

Extra Class License Manual – Supplemental Information and Errata

Working Version

The following text is intended to support or correct the 11th edition of the *Extra Class License Manual* and the 4th edition of the *Extra Class Q&A*. **New items in this version of the document are in red.**

Determine the version of the manual you are using by referring to the first page of the preface inside your copy. Look for the text box with the copyright information where you'll also find the edition and printing information. (If the edition number is not followed by printing information, the book is the first printing.) If the material does not refer to a specific printing, it applies to all versions of the manual.

The question pool for the current Extra Class license took effect on July 1, 2016.

Question Pool Changes

None.

Supplemental Information

Extra Class License Manual

Significant Digits in Answers: Students may be confused when making calculations because the answer in the question pool or example does not reflect the exact number produced by a calculator. For example, when calculating reactance in Example 4.4 on page 4-22, using the formula for X_L a calculator will display a value of 396.2052. Following the rules of significant digits, the answer should be rounded to 400. A tutorial on significant digits is available online at www.chem.sc.edu/faculty/morgan/resources/sigfigs. Although the question pool is not completely consistent regarding significant digits in calculations, the student should expect answers to be rounded or refer to “best representations” to accommodate different methods of calculation. The associated question to this calculation (E5C15) asks only which of the graphed points “best represents” the resulting impedance, for example. High precision is not required in any exam question.

Chapter 6

Page 6-14

In Figure 6-13, the symbol β (beta) is used to represent the feedback ratio through the feedback network. While this is standard terminology (en.wikipedia.org/wiki/Barkhausen_stability_criterion), beta is also used to represent the ratio of collector to base current in a bipolar transistor. The context of the discussion should be used to alert the reader which meaning of the symbol is used. There are many symbols with multiple uses in electronics – caution is advised, along with a good glossary.

Page 6-42

Question E7C11 refers to “back-to-back” L networks forming a Pi network. This is described by Figure 6-44 – imagine L1 in that figure being divided into two series inductors, L1A and L1B. The combination of C1 and L1A forms an L network and the combination of L1B and C2 forms another L network. When connected this way the inductors of the two L networks are in series and the capacitors are connected in shunt at the Pi network’s input and output.

Page 9-31

In the first paragraph’s explanation of the function of the hairpin inductor, it is correct that the hairpin is a shunt inductor. [E9E06] This shunt inductor then combines with the capacitive reactance of the antenna’s driven element to form an L network, matching the antenna’s feed point impedance to 50 ohms.

Extra Class Q&A

None

Errata

Extra Class License Manual

Page references for the following questions are off by one page:

Question	Chapter	Page Ref.	Correct Page
E1B06	3	8	9
E1E09	3	17	18
E1E10	3	17	18
E2B08	8	22	23
E2D11	2	11	12
E3A01	10	15	14
E3A02	10	14	15
E3A03	10	15	14
E4C04	7	17	18
E4C13	7	20	19
E6A09	5	10	11
E6A10	5	10	11
E6A12	5	10	11
E6A14	5	10	11
E6C01	6	9	10
E6F05	5	27	29
E6F06	5	27	28
E6F07	5	27	29
E6F08	5	26	28
E7C11	6	42	43
E7F15	6	40	41
E7H04	6	(none)	15
E8B11	8	5	6
E8D04	8	10	11
E9H11	9	24	2

Page 2-7

Remove [E2C04] at the end of the first paragraph.

Page 2-9

Remove E2C04 from the blue box at the bottom of the page so that the questions references are E2C01 through E2C03, E2C07, and E2C13.

Page 3-12/3-13

Change the sentence spanning the two pages to read "...located more than 50 km above the Earth's surface."

Page 3-17

In the first paragraph of "During the Exam," change "station" to "session."

Page 3-21

The blue box listing questions for Spread Spectrum Operation should list questions E1F01 and E1F09.

Page 4-32

In the paragraph following equation 4.16A, change line 4 to read "will always go down..."

Page 5-25

At the end of the first paragraph, change the reference to Figure 5.43 to Figure 5.42.

Page 6-7

In the final paragraph and continuing on page 6-8, the reference to a closed-loop circuit should be to an open-loop circuit.

Page 6-22

In the first paragraph – the reference to Figure 6.25 should be to Figure 6.22

Page 6-40

In the caption for Figure 6.38, "bn" should be "b_n".

Page 7-19

In the third paragraph of the Analog Receiver IF Filters section, change the third sentence to begin, "Their purpose is to increase receiver dynamic range by rejecting as many..." This creates a stronger explanation for the answer to referenced question E4C13.

Page 7-23

The second equation at the top of the page should be $f_2 = (14.035 + 14.020) / 2 = 14.0275$ MHz.

Page 6-41

In the second paragraph, the first sentence should read “Unlike a symmetrical FIR filter, frequency components of the input signal can be delayed by different amounts.”

Page 8-4

The answer to Example 8.4 should be 3, not 312.

Page 8-16

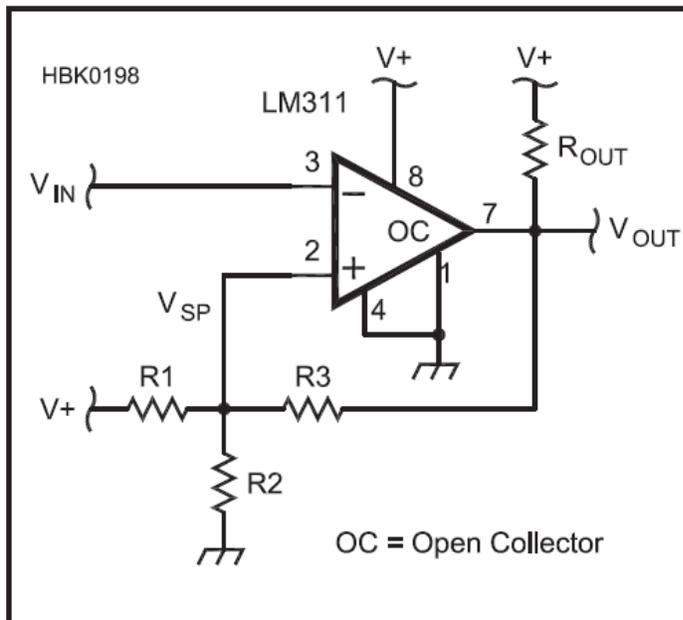
Add question E2C04 to the question reference [E2C09] and add question E2C04 to the blue box at the bottom of the page.

Question Pool: E2C04 – the referenced manual page should be 8-16.

Extra Class Q&A

E2A05 – In Table E2-1, swap the header labels “Downlink” and “Uplink” – the left-hand column (Satellite Receive) is the Uplink frequency.

E6C01 – Figure E6C01 should be graphic HBK0198 as shown below:



E7G04 – the explanation should refer to an open-loop circuit, not closed-loop. This is the revised explanation: Op amp input offset voltage is the dc voltage between the input terminals required to bring the output to zero in an open-loop condition. It is measured by adding a differential voltage to the input terminals such that the output voltage is returned to zero. Offset results from imbalance between the IC's input transistors and their biasing circuits.

E8A09 - The correct answer is D, not C.

E8B04 – The answer to the calculation is 3.

E9E06 – Answer C should read “A shunt inductor”