EQUATIONS

$x[n] = x(t) \quad where \quad t = nT \quad \text{for } 0 \le n \le N-1$ $\qquad Fs \ge 2f_h$

$T = 1/Fs \qquad \Delta f = Fs/N \qquad f = k\Delta f$ $\qquad 6dB/bit$

$X[k] = \sum_{n=0}^{N-1} x[n] \cdot e^{-j\frac{2\pi}{N}kn} \quad \text{for } 0 \le k \le N-1$ $\qquad h[n] * x[n] = \sum_{v=0}^{N_h+N_x-2} h[v]x[v-n]$

Smear if $|\Phi_1 - \Phi_2| < ML/2$ $\qquad$ **SLL** $> |20\log10(A_1/A_2)|$ where $|\Phi_1 - \Phi_2|$

$$H(z) = \sum_{n=-\infty}^{\infty} h[n]z^{-n} \qquad x[n] = \frac{1}{2\pi j}\oint X(z)\cdot z^{n-1}dz$$

$$w' = \frac{2}{T}\tan\left(\frac{\theta}{2}\right) \qquad \theta = 2\tan^{-1}\left(\frac{T}{2}\cdot w'\right)$$

$$s = \frac{2}{T}\left(\frac{1-z^{-1}}{1+z^{-1}}\right) \qquad z = -\left(\frac{s+\frac{2}{T}}{s-\frac{2}{T}}\right)$$

$$R = \frac{ct}{2} \qquad \Delta R = \frac{c\tau}{2} \qquad PRI = \frac{1}{PRF} \qquad R_{\max\ unamb} = \frac{c(PRI)}{2}$$

$$\sin\theta = \frac{a}{d} = 2k\frac{f_c}{F_s} \qquad f = f_o + \frac{2v}{\lambda_o}\cos(\theta)$$

$$Beams[k,n] = X_1[n] + X_2[n+k] + X_3[n+2*k] + X_4[n+3*k]$$

$$r = \sqrt{x^2+y^2} \qquad \theta = arctan(y/x)$$

$$P[x,y] = (1-\beta)\left[(1-\alpha)B[\theta,r] + \alpha B[\theta+1,r]\right] + \beta\left[(1-\alpha)B[\theta,r+1] + \alpha B[\theta+1,r+1]\right]$$

$\beta = (r_p - r)/\Delta r \qquad \alpha = (\theta_p - \theta)/\Delta\theta$

$$y[n] = x[n] - \frac{\sum_{n=1}^{N} x[n]}{N} \qquad y[n] = (1-a)\cdot x[n] + a\cdot y[n-1] \qquad R[n] = \sum_{m=0}^{N-m-1} x^*[m]t[n+m]$$