

Known Corrections Needed to the First Printing of  
**The 3-D Global Spatial Data Model - Book #63014**

Compiled by author, Earl F. Burkholder – June 27, 2008 (& subsequent dates)

1. Page 71:

The digits (numbers) in the matrix of equation (3.47) should not be italicized.

2. Page 71:

The digits “300,034.86” in equation (3.48) should not be italicized. **(See also items 14 and 18 later on.)**

3. Page 82:

7 lines from the bottom – the variable “*SPR*” should be italicized – both places. (as in the preceding line)

4. Page 88:

Equation (4.15) should read:  $d_1 = \Delta e \sin \alpha + \Delta n \cos \alpha \pm \sqrt{d_2^2 - (\Delta e \cos \alpha - \Delta n \sin \alpha)^2}$

5. Page 91:

Equation (4.23) – The variable “*R*” appears twice. Both should be italicized. (currently, one is and one isn't)

6. Page 92:

Equations (4.24), (4.24a), and (4.25) – None of the digits in these equations should be italicized.

7. Page 167:

Figure 6.15 – Author's preference is that the border be removed in the interest of consistency with Figure 6.18 on Page 178.

8. Page 193:

The formal name “Mean Sea Level Datum of 1929” is incorrect. The word “mean” should not be part of the formal name and should be removed:

- a. From the heading near top of page 193.
- b. From line 1 of the paragraph following the heading.
- c. From line 12 of the paragraph following the heading.

9. Page 218 (and others as noted)

It is the policy of the National Geodetic Survey that the name of the program GEOID03 be capitalized. The name GEOID03 is not capitalized in the text and should be changed on the following pages:

Page 218 – lines 22, line 33, and 36 (depending on how lines are counted)

Page 219 – line 3 and line 19

Page 220 – line 37 (twice in the same line – it must be capitalized in URL)

10. Page 268 (and 283 and 284)

The base of natural logarithms is explained just below the middle of page 268. I am satisfied with how it is shown here. Subsequent references should be consistent.

- See page 283 just following equation (10.140) and page 284 just following equation (10.144) – in each case, the words “base of” should be deleted.
- The wording in equation (10.157) appears to be correct. However, for consistency, equation (10.157) should be changed to:

$$\chi = 2 \tan^{-1} \left( \frac{\exp(Q) - 1}{\exp(Q) + 1} \right)$$

11. Page 303:

Equations (11.2) and (11.3) are both complete and the information is all there. But, the formatting should be improved. An example is to follow the formatting used for equations (1.29) and (1.30) on page 15. The two pairs of matrix equations should be shown as identical and the format used on page 15 is preferred. Note, in one case, the variables in the matrices are listed before the equations and in the other case the variable listing follows the matrices. That arrangement is acceptable to the author – no change is needed for the variable listings.

12. Page 342:

The left margin got cut off at the top and some weird things happened to the paragraph prior to “Correlation of Forepoint wrt Standpoint”. Appendix C is pages 1 and 2 of a spreadsheet that can be downloaded by following an appropriate link at <http://www.globalcogo.com/WBK3D.html>.

Additional Corrections to be made to the First Printing of  
**The 3-D Global Spatial Data Model**  
**Book #63014**

Compiled by author, Earl F. Burkholder – October 31, 2008

13. Page 50: Figure 3.5 – The definitions for secant and cosecant got reversed. The correct listing is:

$$\begin{array}{llll} \text{secant } \theta & \sec \theta & = & \mathbf{hyp/adj} \\ \text{cosecant } \theta & \csc \theta & = & \mathbf{hyp/opp} \end{array}$$

14. Page 68: The partial derivative values in equation (3.28) are reversed. This reversal drives various computational corrections in following pages.

$$\mathbf{J}_{YX} = \left[ \frac{\partial V}{\partial R} \quad \frac{\partial V}{h} \right] = [3,141.59 \quad 7,853.98] \quad (3.28)$$

15. Page 69 – top of page:

$$\Sigma_{YY} = [3,141.59 \quad 7,853.98] \begin{bmatrix} 0.0049 & 0.0000 \\ 0.0000 & 0.0004 \end{bmatrix} \begin{bmatrix} 3,141.59 \\ 7,853.98 \end{bmatrix}$$

$$\Sigma_{YY} = \text{Variance of volume} = 73,034.98 \text{ m}^6 \quad (3.28)$$

16. Page 69 – Paragraph 6A:

- a. The number “553.36” should be “270.25”
- b. The number “550” should be “270”
- c. The number “1,106.7” should be “540.5”
- d. The number “1,100” should be “540”

17. Page 69 – Paragraph 6B:

- a. The number “550” should be “270”
- b. The number “1,100” should be “540”

18. Page 71 – Bottom of page:

$$\Sigma_{YY} = [3,141.59 \quad 7,853.98] \begin{bmatrix} 0.004992319 & -0.000247027 \\ -0.000247027 & 0.0004330231 \end{bmatrix} \begin{bmatrix} 3,141.59 \\ 7,853.98 \end{bmatrix}$$

$$\Sigma_{YY} = \text{Variance of volume} = 63,792.91 \text{ m}^6 \quad (3.48)$$

19. Page 71 – last line:

The correlated standard deviation of the computed volume is 252.57 m<sup>3</sup>.

20. Page 72 – First paragraph, sentences 2 and 3 should be re-written as:

The example shows that, although the standard deviations of correlated measurements is smaller, the uncorrelated and the correlated standard deviations are very nearly the same. The volume of the tank is reported as  $78,500 \text{ m}^3 \pm 250 \text{ m}^3$ .

More Corrections to be made to the First Printing of  
**The 3-D Global Spatial Data Model – CRC Press Book #63014**  
November 8, 2008

21. Page 186 – line 4:

The word “latitude” is wrong. It should be “ $\lambda$  = geodetic longitude of . . .”

22. Page 188 – lines 3 and 4:

In each case, it should read “WGS84” not “WSG84.”

23. Page 201 – 3 lines before “Definitions”:

The correct name is “Sea Level Datum of 1929,” remove “Mean.”

24. Page 209 – 3 lines before “Differential Levels”:

The correct name is “Sea Level Datum of 1929,” remove “Mean.”

25. Page 206 – Equation (8.5) should be:

$$\alpha = A - \eta \tan \phi \quad \text{azimuth} \quad (8.5)$$

26. Page 136 – last item in Table 6.1:

It should read “ $c = 6,399,593.6258 \text{ m}$ ” not “ $c = 3,399,593.6258 \text{ m}$ .”

27. Page 345 – index entry:

It should be “arc-to-chord correction” instead of “arc-to-cord correction.”

28. Page 128 – off by 100 years (found by author - August 2009)

The Lapland expedition returned in **1737** not 1637 as stated in book.

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