

**Student Instructions & USPS Errata**  
**Canadian Power and Sail Squadron “Electronic Navigation - 1st Edition”**

## OVERVIEW

This errata document introduces the USPS EN Course details to students. It assumes an instructor has provided a course overview presentation and the student is now reviewing materials. This course teaches effective use of Electronic Navigation devices including the NavStar Global Positioning System, ChartPlotter or other marine navigation computers, and the Automatic Identification System (AIS). It is structured to be understood by beginning boaters with no specific pre-requisites.

The USPS EN Course package includes the Canadian Power and Sail Squadrons (CPS) “Electronic Navigation - 1st Edition” textbook, the USPS provided “Student CD”, and this document. The CD includes material developed by CPS and USPS including a soft version of this document.

Certain points of Canadian law and regulation, Canadian terms, and metric units are stressed in the student text but don’t apply in US waters. Also, there are inconsistencies in the text where terms applying to a specific device were used in a broader context. These issues are corrected for US students through USPS developed errata, glossary and exam documents.

1. This document - “**Errata for CPS Electronic Navigation 1st Edition.pdf**” - identifies specific changes to student text. It is recommended that each student make the errata text changes before studying each Section.
2. The “**Electronic Navigation Glossary.pdf**” consolidates data from student text appendixes 3 and 5; and adds additional definitions of terms to further define terms. The errata document recommends this document be used instead of these two appendixes.
3. The USPS final exams are modified to eliminate these issues.

## USPS EM COURSE MATERIAL

### Electronic Navigation Course (EN Course) Materials:

- CPS “Electronic Navigation” Student Textbook. 1<sup>st</sup> Edition 2013.
- Student CD Containing:
  - “Errata for CPS Electronic Navigation 1st Edition.pdf” (This Document)
  - “Electronic Navigation Glossary.pdf”
  - An automated Student Homework Tool w/ Instructions. Homework is accessed by a button on the main menu, and offers questions on each Section. The program provides the correct answer to missed questions, and an explanation excerpted from the text.
  - MapTech “Chart Navigator” Version 5.06 w/ Manual
  - CPS developed “Simulator” program that illustrates certain aspects of GPS for student experiments.
  - A “Treasure Hunt” game for students initially learning geographic coordinates and Route/Waypoint navigation.
  - ChartPlotter Emulator program for student experiments

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- PowerPoint presentation for each section of textbook are accessible through the automated tool.

## Electronic Navigation Student Text Outline

The student manual contains 15 sections and 9 appendices. All material will not be used. The USPS EM Course consists of the following sections. Corresponding PowerPoint files are provided to teach each section.

- Section 1 Introduction to GPS
- Section 2 How to use a GPS
- Section 3 Types of GPS units
- Section 4 Waypoints and routes Global Positioning
- Section 5 Navigation
- Section 6 The Electronic Chart
- Section 7 Electronic Navigation
- Section 8 Electronic Charting on a Computer
- Section 9 Limits of accuracy
- Section 10 Enhanced ChartPlotters
- Section 11 Tablets
- Section 12 Planning Your Cruise at Home
- Section 14 Chartplotter Features
- Section 16 Automatic Identification System (AIS) (Using Text from Appendix 8)

Of the remaining 8 appendixes the following are recommended to students:

- Appendix 1: Latitude and Longitude. Additional detail on geographic coordinates that many students will already understand.
- Appendix 2: Buying a GPS.
- Appendix 4: Useful References
- Appendix 6: Position Plotting Sheet
- Appendix 7: This Course’s CD
- Appendix 9: Bluetooth, Wi-Fi, 3G, 4G, Satellite

## Excluded Material

The following Sections and appendixes are not used for the USPS Course:

- CPS is in the process of re-writing Section 15. Useful for future student reference.
- Section 13 is not taught and will not be used for test questions. The ChartPlotter Emulator program is available for student experiments. Your instructor may use as demonstration tool. In addition to the provided CP390 program, Standard Horizon has several more modern emulation programs available for free download from <http://www.standardhorizon.com/?cmd=DisplayProducts&DivisionID=3&ProdCatID=84>.
- Appendixes 3 and 5 are fully replaced by the CD file “Electronic Navigation Glossary.pdf”.
- There are a number of paragraphs or figures in the manual that are printed with a grey background. Data from these sections are not included in exam questions.

Text Changes to support USPS Course Release of  
**Canadian Power and Sail Squadron “Electronic Navigation - 1st Edition”**

Page	Section	Paragraph	Issue
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## CHANGES TO “Electronic Navigation 1<sup>st</sup> Edition”

8	1.5.2		Replace Schreiber with Schriever
10	1.6	Figure	The Longitude degree number is expressed as 2 digits. In USPS guidelines it should be expressed as 3 digits with a leading 0 when necessary. Also many real GPS devices will only report Longitude degrees as 3 digits.
14	2	7	Replace the paragraph that begins "Typically, satellites" with: "A satellite has two numbers assigned. The PRIN is logically assigned and can be between 1 and 32. The IS assigned at launch and represents the sequence the satellite was funded. A GPS may use the PRIN to report identify of a satellite or use a arbitrary number of 1 through 24."
18	2.4.3		Replace 1st sentence with: "Set GPS to match the chart of the area. The vertical and horizontal legends of some charts may be set to show degrees, minutes and seconds, while others may be set to show degrees, minutes and thousands of a minute. "
19	2.4.3	4th	Delete this paragraph.
19	2.4.4		Add to the last bullet: "See paragraph 2.4.6."
19	2.4.5		Delete "and UTM" in the paragraph title. Delete the 2nd and 3rd paragraphs. UTM is not covered in the USPS EN Course.
22	2.5.1		Add as a 2nd paragraph. "The term 'Course Deviation Indicator' came from aviation instruments, and may be growing obsolete for marine GPS. Instead the term XTE is commonly adopted as a catch-all term that includes CDI displays."

Text Changes to support USPS Course Release of  
**Canadian Power and Sail Squadron "Electronic Navigation - 1st Edition"**

Page	Section	Paragraph	Issue
25	2.14		Change "3.11.3" to "4.11.3".
33	4.0		Replace Appendix A with Appendix 1
34	4.1	Figure	The Longitude degree number is expressed as 2 digits. In USPS guidelines it should be expressed as 3 digits with a leading 0 when necessary. Also many real GPS devices will only report Longitude degrees as 3 digits.
34	4.2	1st	In 3rd sentence add a comma after the word 'latitude'.
34	4.3		Canadian law requires paper charts onboard. There is no such law in USA for recreational boaters.
35	4.4	6th	In 2nd bullet replace 'Chartplotter' with 'GPS'.
36	4.5		Add the following to 4.5 title: "(Manual Entry of Coordinates)"
41	4.11.2	1st	The term 'Heading' is unique to the GPS device being described. Be aware the term Heading traditionally only applied to the direction the boat is pointed at this time.
42	4.16b	Figure	Delete this figure. It does not represent an accurate GPS report of an off course boat.
42	4.11.4		Add to title: "Reference CDI on Pg. 22."
49	5.4.2	4th	Replace last sentence with: "The XTE will decrease as you approach the waypoint."
52	5.6	6th	Correct the sentence that ends "towards the wind, to correct for the drift." to read " <b>towards the wind and monitor the Bearing report. The Bearing will increase as you approach the course line. Adjust the boat heading when the Bearing is near 270`. Then steer to maintain a 270` Bearing until you reach the waypoint.</b> ". Delete the remainder of the paragraph.

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Page	Section	Paragraph	Issue
53	5.8	last	Insert as the second sentence: "In the USA several organizations can issue a MMSI number including 'USPS', 'Boat US, or 'Federal Communications Commission'".
55	6.1		Delete the first sentence.
55	6.1		Add a 2nd paragraph: ENC (Electronic Nautical Chart) may refer to any type of electronic chart. In recent years the US Government (NOAA) and the Canadian Government ("Fisheries and Oceans Canada") have defined ENC as an official nautical electronic chart in vector format. ENC charts produced by both agencies are created according to IHO S-57 standards (or the similar S-63 for encrypted charts). NOAA also defines Raster electronic charts as RNC.
55	6.2	2nd	Delete this paragraph. FYI - (United States law does not require any types of charts to be onboard pleasure boats.) Replace paragraph with "Raster and Vector charts are described in this section. Any reference to a Paper Chart can be presumed to be referring to a Raster Chart concept. Any reference to the process of creating Vector Charts from a scanned Paper Chart is referring to early electronic charting procedures. Both Raster and Vector charts are now created from source surveys by NOAA and the Canadian Hydrographic Service."
55	6.2		Change title to "The Marine Chart".. Replace the paragraph with: Marine charts are created to satisfy commercial and recreational boaters in several formats. Raster electronic charts are created with the intention or printing the data on waterproof paper for use onboard vessels. Raster charts are formatted to fit both large paper formats and also typical 8"x11" pages. Raster Charts are also intended to be downloaded into Chartplotters or navigation software programs. Vector electronic charts are created to be downloaded into Chartplotters or navigation software programs.
56	6.5		The side note besides this paragraph specifying an internet address is not valid. A misprint or a change since document publication. The link <a href="http://www.chs-shc.gc.ca/twl-mne/index-eng.asp">http://www.chs-shc.gc.ca/twl-mne/index-eng.asp</a> may be the desired link.

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Page	Section	Paragraph	Issue
57	6.10	Side Note	The NOAA provided United States version of Chart 1 may be obtained at <a href="http://www.nauticalcharts.noaa.gov/mcd/chartno1.htm">http://www.nauticalcharts.noaa.gov/mcd/chartno1.htm</a>
59	6.13	1st	Eliminate the 3rd sentence. Add a new last sentence: "In most instances the master plastic films (used by the printer to produce a paper chart) are used during the scanning process."
59	6.13	2nd	Replace 'the illustration' with 'an image displayed'.
59	6.13	Side Note	The side note web address is incorrect. NOTMARs may be located at <a href="http://www.notmar.gc.ca/go.php?doc=eng/index">http://www.notmar.gc.ca/go.php?doc=eng/index</a> .
60	6.14		Delete the first sentence.
61	6.15	1st	Keep the paragraph heading. "... Delete the 1st paragraph as obsolete information: this is clarified in the two entries following"
61	6.16		Replace paragraph with "In today's production environment all chart data is developed as either a Raster computer file or a Vector computer database. When needed Paper charts are printed from the Raster computer files."
61	6.17	2nd	Replace the 2 <sup>nd</sup> paragraph with "In the USA raster chart files are updated weekly by National Oceanographic and Atmospheric Administration (NOAA) and are freely available for download from the NOAA WEB Site."
61			Delete Figure 6.3.
62	6.19		Delete this paragraph.
64			Delete Figure 6.6 as the chart scale is incorrect.
66	6.27.3	2nd, 3rd	Delete the paragraph beginning: "On the other hand," and the one beginning "Compared to scanning" . Both paragraphs focus on outdated techniques that are no longer needed as the data in official vector charts available from both NOAA and CHS can be reformatted as needed using computer techniques.

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Page	Section	Paragraph	Issue
70	7.1.3	New 4th	Add a new paragraph in the 4th position: "The meaning and use of the terms 'Course Up' and 'Track Up' may be exactly opposite from these definitions. Each manufacturer will choose the terms for their display options. At least one uses 'Head Up' instead of 'Track Up'. Students are advised to check their manuals for definitions and usage.
77	8	2nd	Replace 'OpenCPS' with 'OpenCPN'.
77	8	3rd	Replace 'Plotter' with 'Navigator'. Phrase should read "Maptech's Chart Navigator".
87	8.5	3rd	Replace 'OpenCPS' with 'OpenCPN'.
87	8.5	5th	Replace "CPS Course, Radar for Pleasure craft" with "USPS Seminar, Marine Radar"
87	8.6	All	The Maptech software is provided for student experiments as an example of PC charting systems. Students are not required to learn to use the software thus the exercise described by paragraph 8.6 is deleted. Instructors are encouraged to demonstrate MapTech software features and the effective creation of a route using software tools.
98	9.9	2nd	Replace 'Dilution of Position' with 'Dilution of Precision'
102	10.4		Replace "VFH" with "VHF"
111		3rd	Replace the beginning of the 2nd sentence that reads "Although paper charts are easily taken home," with "Although paper charts <b>and laptops with charting programs</b> are easily taken home,"
114	12.3	2nd	Delete extra "will" in 1st sentence.
116	12.7		Add the sentence - "However, this should not be blindly relied upon to avoid a grounding."

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Page	Section	Paragraph	Issue
119	13		This chapter describes a software product provided by "Standard Horizon" that allows their customers to learn to operate a specific Chartplotter. The USPS course does not require you to learn this material. However, it may be interesting to you to install and use the tool to understand generally how a Chartplotter functions.
132			The caption included with Figure 13.14 is incorrect. Please delete all words. The route being planned does in fact pass between the red and green channel markers.
vi		2nd bullet	Term FRS refers to Family Radio Service - a specification for economical radios available in North America. .
vii		Ax. 3	All terms listed are included in the USPS provided "EN Glossary" document.
xiii		Ax. 5	All terms listed are included in the USPS provided "EN Glossary" document.
xix		2nd	Appendix 7 - page xix, second paragraph, third line "...20 BG.." should be "20 GB".
xxvi			Replace "VFH" with "VHF"