Extra Class License Manual - Supplemental Material

1 July 2009 (material missing has been restored)

The following text is presented on the *Extra Class License Manual* Web page as "Supplemental Material" intended to support or correct the 1st edition of the text. It is reproduced here for instructors and students to use independently from Web access.

Section IV

Page 4-3 (sidebar)
In the first example, the angle should be 30 degrees in all equations, not 60. In the paragraph on calculating parallel impedance, the second sentence should begin, "To calculate the denominator ($Z_1 + Z_2$) you would write…"

Page 4-17
In the equation at the very top of the page, the third term should be 10×10^3, not 10×10^4, so it will be in agreement with the conditions of the problem on the previous page. (i.e. - f = 10 kHz, not 100 kHz)

Example 4-16
Change the subscripts in Step 1 from "C" to "L". The rest of the problem is correct. B_L is negative because it is $1/jX_L = -j(1/X_L)$. That means Y will have a negative angle in an inductive circuit. Taking the reciprocal of Y causes the angle to be inverted and so the angle of Z = 1/Y in an inductive circuit will be positive.

Example 4-18
There's nothing wrong with the answer but the equation for r should read $\sqrt{} (1000^2 + (-250)^2$

Example 4-20
Again, the answer is right, but the minus sign in the $(-25)^2$ term under the square root sign should be removed.

Page 4-30 (this item was omitted from some previous supplements)
The fourth equation should read: $(2\pi f)(2\pi f) = 1/LC$
-And-
The fifth equation should read: $4\pi^2 f^2 = 1/LC$

Section V

Page 5-6 (this item was omitted from some previous supplements)
In the first paragraph under "Hot-Carrier Diodes" the final sentence should read, "Compare the inner structure of the hot-carrier diode depicted in **Figure 5-8** to the point-contact diode shown in Figure 5-7." (The figure references were reversed.)

Section VI

On page 6-9, equation 6-4 at the top of the page has V_{OUT} and V_{IN} reversed. The correct equation is:

$$A_V = \frac{V_{OUT}}{V_{IN}} = \frac{-R_F}{R_1}$$

The examples and supporting text are all correct.

In Figure 6-8, the intersection of the load line with the vertical axis should be labeled V_{CC} / R_3+R_4.

Section VII

On page 7-12 in the sidebar on D'Arsonval meter's opening paragraph, the statement "In order to measure ac, you must rectify it and convert the dc voltage back to ac" is misleading. The ac voltage to be measured is rectified (usually by a full-wave bridge rectifier) and applied to the meter's coil, causing a dc current to flow, moving the needle up-scale. The "conversion to ac" is done by calibrating the meter's scale to the RMS value of the applied ac voltage. This calibration is dependent on the waveform of the ac voltage: a square wave and a sine wave of the same peak-to-peak voltage will cause different deflections of the meter. So a better way of stating this in the manual would be, "D'Arsonval meters are dc-operated devices. In order to measure ac, you must rectify it to dc. A bridge rectifier is often used for this purpose. The meter's scale is then calibrated to read effective (RMS) voltage. Such a scale is only useful for sine-wave signals, however."

Section VIII

In the section on calculating the bandwidth of a CW signal, an error in Equation 8-2 requires a change of both Equations 8-2 and 8-3 as follows:

1 WPM = 50 symbols / 60 sec = 0.83 baud or baud = WPM / 0.83 = 1.2 WPM (Equation 8-2)

For CW signals, substituting 1.2 WPM for B in Equation 8-1:

BW = (WPM x 1.2) x K (Equation 8-3)

Section IX

In the text on pages 9-3 and 9-4 the figure of 2.14 dB is used as the gain of a dipole over that of an isotropic radiator. Test questions E9A02, E9A14 and E9A15 use the figure of 2.15 dB, however. The actual difference is insignificant and only one answer for those questions is at all close, whether 2.14 or 2.15 dB is used. The amateur literature uses several different figures for the dipole-isotropic gain differences and even the professional literature varies somewhat. In future printings, the ECLM will standardize on 2.15 dB as the figure used.