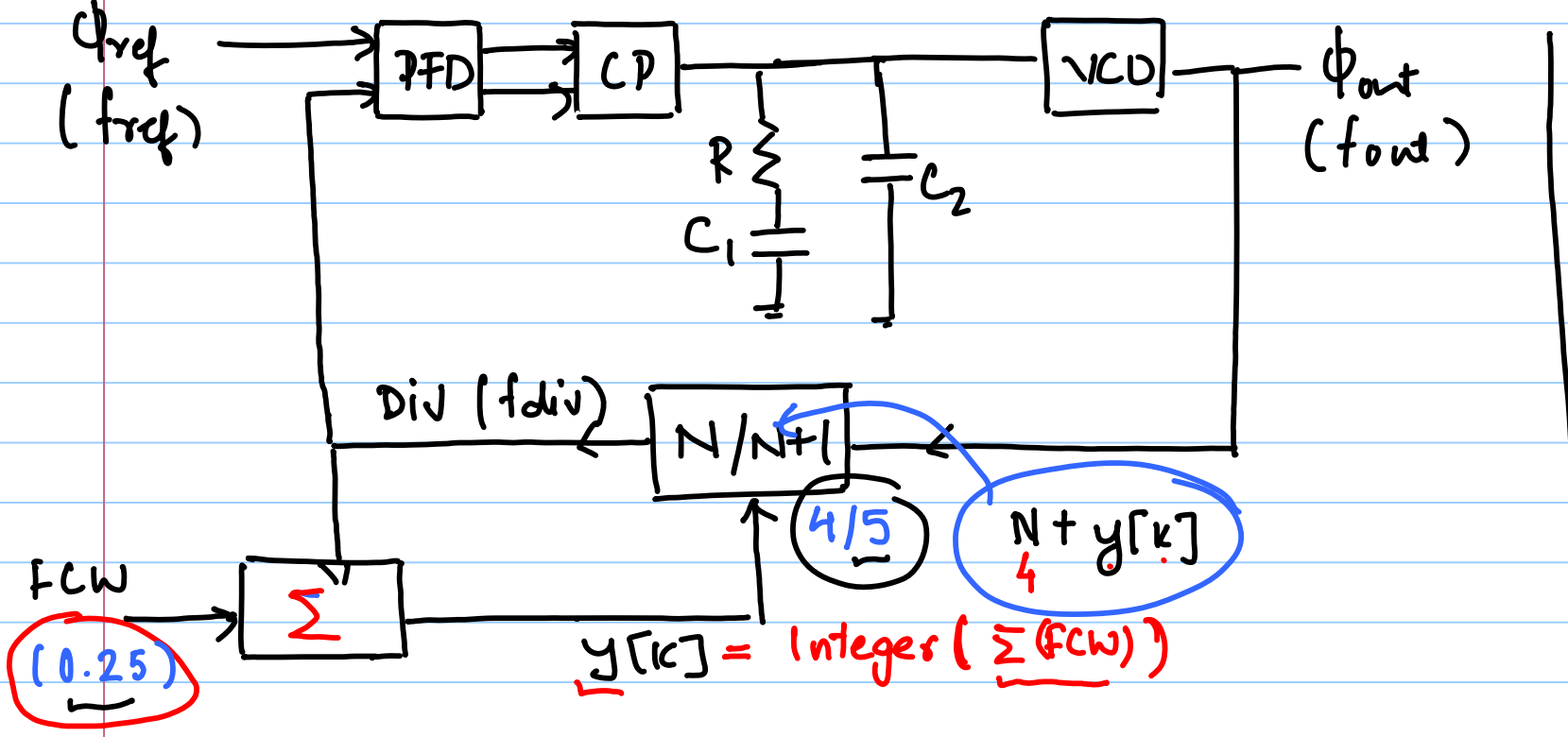
Lecture # 46

Note Title 11-12-2020

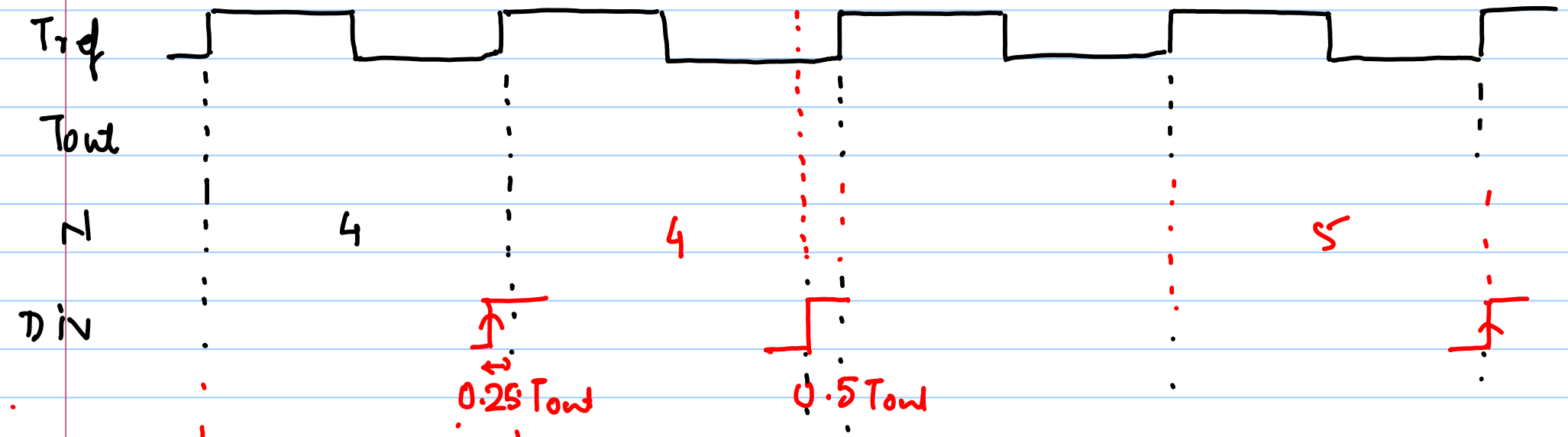


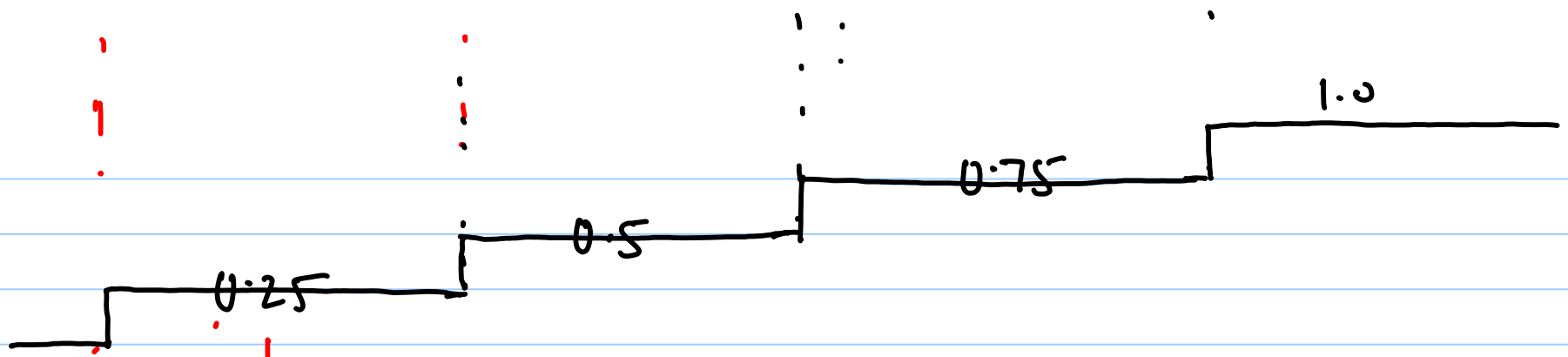
$f_{out} = \frac{4.25}{} f_{ref}$.

$T_{ref} = \frac{4.25}{1} T_{out}$

$= \frac{17}{4} T_{out}$

$4 T_{ref} = 17 T_{out}$.





FCW = 8-bit number

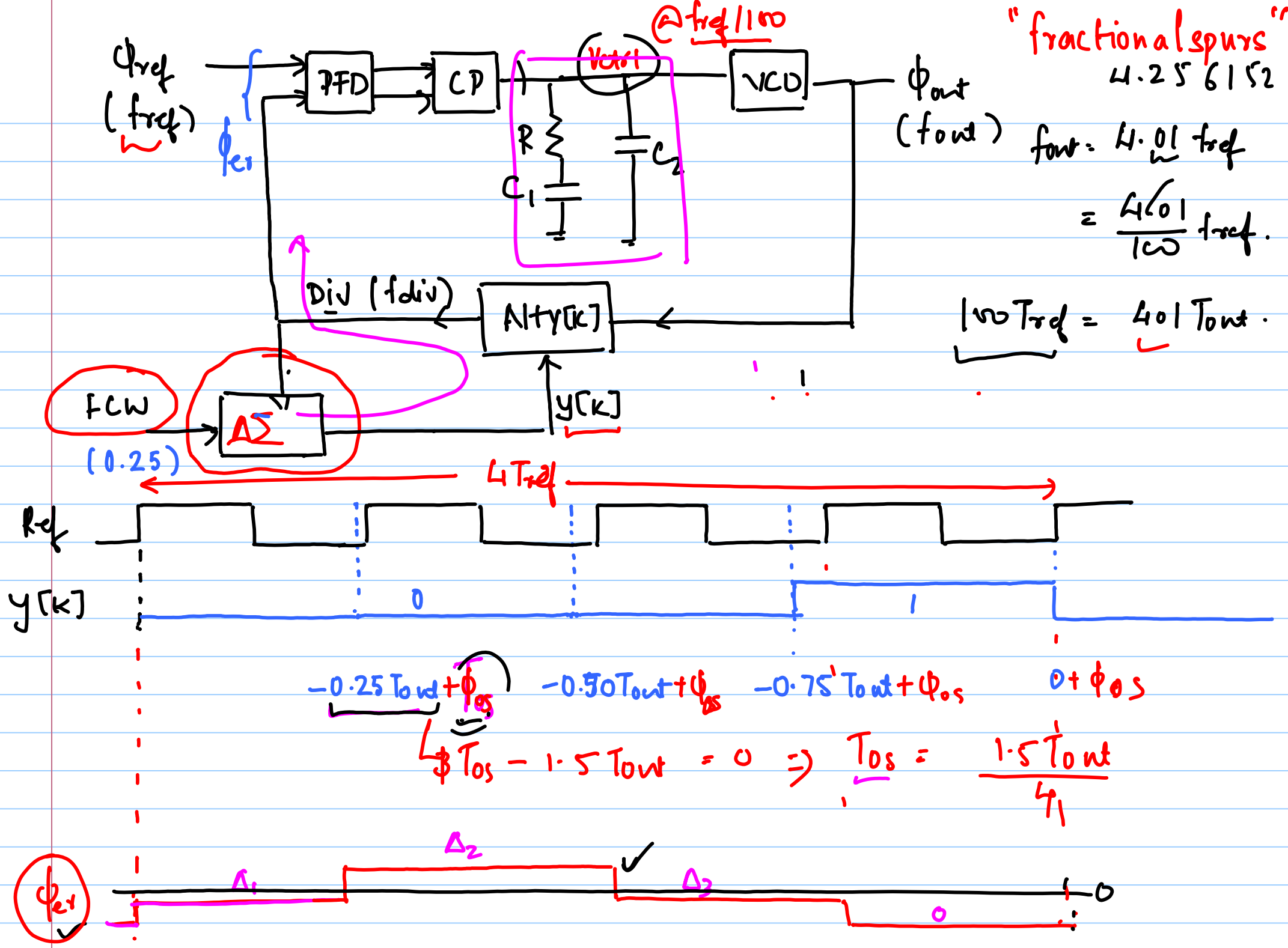
. 0 1 0 . . . 0 = 0100 0000

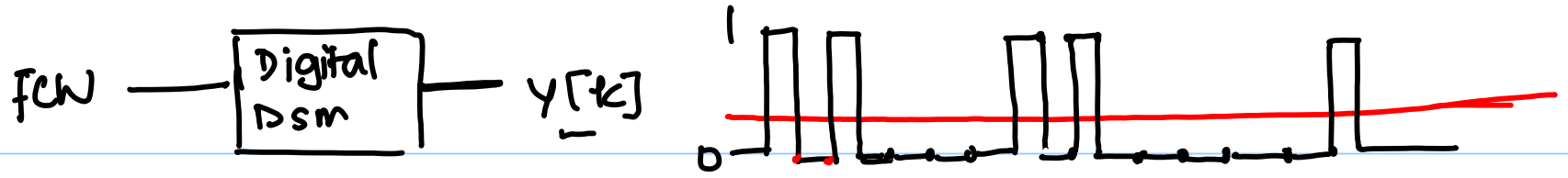
2^{-1} 2^{-2} 2^{-3} 2^{-8}

$y[k] = \sum fcw$

0100 0000 $\xrightarrow{\Sigma}$

0 0100 0000
0 1000 0000
0 1100 0000
0 1100 0000
0 0100 0000


@freq/100
"fractional spurs"
4.256152
ϕ_{ref} (freq)
PFD
CP
Vctrl
VCO
ϕ_{out} (fout)
ϕ_{e1}
R
C_1
C_2
Div (fdiv)
Alty[k]
y[k]
FCW
(0.25)
ΔΣ
fout = 4.01 fref
= 401/100 fref.
100 Tref = 401 Tout.
4 Tref
Ref
y[k]
0
1
$-0.25\,T_{out}+\phi_{os}$
$-0.50\,T_{out}+\phi_{os}$
$-0.75\,T_{out}+\phi_{os}$
$0+\phi_{os}$
$\phi_{os} - 1.5\,T_{out} = 0 \Rightarrow T_{os} = \frac{1.5\,T_{out}}{4_1}$
ϕ_{e1}
Δ_1
Δ_2
Δ_2
0



avg.(FCW)

Analog fractional-N PLL.

Michael Perrott

A Modelling Approach for Σ-Δ fractional-N frequency Synthesizers Allowing Straightforward Noise Analysis