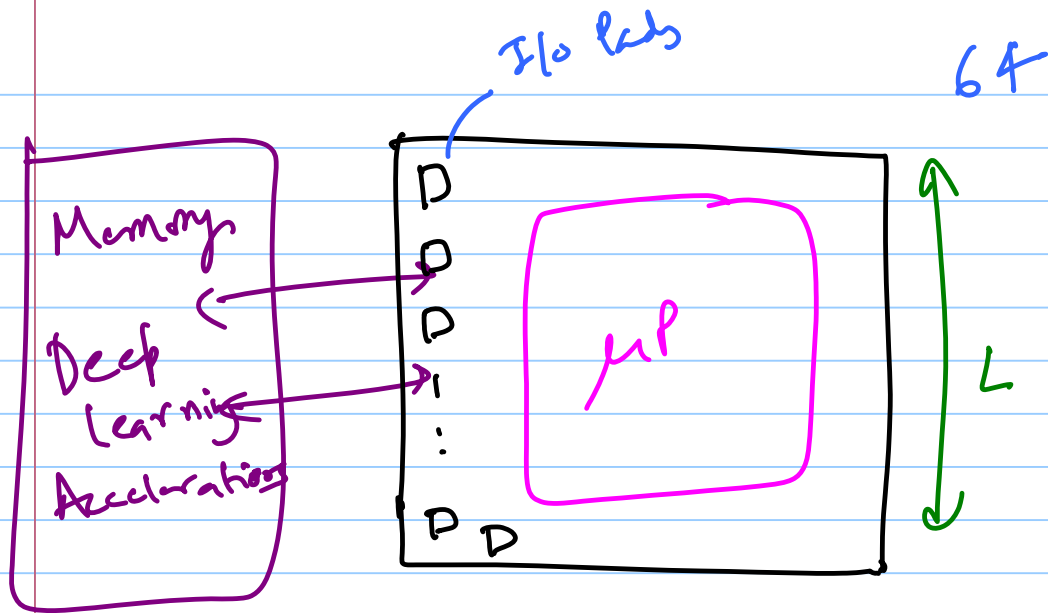
FLL + PLL with Separate Loop-Filter

split-tuned



CDR with Lock Detector



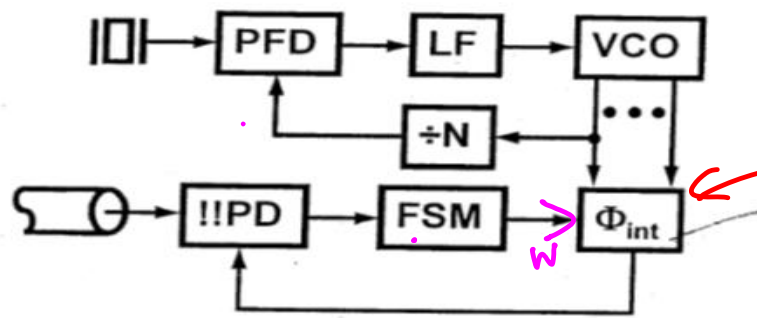


Escape BW Density
 Gb/s/cm

$$\frac{50 \text{ pads} \times 10 \text{ Gbps}}{100 \mu\text{m} \times 50}$$

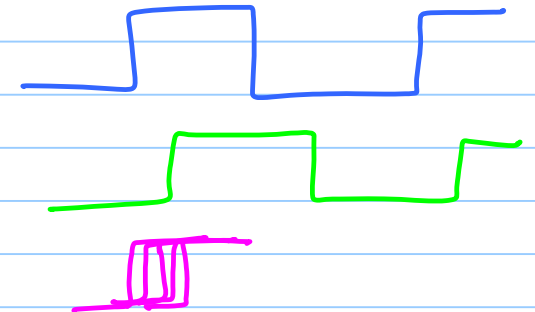
$$= 100 \text{ Gb/s/cm}$$

$$> 10 \text{ Tb/s/cm}$$

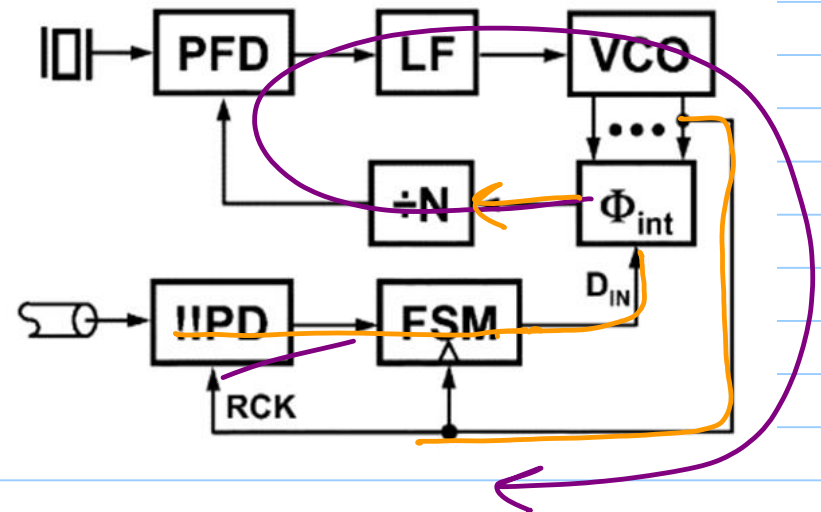
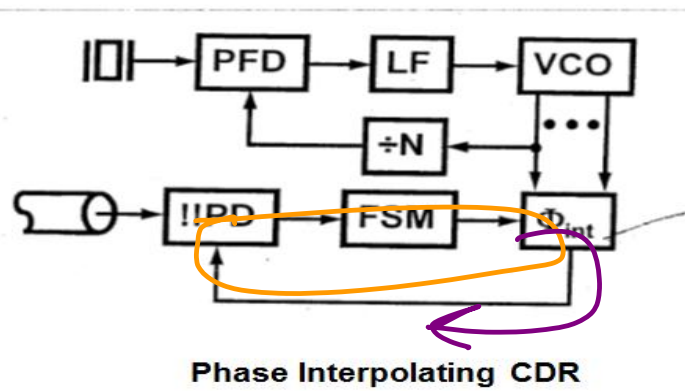


Phase Interpolating CDR

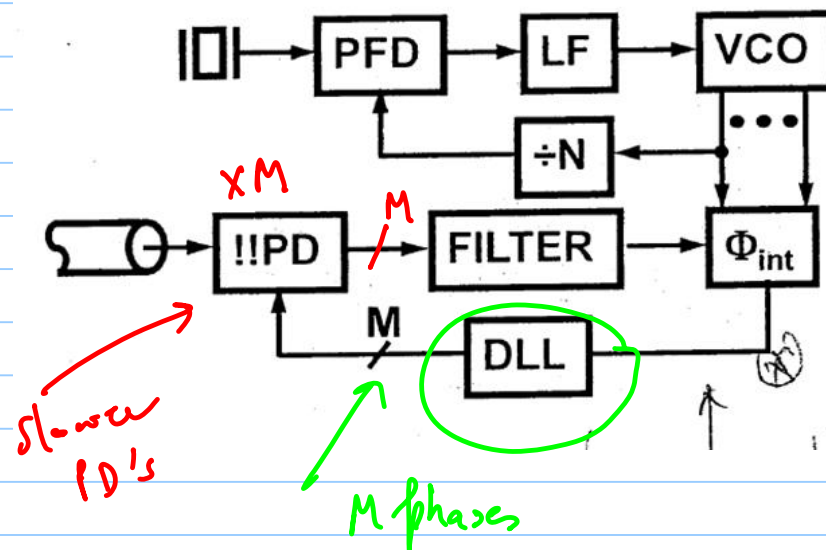
← phase interpolator.



Phase Averaging Type CDR



Multirate CDR



$$PFD \Rightarrow K_{PD} \Rightarrow \frac{V_{DD}}{2R}$$

$$\text{Hogge PD} \Rightarrow \frac{TD}{\pi} \rightsquigarrow \text{Transition density}$$

