

Anti-Image Postfilter (6B)

-
-

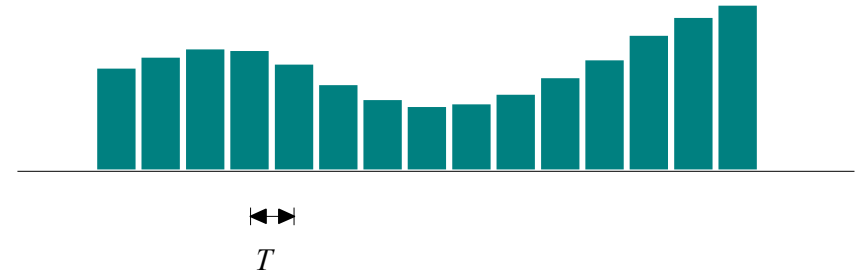
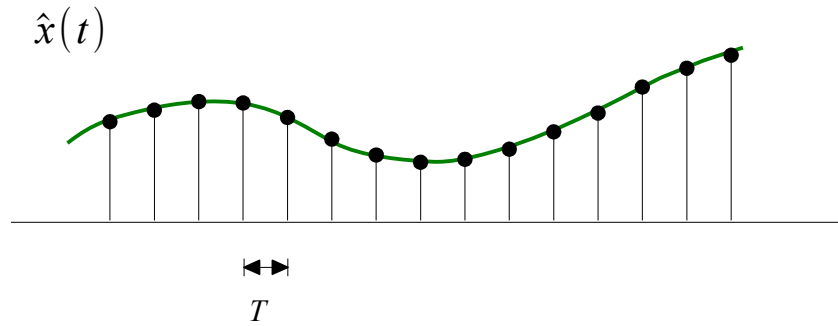
Copyright (c) 2012 Young W. Lim.

Permission is granted to copy, distribute and/or modify this document under the terms of the GNU Free Documentation License, Version 1.2 or any later version published by the Free Software Foundation; with no Invariant Sections, no Front-Cover Texts, and no Back-Cover Texts. A copy of the license is included in the section entitled "GNU Free Documentation License".

Please send corrections (or suggestions) to youngwlim@hotmail.com.

This document was produced by using OpenOffice and Octave.

Analog Reconstructor



$$\hat{y}(t) = \sum_{n=-\infty}^{+\infty} y(nT) \delta(t-nT)$$

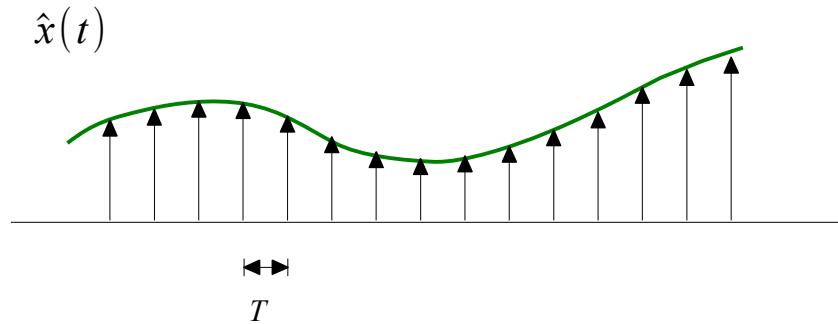
$$Y_a(f) = H(f) \hat{Y}(f)$$

$$y_a(t) = \int_{-\infty}^{+\infty} h(t-t') \hat{y}(t') dt'$$

$$\hat{Y}_a(f) = \frac{1}{T} \sum_{m=-\infty}^{+\infty} Y(f - m f_s)$$

$$y_a(t) = \sum_{n=-\infty}^{+\infty} y(nT) h(t-nT)$$

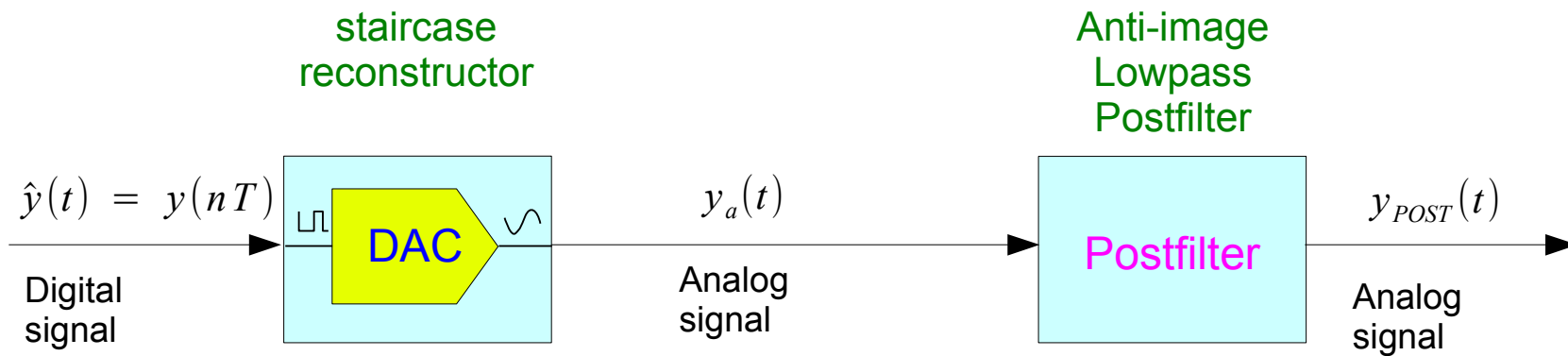
Impulse Response of Ideal Reconstructor



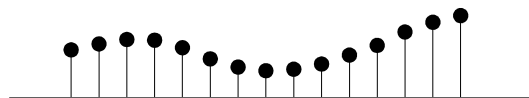
$$\hat{Y}(f) = \frac{1}{T} Y(f) \quad -\frac{f_s}{2} \leq f \leq +\frac{f_s}{2}$$

$$y(t) = \sum_{n=-\infty}^{+\infty} y(nT) h(t-nT)$$

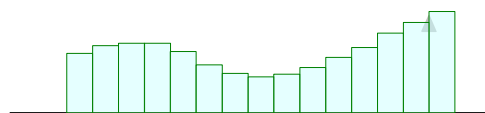
$$h(t) = \frac{\sin(\pi t/T)}{\pi t/T} = \frac{\sin(\pi f_s t)}{\pi f_s t}$$



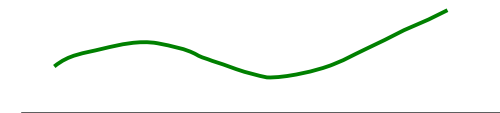
$$\hat{y}(t) = y(nT)$$

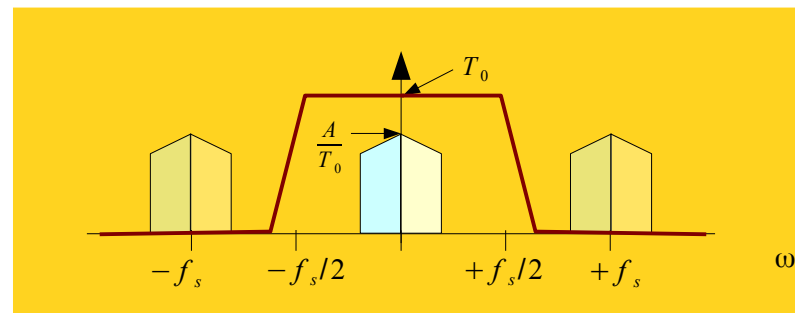
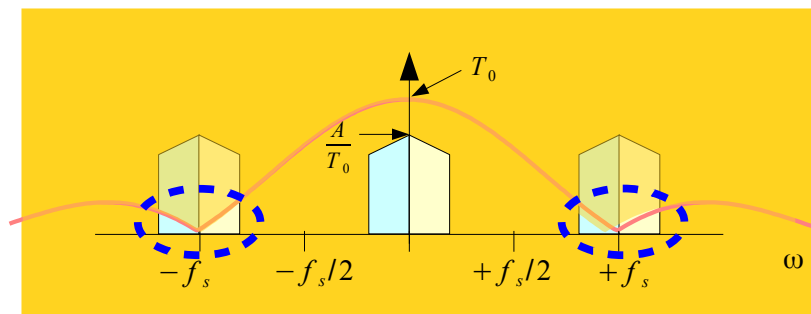
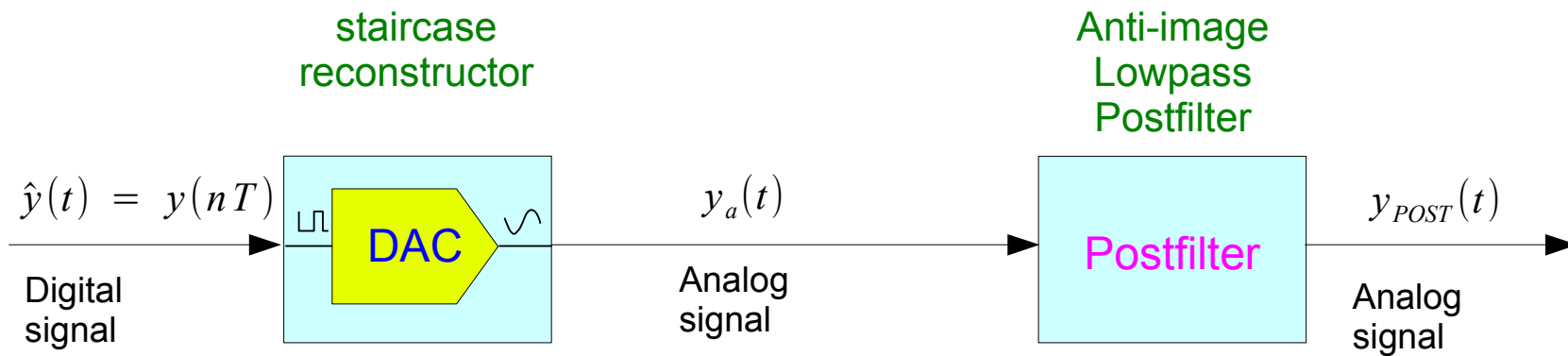


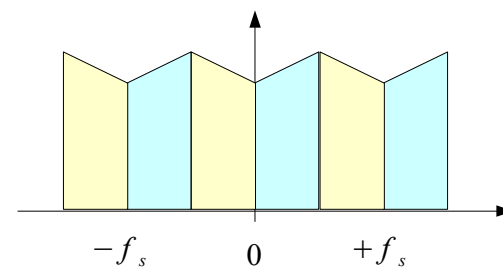
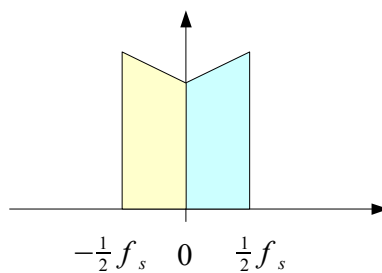
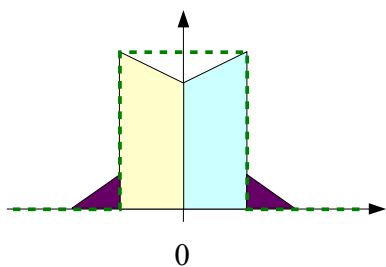
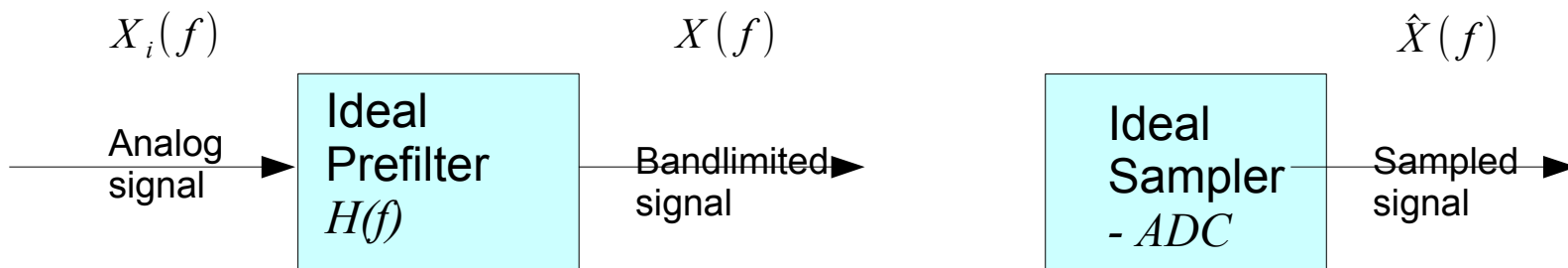
$$y_a(t)$$



$$y_{POST}(t)$$







$\frac{2}{4}f_s$ $\frac{3}{4}f_s$ f_s

References

- [1] <http://en.wikipedia.org/>
- [2] J.H. McClellan, et al., Signal Processing First, Pearson Prentice Hall, 2003
- [3] A “graphical interpretation” of the DFT and FFT, by Steve Mann
- [4] R. G. Lyons, Understanding Digital Signal Processing, 1997
- [5] AVR121: Enhancing ADC resolution by oversampling
- [6] S.J. Orfanidis, Introduction to Signal Processing
www.ece.rutgers.edu/~orfanidi/intro2sp