0071771336 9780071771337 PBG
Practical Electronics for Inventors, Third Edition © 2013
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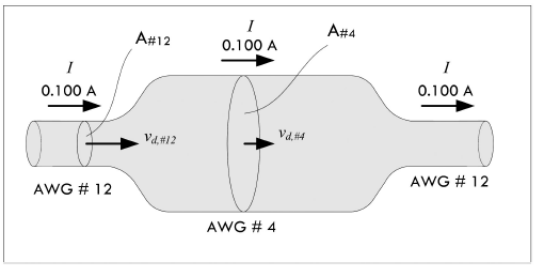
ERRATA

Pg. 17: (Top of the page) "Static electricity is considered a nuisance in ~~electrons~~ electronics, not a source of useful power."

Pg. 25: Figure 2.19. In the top-right box, the units for the Current Density in the 12-gauge column should be A/m^2. In the bottom-right box, the symbols for "Conductivity" and "Resistivity" should be switched.



0.100A Current Flowing		
AWG #	12	4
Wire Diameter (d)	2.05 mm	5.19 mm
Area (A)	3.31 x10^{-6} m^2	2.11 x10^{-5} m^2
Drift Velocity (v_d)	2.22 x10^{-6} m/sec	3.48 x10^{-7} m/sec
Current Density (J)	30,211 A/m$^{3-2}$	4,739 A/m^2

Conductivity (ρ): $1.7\times10^{-8}\ \Omega\cdot m$
Resistivity (σ): $6.0\times10^{7}\ (\Omega\cdot m)^{-1}$
Properties of copper independent of diameter:

FIGURE 2.19 Effects of wire diameter on resistance. A thinner wire has more resistance per unit length than a thicker wire.

Pg. 35: $\nabla T = \left(i\frac{\partial}{\partial t} + j\frac{\partial}{\partial t} + k\frac{\partial}{\partial t}\right)T$

Pg. 45: Figure 2.33. Ground rod should be connected to circuit in 3rd and 6th diagram.

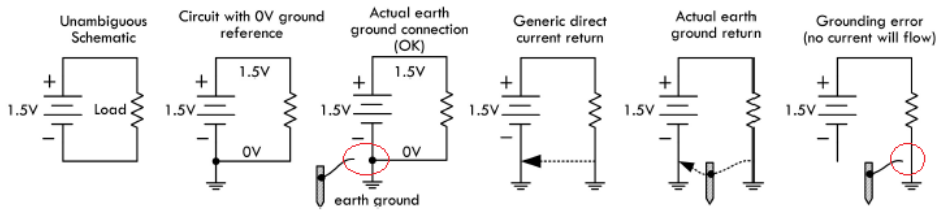


FIGURE 2.33

Pg. 46: Figure 2.34. The first label under the third symbol should be "A-Analog."

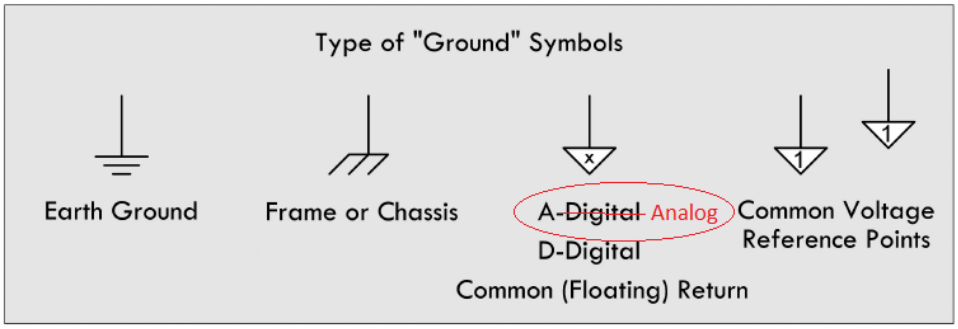


FIGURE 2.34

Pg. 57: (Second-last equation on page) "$P_{\sout{1}R1} = V_1^2 / R_1 = (7\text{ V})^2 / (700\ \Omega) = 0.07\text{ W} = 70\text{ mW}$"

Pg. 58: (Close to top of page) "(If the computed value of the resistance were ~~a 500~~ 510 Ω, a 500 ~~510~~ Ω resistor could be used.)"

Pg. 61: Figure 2.49. The voltage in the Load 2 box should be "+50V".

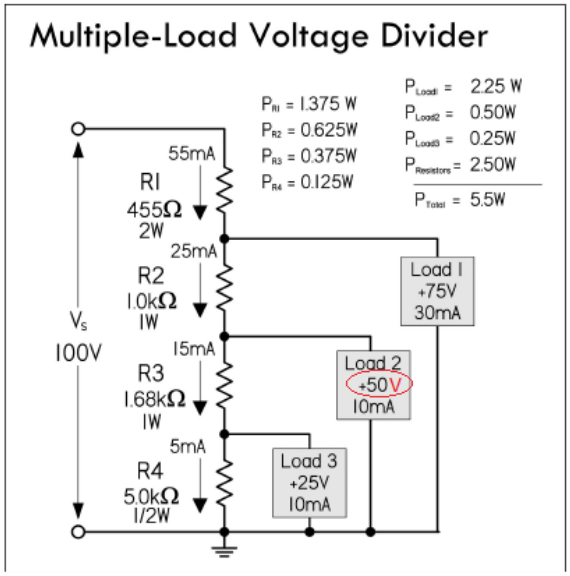


FIGURE 2.49

Pg. 62: (Second paragraph) "…in the proceeding example. ~~IR_4~~ I_{R4} is the bleeder current…"

Just further down: "Calculating ~~R_I~~ R_4:"

A little further down: "To calculate current through ~~R_2~~ R_3, use Kirchoff's current law…"

Pg. 63: (Beginning of second paragraph) "In Fig. 2.52, when a~~n ideal~~ real voltage source…"

Pg. 66: Figure 2.56. Order of Actual/Measured resistance in third diagram should be switched, for consistency with first and second diagrams.

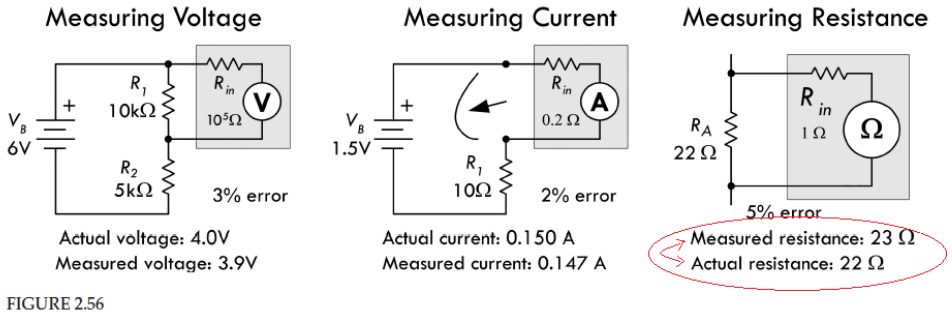


FIGURE 2.56

Pg. 74: (Last paragraph) "It is important...when ~~interrupting~~ interpreting the superposition theorem."

Pg. 104: (Bottom of page) "10 ms: $V_C = \frac{1}{C}\int I_C\,dt = \frac{I_C}{C}t = \frac{50\times10^{-3}A}{10\times10^{-6}F}(10\times10^{-3}\text{s}) =$ ~~0.05V~~ 50V"

Pg. 105: The "V" at the end of the Answer for Example 3 should be eliminated.

Pg. 110: (Near end of second-last paragraph) "In interval BC, the voltage rises ~~to~~ by 21, from 71 to 92."

Pg. 112: Figure 2.107, caption. "(a) Graph showing how reactance ~~increases~~ decreases with frequency…"

Pg. 125: (Second paragraph) "The expanding magnetic field…exerts a force ~~of~~ on free electrons within the coil."

Pg. 131: (Bottom of page) "$L = \mu_0 N^2 A/\ell = (4\pi \times 10^{-7})$~~106~~ 10^6 $(\pi \times$ ~~0.0052~~ $0.005^2)/0.1$ "

Pg. 139: Example 9, Answer:

$$\mathrm{V}_L = L\frac{dI_L}{dt} = (1\times10^{-3}\mathrm{H})\frac{d}{dt}2tA = (1\times10^{-3}\mathrm{H})\left(2\frac{A}{s}\right) = 2\times10^{-3}\mathrm{V} = 2\ \mathrm{mV}$$

Pg. 145: Shaded box: Second-last equation should not have an asterisk (*) at the end.
Figure 2.138 B. Top half of diagram should be replaced with the following:

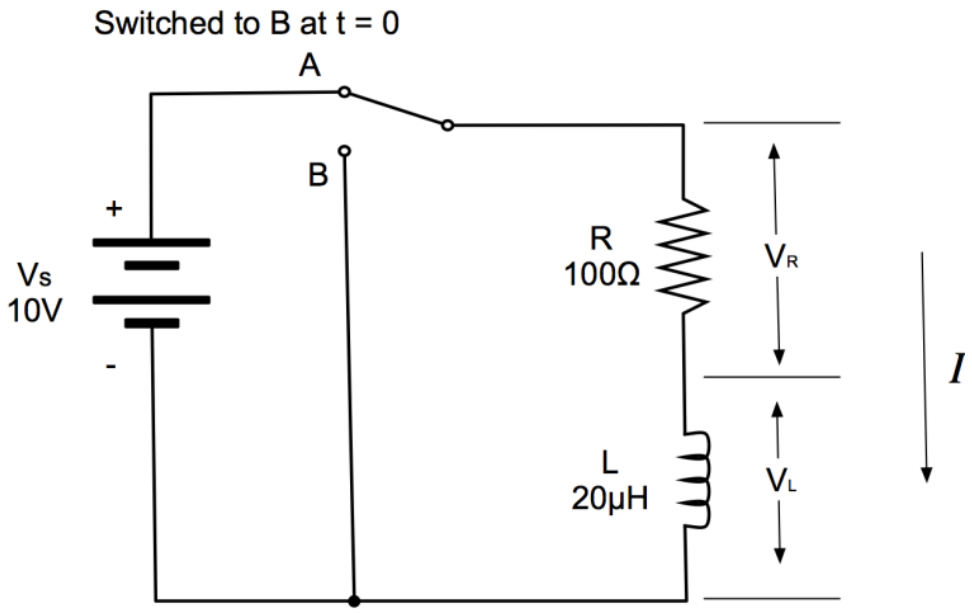


Figure 2.139. Equation below first diagram: "$I(t) = \frac{V_S}{R}e^{-Rt/L}$ ~~$-Rt/L$~~ $-t(L/R)$ "

Pg. 150: (Just above Example 15) "$1/L_1 + 1/L_2 + 1/L_3$ is called the reciprocal equivalent inductance…"

Pg. 154: (End of first paragraph) "Below resonance, the reactance is inductive, but it ~~decreases~~ increases as the frequency increases. Above resonance, the reactance is capacitive and ~~increases~~ decreases with frequency."

Pg. 156: (Top of page) Equations should be listed in the following order:

$$V_R = IR,\ I_R = \frac{V_R}{R}$$

$$V_C = \frac{1}{C}\int I dt,\ I_C = C\frac{dV_C}{dt}$$

$$V_L = L\frac{dI}{dt},\ I_L = \frac{1}{L}\int V_L\, dt$$

Pg. 162: Shaded box below "Addition/Subtraction," first line: "$Z_1 \pm Z_2 = (a \pm c) + j(b \pm d)$"

Shaded box below "Addition/Subtraction," last line: "$Z_1 + Z_2 = (3 + 5) + j(4 - 7) = 8 - j3$"

First row below "Multiplication," final answer: "= -26 + ~~7j~~ $j23$"

First row below "Division," first line: "$\frac{Z_1}{Z_2} = \frac{ac+bd^2}{c^2+d^2} + j(\frac{bc-ad}{c^2+d^2})$"

Second row below "Multiplication": "$Z_1 \times Z_2 = r_1 r_2[\cos(\theta_1 + \theta_2) + j\sin(\theta_1 + \theta_2)]$"

Pg. 163: (Bottom of page, second-last line) "…is the magnitude or ~~modus~~ modulus of a complex number…"

Pg. 170: Figure 2.161, bottom. "X_C" should be "X_L" and all occurrences of lower-case "j" should be distinguishable from lower-case "i".

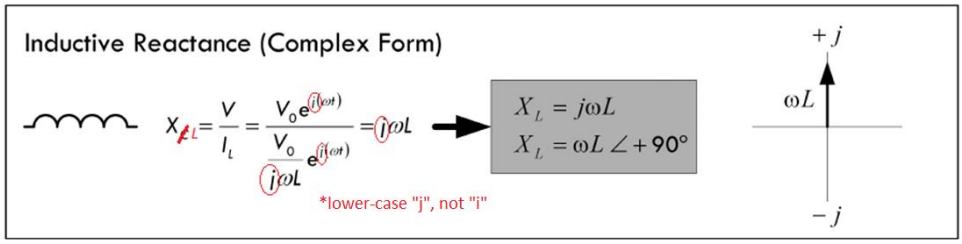
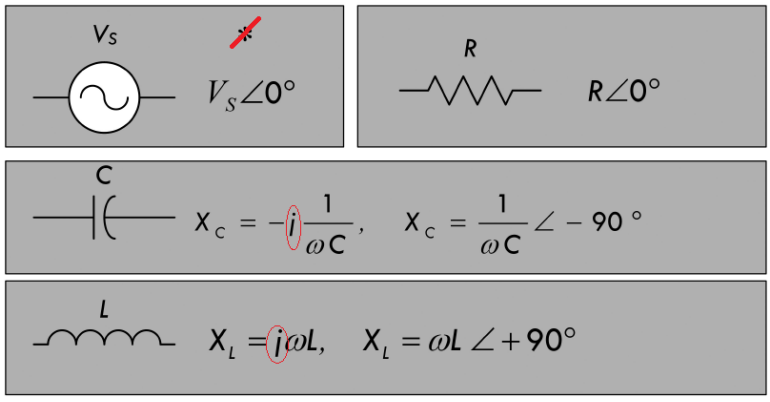


FIGURE 2.161

Pg. 171: Figure 2.162. Asterisk (*) in first box should be removed and all occurrences of lower-case "j" should be distinguishable from lower-case "i".



Pg. 172: Figure 2.164. All occurrences of subscript "*IN*" should be lower-case "*in*".

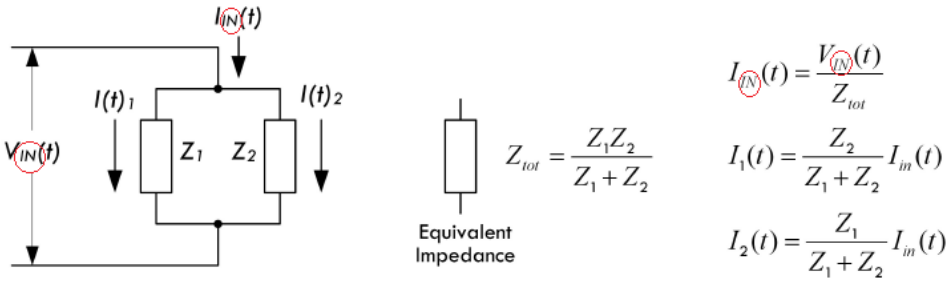


FIGURE 2.164

Figure 2.165. Box at bottom right should be labeled "Z_6", not "Z_1".

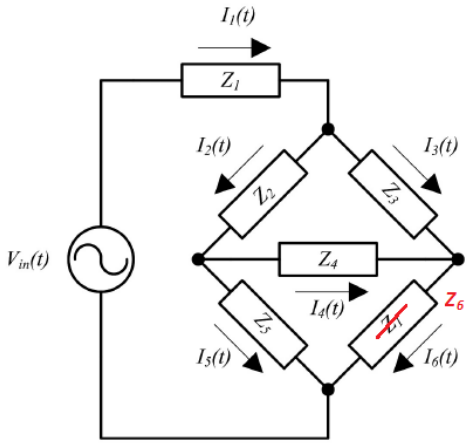


FIGURE 2.165

Pg. 173: Figure 2.166. R_1 and L_1 should be removed from circuit (d). "R_2" should be renamed "R_1" and "R_3" should be renamed "R_2".

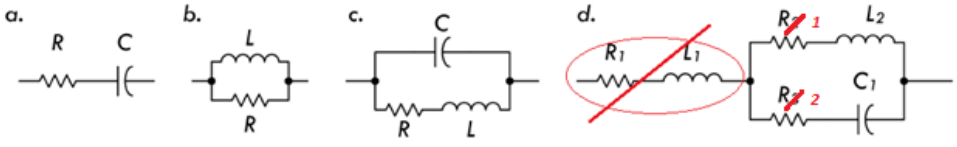


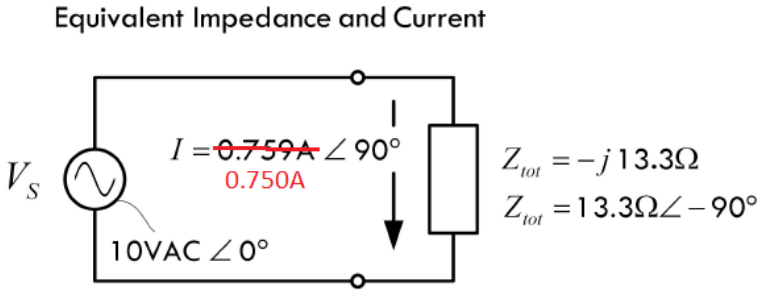
FIGURE 2.166

Answer to (d): All occurrences of "R_2" should be "R_1" and all occurrences of "R_3" should be "R_2".

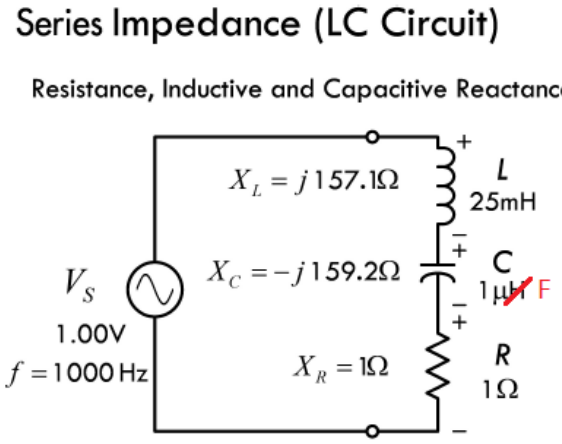
Pg. 180: Equation following "The real (true) power consumed by the circuit is:"
= (0.167 A)^2(0 ~~VAC~~ Ω) = 0 W

Pg. 181: Second equation missing equal sign: " $X_C = -j\frac{1}{\omega C} = -j\frac{1}{2\pi \times 2893.7\ \text{Hz} \times 5.5 \times 10^{-6}\ \text{H}} = -j10\Omega$ "

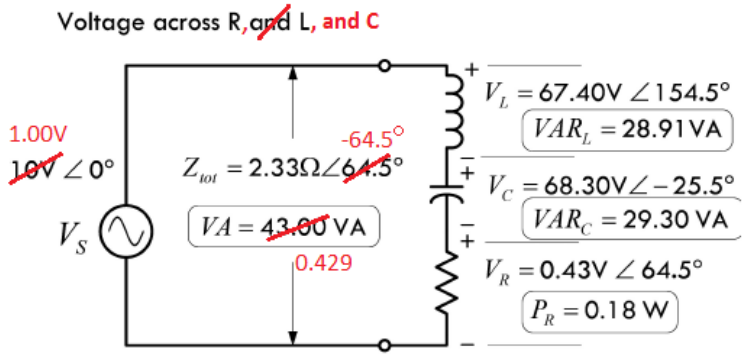
Figure 2.171, "Equivalent Impedance and Current" diagram. "*I* = ~~0.759~~ 0.750A"



Pg. 182: Figure 2.172. The units for the capacitor value should be "µF".



Pg. 183: Figure 2.172 (Continued). First diagram heading should be "Voltage across R, L, and C". Within this diagram, the source voltage should be listed as "1.00V ∠0° ", and the equations within the circuit should be corrected as follows: "$Z_{tot} = 2.33\Omega \angle -64.5°$" and "*VA* = 0.429 VA".



(Middle of page) "$V_L = I_S X_L = (0.429\ \text{A} \angle 64.5°)(157.1\ \Omega \angle 90°)$ "

Three lines down: "$= (0.429\ \text{A} \angle 64.5°)(159.2\ \Omega \angle -90°)$ "

(Bottom of page) " $VA = I_{RMS}V_{RMS} = (0.429\text{ A})(\sout{10}\ 1.00\text{ VAC}) = 0.429\text{ VA}$ "

Pg. 184: (Second-last paragraph) "…the math is relatively easy—use two components in ~~parallel~~ general formula…"

Pg. 185: Figure 2.173 (Continued). Labels "I_L" and "I_C" in upper right corner of "Sinusoidal Waveforms within Parallel LC Circuit" diagram should be switched.

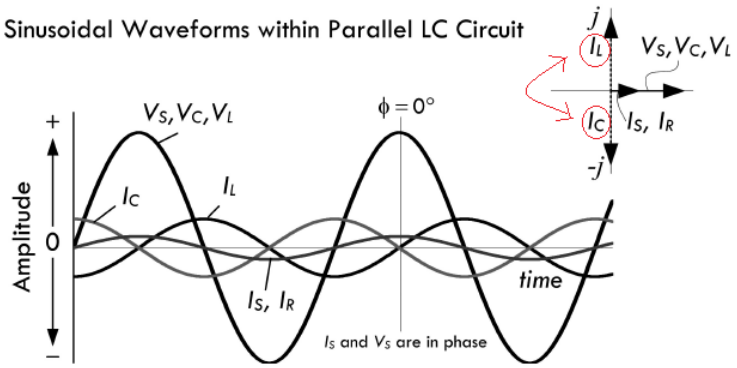


FIGURE 2.173 (*Continued*)

(Bottom of page) "We'll cover resonant circuits in a moment."

Pg. 226: Columns in middle of page: "~~LC~~ RL energizing" and "~~LC~~ RL deenergizing."

Pg. 227: (Third-last equation on page) " $I(0.1) = \left(0.8 + 1.6e^{(-6\times0.1)}\right)\text{A} = 1.68\text{ A}$ "

Pg. 228: Figure 2.206. "R_1" should only be "*R*".

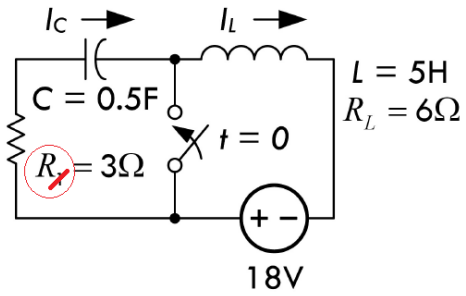


FIGURE 2.206

Pg. 229: (Fifth equation on page) "$I_C = (0^+) = \cdots$" should be "$I_C(0^+) = \cdots$"

Text following equation: "Plugging this back in to find ~~A~~ *B* we get…"

(Equation above Example 5) " $I_L = I_f + I_n = \frac{V_S}{R_{\sout{L}L}} + Ae^{-6t/5}$ "

Answer to Example 5: "Since ~~before~~ the switch is initially closed…"

Pg. 230: (Third-last equation on page) Term "$V_{24\,\mathrm{V}}$" should be "24 V".

Pg. 231: (Last paragraph) "…to an algebraic equation in which first ~~derivates~~ derivatives are replaced…"

Pg. 247: (Third equation on page) Second occurrence of "R_1" should be "R_2":

$$\left(\frac{1}{R_1}+\frac{1}{R_2}\right)V_1+\left(-\frac{1}{R_2}\right)V_2=I_S$$

Pg. 287: Figure 3.31. Within the chart legend, option for "Yes, but not the best choice" should be removed and "Yes, or common" should simply read "Yes." The "d" in the "High peak load-current rating" row, "Supercapacitor" column should be removed.

Selecting the Right Battery (Comparison Chart)

● Yes, or common ● Yes, but not the best choice ○ Borderline No	Carbon Zinc	Zinc Chloride	Alkaline	Lithium	Zinc air	Silver Oxide	Mercury	RAM	Lead Acid (SLA)	NiCad	NiMH	Lithium Ion	Lithium Polymer	NiZn	Supercapacitor
Characteristics of single cell															
Obsolete (not recommended)	●	●						●							
Rechargeable								●	●	●	●	●	●	●	●
Stable voltage				●	●	●	●				●	●	●	●	
High energy density (Wh/kg)		○	●	●	●	●	●	●			○	●	●	●	
High capacity rating (mAh)														●	
High peak load-current rating	○	●	●	●				●	●	●	●	○	○	●	d
High pulsed discharge current		●	●	●		●	●		●	●		●	●	●	●
Low self-discharge rate			●	●				●	●	○		●	●	●	

Pg. 290: Figure 3.33, caption. "A green LED has around 2.0 V ~~on~~ across it when it is illuminated."

Pg. 301: Figure 3.49. Superscripts within shaded boxes should be increased in size and positioned further down. Equations should read as follows:

$$\mathrm{P}=\mathrm{I}^2\times\mathrm{R}$$
$$\mathrm{P}=\mathrm{V}^2/\,\mathrm{R}$$
$$\mathrm{P}=(120\mathrm{mA})^2(100\Omega)=1.44\mathrm{W}$$
$$\mathrm{P}=(12\mathrm{V})^2/\,100\Omega=1.44\mathrm{W}$$

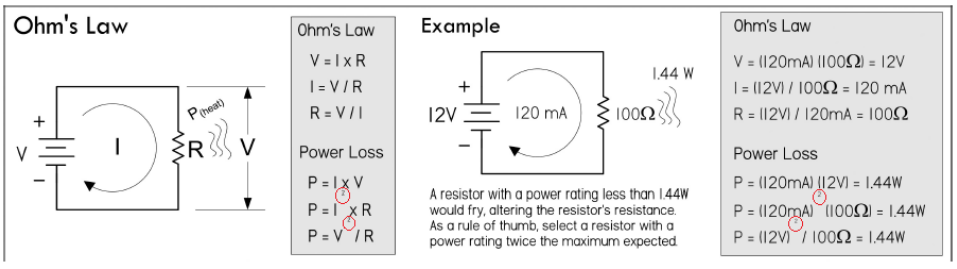
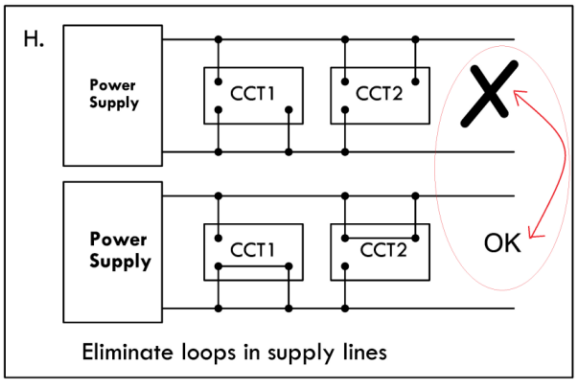


FIGURE 3.49

Pg. 302: (Second equation on page) "$R_{\mathrm{total}}=\frac{R_1\times R_2}{R_1+R_2}$ (Two resistors in parallel)"

Following paragraph: "…the formula reduces to the equation ~~below~~ above."

Pg. 374: Figure 3.95. The "X" and "OK" are reversed in Box H.



Pg. 402: Figure 4.3. Line from "4 valence electrons" should point to outer circle rather than inner.

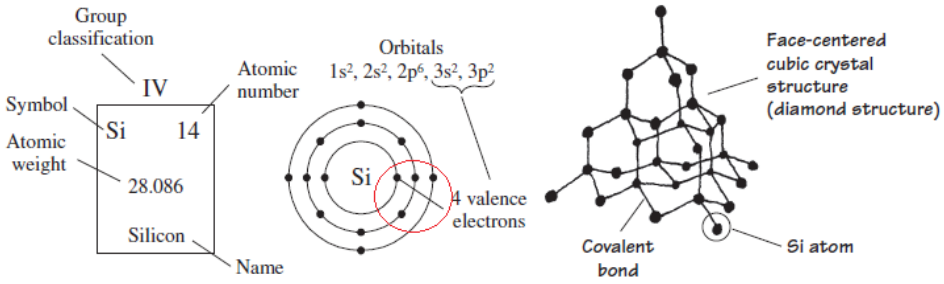
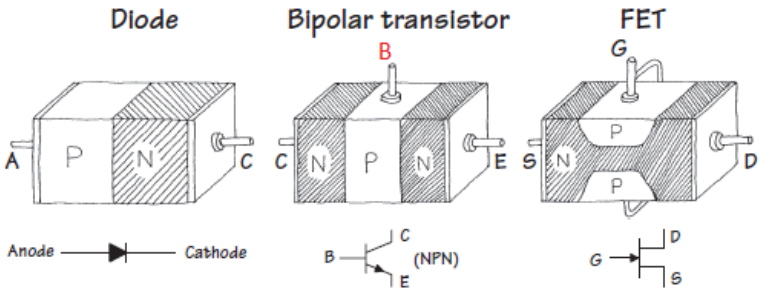


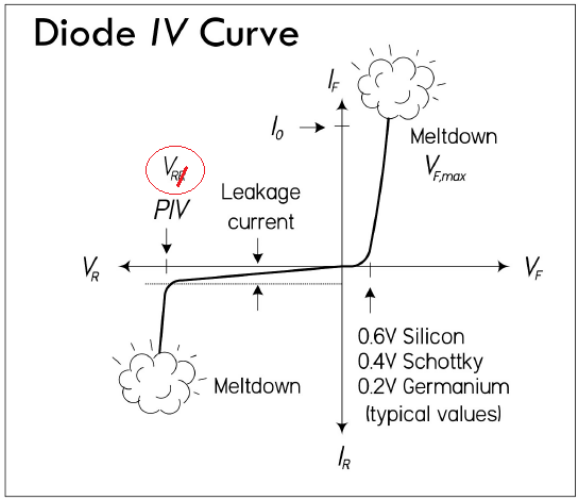
FIGURE 4.3

Pg. 407: Figure 4.9. "Bipolar transistor" graphic missing label "B" at the top.



Pg. 409: (Section 4.2.2, end of first paragraph) "…it's entirely possible for a silicon p-n junction diode's threshold…"

Figure 4.13. "Diode IV Curve" diagram: "$V_{RR\ R}$"



Pg. 419: Figure 4.26. Duplicate D1 labels, both should be removed.

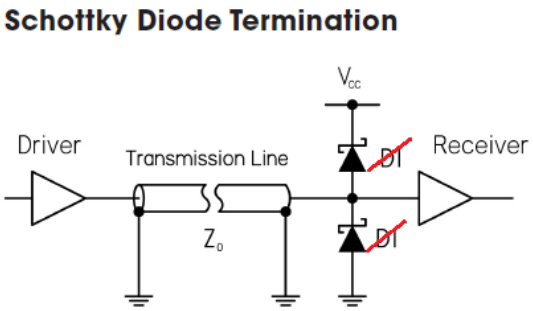


FIGURE 4.26

Pg. 442: (Top of page) "Gain $= -\frac{R_C}{r_{tr} + (R_E \| R_3)} = -100$"

Next line: "(The double line means to take R_E and ~~$(r_{tr} + R_3)$~~ R_3 in parallel.) To find r_{tr}, use… = .026 V / ~~I~~C I_C = …"

Next Gain equation: "10kΩ"

Step 5: "Solving this equation, you get R_{in} = 5kΩ. This means…"

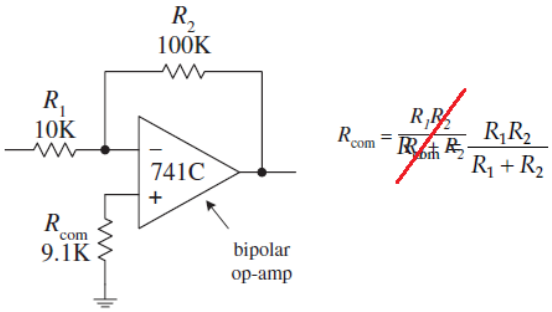
Pg. 507: (Last paragraph) "...you should never look into a laser beam or any ~~secular~~ specular reflection..."

Pg. 599: (Top of page) "Figure ~~7.55~~ 7.56 shows attenuation and rise-time…" (Following caption) "When buying a scope (Figure 7.55), you'll need…"

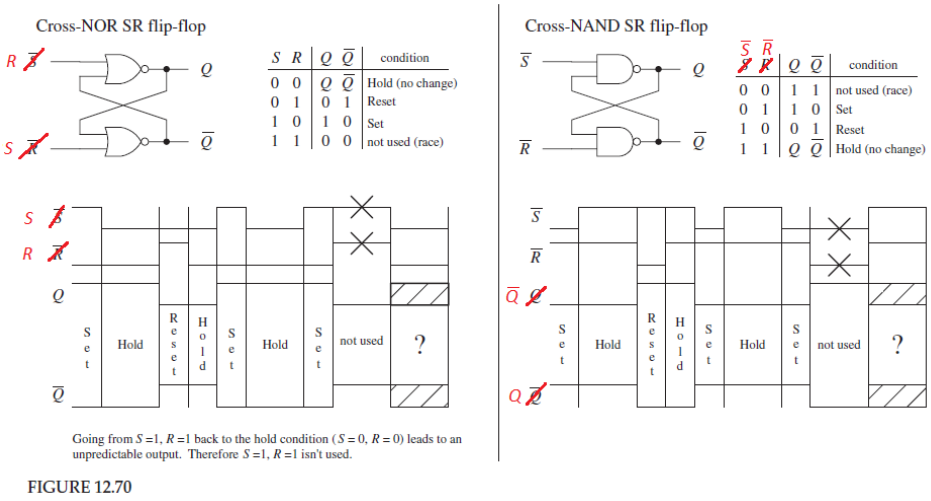
Pg. 605: Figure 7.58. Images are missing labels. Top row should be "(a)" then "(b)" (left to right), followed by bottom row "(c)" then "(d)".

Pg. 624: (Start of Wire and Cable section) "Get a selection of solid and ~~strained~~ stranded hookup wire…"

Pg. 651: Figure 8.26. Misprinted equation, should read as follows: "$R_{\text{com}} = \frac{R_1 R_2}{R_1 + R_2}$"



Pg. 770: Figure 12.70. Mislabeled diagrams.



Going from $S = 1$, $R = 1$ back to the hold condition ($S = 0$, $R = 0$) leads to an unpredictable output. Therefore $S = 1$, $R = 1$ isn't used.

FIGURE 12.70

Pg. 771: (Third paragraph) "This occurs because, unlike the NOR gate, which outputs a ~~low~~ high only when both its inputs are ~~the same~~ low, the NAND gate outputs a ~~high~~ low only when both its

inputs are ~~the same~~ high. This means that the hold condition for the cross-NAND SR flip-flop is ~~*S*~~ $\overline{S}$= 1, ~~*R*~~ $\overline{R}$= 1, while the indeterminate condition is ~~*S*~~ $\overline{S}$= 0, ~~*R*~~ $\overline{R}$ = 0."

Pg. 826: (Second-last paragraph) "…to an output current through the ~~Iout~~ I_{out} terminal."

Pg. 966: (Bottom of page) "Chain rule: If *u* is a function of ~~*y*~~ *v*, and ~~*y*~~ *v* is in turn a function of *x*, then

$$\frac{d}{dx}\{u[v(x)]\} = \frac{du}{\cancel{dx}\ dv} \cdot \frac{dv}{dx}$$ …"

Pg. 967: (Third-last paragraph) "…to place the ~~boundaries~~ boundary points into the *x* term of *F*."

Pg. 968: (Fourth equation) "$\int u\,dv = uv - \int \cancel{u\,dv}\ v\,du$ (integration by parts)"

Next equation: $\int u^n\,du = \frac{u^{n+1}}{\cancel{u}\ n+1} + C \quad (n \neq -1)$

Special thanks to Marco Ariano.