Kevin's full list of typographical errors:

Page 20: The matrices representing the annihilation and creation operators in the unnumbered display equation below Eq.(1.2.25) should be interchanged, at least if they are to follow the natural notation implicit in the unnumbered display equation on page 16.

Page 29: In the middle of the page, you might want "cosmic-ray showers" instead of "cosmic ray showers."

Page 31: In the fourth line after Eq.(1.3.1), the second semi-colon should be changed to a comma or omitted.

Page 56: In Eq.(2.3.7), the last ν should be μ.

Page 71: Here you might want to add West's observation that since ISO(2) is non-compact, its only finite-dimensional unitary representations are those in which the "translation" operators A and B are trivially represented.

After Eq. (2.5.37), insert something like "The commutators of A and B with P_3 do not vanish, but they are proportional to P_1 and/or P_2, which vanish when acting on a state with momentum in the 3 direction."

I don't know how to handle this topic. One might replace $\Psi_{k,a,b}$ with $\Psi_{k,a,b,\sigma}$ in every occurrence. One might put Eq. (2.5.39) right after the eigenvector equations of A and B and then insert the text "Both the eigenvalues a and b must be zero, however, since

$$(\Psi_{k,a,b,\sigma}, [J_3, A]\Psi_{k,a,b,\sigma}) = a\sigma - \sigma a = 0 = (\Psi_{k,a,b,\sigma}, iB\Psi_{k,a,b,\sigma}) = ib$$

and

$$(\Psi_{k,a,b,\sigma}, [J_3, B]\Psi_{k,a,b,\sigma}) = 0 = (\Psi_{k,a,b,\sigma}, -iA\Psi_{k,a,b,\sigma}) = -ia.$$

Then one might drop the rest of page 71 and conclude with Eq. (2.5.38). But these equations may not make sense because the states $\Psi_{k,a,b,\sigma}$ are not normalizable.

Page 73: In Eq.(2.5.47), flip the signs of both i's.

Page 74: Interchange neutrinos and anti-neutrinos near the top of page 74.

Page 78: In the third Ψ, flip σ to $-\sigma$.

Page 78: In the text before Eq.(2.6.19), change "rotation by $-180°$" to "*clockwise* rotation by 180°."

Page 78: In Eq.(2.6.19), flip sign of i.

Page 79: On the first Ψ in the first equation, change k to p.

Page 79: In third equation, flip the signs of both i's.

Page 79: In long fourth equation, flip the signs of all eight i's. It might be helpful to specify the sense of some of the rotations. For example, the rotation $R(\theta)$ typically is a *clockwise* rotation. Normally we use counter-clockwise ones.

Page 108: In Eq.(3.1.1), replace $a_\mu(p_1^\mu \ldots$ with $a_\mu \cdot (\ (\Lambda p_1)^\mu \ldots$

Page 116: In the 2nd equation, the last two denominators should be $E_\beta - E_\gamma \pm i\epsilon$ and $E_\alpha - E_\gamma \pm i\epsilon$.

Page 118: In top equation, drop the last comma.

Page 132: Near the middle of the page, after the new paragraph starts, "are conserved" perhaps should be "is conserved."

Page 132: Use $\overline{K^0}$ to get a nice line that properly covers the K^0 symbol.

Page 139: In Eq.3.4.23), the second, third, and fourth occurrences of $\mathbf{p}_1$ should be $\mathbf{p}_2$.

In the immediately following, unnumbered display equation, the subscripts 1 and 2 should be interchanged.

The solid-angle differential involves $\sin\theta$ not $\sin^2\theta$.

And it is the differential for $\mathbf{p}'_2$.

Page 140: Top line, change 1 to 2.

Eq.(3.4.27) should end with

$$\frac{k'E}{E'_1 E'_2}.$$

In the next line of text, change 1 to 2.

Page 142: In Eq.(3.5.5), H_0 should be $i\,H_0$ in the first exponential.

Page 145: Somewhere before page 145, you might want to mention that to lowest order in ϵ particles of mass m,

$$e^{i\epsilon K_3}\Psi_{k,\sigma} = \Psi_{p,\sigma}$$

where $p = (0, 0, \epsilon m, m)$. That is, the sign in the exponential is positive for a boost in the z-direction.

Page 150: On the LHS Eq.(3.6.18), one needs a factor of

$$F(\alpha) \equiv \left(\frac{V}{(2\pi)^3}\right)^{N_\alpha}$$

On its RHS, one needs a factor of $F(\beta)$ — or equivalently one may change $d\beta$ to $d\mathcal{N}_\beta$.

Unfortunately this error propagates through six of the next seven equations. I don't know the best way to insert appropriate factors of $F(\alpha)$ and of $F(\beta)$ into these six equations.

One way seems to be as follows:

In Eq.(3.6.19), put a factor of $d\mathcal{N}_\alpha$ on the LHS. Then replace the first $d\beta$ by $d\mathcal{N}_\beta$ and omit the inverse factor of $d\alpha$. Then insert a factor of $d\mathcal{N}_\alpha$ into the last term.

Immediately before the next equation, change $d\alpha$ to $d\mathcal{N}_\alpha$.

In that equation then also on the LHS change $d\alpha$ to $d\mathcal{N}_\alpha$. On the RHS, insert an $F(\beta)$ somewhere immediately after the "[" and an $F(\alpha)$ somewhere immediately before the "]."

In the last Eq. on page 150, change $d\alpha$ to $d\mathcal{N}_\alpha$ on the LHS. On the RHS insert an $F(\beta)$.

In the second equation on page 151, change $d\alpha$ to $d\mathcal{N}_\alpha$ on the LHS. Then put an $F(\beta)$ on the RHS.

In the next line of text, replace "second" by "first."

In the third equation on page 151, change $d\alpha$ to $d\mathcal{N}_\alpha$ on the LHS. Then on the RHS interchange α with β everywhere except in the volume element of integration. Then on the RHS, put an $F(\alpha)$ somewhere immediately after the "[" and an $F(\beta)$ somewhere immediately before the "]."

Finally, in Eq.(3.6.20), change $d\alpha$ to $d\mathcal{N}_\alpha$.

The way I understood the top inequality of page 151 was to recognize that

$$e^x \geq ex$$

and then to set $x = P_\alpha/P_\beta$.

Page 173: Eq.(4.2.1) $n \longrightarrow N$.

Page 173: In the last equation, insert $\delta(q - q_r)$.

Page 177: In Eq.(4.2.12), the last σ should be $\bar{\sigma}$.

Page 178: In Eq.(4.3.1), insert $(\pm)$ on RHS.

Page 194: In the middle display equations, replace

$$\sum_{\bar{\sigma}} \quad \text{by} \quad \sum_{\sigma} .$$

In these same equations, in the arguments of the spinors $u_{\bar{l}}$ and $v_{\bar{l}}$, replace σ by $\bar{\sigma}$. In Eqs.(5.1.13) and (5.1.14), in the arguments of the spinors $u_{\bar{l}}$ and $v_{\bar{l}}$, the species argument n should be inserted.

Page 204: Perhaps the notation ϕ^{c+} would be nicer than ϕ^{+c}.

Page 209: At the start of the *Spin One* section, perhaps the phrase "From Eqs. (5.3.6)" could be changed to "From the third component of Eqs. (5.3.6)," so as to provide a hint for students.

Page 210: Right before Eq. (5.3.29), one might insert the equation

$$\Pi^{\mu\nu}(\mathbf{p}) = L^{\mu}_{\alpha}(p) L^{\nu}_{\beta}(p) \left(\eta^{\alpha\beta} + \delta^{\alpha}_{0} \delta^{\beta}_{0} \right)$$

as a hint to the students.

Page 212: In between Eqs. (5.3.39) and (5.3.40), the in-line equation following the word 'Using' should be $(-1)^{1+\sigma} e^{\mu *}(\mathbf{0}, -\sigma) = -e^{\mu}(\mathbf{0}, \sigma)$.

Page 220: The theorem needed is not Schur's lemma but a corollary to it, which Wigner calls Theorem 3 on pages 76 – 77 of his book *Group Theory*.

Page 222: The RHS of Eq.(5.5.20) needs to be divided by $(2\pi)^3$.

Page 222: There should be no division by $(2\pi)^3$ in either part of Eq.(5.5.23).

Page 223: Right before Eq.(5.5.26), $\beta = -i\gamma^0$ should be $\beta = i\gamma^0$.

Page 223: The middle part of Eq.(5.5.26) should have a plus sign, not a minus sign.

Page 223: The use of brackets in Eq.(5.5.29) seems a bit odd, but is certainly not wrong.

Page 224: (second printing) One line 7, the word "real" should be "positive."

Page 225: In Eqs.(5.5.44–45), either drop the subscript l or use parentheses: $(\beta\mathcal{C}v)_l$.

Page 226: In the first equation for $C\Phi$, the term $\xi^*\xi^{c*}$ should be $\xi\xi^c$.

Page 227: In Eqs.(5.5.51-52), the exponents should be $1over2 - \sigma$.

Page 228: In Eq.(5.5.54), the RHS should not have an overall minus sign.

Page 228: In the line after Eq.(5.5.58), the squat I should be 1.

Page 244 of second printing: In the first sentence of the paragraph beginning with "(4) Also," the words "a electromagnetic" should be "an electromagnetic."

Page 245: In Eq.(5.8.3), the RHS should not have an overall minus sign.

Page 245: I'd prefer an explanation of Eq.(5.8.4) — why can we so choose the phases that $\eta\xi\zeta = 1$?

An example: under CPT the hermitian sum of products of scalar fields $P(x) = z\phi_1(x)\phi_2(x) + z^*\phi_2^\dagger(x)\phi_1^\dagger(x)$ goes into $z^*\phi_1^\dagger(-x)\phi_2^\dagger(-x) + z\phi_2(-x)\phi_1(-x)$ which since $[\phi_1, \phi_2] = 0$, is $P(-x)$.

Page 248 of second printing: The matrix $R^\mu_\nu(\theta)$ in the unnumbered display equation in the middle of page 248 differs from the matrix in Eq.(2.5.27) by the transformation $\theta \to -\theta$.

In Eqs.(5.9.8) and (5.9.9), the sum should be over l not over $\bar{l}$.

Pages 246 – 249 of second printing: In Sec. 5.9 of Vol. I, Weinberg has in mind the photon for which $D_{\bar{l}l}$ is a real matrix. But form page 246 up to the middle of page 249, the discussion appears to be for a general massless field for which the matrix D is complex in which case the equations for v are *not* just the complex conjugates of the equations for u. So Eq.(5.9.16) may only be true when $D_{\bar{l}l}$ is a real matrix.

Page 251: In Eq.(5.9.30), I think that p^μ should be $(\Lambda p)^\mu$. Also since $D^\mu{}_\nu(\Lambda) = \Lambda^\mu{}_\nu$, why not write Eq.(5.9.30) as

$$e^\mu(\mathbf{p}_\Lambda, \pm 1)\ \exp(\pm i\theta(\Lambda, \mathbf{p}) = \Lambda^\mu{}_\nu\ [\, e^\nu(\mathbf{p}, \pm 1) + p^\nu \Omega_\pm(\Lambda, \mathbf{p})\,]\ ?$$

Also throughout Section 5.9, in Eqs.(5.9.2–4,6,7,10,11,30), the angles $\theta(\mathbf{p}, \Lambda)$ and $\theta(p, \Lambda)$ should be $\theta(\Lambda, p)$ to conform with the notation of Section 2.5.

Also in Eq.(5.9.33), I think that $(2p^0)^{-3/2}$ should be $(2p^0)^{-1/2}$.

Page 262: The third line from end of the last paragraph should begin as "of interactions of."

Page 274: In Eq.(6.2.1), the pre-factors should be $(2\pi)^{-3}$.

Page 276: In the equation between (6.2.15) and (6.2.16), there is a superfluous square-root.

Page 285: In line 5, the field ϕ was omitted from the formula for the interaction.

Page 290: Great stress is laid on this section (6.4) in the later chapters. So for pedagogical reasons, it would be useful to write the main result (6.4.13) in the simpler form:

$$\left(\Psi^-_\beta, T\left\{O_a(x), O_b(y)\cdots\right\}\Psi^+_\alpha\right) = \left(\Phi_\beta, T\left\{e^{-i\int_{-\infty}^{\infty} V(t)dt} o_a(x), o_b(y)\cdots\right\}\Phi_\alpha\right).$$

Page 293: The equation that defines $\Delta(x)$ should not contain $-y$ or should define $\Delta(x-y)$.

Page 297: In line 3, there is an extra period.

Page 300: In the line of text before Eq.(7.2.9), the reference should be to (7.2.2) or to (7.2.1) and (7.2.2).

Page 302–3: The fields C^r will be called "auxiliary fields" in what follows.

Page 304: In Eq.(7.2.25) the mass term is missing.

Page 309: In Eq.(7.3.14) the factor $\mathcal{F}^l(x)$ is missing from the integrand on the RHS.

Page 313: In Eq.(7.3.43), $\mathcal{P}$ should be P.

Page 319: Between Eqs.(7.5.7) and (7.5.8), it might be worth noting that what changes in going to the interaction picture is not so much the conjugate momentum as the time derivative of the field. In the Heisenberg picture $\dot{\Phi} = \Pi + J^0$, while in the interaction picture $\dot{\phi} = \pi$. In fact $\Pi = \pi$ at $t = 0$.

Page 320: In Eq.(7.5.10) the superscript α should be λ.

Page 322: In the second line of text, 22 should be 20.

Page 328: By "eliminated" Weinberg must mean "satisfied" or "coped with."

Page 341: One of the μ indices should be lowered.

Page 345: In line 3, the sign of J^0 should be changed to plus. In Eq.(7.6.1) the Lagrange density is proportional to $-J_\mu V^\mu$, while in Eq.(8.1.11), it is proportional to $+J_\mu A^\mu$. The latter convention is reaffirmed in Eq.(8.6.2).

The sign convention for the current is different in the case of the massive vector field. If we change the sign convention for the massive vector field, then the sign of J_μ needs to be changed in many of the equations of section 7.5 and in a few of those of the subsequent sections.

Page 347: You might mention that Eq.(8.3.2) is Gauss's law.

In the second line of last paragraph, $P_{\mathbf{x}1}$ should be $P_{1\mathbf{x}}$.

Page 348: In the third display equation, which is unnumbered, the subscript 1 should be 2. In the fourth display equation, which is unnumbered, the subscript 2 should be 1.

In Eq.(8.3.6), change i to j or the j's to i's.

Page 365: Shortly after Eq.(8.7.22), you might mention O. J. Simpson's theorem $\not a \not b + \not b \not a = 2a \cdot b$.

Page 382: In Eq.(9.1.35), $\mathcal{O}\left(P(\tau), Q(\tau)\right)$ should be $\mathcal{O}\left(P(t), Q(t)\right)$.

And in Eq.(9.1.36), the technical punctuation q', t' and q, t should be $q'; t'$ and $q; t$.

Page 383: The last remark applies again to Eq.(9.1.38).

Page 388: In Eq.(9.2.15) the function $f(\tau)$ must be pretty smooth. When I first heard you give this argument at Harvard around 1980, I thought it was marvelous. But now I wonder if the $i\epsilon$'s don't really come from the analytic continuation you performed in the appendix to chapter 9. That appendix was quite nice.

Page 390: In Eq.(9.3.2) t should be τ. But actually I think your book would be slightly easier to read if you used Latin letters more frequently. There are too many Greek letters. (I am reminded now of a line in *Amadeus* spoken by the tone-deaf prince: "Too many notes.")

Page 392: In the first line after the second unnumbered display equation, 4 should be 2.

In the penultimate unnumbered display equation, there should be a minus sign in front of the entire RHS, and the minus sign in front of the 1 should be a plus sign.

Page 393: In the sixth line of text, ultraviolet should be ultravioletly.

Page 394: In the last line of text before the penultimate display equation, Π should be Π_n.

Page 395: In the first paragraph of section 9.4, you refer (for a second time, I think) to ideas sketched in section 6.4 but not supported by display equations or text. A little more of both would be helpful.

Page 402: In deriving Eq.(9.5.20), as one moves each factor $q'_a - q_a$ through the state $|0\rangle$, one would get a minus sign if that state were fermionic. Now the state $|0\rangle$ contains N factors of Q_a acting on the fiducial state $|f\rangle$. So if N is even and if the state $|f\rangle$ is bosonic, then there is no extra minus sign, and Eq.(9.5.20) is correct. But if N is odd and the state $|f\rangle$ is bosonic, then Eq.(9.5.20) requires a factor of $(-1)^N$. This minus sign would occur again in Eq.(9.5.39).

An easy way out would be to restrict the discussion to systems containing an even number N of fermionic modes. In this case the preceding minus sign disappears; the nasty factor χ_N, which first occurs on the top of page 403, is unity; and other factors of $(-)^N$ on pages 406 and 407 also become unnecessary.

Page 408: I think there is a factor of $(-1)^{N(N-1)/2}$ missing from Eq.(9.5.47). This factor too is unity when N is even.

I make no claims at all about the signs in Eq.(9.5.48), except to say that they are simpler when N is even.

Page 426: In Eq.(10.1.1), $P_\mu(x)$ should be P_μ.

In Eq.(10.1.4), replace $p_\beta - p_\alpha$ by $p_\alpha - p_\beta$ or insert a minus sign.

In Eq.(10.1.6), replace $p_\beta - p_\alpha$ by $p_\alpha - p_\beta$.

Page 430: In the text between Eqs.(10.2.2) and (10.2.3), naively one would have $A_r^\dagger \cdots A_1^\dagger \Psi_0$ instead of the reverse order, but I am not sure whether the difference is important.

Page 431: I think there is an extra factor of $2\sqrt{\mathbf{k}^2 + m^2}$ in Eq.(10.2.6).

Page 434: In a subscript on M in Eq.(10.2.12), $-\mathbf{q}$ should be $\mathbf{q}$.

Page 436: In the second display equation, the last squared mass should be m_π^2.

Page 441: In Eq.(10.3.22), use $V_B(\bar{\Psi}\Psi)$ or change Eq.(10.3.27).

Page 442: Of course, the gamma matrices and the identity matrix are linearly independent, so it might be worth mentioning that the equations involving $\gamma^\mu k_\mu = im$ are jargon for the requirement that Σ^* when expressed as a power series in $\gamma^\mu k_\mu - im$ starts with the quadratic term.

Page 444: At the end of the eighth line from the bottom, there is too big a space before the period.

Page 445: In the paragraph of text after Eq.(10.4.18), the exponent $-1/2$ should be omitted from the two Z_3's.

In the last line of text, is "covariant" really the right term?

Page 448: In Eq.(10.5.1), you need $q' \cdot x'$ not $q' \cdot x$.

Also since you have a and b associated with α and β, the footnote on page 450 should probably be moved forward to this equation.

Finally since in Section 10.5, the symbol q is used repeatedly for a charge, it might be better to use p and k for momenta.

Page 450: In Eq.(10.5.9), the subscripts on the first photon propagator should be $\mu_1\nu_1$ and the ϵ's should be e's.

Page 452: In the unnumbered equation between Eq.(10.5.19) and (10.5.20), the second Z_3 should be dropped.

Page 474: In line 1, I'd prefer "high-energy behavior."

Page 479: In the fourth line from the bottom of the page, Z_2 should be Z_3.

Page 480: In the top line of the page, Z_2 should be Z_3.

Page 490: In Eq.(11.3.17), the differential dx is missing.

Page 507: In the line before Eq.(12.2.1), instead of "only allows," I'd prefer "requires."

Page 508: In line 2, you refer to Section 9.7, which is entitled "Varieties of Statistics." Do you really mean Section 9.7?

Page 510: In the line before Eq.(12.2.14), the second ν is superfluous.