Corrections to

Wideband Amplifiers

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First print

(these corrections have already been included in the second print)

Owed to factors beyond the control of both the authors and the publisher the files on the CD version had to be submitted earlier than those for the paper version. Inevitably, some of the errors on the CD version could not be corrected any more, thus they are reported here. Some of the errors are present on paper, too.

Of course, there are probably errors which have escaped our attention altogether and they are therefore present both on the CD and on paper. If the reader discovers any such errors, please report them by e-mail to Erik Margan (erik.margan@ijs.si) so that they can be reported on the publisher's web page for others to download (and eventually corrected in the second edition of the book).

Note: the errors are highlighted in magenta color.

The following errors and inconsistencies were known by October 31st, 2005:

1) in Foreword, Paragraph 1, line 3: missing letter 'p' in the word 'Jupiter'
(this error also present in the book, not just on the CD).

2) in Part 1, Page 1.3, Contents: unnecessary 'o' in 1.1 Three Different Ways ofo...

3) in Part 1, page 1.35, Section 1.6.6, Paragraph1, line 4: a subscript in the text is inconsistent with the one in the the figure: A_3 should be changed to A_4

4) in Part 3, page 3.43, the whole paragraph above Fig. 3.48 should be changed as follows:

The dynamic emitter resistance r_e is directly dependent on the temperature T and inversely dependent on the emitter current I_e, but $I_e = I_s\left(e^{qV_{be}/k_bT} - 1\right)$; since V_{be} and I_s are temperature dependent, we can not expect all effects to cancel. If, e.g., I_c ($\approx I_e$) increases, V_{ce} decreases, and because $P_D = I_c V_{ce}$, it can either increase or decrease, depending on the initial values of I_c and V_{ce}. Consequently, the temperature may also increase or decrease, influencing the dynamic emitter resistance to change accordingly. Since $r_e \approx 1/g_m$, a change in the emitter resistance also changes the DC gain, but $r_e \ll R_e$, so the change in V_{be} is dominant. As shown in Fig. 3.4.8, the change does not occur suddenly at the moment when we apply the input step voltage, but gradually, depending on the transistor thermal time constant. This is known as the 'thermal distortion'.

5) in Part 3, page 3.50, caption to Fig. 3.5.1, line 1: the equation is inconsistent with the axis labeling in the figure: change $\tau_R = RC$ to $\omega_R = 1/RC$.

6) in Part 7, page 7.3, Contents: the following Appendices after 'References' are missing:

7) in Part 7, page 7.17, section 7.2.1, Paragraph 1, line 1: misspelled word:
change definitively to definitely

8) in Part 7, page 7.17, section 7.2.1, Paragraph 1, line 2: unnecessary double 't':
change benefitting to benefiting

9) in Part 2, page 2.102, the hyperlink to Table 2.9.1 is green and inactive, instead of blue and active.

10) in Part 5, page 5.23, the hyperlink to Table 5.1.1 is green and inactive; should be blue and active.

11) in Part 5, page 5.53, the hyperlink to Fig.5.2.23 is green and inactive; should be blue and active.

12) in Part 5, page 5.61, the hyperlink to Fig.5.3.3 is green and inactive; should be blue and active.

13) in Part 5, page 5.72, the hyperlink to Fig.5.3.13a is green and inactive; should be blue and active.

14) in Part 5, page 5.72, the hyperlink to Fig.5.3.13b is green and inactive; should be blue and active.

The following errors and inconsistencies were discovered by November 16th, 2005:

15) Part 1, page 1.67, caption of Fig.1.13.2, line 3:

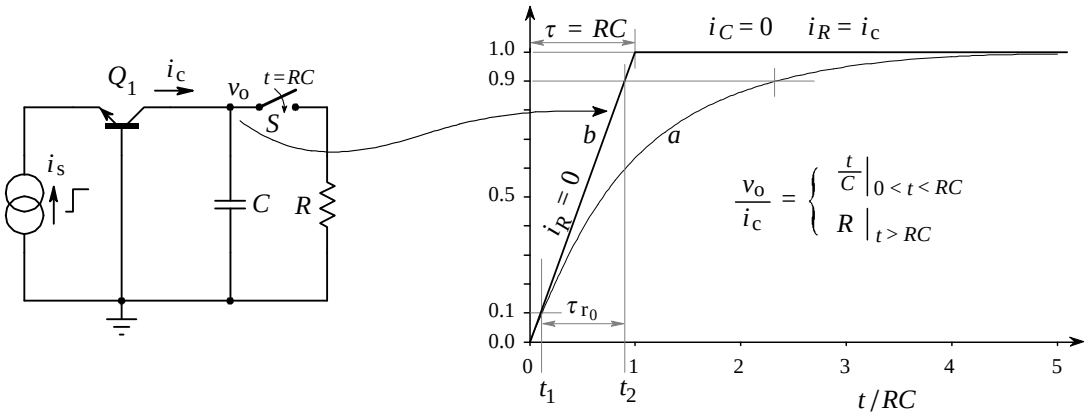
the size of index 1 of s_1 is too large, it should be s_1

16) Part 1, page 1.68, the formula along Fig.1.13.4, line 1:

the size of the superscript of $e^{j\theta}$ is too large, it should be $e^{j\theta}$

17) Part 2, page 2.10, some of the symbols in Fig.2.1.2 are wrong,

the corrected figure is here:



18) Part 2, page 2.84, equation (2.8.6):

the power of 2 of one of the square brackets is missing, and one n symbol should be deleted, as indicated below:

$$|Z(\omega)| = R \sqrt{\frac{\left[1 - m\,n\left(\frac{\omega}{\omega_h}\right)^2\right]^2 + m^2\left(\frac{\omega}{\omega_h}\right)^2}{\left[1 - m\,n\,(1+n)\left(\frac{\omega}{\omega_h}\right)^2\right]^2 + \left(\frac{\omega}{\omega_h}\right)^2\left[1 - m\,n\left(\frac{\omega}{\omega_h}\right)^2\right]^2}} \qquad (2.8.6)$$

The correct equation (2.8.6) is as follows:

$$|Z(\omega)| = R \sqrt{\frac{\left[1 - m\,n\left(\frac{\omega}{\omega_h}\right)^2\right]^2 + m^2\left(\frac{\omega}{\omega_h}\right)^2}{\left[1 - m\,(1+n)\left(\frac{\omega}{\omega_h}\right)^2\right]^2 + \left(\frac{\omega}{\omega_h}\right)^2\left[1 - m\,n\left(\frac{\omega}{\omega_h}\right)^2\right]^2}} \qquad (2.8.6)$$

19) Part 2, page 2.84, the two equations labeled (2.8.8)

in the top equation an m symbol is missing:

$$m^2 - 2\,m\,n = 1 - 2\,m(1+n)$$

$$m^2 n^2 = m^2(1+n)^2 - 2\,m\,n \qquad (2.8.8)$$

20) Part 2, page 2.88

there is a thin space before the last zero in the equation for $g(t)$ at:

b) MFED response ($m = 0.333$ and $n = 0.200$):

$$g(t) = 1 + 0.8054\,\mathrm{e}^{-1.839\,t/T}\,\sin(1.754\,t/T - 0.1772 + \pi) - 1.142\,0\mathrm{e}^{-2.322\,t/T}$$

instead, the thin space should be between the 0 and e, as below:

$$g(t) = 1 + 0.8054\,\mathrm{e}^{-1.839\,t/T}\,\sin(1.754\,t/T - 0.1772 + \pi) - 1.1420\,\mathrm{e}^{-2.322\,t/T}$$

21) Part 2, page 2.94, equation (2.9.30)

the factor k should be changed to η_b:

$$m_1 = \frac{1}{2.6131\,k} = \frac{1}{\eta_\mathrm{b}^2} = 0.1464 \qquad (2.9.30)$$

the correct equation is:

$$m_1 = \frac{1}{2.6131\,\eta_\mathrm{b}} = \frac{1}{\eta_\mathrm{b}^2} = 0.1464 \qquad (2.9.30)$$

22) Part 2, page 2.96,

there is one TAB too many in front of the poles $s_{3\mathrm{n},4\mathrm{n}} =$ ... under b), c), and d); they should be in vertical alignment with poles $s_{1\mathrm{n},2\mathrm{n}} =$ …, as here:

The poles are: $s_{1\mathrm{n},2\mathrm{n}} = \ldots.$
$s_{3\mathrm{n},4\mathrm{n}} = \ldots.$

23) Part 3, page 3.13, the markings of footnote 1 after equation (3.1.5) and at the beginning of the footnote itself:

the marking superscript character[1] is **bold**; instead, it should be normal.

24) Part 3, page 3.39, caption of Fig.3.4.3, line 3

the word ‘provides’ has been misspelled as ‘porvides’

25) Part 4, page 4.9, Fig.4.1.1 (and several other figures, as reported earlier)

some of the objects in the schematic diagram are not aligned well to the connecting lines; it is of course possible that this is owed to the low resolution of the preview PDF file, since in original drawings as well as in the drawings exported to the manuscript PDF files the alignment was perfect.

26) Part 4, page 4.66, the second sentence from the top:

We know that the second-order system from Table 4.4.3 has an optimal step response; since $s_{4,5}$ have a larger imaginary part, their angle θ_4 is greater than the angle of the optimal case; we thus expect that the stage with $s_{4,5}$ would exhibit a pronounced overshoot.

...must be rephrased as:

We know that the second-order system from Table 4.4.3 has an optimal step response; since the imaginary to real part ratio of $s_{4,5}$ is larger (their $\tan\theta_4$ is greater) than it is with the poles of the optimal case, we thus expect that the stage with $s_{4,5}$ would exhibit a pronounced overshoot.

27) Part 5, page 5.35, caption of Fig. 5.2.6, one line before the last

the word 'capacitance' has been misspelled as 'capaciatance'

also there is a double space between the words: 'section␣␣is'

28) Part 5, page 5.40, the caption of Fig. 5.2.9

Fig. 5.2.9: The attenuator and the source follower JFET_1 (JFET_2 acts as a constant current source bias for JFET_1). The input loop inductance L_1 should be low, but it can be compensated by L_{1b}. The inductance L_2 of the second loop can be 'tuned' and damped by an appropriate value of R_d to provide a Bessel step response, as seen below.

Replace 'it' with: 'the attenuation'.
Replace 'below' with: 'in Fig. 5.2.10'.

29) Part 5, page 5.41, the caption of Fig. 5.2.10

Fig. 5.2.10: Step response of the circuit in Fig. 5.2.9. With a low L_1, a correctly damped L_2, and a good JFET, a 350 MHz bandwidth (v_{L2} rise time $\approx$ 1 ns), can be easily achieved. The source follower gain is a little less than one. v_o and v_L are drawn for the two L_2 cases.

The colored text is missing.

30) Part 5, page 5.89, second paragraph, last sentence, third line before its end:

delete the letter 'd' in the word: 're-balanced'.

31) Part 5, page 5.91, third paragraph, line 6: the word in is missing.

... since we are interested in not just ...

32) Part 5, page 5.93, second paragraph, line 5

... the digital display's resolution which the readout accuracy ...

Replace the word 'which' with: 'limits'

33) Part 5, page 5.117, second paragraph, line 6

... its two single-channel plug ins required ...

The words 'plug ins' should be hyphened: 'plug-ins'

34) Part 5, page 5.128, footnote 1, line 3

the MC1496 should be replaced by MC1495

The following errors, present both on paper and the CD, have been detected after December 26th, 2005:

35) Part 1, page 1.18, Equation 1.3.7: missing 'n' in the last two exponents:

$$f(t) = \sum_{n=-\infty}^{\infty} \frac{1}{T} F(n\,\omega_1)\,\mathrm{e}^{jn\omega_1 t} = \frac{1}{2\,\pi} \sum_{n=-\infty}^{\infty} \frac{2\,\pi}{T} F(n\,\omega_1)\,\mathrm{e}^{jn\omega_1 t}$$

$$= \frac{1}{2\,\pi} \sum_{n=-\infty}^{\infty} \omega_1 F(n\,\omega_1)\,\mathrm{e}^{jn\omega_1 t} \qquad (1.3.7)$$

36) The "Table of Contents" at the beginning of the book shows the page numbers in a different way (counting from 1 to 625) from the style used in the rest of the book (chapter number [dot] page number).

37) Part 5, page 5.22, Table 5.1.1, row 4, column 1:

The dimension Ω of the parameter R_a is out of its brackets; it should be:

R_a [Ω]

The following errors, present both on paper and the CD, have been detected after January 21st, 2006:

2006.02.12.

38) Part 1, page 1.45, 1st paragraph, the references in the line before the last one should be corrected as:

and [1.13] (in English), [Ref. 1.14] (in German), and ...

39) Part 1, page 1.55, the paragraph under the Eq. 1.10.2, first line:

which is similar to the integral in Eq. 1.9.5, except...

40) Part 1, page 1.65, the last line of the paragraph above the formula:

out in this integration path. As we have already proved by Eq. 1.9.5:

41) Part 1, page 1.84, in the first line of the Eq. 1.15.2 $G(s)$ and $F(s)$ should be exchanged, in order to comply with the second line (since the convolution operation is commutative, both in time and frequency domain, the order of the operands is not important, yet it is better to avoid any posibility of confustion):

$$y(t) = \mathcal{L}^{-1}\{F(s) \cdot G(s)\}$$

$$= \sum \text{res} \underbrace{\left[\frac{s_1\, s_2}{s\,(s-s_1)(s-s_2)}\right]}_{F(s)} \underbrace{\left[\frac{s_3\, s_4}{(s-s_3)(s-s_4)}\right]}_{G(s)} e^{st} \qquad (1.15.2)$$

42) Part 1, page 1.19, in the paragraph under Eq. 1.3.12 the equation numbers should be exchanged:

1st line: In Eq. 1.3.8 ...
3rd line: In Eq. 1.3.9 ...

The following errors, present both on paper and the CD, have been detected after February 12th, 2006:

2006.07.17.

43) Part 5, p.116, Fig.5.4.31: obviously, this is a time domain plot, not frequency domain.

44) Part 5, p.118, second paragraph should be:

Finally, the Cascomp has a limited ability ... (not limiting).

45) Part 5, p.121, line 3 from bottom: ... but three or more more can be ...

Replace by "several".

The following errors, present both on paper and the CD, have been detected after July 7th, 2006:

2006.08.20.

We have discovered a few equations with transcription errors. Here we report the correct versions:

44) Part 4, page 4.19: there was an eror in the transcription of the following three equations (fortunately the final result was written correctly, so further equations and graphs are also OK); the correct equations are:

$$\frac{\tau_{rk}}{A}\left(\frac{1}{2\sqrt{n}}\,A^{1/n}-\sqrt{n}\,\frac{A^{1/n}}{n^2}\ln A\right)=0 \qquad (4.1.35)$$

....

$$\frac{1}{2\sqrt{n}}-\frac{\sqrt{n}}{n^2}\ln A=0 \qquad (4.1.36)$$

....

$$1-\frac{2}{n}\ln A=0 \quad\Rightarrow\quad n=2\ln A \qquad (4.1.37)$$

45) Part 4, page 4.24: all the 5 equations marked (4.1.17) must have alternating signs. The equation for $n=5$ must have a negative sign at the coefficient 0.6667:

$$n=5 \quad\Rightarrow\quad g_5(t)=\mathrm{e}^{-t}\left(1-4\,t+3\,t^2-0.6667\,t^3+0.0417\,t^4\right) \qquad (4.2.17)$$

46) Part 4, page 4.40: the relation for calculation the Bessel polynomial corfficients has a '1' in the numerator, which should be 'i' instead:

$$\boxed{a_i=\frac{(2\,n-i)!}{2^{n-i}\,i!\,(n-i)!}} \qquad (4.4.10)$$

Note that the same equation in Part 6, page 6.17 is correct.

47) Part 6, page 6.17: the DeMoivre formula is:

$$-1=\cos(\pi+k\,2\pi)+j\sin(\pi+k\,2\pi)$$

but the correct equation (6.3.5) should be:

$$(-1)^{1/2n}=\cos\frac{\pi+k\,2\pi}{2n}+j\sin\frac{\pi+k\,2\pi}{2n} \qquad (6.3.5)$$

The following errors, present both on paper and the CD, have been detected after August 26th, 2006:

2006.09.17.

48) Part 7, page 25, last sentence: $f_\mathrm{s}=2f_\mathrm{s}$ is obviously wrong. It must be:

Therefore since $f_\mathrm{s}=2f_\mathrm{N}$, ...

49) Part 5, page 10, Fig.5.1.1 and Eq.5.1.1: the emitter resistor of Q_3 is labeled $R_{\mathrm{e}3}$ in the schematic, but in Eq.5.1.1 it is labeled $R_{\mathrm{e}2}$. The correct equation shold be:

$$A_0=2\,\frac{R_\mathrm{a}}{R_{\mathrm{e}1}}\cdot\frac{R_\mathrm{b}}{R_{\mathrm{e}3}} \qquad (5.1.1)$$

Second print

We express our thanks to Mr. Turki AlMadhi, MEngrEE, Dept. of EE, King Saud University, Riyadh, Saudi Arabia, for his valuable comments and for reporting to us the following errors:

2008.06.12.–2008.09.02.

50) Part 1, page 1.8, equation 1.1.5: the multiplications by $\pm j$ indicated in the text immediately above are missing in the equation. It should have been written as follows:

$$f(t) = j\frac{A}{2j}\,\mathrm{e}^{j\omega_1 t} - (-j)\frac{A}{2j}\,\mathrm{e}^{-j\omega_1 t} = A\cos\omega_1 t \qquad (1.1.5)$$

51) Part 1, page 1.13, in the paragraph between equation 1.2.3 and 1.2.4 the variable t is missing in both exponents, $\mathrm{e}^{-j\omega_k}$ and $\mathrm{e}^{j\omega_k}$. The correct expressions are:

Now we multiply this expression by a unit amplitude, clockwise rotating phasor $\mathrm{e}^{-j\omega_k t}$ (having the same angular frequency ω_k) to cancel the $\mathrm{e}^{j\omega_k t}$ term, [Ref. 1.2]:

52) Part 2, page 2.27, equation 2.3.1, the denominator in the third term is wrong:

$$Y_i = j\omega C_i + \frac{1}{R} + \frac{1}{\dfrac{1}{j\omega L} + j\omega C} \qquad (2.3.1)$$

It must be:

$$Y_i = j\omega C_i + \frac{1}{R} + \frac{1}{j\omega L + \dfrac{1}{j\omega C}} \qquad (2.3.1)$$

Our gratitude goes to Mr. Lee Szymanski of Pico Technology for reporting the following errors:

53) Part 3, page 3.98: Reference [3.24]: the date should be April 1966, its currently April 1996

54) Part 5, page 5.42: Spelling mistake 'capaciatnce' on the second line from the top.

55) Part 5, page 5.75. In the caption of figure 5.3.16 a zero was given the formula $1/2\pi R_e||R_e C_f$, in fact it must be $1/2\pi R_f||R_e C_f$, as it is in the diagram.

2008.09.02.–2014.10.06.

Many thanks also to Mr. Dexian Tang, a student from China, who also reported the error 50 above, and in addition the error 56:

56) Part 2, page 14, equations 2.2.6 and 2.2.7, R and C must be squared, the correct forms are:

$$F(s) = \frac{1}{mR^2C^2} \cdot \frac{1}{(s - s_1)(s - s_2)} \tag{2.2.6}$$

$$F(0) = \frac{1}{mR^2C^2} \cdot \frac{1}{s_1 s_2} \tag{2.2.7}$$