Errata for the <u>10th Printing</u> of
"Understanding Digital Signal Processing, 2/E",
by Richard Lyons

    I beg your pardon for the typographical errors in the book. It will not take long to make these corrections. I promise.

                                              -Rick Lyons-

Page 7: In the third line below Eq. (1-7), the text:

   "... indicate that $X_{sum}(n)$ has a frequency ..."

The uppercase "X" should be lowercase "x" as:

   "... indicate that $x_{sum}(n)$ has a frequency ..."

[Found by Angela Livingstone, 3/30/08; [Production Error]

Page 37: The "f_s" labels, within the arrows, at the very bottom of Figure 2-13 should be "$f_s/2$".

[Found by Author [6/20/06].][Author Error]

Page 38: In the fifth line up from the bottom of the page, the text:

   "... where m_{odd} is an odd integer[14]."

should be changed to:

   "... where m_{odd} is an odd integer greater than one[14]."

[Found by Jim Murphy [9/14/05] & Justin Reeves [6/20/06].][Author Error]

Page 40: In the 2nd line below Eq. (2-14), the text:

   "$m = 2$ provide an optimum ..."

should be changed to:

   "$m_{even} = 2$ provide an optimum ..."

[Found by Justin Reeves, 6/20/06.][Author Error]

Page 42: In the middle of Table 2-2, on the right side, the text:

   "m_{odd} is any positive odd integer ..."

should be changed to:

   "m_{odd} is an odd integer greater than one ..."

[Found by Justin Reeves, 6/20/06.][Author Error]

Page 48: The incorrect letter "v" in the third line of Eq. (3-4d) should be replaced with a "$\cdot$" multiplication symbol.

Page 62: The second part of equation (3-18') printed as:

$$x(n) = \frac{1}{\sqrt{N}} \sum_{n=0}^{N-1} X''(m)e^{j2\pi nm/N} \qquad (3\text{-}18')$$

should have the lower limit of the summation changed to "m"
instead of "n", as:

$$x(n) = \frac{1}{\sqrt{N}} \sum_{\boldsymbol{m}=0}^{N-1} X''(m)e^{j2\pi nm/N} \qquad (3\text{-}18')$$

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Page 77: For **both** Eq. (3-29) and Eq. (3-30), the "-1" characters
should be deleted from the denominator of the cosine arguments.
The cosine argument, in both equations, should be:

"$\ldots \cos(2\pi n/N)$,"

Page 93: The last term in Equ. 3-37 has a missing minus sign in
its exponent. The last term should be:

$$\ldots + e^{-jq(K-1)}].$$

Page 143: In Figure 4-10, in the middle stage there is
the number 4 on the 1st and 2nd (counting down from the top)
southeast-pointing arrows. Those 4s should not be there.
The 4s should be on the 3rd and 4th southeast-pointing arrows
of the middle stage as shown below.
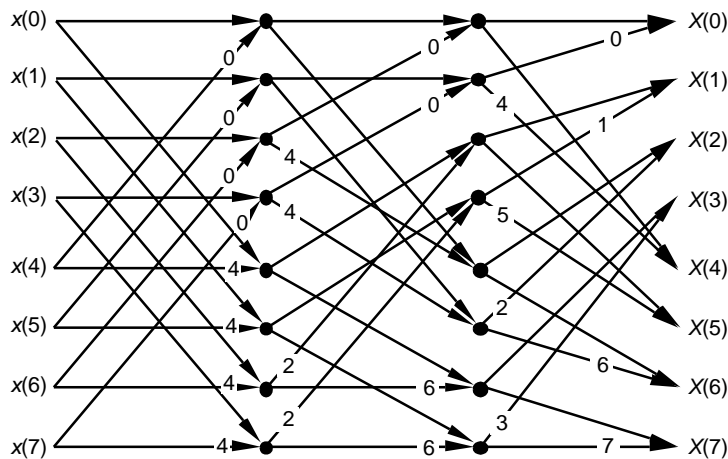
Page 244: The normalized-frequency labeling (radians/sample) on the
frequency axis of Figures 6-24(b) and 6-24(c) should be changed as:

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     -2π   changed to -4π
     -π    changed to -2π
      π    changed to 2π
     2π    changed to 4π
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[Found by Author, 10/17/08.][Author Error]

Page 257: In the eleventh line below Eq. (6-87)

>   "... Figure 6-21(b). Knowing that ..."

should be changed to:

>   "... Figure 6-**22**(b). Knowing that ..."

 [Found by Yancen Li (7/14/14)]; [Author Error]

Page 264: In the 6th line of the first full paragraph, the text:

>   "...squeezed in toward zero Hz."

should be:

>   "...squeezed in toward $\mathbf{f_s/2}$ Hz."

[Found by VV (vanamali), 3/12/09.] [Author Error]

Page 264: In the next to the last line of the first full paragraph there's a missing "|" vertical bar character indicating "magnitude". The text:

>   "...in $|H_d(f_d)-$..."

should be:

>   "...in $|H_d(f_d)|-$..."

[Found by Author, 7/14/05.] [Author Error]

Page 267: There is a missing "x(n)" factor in Equation (6-114), the first part of that equation should be:

> $y(n) = 0.20482712 \cdot \mathbf{x(n)} + 0.40965424 \cdot x(n-1) + ...$

[Found by Kendall Castor-Perry, 5/3/09.] [Author Error]

Page 286: The feedback coefficient of the resonator in Figure 7-3, printed as:

$$e^{j\square r}$$

it should be changed to:

$$e^{j\omega r}$$

[Found by Author, 7/14/09.] [Production Error]

Page 345: On the right side of Figure 8-8 the term $e^{j2\pi f_o t}$ should be divided by two, making it

$e^{j2\pi f_o t}/2$.

[Found by John Littig, 9/24/07.] [Author Error]

Page 353: In the sentence just before Eq. (8-17), the described notion of orthogonality of $i(n)$ and $q(n)$ is only conditionally true. Because this orthogonality topic was not described in sufficient detail, I suggest you strike out both the sentence just before Eq. (8-17) as well as Eq. (8-17) itself.

[Found by Ken Walsh, 5/9/06.] [Author Error]

Page 389: In the seventh line of the second paragraph, the text is printed as:

     "The lower the attenuation, the ...".

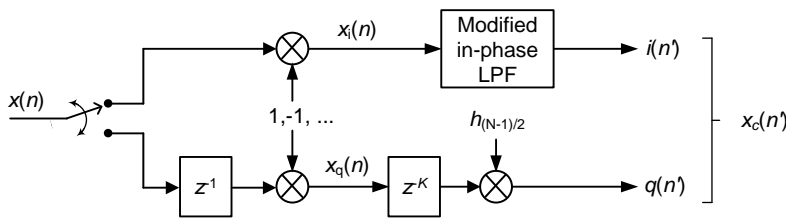Please change the word "lower" to "greater" so that the text reads:

     "The **greater** the attenuation, the ...".

[Found by Mark Kolber, 1/29/08.][Author Error]

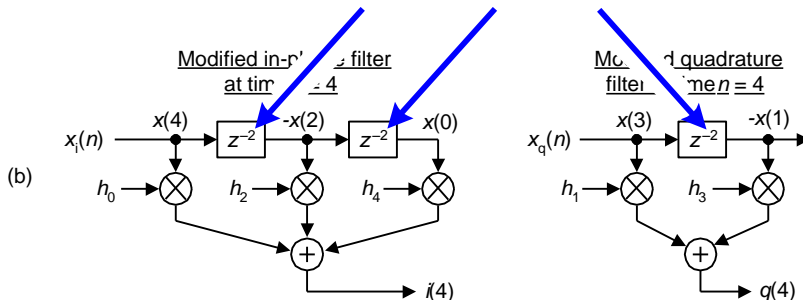**Page 478:** in the fifth line down, delete the text:

     "...followed by another K delay..."

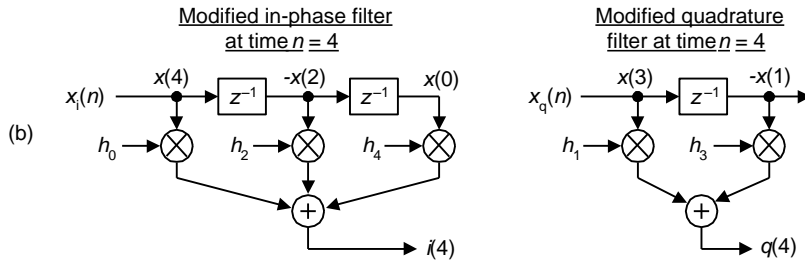In Figure 13-6(c) the final z^{-K} delay block should be deleted making that figure look as follows:

[Found by Brian Frantz, 8/8/17.][Author Error]

Page 479: In Figure 13-6(b) the superscripted "-2" characters shown by the large arrows below:

Should be changed from "-2" to "-1" making Figure 13-6(b) become:

Modified in-phase filter at time $n = 4$

Modified quadrature filter at time $n = 4$

(b)

[Found by Damon Bradley, 10/1/09.][Author Error]

Page 484: Equation (13-10) has suffered a series of "foul-ups"
in different Printings of the book. Eq. (13-10) should be:

$$W(m) = \sum_{n=0}^{N-1} \alpha e^{-j2\pi nm/N} - \frac{\beta}{2} \cdot \sum_{n=0}^{N-1} e^{j2\pi n/N} e^{-j2\pi nm/N} - \frac{\beta}{2} \cdot \sum_{n=0}^{N-1} e^{-j2\pi n/N} e^{-j2\pi nm/N}$$

$$= \alpha \sum_{n=0}^{N-1} e^{-j2\pi nm/N} - \frac{\beta}{2} \cdot \sum_{n=0}^{N-1} e^{j2\pi n(m-1)/N} - \frac{\beta}{2} \cdot \sum_{n=0}^{N-1} e^{-j2\pi n(m+1)/N}. \qquad (13\text{–}10)$$

[Found by Author, 3/22/04.][Author Error]

Page 518: For more accurate results, the "12/M" factor at the
beginning of Eq. (13-70) should be changed to sqrt(12/M).
Thus Eq. (13-70) should be:

$$y_{\text{desired}}(n) = \sqrt{\frac{12}{M}} \cdot \sigma' \cdot \left[\left(\sum_{k=1}^{M} x_k(n) \right) - \frac{M}{2} \right] + \mu'. \qquad (13\text{-}70)$$

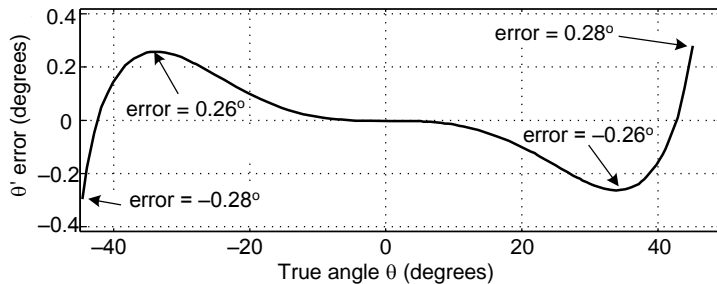[Found by Bharat Pathak, 7/13/07.][Author Error]

Page 548: 4th line below Eq. (13-107), change the text:

"... 0.26^o using ..."

to

"... $0.2\mathbf{8}^o$ using ...".

For preciseness, you might note on Figure 13-59 that the error
is -0.28^o at True $\theta = -45^o$, and the error is $+0.28^o$ at True $\theta = +45^o$,
as shown in the following figure.

[Found by Chris Zarowski, 4/27/06.][Author Error]

Page 549: 4th line below Eq. (13-109'), change the text:

"... error is 0.26^o for ..."

to

"...error is 0.2**8**° for ...".

Page 560: In Figure 13-70(b), on the right side in the
"Section 3, r = 1" part of the figure, there should be three
stages of delay lines instead of only two stages as shown
in the figure. That "Section 3, r = 1" part of the figure should
look like the following:

Section 3, $r = 1$
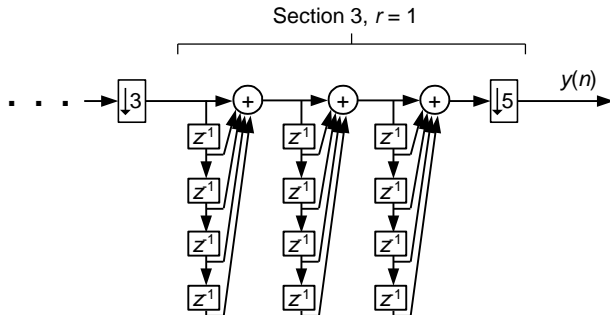
Page 561: Equation (13-123) has a missing 1/N scale factor in
front of the summation. That equation should be:

$$M(q) = \frac{1}{N} \sum_{k=qN}^{(q+1)N-1} x(n) \qquad\qquad (13\text{-}123)$$

Page 569: In the right $X_{int}(m)$ column of Table 13-8, the *underline*
character associated with row $m = 9$ should be a zero "0" value
as follows:

m	$X_{int}(m)$
...	...
9	0
...	...

Page 607: Two corrections: In the second line of Eq. (D-7), the
term:

   "... $-\cos(\omega t)$] ...

should be:

   "... $-\cos(\mathbf{2}\omega t)$] ...

In the third line of Eq. (D-7), the term:

   "... $-\frac{1}{2}(\sin(\omega t))$..."

should be:

   "... $-\frac{1}{4}(\sin(\mathbf{2}\omega t))$..."

Page 610: The final ratio at the end of Eq. (D-12) **MAY**
be printed as:

$$\frac{(b-a)^2}{12}.$$

Make sure the numerator looks like (with a PLUS sign):

$$\frac{(b+a)^2}{12}.$$

 [Found by Author, 1/15/05.][Author Error]

Dear Reader, if you find any additional errors, no matter how trivial,
please notify me at: **R.Lyons@ieee.org**
I'd sure appreciate hearing from you and I promise I'll reply to
your E-mail.

Thanks,
[-Rick Lyons-]