Digital Systems Engineering
William J. Dally and John W. Poulton

Errata as of September 26, 1999

Page	Correction
36	Figure 2-7 → Figure 2-8
39	expoxy → epoxy
51	db → dB
59	"phono" → phone
60	The term BNC is an acronym meaning "bayonet Neill Concelman". This connector is named after its designers, Paul Neill of Bell Labs and Carl Concelman of Amphenol. The "B" originally stood for "baby" but was changed to "bayonette" after the TNC connector was introduced to distinguish the bayonet fastening of the BNC connector from the threaded fastening of the TNC connector.
63	kilometer → kilometers
83	*Equation (3-7) should read* $C_e = \frac{we}{s} + \frac{2pe}{\log(4s/h)}$
85	*Equations (3-10) is consistent if the current arrow is pointing to the left. However most people draw the current arrow pointing toward the right. In this case, both equations are negated becoming* $\frac{\partial V}{\partial x} = -RI - L\frac{\partial I}{\partial t}$ $\frac{\partial I}{\partial x} = -GV - C\frac{\partial V}{\partial t}$
86	numerator → middle term
93	*delete* ", the line"
94	*a* → a *In three places, for example* (a +1-V step). *Here "a" is the word "a", not a symbol.*
199	*Equation (4-52) should read:* $\frac{\partial I}{\partial V} = bV_{GT} = \frac{2I_S}{V_{GT}} = g_m$
156	*The equation in footnote 6 should read* $V_{DE} = V_{DS} + V_{sat} - \left(V_{DS}^2 + V_{sat}^2\right)^{1/2}$
181	*The last sentence should read:* If the ratio of input capacitance to output capacitance η=1.5, …
224	*Equation (5-2) should read:* $V_{ji} = \frac{V_s Z_{ij}}{Z_0 + Z_{ij}}$ *Equation (5-3) should read:* $V_R = V_S\left(1 - \frac{Z_{ij}}{Z_0 + Z_{ij}}\right)$
248	10mF → 10-μF
264	As illustrated on the right side of Figure 6-2 → As illustrated on the left side of Figure 6-2
267	Section 12.1 → Section 12.2
269	$\mathbf{t}_{xp} \rightarrow \mathbf{t}_{xc}$ *in equations (6-5) and (6-6)*

270	$\mathbf{t}_{xp} \rightarrow \mathbf{t}_{xc}$ *also:* Smear connecting the rightmost two conductors on Metal 3 in Figure 6-9 should be eliminated
273	*Equation (6-9) should read* $\frac{\partial I_A(x,t)}{\partial t} = -\frac{\partial V_A(x,t)}{L\partial x}$
276	*The correct values for k_{cx} in Table 6-3 are:* 0.073, 0.022, 0.024, 0.007, 0.044, 0.005, 0.009, and 0.001 *These values represent $k_{cx} = \frac{C_m}{C}$ because C already includes C_m.*
280	$ZP \rightarrow Z_P$
287	*The second to last sentence should read* If all this energy is absorbed by the silicon, which generates a hole-electron pair for each 3.6eV, then 1.4M hole-electron pairs are generated, giving a total charge, $Q_{\alpha T}$, of 220fC.
289	*Rather than use the absolute tolerances given in Table 6-4, most designers uses a statistical model of process variation based on [PelgDuin89]. With this model, variations are considered to have a normal distribution with a standard deviation that varies inversely to the square-root of the area of the device. That is,* $\Delta V_{Tn} = \frac{A_{VT}}{\sqrt{WL}}$ *and* $\frac{\Delta b}{b} = \frac{A_b}{\sqrt{WL}}$ *For a typical 0.35μm process, A_{VT} = 10mV/μm and A_b = 0.03/μm.*
290	*Equation (6-31) should read* $V_{IO} = \Delta V_{Tn} + 0.5(V_{GS} - V_{Tn})\left(\frac{\Delta b}{b}\right)$
295	$0.51 \rightarrow 0.48$ *also:* $1.02 \rightarrow 0.48$
297	V_M is the *net* noise margin, not the *gross* noise margin. 'gross' → 'net' in two places.
307	$3.3\text{mA}/50\Omega \rightarrow 3.3\text{mA} \times 50\ \Omega$
308	current applied → current is applied
309	*The bottom four numbers in the CMOS column of Table 7-3 should be:* 2.05, 1.25, 1.25, 1.25 *The bottom four numbers in the LSC column of Table 7-3 should be:* 15, -15, 150, 150
310	*The bottom row of Table 7-4 should be:* 700, 18 *also:* 850mV, slightly more than half → 700mV, almost half *also:* 550mV → 400mV
311	*In the first line:* 50% → 25% *also:* 5.7V → 4.7V *also:* 92mV → 72mV *also:* 3.6 → 4.6
317	*On the third line:* $I_{T1} = V_{T1}/Z_0 \rightarrow I_{T1} = V_{T1}/(Z_0 + Z_X)$ *also, equation (7-7) should be:* $V_X = I_X Z_0 = V_{T1}\left(\frac{Z_0}{Z_0 + Z_X}\right)\left(\frac{Z_{RT}}{(N-1)Z_{RT} + R_O + Z_0}\right)$ *also, equation (7-8) should be:* $K_{XRT} = \frac{(N-1)V_X}{V_{T1}} = \left(\frac{(N-1)Z_{RT}}{(N-1)Z_{RT} + R_O + Z_0}\right)\left(\frac{Z_0}{Z_0 + Z_X}\right) \le \frac{(N-1)Z_{RT}}{R_O + Z_0}$

318	The lower part of Figure 7-7 should be labeled (b)
321	*In Figure 7-11 (b) and (c), impedance Z_{RR} should be added between the bottom of R_T and the line return.*
323	*Note that in Figure 7-13, we have made the assumption that R_O from Figure 7-4 is 0. Also, in Equations (7-11) and (7-12) we have assumed that $R_T = Z_0$.*
325	Line series, termination → line, series termination *also:* *In 7.3.3.1 add:* It should be pointed out that the major noise issue with source-terminated lines is that near-end cross talk appears at the far end of the line due to coupling of the reflected wave.
332	*The exponent in equation (7-23) should be negative.*
335	*In Figure 7-28, the last pulse on V_R should be displaced one third of a bit cell to the right.*
338	Substituting Eq. (7-28) into Eq. (7-29) → Substituting Eq. (7-29) into Eq. (7-28) *also:* Equations (7-31) and (7-32) should have their denominators multiplied by *LC* *also:* in (7-32) V(s) → V_T(s) *also:* *Equation (7-34) should read* $V_R(t) = 1 - \exp\left(-\frac{Rt}{2L}\right)\cos(wt)$
339	*Equation (7-37) should read* $V_T(t) = U(t)\frac{t}{t_r} - U(t-t_r)\frac{t-t_r}{t_r}$
340	The negative ramp in Figure 7-33 should be labeled $-U(t-t_r)(t-t_r)/t_r$
341	$f \cong 2p \pm p/4 \rightarrow f \cong 2p \pm p/2$
342	*After (7-46):* if → If
347	$K_{MN} \rightarrow K_{NM}$
348	*Equation (7-62) should read:* $U = \begin{cases} V_L + K_h \Delta V & \text{if last bit was 0} \\ V_H - K_h \Delta V & \text{if last bit was 1} \end{cases}$
349	the slope of the transfer function must → the slope of the transfer function, must
351	*Just before (7-66):* that → so that
403	The RMS value in Table 9-4 should be $\sqrt{1/6} = 0.408$
436	In the first line, insert a comma (,) after the word 'stops'.
468	drives a current onto → sinks a current off of
493	*Replace a comma with a period after the sentence:* Each state is labeled with the output (*ain, rout, go*).
505	In Figure 10-43 add an arrow from state 2 to state A
510	Touring → Turing
543	In Figure 11-29, insert overbars over the right input of both amplifiers, $\overline{in}$. Also insert an overbar over the left output of Figure 11-29 (b).
545	In Figure 11-31 there should be an overbar over the symbol ϕ driving the clock input of the clocked amplifier.
547	In Figure 11-33, insert overbars over the right *in* and the lower *s.*
649	Bartovi → Partovi

659	*In the index entry for "impulse response" the page numbers should be:* 545-547.

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