Chapter 1

p 32, delete problem 2a
.
p. 32, problem 5, replace last sentence with **What is the total mass the balloon can lift at 27ºC and 1013 hPa?**

p 34, problem 11c): add an additional note

Chapter 2

p 72, problem 7a

$$\left[\frac{\partial}{\partial v}\left(\frac{\partial \eta}{\partial T}\right)_v\right]_T = \frac{1}{T}\left(\frac{\partial c_v}{\partial V}\right)_T$$

p 73, problem 7b

$$\left[\frac{\partial}{\partial T}\left(\frac{\partial \eta}{\partial v}\right)_T\right]_v = -\frac{p}{T^2} - \frac{1}{T^2}\left(\frac{\partial u}{\partial v}\right)_T + \frac{1}{T}\left(\frac{\partial p}{\partial T}\right)_v + \frac{1}{T}\left(\frac{\partial^2 u}{\partial T \partial v}\right)$$

p. 73, problem 7d

$$\left(\frac{\partial u}{\partial v}\right)_T = T\left(\frac{\partial p}{\partial T}\right)_v - p$$

Chapter 3

p 83, equation (3.32)

$$mc_p \frac{T}{\theta}\frac{d\theta}{dt} = A\,dF$$

where A is the cross-sectional area.

p 84, replace top line with

$$\rho = \frac{m}{v} = \frac{m}{A\,\Delta z}$$

p 83, equation (3.34)

$$\frac{T}{\theta}\frac{d\theta}{dt} = \frac{g}{c_p}\frac{\partial F}{\partial p}$$

p 93, equation (3.54)

$$\frac{\partial\theta}{\partial t} + u_j \frac{\partial\theta}{\partial x_j} + \frac{\partial \overline{u_z{}'\theta'}}{\partial z} = \frac{\theta}{T}\left[\frac{\partial}{\partial z}\left(\frac{\kappa}{\rho c_p}\frac{\partial T}{\partial z}\right) + \frac{1}{c_p}\frac{dq}{dt}\right]$$

p 93, equation (3.56)

$$\frac{\partial\theta}{\partial t} + u_j \frac{\partial\theta}{\partial x_j} + \frac{\partial \overline{u_z{}'\theta'}}{\partial z} = \frac{\theta}{T}\left[\frac{\partial}{\partial z}\left(\frac{\kappa}{\rho c_p}\frac{\partial\theta}{\partial z}\right) - \left[\frac{1}{\rho c_p}\frac{dF}{dz} + \frac{L}{c_p}E\right]\right]$$

Chapter 4

p 120, equation (4.53)

$$\frac{\partial\left(\mu_i/T\right)}{\partial T}\,dT = \frac{\partial\left(\mu_l/T\right)}{\partial T}\,dT + \frac{\partial\left(\mu_l/T\right)}{\partial X_l}\,dX_l$$

Chapter 5

p 158, problem 7d

$$w_l = \frac{\rho_l}{\rho_a}\frac{4}{3}\pi\int_0^\infty r^3 n(r)\,dr$$

Chapter 6

p 166
Figure 6.2 is incorrect

p 167 equation (6.22c)

$$dq = \left[c_p + \frac{L_{lv}^2 e_s}{pR_d T^2}\right] dT$$

p. 182
in the equations on this page, change w_s to w_v

p 184, replace the two equations in the middle of the page

$$0 = \left(c_{pd} + w_t c_l\right) dT + d\left(L_{lv} w_v\right) - v_d\,dp$$

$$0 = (c_{pd} + w_t c_l)dT + d(L_{lv} w_v) + (1 + w_t) g dz \equiv dh$$

p 190, problem 6
add the following text to the end of the problem
Determine your answer analytically. Check it with the thermodynamic chart.

Chapter 7

p 192, equation (7.3)

$$\frac{du_z'}{dt} = g\left(\frac{\rho - \rho'}{\rho'}\right)$$

Chapter 8

p 245, problem 5, replace text by:

5. Cloud drop size distributions are determined from aircraft measurements using a FSSP (Forward Scattering Single Probe) instrument, which determines drop sizes and concentrations by using optical techniques. The FSSP typically gives counts of particles in fifteen different size bins, with Δr = 1.5 μm. These counts can then be converted into concentrations 1.5 µm (# cm^{-3} **1.5 µm^{-1}**) by taking into account aircraft velocity, etc. One dropsize distribution, *n(r)*, determined from the FSSP during the Arctic Stratus Experiment is given below, from the middle of a stratus deck. The values of the droplet radii given at the top of the table represent the average radius of the 1.5 **μm** size bin.

p 246, problem 5a, replace last line by
σ_{ext}: **volume extinction coefficient** for solar (shortwave) radiation (m^{-1})

Chapter 9

p 248, equation (9.2)

$$F_{Q0}^{rad} = (1 - \alpha_0)F_0^{SW} + \mathbf{[1 - (1 - \varepsilon_0)]}\, F_0^{LW} - \varepsilon_0 \sigma T_0^4$$

where (1-ε_0) is the surface longwave reflectivity.

p 251, equation (9.9)

$$u_*^2 = \left[\overline{(u'w')}_0^2 + \overline{(v'w')}_0^2\right]^{1/2} = C_D\,(u_a - u_0)^2$$

p 260, equation (9.27)

$$F_{B0} = \frac{g\alpha}{c_{p0}}\left[F_{Q0}^{rad} + F_{Q0}^{SH} - \rho L_{lv}\dot{E} + \rho_l\, c_{pl}\dot{P}_r\,(T_{wa} - T_0)\right] - g\beta\,(\dot{E} - \rho_l\,\dot{P}_r)\,s_0$$

Chapter 12

p 332, equation (12.1a)

$$S\left(1 - \alpha_p\right)\pi r^2 = \sigma T_e^4\, 4\,\pi r^2$$

p 335, replace table at top of page

n	a_n	b_n
0	1.000110	0
1	0.034221	0.001280
2	0.000719	0.000077

p 338 equation (12.5)

$$E_I = c_v \int_0^\infty \rho T\, dz = \frac{c_v}{g}\int_0^{p_0} T\, dp$$

p 245, equation (12.15)

$$T_\nu^* = \frac{h\nu}{k}\left[\ln\left(\frac{2h\nu^3}{c^2 I_\nu} + 1\right)\right]^{-1}$$

Chapter 13

p. 370, equation (13.29)

$$\frac{d\tau_c}{dT_0} = \frac{3}{2}\left(\frac{1}{r_{el}\rho_l}\frac{dW_l}{dT_0} + \frac{1}{r_{ei}\rho_i}\frac{dW_i}{dT_0} - \frac{1}{r_{el}^2\rho_l}\frac{dr_{el}}{dT_0} - \frac{1}{r_{ei}^2\rho_i}\frac{dr_{ei}}{dT_0}\right)$$

Chapter 14

p 387, add units in Table 14.1

Planet	m_P **10^{23} kg**	r_P **10^3 m**	g_0 **m s^{-2}**	R_P **10^6 m**	P	ϕ	Ω	P_0 **hPa**	T_0 **K**

p 406, equation (14.13)

$$T_0 = (1+n)^{1/4} T_e^*$$