



NAUTICAL CHART MANUAL - VOLUME 1 - POLICIES AND PROCEDURES
Seventh (1992) Edition

CHAPTER 5 - NAVIGATIONAL AIDS

**U.S. Department of Commerce
Office of Coast Survey**

**NATIONAL OCEAN SERVICE
Office of Coast Survey
Marine Chart Division**

CARTOGRAPHIC ORDER 021/01

December 7, 2001

FILE WITH NAUTICAL CHART MANUAL, VOLUME 1, PART 2, SECTION 5.1

TO: All Cartographers
Marine Chart Division

SUBJECT: Revision of the [Temporary Defects Caution Note](#) and
the [Combined Temporary Defects/Seasonal Aids Caution Note](#)

APPLICATION: All Affected Nautical Charts

Effective immediately, the content of the last sentence of the Temporary Defects Caution Note shall be revised from "See Notice to Mariners." to "See Local Notice to Mariners."

CAUTION
Temporary changes or defects in aids to
navigation are not indicated on this chart. See
Local Notice to Mariners.

Effective immediately, the corresponding change shall also be made to the last sentence of the first paragraph of the Combined Temporary Defects/Seasonal Aids Caution Note. The second paragraph of the combined note replaces an incorrect note in current documentation.

CAUTION
Temporary changes or defects in aids to
navigation are not indicated on this chart. See
Local Notice to Mariners.
During some winter months or when endan-
gered by ice, certain aids to navigation are
replaced by other types or removed. For details,
see U.S. Coast Guard Light List.

Both notes shall be in 7 pt. Swiss Light type, 2" wide, and in black.

Revisions to the Notes Cell Library have been made and both notes are available for immediate chart application.

Pages 5-3 and 5-4 replace the corresponding pages in the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition.

Pages IV-20e and IV-20f replace the corresponding pages in the Nautical Chart Manual, Volume 2, Appendix IV: Miscellaneous References, Seventh (1992) Edition.

Attachments

Nicholas E. Perugini
Captain, NOAA
Chief, Marine Chart Division

NATIONAL OCEAN SERVICE
Office of Coast Survey
Marine Chart Division

CARTOGRAPHIC ORDER 023/01

DECEMBER 21, 2001

File With Nautical Chart Manual Volume 1, Section 5

TO: All Cartographers
Marine Chart Division

SUBJECT: Nautical Chart Manual, Chapter 5-Navigational Aids: Updating of
General Information and Embedding of ENC Requirements

APPLICATION: All Nautical Charts

Effective immediately, the following attachment replaces the chapter separator and pages 5-1 through 5-4; and adds pages 5-2.1 through 5-2.12 to the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition.

The attachment:

1. revises the name of Chapter 5 from “Aids to Navigation” to “Navigational Aids”. (The term *navigational aids* is the more appropriate categorization of the content of the chapter.)
2. updates the *aids to navigation* general information section and embeds the respective ENC encoding requirements.

The chapter separator and pages 5-1 through 5-4 are to be inserted into the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition immediately before page 5-5.

Attachment

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NAUTICAL CHART MANUAL

5 NAVIGATIONAL AIDS

5.1 Aid to Navigation vs. Navigational Aid

An "**aid to navigation**" is a man-made structure or device external to a craft, and specifically designed to assist navigators in determining their position or a safe course, or to warn of dangers or obstructions. When the information is transmitted by light waves, the device is a visual aid to navigation; if by sound waves, an audible aid to navigation; and if by radio waves, a radio aid to navigation. Any aid to navigation using electronic equipment, whether or not radio waves are involved, may be considered an electronic aid to navigation. [Lights](#), [fog signals](#), [buoys](#), [daybeacons](#), [landmarks](#), [radiobeacons](#) and [LORAN-C](#) lattices are the principal aids to navigation shown on MCD charts.

The term "**navigational aid**" is a general term which covers any instrument, device, chart, method, etc., intended to assist in the navigation of a craft. This category encompasses all "*aids to navigation*", and also includes [ranges](#), [course lines](#), [traffic separation schemes](#), [vessel traffic services](#), [ferries](#) and rescue stations, etc.

The term "aid to navigation" should not be confused with the more general term "navigational aid".

5.2 Aids to Navigation

Authorities: The United States Coast Guard (USCG) is the principal authority for establishing and maintaining aids to navigation in U.S. waters. Complete information concerning aids and their characteristics can be found in the United States Coast Guard (USCG) Light Lists. Despite the title, the USCG Light Lists not only provide information on lighted aids, they also include information on fog signals, unlighted buoys, radio-beacons, RDF stations, daybeacons, racons, etc. The Canadian Coast Guard and the Saint Lawrence Seaway Development Corporation are equivalent authorities for waters under their jurisdiction.

Any aid to navigation to be charted which is not established and maintained by the USCG or equivalent authority, shall be identified on the charts either by the label "Priv" or by naming the agency that is responsible for its maintenance.

NOTE: The United Coast Guard Auxiliary is <u>not</u> an authoritative source for the addition or revision of aids to navigation.

Geographic Positions of Aids to Navigation Provided by an NOS Field Survey: NOS Field Party reports which list the geographic positions of lights or daybeacons on [NOAA Form 76-40](#) (*see example on following page*) shall also be considered an official source of an aid revision. When fixed aids are reported as such, it shall be the responsibility of the cartographer to determine the most current and correct position of the aid. The official Date of Location and positional accuracy shall be the primary determinants. The Nautical Data Branch, upon the receipt of such a document, shall furnish USCG Headquarters and the affected USCG local district a copy of the respective form 76-40.

Documents from sources other than the USCG, NOS, the Canadian Coast Guard and the Saint Lawrence Seaway Development Corporation, and which report the addition, revision or deletion of aids to navigation shall be forwarded to the Nautical Data Branch (NDB) for verification with the USCG. Aid revisions reported from non-official sources shall not be applied before documentation citing USCG approval is received in NDB.

The Lateral System: Aids to navigation are not established in navigable waters haphazardly, but are deployed in accordance with a prescribed pattern. The United States has adopted the lateral system, IALA (International Association of Lighthouse Authorities) in which the colors, shapes, and numbers of lights, buoys, and daybeacons are determined by their location in relation to safe water and by the general direction taken by the mariner when approaching port from seaward.

The lateral system of aid to navigation identification is also applied to (a.) offshore buoys and lights located along those coasts and (b.) traffic routes which do not lead distinctly *from* seaward or *toward* headwaters. However, the color and number designations are applied so that even-numbered aids mark the starboard side when proceeding in a southerly direction along the Atlantic coast, in a northerly and westerly direction along the Gulf coast, and in a northerly direction along the Pacific coast. The aids in the Intracoastal Waterway are similarly marked in the direction proceeding from the north Atlantic states to the lower coast of Texas. These markings are regardless of the compass headings of individual sections of the waterway.

Local Notice to Mariners (LNM) vs. Weekly Notice to Mariner (NM): In general, most changes affecting newly established, revised, or deleted aids to navigation are first applied to a chart from the Local Notice to Mariners (LNM). The Local Notice to Mariners is a publication issued by each United States Coast Guard District for the purpose of disseminating information affecting navigation safety within the district. Although the LNM is usually published weekly, it may be published as often as required.

The LNM shall serve as the primary source document for the application and revision of all aids to navigation falling in United States waters and under the jurisdiction of the USCG.

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(NOTE: Form is not shown true to scale.)

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Example of NOAA Form 76-40: NONFLOATING AIDS OR LANDMARKS FOR CHARTS

(Back)

(NOTE: Form is not shown true to scale.)

TYPE OF ACTION	RESPONSIBLE PERSONNEL NAME	ORIGINATOR
OBJECTS INSPECTED FROM SEAWARD		<input type="checkbox"/> PHOTO FIELD PARTY <input type="checkbox"/> HYDROGRAPHIC PARTY <input type="checkbox"/> GEODETIC PARTY <input type="checkbox"/> OTHER (Specify)
POSITIONS DETERMINED AND/OR VERIFIED		FIELD ACTIVITY REPRESENTATIVE
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES		OFFICE ACTIVITY REPRESENTATIVE
<input type="checkbox"/> REVIEWER <input type="checkbox"/> QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE		
INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION' <i>(Consult Photogrammetric Instructions No. 64)</i>		
<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p>OFFICE</p> <p>I. OFFICE IDENTIFIED AND LOCATED OBJECTS Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object. EXAMPLE: 75E (c) 6042 8-12-75</p> <p>FIELD</p> <p>I. NEW POSITION DETERMINED OR VERIFIED Enter the applicable data by symbols as follows: F - Field P - Photogrammetric L - Located Vis - Visually V - Verified 1 - Triangulation 5 - Field Identified 2 - Traverse 6 - Theodolite 3 - Intersection 7 - Planetable 4 - Resection 8 - Sextant</p> <p>A. Field positions* require entry of method of location and date of field work. EXAMPLE: F-2-6-L 8-12-75</p> <p>*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.</p> </div> <div style="width: 48%;"> <p>FIELD (Cont'd)</p> <p>B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object. EXAMPLE: P-8-V 8-12-75 74L (c) 2982</p> <p>II. TRIANGULATION STATION RECOVERED When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery. EXAMPLE: Triang. Rec. 8-12-75</p> <p>III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH Enter 'V-Vis.' and date. EXAMPLE: V-Vis. 8-12-75</p> <p>**PHOTOGRAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.</p> </div> </div>		

NOAA FORM 76-40 (8-74)

SUPERSEDES NOAA FORM 76-40 (2-71) WHICH IS OBSOLETE, AND EXISTING STOCK SHOULD BE DESTROYED UPON RECEIPT OF REVISION.

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Newly established aids to navigation shall not be charted unless a Light List number has been assigned to the aid when it is first published in the LNM. As a general rule, only those aids which are now included or shall in the future be included in the USCG Light List, are to be charted on MCD charts. However, aids established by neighboring foreign countries, aids having reliable maintenance authorities (such as those established by the military), and environmental buoys which fall beyond Light List limits may also be charted. In addition, radar reflectors, lights, and sound signals shall continue to be charted for those features which are not specifically intended for use in navigation, whether or not the feature is listed in the Light List. Features in this category include floats, targets, platforms, dredging range markers and data-collecting buoys.

If a new edition of a Light List includes an aid change that was not published in a LNM, the change should be verified by the *Update Service Branch* before the chart is revised.

The Weekly Notice to Mariners (NM) is produced by the National Geospatial-Intelligence Agency (NGA) and is a weekly publication prepared jointly with the National Ocean Service and the USCG. Although this publication also contains information concerning changes in aids to navigation, items affecting navigation safety and selected items from the Local Notice to Mariners, it shall serve as a supplementary source for the application and revision of aids to navigation falling within the limits of MCD charts.

The Weekly Notice to Mariners (NM) shall be used primarily to:

- Apply any additions, revisions and deletions of aids to navigation (and other items) which were not previously reported in a USCG Local Notice to Mariners (LNM).
- Apply all additions, revisions and deletions affecting aids to navigation (and other items) falling under the jurisdiction of neighboring foreign authorities (e.g., Cuba, Mexico, the Bahamas, Russia). *NOTE: "Neighboring foreign authorities", as mentioned in this paragraph, does not include Canada and waters falling under the jurisdiction of the Saint Lawrence Seaway Development Corporation. Changes to aids in these waters shall be provided in the Canadian Notice to Mariners.*

ENC Bulletin. RE: Source Documents for ENC Aids to Navigation

USCG Local Notice to Mariners (LNM), NGA Weekly Notices to Mariners (NM) and fixed aids to navigation listed on NOAA Form 76-40 from NOS Field Party examinations shall serve as the official source documents for encoding all aids to navigation to be displayed on Electronic Navigational Charts. These documents shall not only serve as the official source of recently reported aid additions and revisions, but they shall also serve as the source of information acquired from historical document research, performed for the purpose of ensuring the current status of a previously charted aid is accurately encoded in the ENC database.

Symbolization: The symbols to be used in charting aids to navigation are illustrated in Sections [P](#), [Q](#), [R](#) and [S](#) of [Chart No. 1, Nautical Chart Symbols Abbreviations and Terms](#). Additional information concerning the proper aid symbolization is provided in the back sections of Chart No.1, pages [96](#) through [99](#). The symbols and information presented on these ([Chart No. 1](#)) pages are to be used exclusively for charting those aids which are: (a) intended for use in normal navigation and, (b) are listed in the USCG Light List.

NOTE: To chart those aids which are not specifically intended for use in general navigation, and which are not in the [USCG Light List](#), the appropriate landmark symbol and identifying label shall be used.

ENC Bulletin. RE: [IHO S-57 Appendix B.1, Annex D](#)

[IHO S-57 Appendix B.1, Annex D](#), is the ENC equivalent to the National Ocean Service's [Chart No. 1, Nautical Chart Symbols Abbreviations and Terms](#). It is the publication which contains the official library of symbols and color specifications of all ENC objects to be displayed on Electronic Chart Display and Information Systems (ECDIS).

Characteristics and Labels: The characteristics of an aid to navigation are the audible, visual or electronic signals displayed by an aid to navigation to assist in its identification. Generally all characteristics of an aid to navigation are charted, except for the specific omissions and exceptions described in this chapter. Characteristics shall be charted in the form of a label and shall be shown in black 7 pt. Swiss Regular Vertical type (fixed aids to navigation) or 7 pt. Swiss Regular Italic type (floating aids to navigation). In congested areas, a type size not less than 5 pt. Swiss Regular may be substituted.

ENC Bulletin. RE: Characteristics of ENC Aids to Navigation

Within the ENC environment, there are several general categories into which the characteristics of aids to navigation are encoded. These categories, called *attributes*, not only identify the characteristics typically portrayed on an MCD chart, they also provide a more thorough description (physical and informative) of the aid as it exists in the real world. For example, an attribute may provide the type of structure supporting the aid, the intended purpose of the aid, the name of the aid and the source (and source date) which establishes, revises or relocates an aid.

Location: All aids shall be charted in the true geographic positions reported in the official source document. **Aids shall not be charted in the positions provided in the USCG Light List.**

Aids shall not be moved off ranges or natural objects.

Aids and their identifying characteristics must be charted so as to be readily identifiable by the chart user.

When [buoys](#), [daybeacons](#), and [lights](#) are to be charted along channels, the respective symbols (and labels) should be placed so that channel limits are kept clear. Those aids to navigation which are charted along dredged channels and which overprint due to being placed in their true positions, may, with the approval of the Production Branch Chief, be separated by a distance of 0.5 mm. This procedure, however, shall seldom be necessary for many aid symbols are still legible, even when overprinted.

Aids and their identifying characteristics must be charted so that they are identified readily by the chart user and are not obscured by less important information.

ENC Bulletin. RE: Geographic Positions of ENC Aids to Navigation

Within the ENC environment, all aids to navigation shall be encoded at the official geographic position provided in the source document and are not to be moved because of overprinting which may tentatively occur on a paper/raster chart.

Temporary and Seasonal Aids/Changes: Temporary aids shall not be charted unless they have been assigned a Light List number. Exceptions shall be handled on a case-by-case basis.

Temporary changes or defects in aids to navigation are also not to be indicated on MCD charts. The following standard “temporary defects” CAUTION note stating this practice, shall be placed on all charts and shall be shown in black 7 pt. Swiss Light type, 2" wide format:

CAUTION

Temporary changes or defects in aids to navigation are not indicated on this chart. See Local Notice to Mariners.

Seasonal aids/changes are those aids and characteristics which are established or changed for the winter navigation season. These changes are also considered temporary and therefore shall not be charted. However, specific details for important aids, such as seasonal fog signals at major aids,

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shall be charted in all geographic areas. The following paragraph pertaining to seasonal aids to navigation, shall be added to the “temporary defects” CAUTION note on all charts falling within the Great Lakes and on east coast charts from Cape Henry, Virginia, northward. The entire note shall be shown in black 7 pt. Swiss Light type, 2" wide format and shall read:

CAUTION

Temporary changes or defects in aids to navigation are not indicated on this chart. See Local Notice to Mariners.

During some winter months or when endangered by ice, certain aids to navigation are replaced by other types or removed. For details, see U.S. Coast Guard Light List.

The [Update Service Branch](#) shall ascertain when the above note is applicable for areas outside the designated geographic areas listed above.

ENC Bulletin. RE: Seasonal ENC Aids to Navigation

Although seasonal aids and changes are considered temporary, and are only provided for on an MCD paper/raster chart through the application of the “seasonal aids” note, seasonal information shall be encoded individually for each affected ENC aid to navigation. The attributes which shall contain the seasonal information are *Status (STATUS)*, *Period Date Start (PERSTA)* and *Period Date End (PEREND)*. *Status (STATUS)* shall be encoded with a value of five (5) to indicate a periodic/intermittent status of the aid. *Period Date Start (PERSTA)* shall be encoded with the starting date of the active season of the aid. *Period Date End (PEREND)* shall be encoded with the ending date of the active season.

On Alaskan charts, specific details published in [Notice to Mariners](#) concerning seasonal aids shall be charted by individual or general notes. Specific details for important aids, such as seasonal fog signals, shall be charted on major aids charted on Alaskan charts.

Radar Reflectors: A radar reflector is a special fixture or reflective material fitted to or incorporated into the design of certain aids. Its purpose is to enhance the aid’s capability of reflecting radar energy. Since radar reflectors have been placed on nearly all USCG maintained floating aids, the label “Ra Ref” shall be omitted as part of the charted characteristics of floating aids, and the following general note shall be added to all MCD charts. The note shall be shown in black 7 pt. Swiss Light and shall read:

RADAR REFLECTORS

Radar Reflectors have been placed on many floating aids to navigation. Individual radar reflector identification on these aids has been omitted from this chart.

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Fixed aids to navigation which are equipped with radar reflectors, shall contain the label “Ra Ref” as part of the associated label.

For those features which are not specifically intended for navigation (e.g. [floats](#), targets, [platforms](#), [dredging range markers](#) and data collection buoys) and which are equipped with radar reflectors, the label “Ra Ref” shall also be charted as part of the associated label. The “Ra Ref” label shall be charted for these features whether the feature is listed in the Light List or not.

The radar reflector symbol [S 4](#) in [Chart No. 1](#) shall no longer be used on NOS nautical charts.

ENC Bulletin. RE: Radar Reflectors and Aids to Navigation

A radar reflector shall not be encoded as a separate ENC object when the reflector is attached to an aid to navigation. In this situation, the existence of the radar reflector shall be indicated by encoding (with the proper value), the *Conspicuous, radar (CONRAD)* attribute associated with the aid's structure.

Articulated Aids: Articulated aids are designed primarily to mark narrow channels in depths of up to 60 feet. They consist of a vertical pipe structure that oscillates around a universal coupling connected to a sinker. The structure is kept upright by the buoyancy of a submerged flotation chamber.

There are two types of articulated aids which are currently charted by MCD, an [articulated light](#) and an [articulated daybeacon](#). See [Sections 5.3.3](#) and [5.6](#) for more information.

ICW Aids: Where the Intracoastal Waterway (ICW) coincides with another waterway, the USCG uses yellow squares and triangles to indicate lateral significance on dual purpose aids to navigation.

Yellow triangles are used on all buoys and daymarks that should be passed on the starboard (right) side of the vessel.

Yellow squares are used on all buoys and daymarks that should be passed on the port (left) side of the vessel.

Non-lateral aids to navigation such as safewater marks, isolated danger marks and range marks will display a horizontal yellow band.

These yellow triangles, squares and horizontal bands do not affect the symbology of the charted red

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or green aids. However, the following notes shall be shown on the appropriate charts depending upon the range of the ICW covered by the chart. The notes shall be shown in magenta, 7 pt. Swiss Light type.

New Jersey ICW - Charts: 12324, 12316

INTRACOASTAL WATERWAY AIDS

The U.S. Aids to Navigation System is designed for use with nautical charts, and the exact meaning of an aid to navigation may not be clear unless the appropriate chart is consulted.

Aids to navigation marking the Intracoastal Waterway exhibit unique yellow symbols to distinguish them from aids marking other waterways.

When following the Intracoastal Waterway southward from Manasquan Inlet to Cape May, NJ, aids with yellow triangles should be kept on the starboard side of the vessel and aids with yellow squares should be kept on the port side of the vessel.

A horizontal yellow band provides no lateral information, but simply identifies aids to navigation as marking the Intracoastal Waterway.

All lights and lighted buoys marking the Intracoastal Waterway on this chart show a flash every four seconds, unless otherwise specified.

The aids marking tributary channels, in general, are maintained by the state of New Jersey.

Norfolk, Va. to Cross Bank, FL. ICW - Charts: 12205, 12206, 11553, 11541, 11534, 11518, 11507, 11491, 11489, 11485, 11472, 11428, 11467, 11451, 11463, 11465

INTRACOASTAL WATERWAY AIDS

The U.S. Aids to Navigation System is designed for use with nautical charts, and the exact meaning of an aid to navigation may not be clear unless the appropriate chart is consulted.

Aids to navigation marking the Intracoastal Waterway exhibit unique yellow symbols to distinguish them from aids marking other waterways.

When following the Intracoastal Waterway southward from Norfolk, Va. to Cross Bank in Florida Bay, aids with yellow triangles should be kept on the starboard side of the vessel and aids with yellow squares should be kept on the port side of the vessel.

A horizontal yellow band provides no lateral information, but simply identifies aids to navigation as marking the Intracoastal Waterway.

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Okeechobee Waterway - Charts: 11427, 11428, 11472**INTRACOASTAL WATERWAY AIDS**

The U.S. Aids to Navigation System is designed for use with nautical charts, and the exact meaning of an aid to navigation may not be clear unless the appropriate chart is consulted.

Aids to navigation marking the Intracoastal Waterway exhibit unique yellow symbols to distinguish them from aids marking other waterways.

When following the Okeechobee Waterway westward from St. Lucie Inlet to Fort Myers, FL, aids with yellow triangles should be kept on the starboard side of the vessel and aids with yellow squares should be kept on the port side of the vessel.

A horizontal yellow band provides no lateral information, but simply identifies aids to navigation as marking the Okeechobee Waterway.

Caloosahatchee River to Anclote, FL. ICW - Charts 11427, 11425, 11411**INTRACOASTAL WATERWAY AIDS**

The U.S. Aids to Navigation System is designed for use with nautical charts, and the exact meaning of an aid to navigation may not be clear unless the appropriate chart is consulted.

Aids to navigation marking the Intracoastal Waterway exhibit unique yellow symbols to distinguish them from aids marking other waterways.

When following the Okeechobee Waterway westward from the Caloosahatchee River to, Anclote, FL, aids with yellow triangles should be kept on the starboard side of the vessel and aids with yellow squares should be kept on the port side of the vessel.

A horizontal yellow band provides no lateral information, but simply identifies aids to navigation as marking the Intracoastal Waterway.

Carabelle, FL. to Brownsville, TX. ICW - Charts 11404, 11402, 11393, 11390, 11385, 11378, 11374, 11372, 11367, 11365, 11355, 11354, 11345, 11352, 11350, 11348, 11331, 11326, 11324, 11322, 11319, 11315, 11314, 11308, 11306, 11303, 11302**INTRACOASTAL WATERWAY AIDS**

The U.S. Aids to Navigation System is designed for use with nautical charts, and the exact meaning of an aid to navigation may not be clear unless the appropriate chart is consulted.

Aids to navigation marking the Intracoastal Waterway exhibit unique yellow symbols to distinguish them from aids marking other waterways.

When following the Intracoastal Waterway westward from Carrabelle, FL to Brownsville, TX, aids with yellow triangles should be kept on the starboard side of the vessel and aids with yellow squares should be kept on the port side of the vessel.

A horizontal yellow band provides no lateral information, but simply identifies aids to navigation as marking the Intracoastal Waterway.

Feature Removal: An aid to navigation shall not be deleted from a chart until it has been published as discontinued in a [Local Notice to Mariners \(LNM\)](#), [Notice to Mariners \(NM\)](#) or NOS Field Party report (i.e. NOAA Form 76-40). Non-official sources (e.g., U.S. Power Squadron, U.S. Coast Guard Auxiliary reports and photo-revisions without a field edit) shall not have sufficient authority to declare a feature non-existent. Documents from these sources shall be forwarded to the Nautical Data Branch (NDB) for verification with the USCG. Aid revisions reported from non-official sources shall not be applied before documentation citing USCG approval is received in NDB.

When a fixed aid to navigation has been built on a [rock](#) or other isolated feature (i.e., foundation, [shoal](#), [ledge](#), [wreck](#), etc.) and the LNM reports the aid as having been discontinued or relocated, care must be taken to restore these features to the affected nautical charts. The Light List should be consulted to identify any isolated features on which the aid to navigation may have been located. Subsequent verification with the NDB should also be obtained to validate the isolated feature's continued existence.

ENC Bulletin. RE: Feature Removal

☐ **Fixed Aids Which are Built on Isolated Features:**

When a fixed aid to navigation has been **built** on an isolated feature and the aid is to be subsequently deleted (per a Local Notice to Mariner) from the ENC database, the status (i.e., continued existence or removal) of the remaining isolated feature shall be verified with the Nautical Data Branch (NDB).

☐ **Aids Which Mark Isolated Features:**

When aids to navigation **mark** isolated features, the *relationship* between the aid and the isolated feature is encoded in such a manner as to produce an ancillary object. This ancillary object (or grouping) is encoded as an C_ASSOC “collection object”, and is used to identify an association between the aid and the isolated feature. When the aid is to be deleted from the ENC database, the C_ASSOC must be removed before deletion of the aid is performed.

Prudent Mariner and Aids to Navigation Notes:

Prudent Mariner Note - The following prudent mariner warning note shall be charted on all charts and shall be shown in magenta 7 pt. Swiss Light type:

WARNING
The prudent mariner will not rely solely on
any single aid to navigation, particularly on
floating aids. See U.S. Coast Guard Light List
and U.S. Coast Pilot for details.

Aids to Navigation Note - The following aids to navigation note shall be charted on all charts and shall be shown in black 7 pt. Swiss Light type:

AIDS TO NAVIGATION
Consult U.S. Coast Guard Light List for
supplemental information concerning aids to
navigation.

5.2.1 Application of Corrections from Notice to Mariners

All corrections applied to the raster chart files from the LNM/NM or other sources shall be shown using standard symbols, notes, and characteristics. Changes to aids are recorded in the NM Update Service CRIT database.

5.2.1.1 Update Service Branch (USB)

The Update Service Branch is responsible for the following:

- evaluating and taking appropriate corrective action in applying LNM/NM changes to the raster chart files.
- recording LNM/NM changes in a CRIT database
- marking each item in the LNM/NM to indicate that the appropriate corrective action has been taken in accordance with established procedures.
- keeping track of the number of corrections made to a chart from a LNM/NM in accordance with the following:

<u>Correction</u>	<u>Numeric Count</u>
(a) adding a symbol, its color and characteristics.....	1
(b) deleting a symbol, its color and characteristics.....	1
(c) revising an existing aid location or characteristic.....	2
(d) history cross-referencing (i.e., coordinating the published LNM with the originating source material, e.g., tabulations).....	2

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- returning the permanent record copy of the LNM or NM immediately to the Nautical Data Branch (NDB) for historic retention and future binding, once the marked copy has been applied to all raster chart files affected.
- retaining reference copies of LNM/NMs for use in coordinating questionable items with the USCG and NGA.
- making a final determination as to whether items applied to the raster chart files from the production branches and which originated from the Marine Chart Division, should be published in the LNM/NM.
- applying the *Notice Writer* corrections to the Update Service Branch raster files
- performing a cursory check of aids before all raster chart files are sent to reproduction.

5.2.1.2 Production Branch Responsibilities

The raster production branches shall be responsible for:

- incorporating (into the raster chart files to be forwarded to reproduction), the LNM/NM corrections applied by the Update Service Branch (USB).
- ensuring that there are no overprinted items upon the incorporation of LNM/NM corrections.
- bringing to the attention of the Chief, Update Service Branch any problems arising in the incorporation of LNM/NM corrections so that resolution with the appropriate USCG District and NGA may be made.
- (RE: Recommendations for publication in the LNM/NM):
preparing the announcement for publication (i.e. *Notice Writer*), inspecting all recommended items and forwarding to the Update Service Branch items applied to the raster chart files from documents originating with the Marine Chart Division and which are recommended for publication in the LNM/NM. Both the raster chart files and the source document should be forwarded. The Update Service Branch shall make the final determination as to whether the information should be included in the LNM/NM.
- providing a final check of all aids and determining a print date of a chart after all necessary work has been performed by reproduction and the chart is ready for printing.

REVISED JANUARY 8, 2004

ENC Bulletin. RE: ENC Responsibilities

❑ **Initial Encoding of a Chart:**

During the initial encoding of a MCD chart, it may be necessary to perform historical document research to ensure the current status of a previously charted aid is accurately encoded in the ENC database. Although LNMs / NMs / NOAA Form 76-40 are the primary source documents for the position and characteristics of aids, two (2) MCD database listings exist which have incorporated changes reported in the LNM/NM /NOAA Form 76-40 (and other official sources), and which may facilitate the encoding of all affected aids.

These database listings are the CRIT (Aid to Navigation **CRIT**ical Corrections) and the DIPFILE (**D**iscrete **I**ndependent **P**oint **FILE**).

The CRIT database began in 1987 incorporating aid changes reported in LNMs /NMs and continues today to serve as the official aids to navigation history of cartographic work.

The DIPFILE, established in 1972 and maintained until 1986 was a database which contained the source and geographic positions of not only all aids to navigation as they existed on MCD charts in 1972 through 1986, it also contained the source and geographic position of other cartographic features such as landmarks, wrecks and obstructions.

To perform the initial encoding of all aids to navigation which are currently charted on a MCD chart, the following resources shall be used and in accordance with the specified order:

- (1) CRIT database listing
- (2) DIPFILE
- (3) the respective chart

❑ **Continual Maintenance:**

During the continual maintenance phase of an ENC, all LNM/NM corrections shall be applied to the ENC database by obtaining the appropriate CRIT database listing and applying all specified corrections. The actual LNM/NM may be obtained to encode aid attributes which are not available on the CRIT listing, but the LNM/NM shall not be used to apply changes independently of the CRIT listing and the Update Service Branch.

When fixed aids are reported on NOAA Form 76-40, it shall be the responsibility of the cartographer to determine the most current and correct position of the aid. The official Date of Location and positional accuracy shall be the primary determinants. The Nautical Data Branch, upon the receipt of such a document, shall furnish USCG Headquarters and the affected USCG local district a copy of the respective form 76-40.

5.2.2 Hurricane and Tropical Storm Warning Note

The following note shall be placed on charts covering any part of Biscayne Bay or Hawk Channel, Florida and the Gulf Coast from Longitude 89° West to Longitude 95° West.

CAUTION

Hurricanes and tropical storms disturb objects on the sea floor and cause considerable damage to offshore structures, aids to navigation and moored vessels resulting in extensive debris being submerged in unknown locations. Wrecks and submerged obstructions may have been displaced from charted locations, and pipelines may have become uncovered or moved due to the force of storm surge. Aids to navigation may not be reliable immediately following such storms. Mariners are urged to exercise extreme caution and are requested to report aids to navigation discrepancies and hazards to navigation to the nearest United States Coast Guard Unit.

This note shall print in black, 7 point Swiss Light style type, set 2 1/2 or 3 inches wide.

(This space is intentionally blank.)

5.3 Lights

Lights on fixed structures are placed to assist the mariner in position determination, to mark channels, and to warn of dangers or obstructions to navigation. Lights are identified on charts both by their light



UNITED STATES DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

NATIONAL OCEAN SERVICE

Office of Coast Survey

Silver Spring, Maryland 20910-3282

MARCH 14, 2002

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: Nautical Chart Manual: Section Number Revisions; Correction Pages
- Pages 5-5 and 5-6

Effective immediately, the following attachment replaces pages 5-5 and 5-6 in the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition.

The attachment:

1. Revises the section numbers of Sections 5.2.1 and 5.2.2 to Sections 5.3.1 and 5.3.2 respectively,
2. Improves the legibility of the graphics on pages 5-5 and 5-6.
3. Changes the term “digital” to the term “raster” in paragraph 5.3.2.

Pages 5-5 and 5-6 are to be inserted into the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition immediately after page 5-4.

Attachment

characteristics and magenta flare. Lights of different colors and having different sequences and lengths of light and dark periods help mariners distinguish charted lights and locate their position. The source of new or revised light positions and characteristics are generally the LNM and NM, the USCG Light List, and the Canadian NM and List of Lights, Buoys and Fog Signals. See [Section 5.4, Buoys](#), for changes in colors of lights (e.g., the phasing out of white lights) in conformance with the [IALA Maritime Buoyage Systems](#). The symbols used to chart lights are shown in [section P](#) of Chart No. 1.

5.3.1 Charting Practices

The position of a light shall be shown by a black 0.75-mm dot, with a magenta flare drawn about 1 mm from the light dot ([P 1](#)). The orientation of the flare should be directed toward the label, if possible, and should avoid obscuring other detail. Flare orientation should, in general, be at the same angles as the orientation of buoy symbols (see [Section 5.4.1](#)). In the case of a leading light, the flare may be oriented seaward along the line ([P 1](#)).

When positions of fixed aids are listed on NOAA Form 76-40, Nonfloating Aids or Landmarks for Charts, the cartographer must determine their correct, current position. Date of location and positional accuracy are the primary determinants. NDB shall furnish USCG Headquarters and the affected USCG Local District with a copy of Form 76-40. MCD shall not initiate a [NM](#) in this instance.

The Light List should be consulted when the [LNM](#) reports a light has been discontinued or relocated and the light structure removed. If the Light List states that the light was located on a foundation, [shoal](#), [ledge](#), [wreck](#), etc., this feature should be charted. In the case of a discontinued lighthouse, the lighthouse structure itself may be charted as a landmark, e.g., "TOWER (ABAND LT HO)". The symbol "PA" (position approximate) is added when a destroyed light is reported in the NM as having been reconstructed and the exact fixed position has not been established.

5.3.2 Light Characteristics

The characteristics and number of a light should be shown on the digital chart files in the exact position they will occupy on the finished chart. If the name of the light appears in the Light List in bold type and space permits, it should be shown above the characteristics. How the various characteristics of a light, which identify it as fixed or having a particular flash configuration, its visibility and its color, are charted as shown in [P 10.1](#) through P 10.11 in Chart No. 1.

Two lights on the same structure should be labeled by their separate characteristics even though both are the same, e.g.:

(FI R)
(FI R)

Section 5.3.2

NAUTICAL CHART MANUAL

Large-scale charts shall provide complete information as to light characteristics. On smaller-scale charts covering only coastal areas, complete information regarding characteristics should be given for those lights which will be used in coastwise navigation.

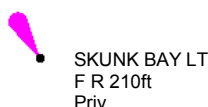
1. Charted Characteristics

The various identifying characteristics of lights that are charted are discussed below in general terms. For a complete list of characteristics and their charted abbreviations, see [Chart No. 1](#) and the Light List.

Light Name

The characteristics and number of a light should be shown in 7 pt. Swiss Regular type except in congested areas where 6 pt. type may be used. The light name should be shown in 7 pt. Swiss Regular, vertical type..

Example:



Flash Characteristics ([P 10.1](#) - P 10.11)

A **fixed light** shows continuously and steadily and is charted with the label "F".

An **occulting light** displays a total duration of light in a period longer than the total duration of darkness and the intervals of darkness (eclipses) are usually of equal duration. An occulting light is charted with the label "Oc".

An **isophase light** shows equal durations of light and darkness and is charted with the label "Iso".

A **flashing light** has a total duration of light in a period shorter than the total duration of darkness and the appearance of light (flashes) usually of equal duration. A flashing light is charted with the label "Fl".

A **group-flashing light** displays a group of flashes, specified in number, regularly repeated, and charted with the label "Fl (3)".

A **composite group-flashing light** is similar to a group-flashing light except that successive groups in a period have different numbers of flashes. A composite group-flashing light is charted with the label "Fl (3+1)".

A **continuous quick light** has regularly repeated flashes of not less than 50 flashes per minute but less than 80 flashes per minute. A continuous quick light is charted with the label "Q".

REVISED MARCH 14, 2002



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey

MAY 8, 2002

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: Nautical Chart Manual: Page Header Number Revision

Effective immediately, the following attachment replaces pages 5-7 and 5-8 in the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition. The attachment revises the page header number from Section 5.2.2 to Section 5.3.2,

Pages 5-7 and 5-8 are to be inserted into the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition immediately after page 5-6.

Attachment

An **interrupted quick light** has sequences of flashes interrupted by regularly repeated eclipses of constant and long duration. An interrupted quick light is charted with the label "IQ".

An **alternating light** displays different colors alternating and is charted with the label "Al W R".

Color ([P 11.1 - P 11.8](#))

The color of lights shall be shown using abbreviations (R, G, etc.). They shall be charted in 7 pt. Swiss Regular type.

Generally, white lights are not labeled as to color; thus charted lights with no color indication can be presumed to be white. However, where a light exhibits more than one color, including white (as in some sector lights and in alternating lights), the abbreviation "W" must be shown.

Amber lights are charted as yellow, i.e., "Y".

Period ([P 12](#))

The period a light takes to exhibit a full sequence of phases is expressed in seconds, e.g., "15s". Periods will be charted to the nearest tenth of a second expressed as a decimal.

Height ([P 13](#))

The height of a light is the vertical distance between the light source and the shoreline reference datum (normally [MHW](#), see [Section 2.8](#)). Height is shown in feet using the abbreviation "ft" except on metric charts, where height is shown in meters using the abbreviation "m".

Visibility ([P 14](#))

A light's visibility is expressed in the Light Lists as the "nominal range." This is the maximum distance a light may be seen in clear weather (meteorological visibility of 10 nautical miles) without regard for the height of the light or the height of the observer. The nominal range is charted in nautical miles in coastal areas, e.g., "10M". The nominal range is charted in statute miles on non-metric Great Lakes charts, e.g., "12StM". On Great Lakes metric charts, nominal range is given in nautical miles, e.g., "10NM". The visibility of range lights shall not be charted.

Converting a Nominal Range from Nautical Miles to Statute Miles

Conversion Value

When converting a nominal range from nautical miles to statute miles, a conversion value of 1.151 shall be used (i.e., $1.151 \times (\text{nominal range in nautical miles}) = \text{nominal range in statute miles} - \text{before rounding}$). This conversion value is the same value used by the U. S. Coast Guard and also

Section 5.3.2

NAUTICAL CHART MANUAL

contained in The American Practical Navigator, Publication No. 9, 1995.

NOTE: The conversion value is computed by dividing the number of feet contained in 1 nautical mile (6,076.11548) by the number of feet contained in 1 statute mile (5,280) and rounding to three significant digits.

Rounding

Resultant decimal values are rounded, not truncated. Decimal values equal to or greater than .5 statute miles are rounded upward to the next whole unit. Decimal values less than .5 statute miles are rounded downward to the whole unit.

Conversion Table

The table on the following page is provided as an alternative to multiplying the nautical mile value by the conversion value. The table provides conversions for all nautical mile values (columns 1 and 3) to statute mile conversions (columns 2 and 4). The table contains statute mile conversions for all nautical mile values from 1 to 100 nautical miles. A value extracted from Table 9 must be rounded according to the established conventions provided in the previous section.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

MARCH 14, 2002

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: Nautical Chart Manual: Page Header Number Revision; Correction
Pages - Pages 5-9 and 5-10

Effective immediately, the following attachment replaces pages 5-9 and 5-10 in the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition.

The attachment:

1. Revises the page header number from Section 5.2.2 to Section 5.3.2,
2. Improves the legibility of Table 9, and,
3. Improves the legibility of the light characteristics' table and legend on page 5-10.

Pages 5-9 and 5-10 are to be inserted into the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition immediately after page 5-8.

Attachment

TABLE 9							
Conversion Table for Nautical and Statute Miles							
1 nautical mile = 6,076.11548 feet				1 statute mile = 5280 feet			
Nautical Miles to Statute Miles				Statute Miles to Nautical Miles			
Nautical Miles	Statute Miles	Nautical Miles	Statute Miles	Statute Miles	Nautical Miles	Statute Miles	Nautical Miles
1	1.151	51	58.690	1	0.869	51	44.318
2	2.302	52	59.840	2	1.738	52	45.187
3	3.452	53	60.991	3	2.607	53	46.056
4	4.603	54	62.142	4	3.476	54	46.925
5	5.754	55	63.293	5	4.345	55	47.794
6	6.905	56	64.444	6	5.214	56	48.663
7	8.055	57	65.594	7	6.083	57	49.532
8	9.206	58	66.745	8	6.952	58	50.401
9	10.357	59	67.896	9	7.821	59	51.270
10	11.508	60	69.047	10	8.690	60	52.139
11	12.659	61	70.197	11	9.559	61	53.008
12	13.809	62	71.348	12	10.428	62	53.877
13	14.960	63	72.499	13	11.297	63	54.746
14	16.111	64	73.650	14	12.166	64	55.614
15	17.262	65	74.801	15	13.035	65	56.483
16	18.412	66	75.951	16	13.904	66	57.352
17	19.563	67	77.102	17	14.773	67	58.221
18	20.714	68	78.253	18	15.642	68	59.090
19	21.865	69	79.404	19	16.511	69	59.959
20	23.016	70	80.554	20	17.380	70	60.828
21	24.166	71	81.705	21	18.249	71	61.697
22	25.317	72	82.856	22	19.117	72	62.566
23	26.468	73	84.007	23	19.986	73	63.435
24	27.619	74	85.158	24	20.855	74	64.304
25	28.769	75	86.308	25	21.724	75	65.173
26	29.920	76	87.459	26	22.593	76	66.042
27	31.071	77	88.610	27	23.462	77	66.911
28	32.222	78	89.761	28	24.331	78	67.780
29	33.373	79	90.911	29	25.200	79	68.649
30	34.523	80	92.062	30	26.069	80	69.518
31	35.674	81	93.213	31	26.938	81	70.387
32	36.825	82	94.364	32	27.807	82	71.256
33	37.976	83	95.515	33	28.676	83	72.125
34	39.126	84	96.665	34	29.545	84	72.994
35	40.277	85	97.816	35	30.414	85	73.863
36	41.428	86	98.967	36	31.283	86	74.732
37	42.579	87	100.118	37	32.152	87	75.601
38	43.730	88	101.268	38	33.021	88	76.470
39	44.880	89	102.419	39	33.890	89	77.339
40	46.031	90	103.570	40	34.759	90	78.208
41	47.182	91	104.721	41	35.628	91	79.077
42	48.333	92	105.871	42	36.497	92	79.946
43	49.483	93	107.022	43	37.366	93	80.815
44	50.634	94	108.173	44	38.235	94	81.684
45	51.785	95	109.324	45	39.104	95	82.553
46	52.936	96	110.475	46	39.973	96	83.422
47	54.087	97	111.625	47	40.842	97	84.291
48	55.237	98	112.776	48	41.711	98	85.160
49	56.388	99	113.927	49	42.580	99	86.029
50	57.539	100	115.078	50	43.449	100	86.898

Source of Table: The American Practical Navigator, Publication No. 9, Defense Mapping Agency Hydrographic/Topographic Center, 1995, Table 9, Conversion Table for Nautical and Statute Miles, page 668.

REVISED MARCH 14, 2002

Section 5.3.2

NAUTICAL CHART MANUAL

Number

The assigned number or letter(s) of the structure, if any, should be shown in quotes, e.g., "2".

Privately Maintained ([P 65](#))

In general only privately maintained lights that are listed in the USCG Light List should be charted. If lights established and maintained by private interests are charted, the same guidelines for adding characteristics to USCG lights apply, and they shall be labeled "Priv" in 7 pt. Swiss Regular type. The service name shall be charted on Military aids, e.g., "Navy". On small-scale charts, this information may be omitted if it is charted on one or more large-scale charts covering the area, or where space is extremely limited.

2. Order of Characteristics

On large-scale charts, the characteristics of lights shall be shown in the following order:

Characteristic	Charting Example	Explanation
1. Flash characteristic (including number of flashes in a group flash)	Fl (3)	group of 3 flashes
2. Color (omit if white)	R	red
3. Period	10s	10 seconds
4. Height	85ft	85 feet
5. Visibility	10M	10 miles

The complete legend would appear on the charts in this form:

Fl (3) R 10s 85ft 10M "2"

3. Omission of Characteristics

Small-scale charts should show complete information regarding characteristics for major seacoast lights expected to be used in coastal navigation. However, where congestion is a problem, less important lights may be shown in a more abbreviated format. When this is necessary, omissions of light characteristics shall be made in the following order:

REVISED MARCH 14, 2002



UNITED STATES DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

NATIONAL OCEAN SERVICE

Office of Coast Survey

Silver Spring, Maryland 20910-3282

MARCH 14, 2002

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: Nautical Chart Manual: Section Number Revision; Correction
Pages - Pages 5-11 though 5-14

Effective immediately, the following attachment replaces pages 5-11 through 5-14 in the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition.

The attachment:

1. Revises the section number of Section 5.2.3 to Section 5.3.3,
2. Improves the legibility of the Articulated Aids Note, and,
3. Improves the legibility of all associated graphics.

Pages 5-11 though 5-14 are to be inserted into the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition immediately after page 5-10.

Attachment

- 1st, *height:*
Fl (3) R 10s 10M "2"
- 2nd, *period:*
Fl (3) R 10M "2"
- 3rd, *number of flashes in group:*
Fl R 10M "2"
- 4th, *daymark number:*
Fl R 10
- 5th, *visibility:*
Fl R

5.3.3 Types of Lights

Some of the more common lights shown on nautical charts are described below.

Aeronautical Lights ([P 60](#))

Aeronautical rotating white-and-green navigation lights usually associated with airports are the most dependable lights during their hours of operation that can be shown on the nautical chart. They are often the most conspicuous of the nonstrobe lights and their visibility range is usually greater than that of the lights established for marine navigation. Therefore, when an aeronautical light is recommended for charting, it shall be charted as a light rather than as a landmark. Its position is indicated on the chart by a standard light dot with a magenta flare. The flare is used to emphasize a light's dependability, and thus is also used for USCG aids. The light symbol should be accompanied by its characteristics and the label "AERO".

Since these lights are rotating, they are shown on the chart as "Rot". The color is shown by the standard abbreviations used for nautical lights. The period, height, visibility, and number are not charted.

A file with data for each rotating aeronautical light is maintained in NDB. This file gives the location and color of these lights. The compiler should consult this file before making any changes to charted aeronautical lights. If changes are made, the file should be corrected accordingly and, if necessary, the change should be published in the [NM](#).

Articulated Lights ([P 5](#))

Articulated lights are floating lights. They are basically a vertical pipe structure that oscillates around a universal coupling connected to a sinker. The structure is kept upright by the buoyancy of a submerged floating chamber.

The introduction of this type of aid to navigation, which is neither buoy nor fixed light, required a new symbol for charting. A black open circle 1.0 mm in diameter (the "approximate position" landmark symbol) is centered on the published position with a magenta flare. The open circle is used instead of a dot because the top of the structure may be displaced by an amount exceeding third-order light position accuracy (within 10 feet of its true position or reported to 0.1 second). The articulated light shall be labeled "Art" in Swiss Regular Italic type. The format for charting its characteristics shall be the same as for buoys and daybeacons:



An explanatory note shall be placed on all charts with articulated aids. The note shall be in black 7 pt. Swiss Light type, set 2" wide:

ARTICULATED AIDS

An articulated aid to navigation consists of a pipe structure that oscillates around a universal coupling connected to a sinker. the structure is kept upright by the buoyancy of a submerged flotation chamber. It is designed primarily to mark narrow channels in depths of up to 60 feet. All articulated aids are labeled "Art".

Directional Lights ([P 30](#))

Several types of directional lights are in use, all having a very narrow sector intended to mark a direction to be followed. The narrow sector may be flanked either by obscured or un-intensified light, or by lights of a different color or character.

When the main beam is flanked by obscured or un-intensified light, the central line of the sector shall be charted like a range line (see [Section 5.8, Ranges](#)). When the major beam is flanked by a light of a different color or character, the sector limits and arcs shall be charted, if possible.

A directional light normally shows three adjoining sectors of red, white, and green, in that order, reading clockwise. The center white beam is oriented to mark the preferred channel passage and is usually somewhat narrower than the red and green sectors. The bearings that define the arcs of visibility for these lights when looking from the mariner's point of view toward the light are

published in the NM and in the Light List. An easy way to plot these bearings is to place the center point of a compass on the light position dot, rotating the compass until 180E points true north. Then, reading clockwise, the bearings given for the sectors can be plotted. Specific bearings are sometimes not given in the NM or Light List. The bearings may be described as "White when on centerline of channel, red when right and green when left of white beam entering from seaward." In this case, a range line shall be charted down the center of the channel from the light, with red and green sectors shown on their respective sides of the range line.

The red and green sectors are obtained through the use of shields of these colors installed in the lens of the base light. They are shown on the chart by the legends "R SEC" and "G SEC" some distance from the light, within their arc of visibility. Where the chart scale is too small to show the directional light sector, the light symbol only is shown.

The label "Directional Light" should be charted if this term is used in the Light List.

Leading Lights ([P 20](#))

A leading light is similar to a range light ([Section 5.8](#)), except that it marks a channel with a single light (without a range line or ray lines) rather than with two separate lights. It usually has a high-intensity beam marking the safe channel which diminishes to far less intensity around the remainder of the horizon. It differs from a directional light in that it shows only one color of light instead of the three color sectors of the directional light.

Preferred Channel Lights ([Q 130.1](#))

The light and the dayboard colors on a preferred channel light have lateral significance and provide guidance to the mariner for the channels emerging from a junction point. Primarily, the dayboard is for day use and the light for night use. The light (which may also be a buoy or daybeacon) usually is placed in the "Y" formed by the merging channels. When the preferred channel in IALA Region B is to the left of the light, the light will be red (or white) and the dayboard will be red on top and green (or black) on the bottom. If the preferred channel is to the right of the light, the light will be green (or white) and the dayboard will be green (or black) above red. The colors would be reversed to indicate the preferred channel in IALA Region A.

Sector Lights ([P 40](#), [P 42](#), [P 43](#))

Sector lights are used primarily to warn mariners of dangerous shoals or obstructions hazardous to surface navigation. They are usually red, but may also be white or green. They are charted from the perspective of the mariner looking toward the light and should be plotted in the same manner as described for [directional lights](#), using dashed ray lines to show the limits of each sector. The ray lines should be a reasonable length, though not necessarily to the limits of visibility and in no instance greater than the visibility published in the Light List. The ray lines shall be discontinued when they intersect the shoreline and would no longer be useful.

Section 5.3.3

NAUTICAL CHART MANUAL

For obscured sectors ([P 43](#)), two bearings are normally given to show the limits of the obscured sector. Both sector lines shall be charted even if part of the sector is obscured by an object higher than the light.

Sector lights aid in safe navigation because the mariner can easily determine whether the vessel is in a safe position based on whether the sector light is visible.

Where the Light List shows different nominal range distances for sectored lights, the shorter of the two distances is charted. The length of charted sector lines are shown to this shorter distance or to the terminating neatline or a land mass.

Strobe Lights

Many charted features are marked with very quick-flashing ultrabright lights. These are produced by a strobe-producing light device, usually a xenon gas condenser-discharge flash lamp or flash tube. Strobe lights are used on certain USCG-maintained aids to navigation and on aeronautical hazards such as stacks, towers, and buildings. The terms "flick" and "flash tube" as used in the LNM are labeled "Strobe" on NOS charts. Aids published in the NM and Light List as well as landmarks with strobe lights, shall include the label "Strobe" as well as the label of the particular feature.

The flash period of a strobe light is usually omitted because of its extremely short duration (considerably less than 1 second). Occasionally an incandescent light will produce a high-intensity short flash characteristic of a strobe light. This usually occurs when lights are equipped with rapidly rotating mirrors or special lenses. Incandescent lights of this type shall be charted as strobe lights. Other high-intensity lights of longer flash duration and not of exceptionally strong candlepower shall not be charted as strobe lights.

Charting Examples

1. A light listed in the LNM as follows:

Oc (4+1) W, 30s = Fl, 1.0s; Fl, 1.0s; Fl, 1.0s;
Fl, 1.0s; Fl, 26.0s. (5 flashes)

would be charted thus:



Strobe Oc (4+1) 30s

2. A lighted buoy listed in the Light List as follows:

FL W, 4s; FL W, 2.5s (where the FL W, 2.5s is identified as a high-intensity flash tube in the remarks column)

would be charted thus:



Fl 4s
Strobe Fl 2.5s



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

MARCH 14, 2002

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: Nautical Chart Manual: Correction Pages - Pages 5-15 and 5-16;
Section Number Revision

Effective immediately, the following attachment replaces pages 5-15 and 5-16 in the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition.

The attachment:

1. Improves the legibility of the graphics on page 5-15,
2. Deletes the *stack with strobe light* graphic erroneously introduced during the NCM digital conversion processes, as a graphic example of a *strobe light used as a marker* (i.e., item 4. on page 5-15), and,
3. Revises the section number of Section 5.3 to Section 5.4.

Pages 5-15 and 5-16 are to be inserted into the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition immediately after page 5-14.

Attachment

3. A stack identified as a landmark with a strobe light would be charted thus:



4. A strobe light used as a marker would be charted thus:



5.4 Buoys

A buoy is a floating object, other than a lightship, moored or anchored to the bottom as an aid to navigation. Buoys may be classified according to:

Shape: spar, cylindrical or can, conical, nun, spherical, barrel, dan or pillar.

Color scheme: red, green, or checkered.

Topmark: fitted with a characteristic shape at the top to aid in its identification.

Sound: characteristic sound signal, may be further classified according to the manner in which the sound is produced, as a bell, gong, horn, trumpet, or whistle. buoy.

Light: buoy with a light having definite characteristics for detection and identification during darkness. If the light is produced by gas, it may be called a gas buoy.

Radiobeacon buoy: equipped with a marker radiobeacon

Sonobuoy: with equipment for automatically transmitting a radio signal when triggered by an underwater sound signal is called a sonobuoy.

Combination buoy: has more than one means of conveying intelligence; it may be called a lighted sound buoy if it is a lighted buoy provided with a sound signal.

Location: channel, mid-channel, middle ground, turning, fairway, bifurcation, junction, or sea buoy. A bar buoy marks the location of a bar. A buoy marking a hazard to navigation may be classified according to the nature of the hazard, as obstruction, wreck, telegraph, cable, fish net, dredging, or spoil ground buoy.

Section 5.4

NAUTICAL CHART MANUAL

Special Use: classified according to their use, as anchor, anchorage, quarantine, mooring, warping, swinging, marker, station, watch, or position buoy. A light-weight buoy especially designed to withstand strong currents is called a river buoy. An ice buoy is a sturdy one used to replace a more easily damaged buoy during a period when heavy ice is anticipated.

IALA

The USCG has completed the conversion of U.S. Aids to Navigation to the International Association of Lighthouse Authorities (IALA) Maritime Buoyage System in both Region A and Region B. The IALA system is followed by most of the world's maritime nations. The significant changes are these: black buoys shall be green; black-and-white vertically striped buoys shall be red-and-white vertically striped buoys; and white lateral lights shall be red or green, as appropriate. See also [Section Q](#) of Chart No. 1.

All navigable waters of the United States follow Region B, except U. S. possessions in the western Pacific Ocean west and south of a line extended in a southerly direction along the International Date Line to 10° N latitude, then easterly to 120° W longitude, which follow IALA Region A. Although there are differences in lateral aids to navigation between Region A and Region B, non-lateral aids to navigation are the same in both Regions.

Lateral marks define the port and starboard sides of a route to be followed when proceeding in the conventional direction of buoyage. On entering a channel from seaward, buoys on the starboard (right) side are green or black with even numbers in Region A and red with even numbers in Region B. Buoys on the port (left) side are red with odd numbers in Region A and green or black with odd numbers in Region B. Lights on red buoys may be red or white, while lights on green or black buoys may be green or white; however, white lights have been phased out of the lateral system. Safe Water buoys have red-and-white vertical stripes, are spherical or, in many instances, have a spherical topmark (see Chart No. 1, [Q 11](#), [Q d](#), [Q e](#)), and may be passed on either side. Preferred Channel buoys have red-and-green horizontal bands, the top band color indicating the preferred side of passage. Black may still be found in place of red on some safe water buoys, and in place of green on some preferred channel buoys.

Revision to charted aids shall be made on NOS charts from information published in the [LNM](#), [NM](#), Light List, and Canadian NM. Black buoys shall be changed to green and shall be depicted by an open buoy symbol with Green 225 (50 percent, 120-LPI) fill and labeled "G"; red-and-black horizontally banded buoys shall be changed to red-and-green and labeled "RG" or "GR" as appropriate (the top color indicating the preferred side of passage and listed first on the label); the changing of black-and-white vertically striped buoys to red-and-white will also require a change in the accompanying label. On lighted or sound red-and-white buoys only, a spherical topmark (see Chart No. 1, [Q 11](#)) may be added. The NM should be carefully examined for the announcement of the addition of such topmarks.

REVISED MARCH 14, 2002



UNITED STATES DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

NATIONAL OCEAN SERVICE

Office of Coast Survey

Silver Spring, Maryland 20910-3282

MARCH 14, 2002

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: Nautical Chart Manual: Page Header Number and Section Number
Revisions; Correction Pages - IALA Maritime Buoyage System
Notes

Effective immediately, the following attachment replaces pages 5-17 and 5-18 in the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition.

The attachment:

1. Revises the page header numbers from Sections 5.3 and 5.3.1 to Sections 5.4 and 5.4.1 respectively,
2. Revises Sections 5.3.1 and 5.3.2 to Sections 5.4.1 and 5.4.2 respectively, and,
3. Improves the legibility of the IALA Maritime Buoyage System Notes

Pages 5-17 and 5-18 are to be inserted into the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition immediately after page 5-16.

Attachment

Charts in the process of conversion to the IALA Maritime Buoyage System shall carry one of the following notes. After a chart has been converted, the note shall be removed.

The following note shall be added to all Region A charts going forward:

CAUTION
CHANGES IN BUOYAGE

Mariners are advised that authorized aids to navigation are being changed to conform to maritime standards of the International Association of Lighthouse Authorities Maritime Buoyage System, Region A. Significant changes are: black or green port hand buoys to red with an even number, red starboard buoys to green with an odd number; black and white vertically striped buoys to red and white vertically striped buoys; and lateral lights from white to red and green as appropriate. Changes to aids to navigation will be announced in the National Geospatial-Intelligence Agency weekly Notice to Mariners and the U.S. Coast Guard 14th District Local Notice to Mariners.

The following note shall be added to all Region B charts going forward:

CAUTION
CHANGES IN BUOYAGE

Mariners are advised that authorized aids to navigation are being changed to conform to maritime standards of the International Association of Lighthouse Authorities Maritime Buoyage System, Region B. Significant changes are: black port hand buoys to green; black and white vertically striped buoys to red and white vertically striped buoys; and lateral lights from white to red or green as appropriate. Changes to aids to navigation will be announced in the National Geospatial-Intelligence Agency weekly Notice to Mariners and the U.S. Coast Guard Local Notice to Mariners.

The notes shall be in magenta, 7 pt. Swiss Light, set 3 1/2" wide, and shall be outlined with an 0.008" magenta border 1/8" from the text. The notes will preferably be placed in any prominent location in the top margin. If sufficient margin space is not available (as determined by examination of a trimmed copy of the chart), the notes may be placed anywhere within the chart that will not require the deletion (and later replacement) of charted detail. The notes shall be removed when all nonconforming charted aids to navigation have been converted to the IALA system.

The Canadian Coast Guard (CCG) has completed the implementation of the IALA Maritime Buoyage System in Canadian waters. All charted Canadian aids to navigation should be checked for IALA compliance.

5.4.1 Charting Practices

The position of a buoy is shown with a small circle, the "approximate position" symbol ([Q 1](#)), because of practical limitations in positioning and maintaining buoys and their sinkers in precise geographic locations.

Section 5.4.1

NAUTICAL CHART MANUAL

Channel buoy symbols should be shown at a 65° angle from the channel lines, with the symbol pointing toward the top of the chart whenever possible. They should be shown in their published position on large-scale charts. A floating aid may be charted off position only on a small-scale chart where it marks the edge of a maintained channel which is charted larger than its true width (that is, one that is exaggerated in width to a minimum size). In this case, the floating aid shall be positioned on the charted channel limit line and not inside the channel. Where a buoy position would coincide with the symbol for another critical feature, such as a rock awash, the buoy may be charted slightly off position, for clarity, but always on the same azimuth to the feature it marks.

Buoy symbols marking the limits of fish trap areas ([Section 4.14.2](#)) should be oriented so as to fall inside the area and, in general, at an angle of 65° from the limiting lines.

Except as noted above, the orientation of buoy symbols should be about 25° from the vertical with the symbol inclined toward the label.

5.4.2 Buoy Characteristics

1. Charted Characteristics

The characteristics of buoys (their color and shape and the color and period of their light) should be shown on the digital chart files in the exact position they will occupy on the printed chart. All characteristics shall be abbreviated as shown in Chart No. 1 ([Q 2](#) - Q 71, and [a](#) - u) and the Light List. Buoy characteristics shall be shown in 7 pt. Swiss Regular Italic. Buoy numbers and characteristics should be shown clear of [rock](#) symbols, [shoals](#), [least depths](#), etc.

Shape and Fog Signal ([Q 20 - 26](#) & [a - e](#), [R 10 - 16](#), [R 20 - 22](#))

Buoys are identified on charts by their shape (can, nun, spherical buoy, spar buoy, or pillar buoy) and by any audible signal they emit (bell, whistle, gong).

Color ([Q 2 - 6](#) & [a - n](#))

All buoys except mooring buoys and black buoys should show their color characteristic using the specified abbreviations. Red buoys are shown with magenta fill labeled "R", green buoys with green fill and "G" label, and black buoys with black fill. The black section of multi-colored buoys is labeled "B". The color of mooring buoys is never shown.

Number ([Q 3](#), [Q f](#), [Q g](#))

The identifying number (or letter) which is painted on the buoy should be shown in quotes, e.g., "22".

REVISED MARCH 14, 2002



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

MAY 1, 2002

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: Nautical Chart Manual: Page Header Number and Section Number
Revisions; Correction Pages - Pages 5-19 through 5-22

Effective immediately, the following attachment replaces pages 5-19 through 5-22 in the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition.

The attachment:

1. Revises the page header numbers from Sections 5.3.2 and 5.3.3 to Sections 5.4.2 and 5.4.3, respectively.
2. Revises the section number of Section 5.3.3 to Section 5.4.3,
3. Improves the legibility of the Radar Reflectors Note and the Racing Buoys Note,
4. Improves the legibility of the *order of characteristic omission* examples, and
5. Revises the full name of the acronym: ODAS to the correct term: Ocean Data Acquisition System

Pages 5-19 through 5-22 are to be inserted into the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition immediately after page 5-18.

Attachment

Light Characteristics

Lighted buoys are charted with a magenta disc, 2.5 mm in diameter, centered on the circle at the base of the buoy symbol ([Q 7](#)). The light is identified by its flash characteristics and color.

Example: "Fl R 4s"

The period (cycle) of lights on lighted buoys is expressed in seconds using the abbreviation "s". Periods shall be given to the nearest tenth of a second as reported by the source.

Privately Maintained Buoys ([Q 70](#))

Private buoys listed in the Light List shall be identified with the label "Priv" in 7 pt. Swiss Regular Italic. The service name shall be charted on military aids, e.g., "Navy". On small-scale charts, or when space is limited, this information may be omitted if it is charted on one or more large-scale charts covering the area. Privately maintained buoys not listed in the Light List generally are not charted.

Radar Reflectors

A radar-enhancing structure or reflective material has been installed on nearly all major buoys and many minor buoys. Reference to this radar reflector should not be charted as part of the buoys' characteristics, but the following note should be included on the chart:

RADAR REFLECTORS

Radar reflectors have been placed on many floating aids to navigation. Individual radar reflector identification on these aids has been omitted from this chart.

2. Order of Characteristics

On large-scale charts, the characteristics of buoys shall be shown in the following order:

1. Color of buoy (omit if black)
2. Number (or letter)
3. Flash character (if lighted)
4. Light color (if lighted)
5. Light period (if lighted)
6. Fog signal

The complete legend would be charted as follows:

Section 5.4.2

NAUTICAL CHART MANUAL

Lighted buoy

R "22"
FI R 4s BELL

Unlighted buoy

R
N "22"

3. Omission of Characteristics

In congested areas and on smaller-scale charts, omissions of buoy characteristics shall be made in the following order:

Lighted Buoys

1st, light period:

R "22"
FI R 4s BELL

2nd, color of buoy:

FI R "22"
BELL

3rd, number:

FI R
BELL

4th, light color and flash characteristic:

BELL

Unlighted Buoys

1st, color of buoy:

N "22"

2nd, number:

N

5.4.3 Types of Buoys

Cardinal Buoys

Cardinal buoys do not have a unique shape, but are normally pillars or spars. They are always painted with yellow and black horizontal bands, and their distinctive topmarks are always black. Lighted

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cardinal buoys also have a special system of flashing white lights. The rhythms are "very quick" or "quick" flashing, but the flashing phase is broken into varying lengths. Variations in the light characteristics, the order of the painted bands, and the arrangement of the topmarks all serve to identify the area of navigable water relative to the buoy (see Chart No. 1, pages 74 [[Q 130.3](#) - 130.6] and 98 [[IALA Maritime Buoyage System](#) - Cardinal Marks Regions A and B]).

The USCG will not use cardinal buoys in its modification of the IALA Buoyage System in the foreseeable future. However, since Canada uses cardinal buoys, the pictorial buoy symbols are required for Great Lakes metric charts.

Nautical charts of the east coast, west coast, and Great Lakes waters that use traditional (non-metric) units shall chart cardinal buoys with a horizontally banded buoy symbol ([Q 4](#)). No color will be shown within the buoy symbol, nor will topmark symbols be used. Metric charts of the Great Lakes shall show cardinal buoys with a horizontally banded pictorial buoy symbol along with the proper arrangement of topmarks. See [Q 130.3](#), page 74 of Chart No. 1 for further details concerning cardinal buoys, called "cardinal marks" therein.

Mooring Buoys ([Q 40](#), Q s, Q t)

A **mooring buoy** is a buoy established for the purpose of mooring a vessel, usually by means of a ring fitted to the top of the buoy. For charting purposes, mooring buoys do not include superbuoys.

Small noncommercial, single-boat mooring buoys that are usually used for mooring pleasure craft and do not obstruct traffic or otherwise constitute a hazard to navigation shall not be charted.

Mooring buoys that are to be charted, whether they are lighted or unlighted cans, nuns, spars, or any other shape, shall be shown by the mooring buoy symbol.

Mooring buoys are not generally included in the Light List, but they are charted when they are published in the NM or at the request of the establishing agency.

Pictorial Buoys

NOS uses the CHS pictorial buoy symbols on metric charts of the Great Lakes co-produced with CHS. CHS has recently redesigned these pictorial buoy symbols so that they are now available in two sizes; the larger size is to be used except in congested areas. In addition, some of the buoy symbols are available with either a right-hand or a left-hand slope. The right-hand slope is considered the standard presentation. However, either symbol may be rotated, if necessary, to clear channels or adjacent charted detail. Port-side buoys retain a black fill despite the change of color of buoy itself from black to green. Starboard-side buoys retain a magenta fill. The other pictorial buoy symbols do not employ color fill. CHS also has introduced a new pillar buoy symbol for charting all lighted buoys, except lighted spars and superbuoys, and all sound buoys whether lighted or not. The magenta fog-signal symbol of three concentric arcs ([R 1](#)) is no longer used.

Section 5.4.3

NAUTICAL CHART MANUAL

Preferred Channel Buoys ([Q 4](#), [Q h](#))

The USCG uses red-and-green horizontally banded buoys to aid in safe navigation at waterway junctions and to mark safe routes past hazardous obstructions. The color of the topmost band of a preferred channel buoy directs the mariner to the side of preferred passage. Thus, in IALA Region B, green on the topmost band means the preferred channel is to starboard, while red on the topmost band means the preferred channel is to port. The colors would be reversed to mark the preferred channel in IALA Region A. The correct descriptive label "RG" (when the topmost band is red) or "GR" (when the topmost band is green) shall be shown as part of the charted label. Black may still be found on some aids and shall continue to be charted as such until the change to green for that aid is announced by the establishing authority.

Racing Buoys

These buoys are not usually included in the Light List and should not be charted except by special request. In certain areas where racing buoys are established, the following note shall be shown:

RACING BUOYS

Racing buoys within the limits of this chart are not shown hereon. Information may be obtained from the U. S. Coast Guard District Offices as racing and other private buoys are not all listed in the U.S. Coast Guard Light List.

Safe Water Buoys ([Q 11](#), [Q 130.5](#), [Q d](#), [Q e](#))

The black-and-white vertically striped midchannel, fairway, or safe water buoys are being changed to red-and-white vertically striped buoys. These changes are announced in the LNM. The NM also announces any additions of spherical topmarks on lighted or sound-equipped red and white vertically striped buoys. See Q 11 for the symbol for a spherical topmark.

Superbuoys ([P 8](#), [Q 26](#), [Q 58](#))

The term "superbuoy" usually refers to one of three principal types of buoys:

SPM's (single-point moorings) are large mooring buoys (or tanker terminal buoys) used to moor tankers for offshore loading and unloading.

ODAS (Ocean Data Acquisition System) buoys are used for collecting oceanographic or meteorological information.

LNB's (Large Navigation Buoys) or LANBY's (Large Automatic Navigation Buoys) are usually designed to take the place of lightships.

REVISED MAY 1, 2002



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

APRIL 30, 2002

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: Nautical Chart Manual: Intracoastal Waterway Aids to Navigation
Paragraphs (and Note Examples) Removed from "Ranges"
Section; Page Header Number and Section Number Revisions;
Correction Pages - Pages 5-23 through 5-32

Effective immediately, the following attachment replaces pages 5-23 through 5-34 in the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition.

The attachment:

1. Removes the paragraphs explaining Intracoastal Waterway Aids to Navigation (and the associated note examples) from "Ranges" section (Note: IWW Aids moved to Section 5.2 per Cartographic Order 023/01),
2. Improves the legibility of the Articulated Aids Note,
3. Improves the legibility of all associated graphics.
4. Revises all section numbers and page header numbers as indicated.

Pages 5-23 though 5-34 are to be inserted into the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition immediately after page 5-22.

Attachment

These superbuoys vary in size from about 21 feet in diameter for some of the SPM's to 33 and 40 feet in diameter for ODAS buoys and 40 feet in diameter for LNB's. Because their large size renders them an unusual hazard to navigation, these buoys shall be emphasized on nautical charts by the use of the appropriate superbuoy symbol.

Superbuoys are identified in the LNM by the following notations:

"LNB" on all items concerning LNB's

"SPM" on all items concerning tanker terminal buoys

"ODAS" on all items concerning anchored oceanographic buoys.

Any buoy identified with the acronym "ODAS" in the source material shall be charted as a superbuoy, regardless of its size.



Non-circular buoys shall be charted as superbuoys if the largest dimension is greater than 16 feet.

The height and visibility of lights shall be charted for LNB's from USCG-supplied information.

Isolated Danger Buoys ([Q 130.4](#), [Q h](#))

These buoys will be erected on or moored above or near an isolated danger which has navigable water all around. The buoy will be horizontally banded black and red with a topmark consisting of two black spheres mounted atop one another. If lighted, isolated danger buoys will exhibit a white light with a group flashing (two flashes) five second characteristic (FL (2) W 5s).

Example:



Fish Aggregating Devices (FADS)

In Hawaii, fishery biologists have developed Fish Aggregating Devices (FADS) to attract fish for recreational and commercial fishermen.

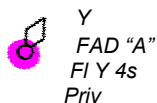
These are clusters of submerged hollow spheres tethered to 5-foot diameter spherical buoys, yellow in color, displaying a flashing amber light every 4 seconds. They are anchored to the bottom by heavy concrete blocks, and placed in depths of 480 to 9,000 feet at distances of 2 to 15 miles offshore.

Section 5.5

NAUTICAL CHART MANUAL

They shall be shown on charts of the Hawaiian Islands.

Example:



5.5 Fog Signals

Fog signals are audible aids used to warn of danger and to provide the mariner with a means of determining a craft's position when visibility is obscured by fog, snow, rain, smoke, or thick weather. Among the devices in common use as fog signals are the following:

Diaphones produce sound by means of a slotted reciprocating piston actuated by compressed air. "Two-tone" blasts consist of two tones of different pitch, beginning with a high-pitched blast and ending on a low pitch.

Diaphragm horns produce sound by means of a disc diaphragm vibrated by compressed air or electricity.

Sirens produce sound by means of either a disk or a cup-shaped rotor actuated by compressed air or electricity.

Whistles produce sound by compressed air emitted through a circumferential slot into a cylindrical bell chamber.

Bells produce a distinctive sound by the vibration of a hollow, cup-shaped metallic vessel which gives forth a ringing sound when struck.

Gongs produce a sound by the vibration of a resonant disc excited by a blow.

Each fog signal has specific characteristics by which it can be distinguished (see [section R](#) of Chart No. 1). The signal characteristic is the phase relationship of the recurring sound emissions. Fog signals on fixed stations and large navigational buoys produce a specific number of blasts and silent periods each minute, when operating, to provide positive identification. Fog signals on buoys are generally activated by the motion of the sea; therefore, they do not emit regular signal characteristics and, when the sea is calm, may emit no sound signals.

Fog signals are labeled as "DIAPHONE", "HORN", "SIREN", "WHISTLE", "BELL" or GONG". The appropriate designation should be spelled out as part of the characteristic of the aid. The characteristics of a grouped sound signal shall be charted using the same guidelines as for a grouped light, e.g., HORN (3) 20s.

REVISED APRIL 30, 2002



5.6 Daybeacons

Daybeacons are unlighted fixed aids to navigation placed either on shore or in the water. They are established and maintained by the USCG and are identified on charts by their color and shape. Some daybeacons have reflective borders to enable navigators using a searchlight to more readily locate them at night. These reflectors are the same color as the aids.

Daybeacons ([Q 80 - 83](#), Q r)

Where daybeacons are charted, they shall be shown on the raster chart files in their true position by the standard square or triangular symbol. The center of the daybeacon symbol is the aid's correct geographic position.

The standard symbol to depict triangularly shaped dayboards is a triangle 2.0 mm on each side. A 1.5-mm triangle may be used as an alternative. Non-triangular dayboards, i.e., square, rectangular, round, octagonal, or diamond-shaped dayboards, are all charted with the standard square daybeacon symbol. This is a square 1.65 mm on each side (or a smaller 1.3-mm square).

Examples:    

The larger symbols should be used wherever possible. The smaller symbols are to be used only in very congested areas to improve symbol legibility by reducing overlap with other symbols and detail and to avoid symbol displacement. The two sizes of symbols should not be used in close proximity to one another.

Triangular daybeacons marking the starboard (right) side of a channel shall be shown with a green fill in [IALA](#) Region A and a magenta fill in IALA Region B; triangular daybeacons of any other color shall be shown as open triangles with colors and identifying numbers or letters included in the label.

Square daybeacons marking the port (left) side of a channel shall be shown with magenta fill in [IALA](#) Region A and a green fill in IALA Region B. Square symbols for other colors of daybeacons will be shown as unfilled squares and labeled as to color and identifying numbers or letters.

Examples:  W Bn  GR Bn

The abbreviation "Bn" should be used only to depict beacons which do not have identifying numbers or letters. In congested areas, the legend "Bn" may be omitted, but the color designation should be retained. The color abbreviation shall be shown and placed above the identifying number, or above or after "Bn". Identifying numbers or letters are included in quotes.

Example:



A daybeacon's characteristics are shown in 7 pt. Swiss Regular type.

Private beacons listed in the Light List shall be charted and labeled "Priv" in 7 pt. Swiss Regular type. On small-scale charts or when space is limited, this information may be omitted if charted on one or more large-scale charts covering the area. Privately maintained beacons not listed in the Light List generally are not charted. However, see also Section 5.6, Markers.

Articulated Daybeacons

An articulated daybeacon is structurally similar to an Articulated Light. Both consist of a vertical pipe structure that oscillates around a universal coupling connected to a sinker, and is kept upright by the buoyancy of a submerged flotation chamber.

The introduction of this new type of aid to navigation requires a new chart symbol. Because of the structural similarities to the articulated light and the oscillating characteristics, the 1.0 mm diameter approximate position circle must be centered along the base of the fixed symbol representing the published position. The color fill for this new articulated daybeacon symbol shall be the same as the fill on the fixed daybeacon symbol; it shall not be broken for the 1.0 mm circle. The articulated daybeacon shall be labeled "Art", caps and lower case Swiss Regular Italic type style. The format for charting characteristics shall be the same as for fixed daybeacons:



An explanatory note shall be placed on all charts with articulated aids. The note shall be in black 7 pt. Swiss Light type, set 2" wide:

ARTICULATED AIDS

An articulated aid to navigation consists of a pipe structure that oscillates around a universal coupling connected to a sinker. The structure is kept upright by the buoyancy of a submerged flotation chamber. It is designed primarily to mark narrow channels in depths of up to 60 feet. All articulated aids are labelled "Art".

5.7 Markers

The term "**marker**" generally refers to any private fixed aid to navigation (lighted or unlighted) erected to mark minor channels. Such markers are not established or maintained by the USCG and are not listed in the Light List.

The term may also refer to markers having other specific purposes, e.g., measured mile marks or dredging range markers.

A marker's purpose, status, position, date of establishment, the agency or person who established it, and whether the aid is maintained should be determined before a marker is charted.

The position of recently established markers should be confirmed by NOS field parties, but they may be charted during the interim without this confirmation if the source is deemed valid.

Markers ([B 32](#), [B 33](#), [P 3](#), [Q 101](#))

Markers established and maintained either privately or by State or local governments shall be charted with the accurate landmark symbol and the label "MARKER", if the position meets third-order triangulation standards (within 10 feet of its true location or reported to 0.1 second).

A marker that does not meet these accuracy standards may be charted with the "position approximate" symbol and label "Marker".

Example:  Marker

The label "(lighted)" shall be added if the marker is lighted ([P 3](#)).

5.8 Ranges

When two or more objects appear directly in line, one behind the other, they are said to be "in range." When two or more aligned objects are charted, they constitute a range which can provide mariners with a very accurate and easily obtained line of position. Ranges are so useful in marking a course that artificial ranges, usually in the form of two lights mounted on daymarks, have been installed in line with channels in many ports. Most ranges are aligned with the center of the channel, but in some areas more than one range may be charted to define the inbound and outbound ranges of the channel. Only ranges published in the Light List shall be charted.

The line defined by the range is called a "range line" or "leading line." Daybeacons and other charted objects forming a range are often called "leading marks." Range lights are often called "leading lights."

Range Lines ([M 1](#))

The usable portion of ranges shall be shown by a solid line to the point where the vessel should leave the range. From that point, the range shall be continued with a short-dashed line to the rear navigational aid. Names of ranges may be charted if they are published in the Light List. Bearings of ranges may be charted if they are published in the Light List and are considered useful to the mariner.

In the event of extreme shoaling or shoaling over a large area in an improved channel, range lines may be dashed or even omitted through a shoaling area that is depicted by hydrography.

Range Lights ([P 20.1](#))

Range lights, or leading lights, are pairs of lights forming a range to mark a preferred channel or entrance to a harbor. The rear light is higher than the front light and a considerable distance behind it; the mariner uses the range by keeping the lights in line as the vessel progresses along the channel. High-intensity range lights are sometimes used to aid in daylight navigation. Otherwise, the range light structures are equipped with dayboards for daytime use.

Range lights may be of any standard light color or period, the principal requirement being that they stand out from their surroundings. Most range lights show a high-intensity beam within only a very narrow arc of visibility marking the channel centerline and are obscured around the remainder of the horizon. Most range lights appear to lose brilliance rapidly or become totally obscured as a ship diverges from the range line. Range-marking lights are often visible miles beyond the length of the channel they are marking. This strong beam is necessary to ensure visibility in even the most adverse weather conditions. The visibility range of range lights shall not be charted.

Where the scale is too small to chart a pair of range lights individually, they should be shown with one light dot and labeled, for example, "2F".

Passing Lights

A passing light is generally used on the front light of a range structure located in the water. It serves as an extra precaution to alert mariners to the existence of the range light structure when approaching the light from its dark side at night. (The range light normally is a strong narrow beam visible only along the channel being marked.) Not all range lights in water areas have passing lights; usually they are placed on range lights that are located some distance from other channel aids, where heavy traffic is expected, or at potential danger points. Since the passing light is of secondary importance to the range light, its characteristic is charted on a separate line below the range light label. This is also the order used by the USCG in the Light List. A passing light's visibility as listed in the Light List should be included in the label. Passing lights on unlighted ranges formed by daybeacons are generally not charted. Those selected for charting shall be labeled ("lighted").

Unlighted Ranges (Daybeacons) ([Q 120](#))

Some secondary channels have unlighted ranges marked by daybeacons. The range line shall be charted in the same way as a lighted range. Unlighted ranges may have passing lights.

Dredging Ranges

The [USACE](#) has established ranges in some areas to control channel maintenance dredging. These ranges (often unlighted) are not intended for navigation and shall be identified only as a "DREDGING RANGE". Such structures should be charted as landmarks using the appropriate accuracy symbol and the identifying label. If the dredging structure is listed in the Light List, the label may carry listed light and fog signal information.

Natural Ranges

[Tanks](#), [steeple](#)s, [towers](#), [cupolas](#), etc., may form natural ranges which chart users sometimes recommend for charting. Natural ranges shall not be charted unless recommended by the USCG and published in the LNM.

Intracoastal Waterway Aids to Navigation

(See [Section 5.2](#))

5.9 Courses

Courses, also called tracks, are a long-established feature on some nautical charts. They are usually established in rivers, bays, and other inshore waters and are used primarily to help mariners avoid shoal depths rather than to regulate shipping movement. The use of courses is generally left to the discretion of the mariner and will depend on the vessel's draft, the state of the water level, adequacy of navigational aids, etc. Charted courses shall not be repositioned on a chart unless recommended by the agency which has jurisdiction for establishing that particular course. When safe passage along certain parts of a course is questionable due to changing conditions, those sections shall be deleted from the chart. Courses may be part of general routing systems (see [Section 5.10](#)).

Bearings charted along courses must be true and not magnetic and shall be charted in degrees and tenths of a degree. However, quarters of degrees listed in the Light List shall be charted as given. Bearings measured from the chart must agree with bearings stated on the chart, in the Light List, and in [Coast Pilots](#). Bearings charted along two-way courses must be reciprocal.

Distances along courses, if charted, may be in statute miles or nautical miles depending on the recommendation and the data submitted by the authorizing agency. Charted distances shall be given in miles and tenths of a mile. A 1/4 mile distance shall be charted as 0.2 mile and a 3/4 mile distance shall be charted as 0.7 mile.

Mileage ticks along courses have been charted in some areas and are usually furnished by the authorizing agency. Mileage ticks are generally charted in statute miles at either 1-mile or 5-mile intervals, depending on the scale of the chart. Other subdivisions of benefit to the chart user may also be charted. The distance between mileage ticks should be at least 5 cm but not greater than 25 cm. At scales larger than 1:30,000, 1-mile intervals should be used. At smaller scales, 5-mile intervals should be used. Mileage ticks shall be in magenta, 2 cm in length, 0.2-mm lineweight, perpendicular to and centered on the recommended course. The mileage designation shall be in 7 pt. Swiss Regular Italic and charted in this format "St M 125". The mileage label should be placed along the tick, but may be moved perpendicular to the recommended course to clear charted detail. Mileage ticks and labels shall be deleted when accompanying sections of recommended courses are deleted as the result of changing conditions.

For charts that show mileage ticks only, the orientation of the ticks shall be along the natural channel and shall follow the guidelines stated in the previous paragraph.

A magenta dot shall not be charted at the intersection of the mileage tick and the recommended course or to indicate the location of a natural channel where the mileage tick only is charted.

5.9.1 Recommended and Alternate Courses

Recommended Courses Marked by Aids ([M 3](#))

Recommended courses marked by fixed or floating aids shall be charted with an 0.2-mm solid magenta line based on data furnished by the agency that has jurisdiction for establishing the course

(M 3 Supplementary National Symbol). Traffic-flow directional arrows may be inserted at regular intervals along the line, if recommended. A two-way course should have opposing pairs of arrows inserted at regular intervals.

Recommended Courses Not Marked by Aids ([M 4](#))

Recommended courses that are not marked by fixed or floating aids shall be charted with an 0.2-mm dashed magenta line, again based on data furnished by the agency that has jurisdiction for establishing the courses. The dash length shall be 2.0-mm with an 0.75-mm space between dashes. The same criteria for adding arrows to indicate the direction of traffic flow apply as for courses marked with aids.

Alternate Courses ([M c](#))

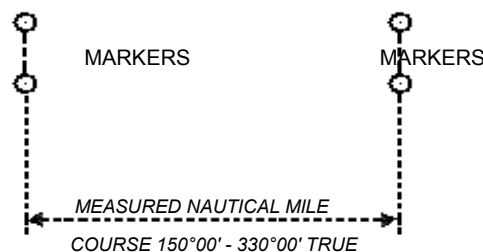
An alternate course is a secondary course available to shallower draft vessels. Usually an alternate course will rejoin the recommended course.

An alternate course shall be charted with a dashed magenta line whether or not it is marked by aids to navigation. Arrows should be used to indicate the direction of traffic flow if so recommended.

5.9.2 Trial Courses ([Q 122](#))

A trial course is a course at sea, the ends of which are marked by ranges ashore and the length of which has been accurately measured. Trial courses are used by vessels to calibrate logs, engine revolution counters, etc., and to determine speed. Reciprocal bearings shall be charted.

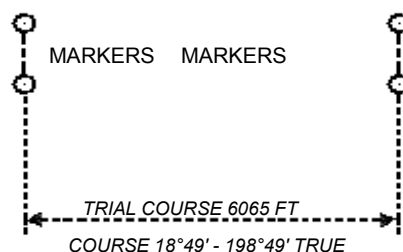
Standard landmark symbols shall be used to mark the ranges ashore. When the measured distance is within 6 feet of the standard value for a nautical mile (1,852 meters or 6,076.1 feet), a trial shall be charted as shown in figure below.



Section 5.9.2

NAUTICAL CHART MANUAL

When the measured distance of the course differs from the standard value by more than 6 feet, the actual measured distance must be stated as shown in figure below.



5.10 Routing Systems

Routing systems are measures aimed at reducing the risk of casualties. They include safety fairways, traffic separation schemes, course lines, and recommended tracks. Note that recommended tracks are discussed in [Section 5.9.1](#).

5.10.1 Safety Fairways

Shipping safety fairways and fairway anchorages have been established to provide unobstructed approaches for vessels using U.S. ports. They will be charted with a solid magenta line and a magenta label which includes the appropriate CFR number.

1. Shipping Safety Fairways

Shipping safety fairways have been established to control the erection of structures in the approaches through oil fields in the Gulf of Mexico to entrances to the major ports. No artificial

island or fixed structure, whether temporary or permanent, is permitted in these fairways. Temporary underwater obstructions may be permitted under certain conditions as described for specific areas in 33 CFR 166. USCG-approved aids to navigation may be established in a fairway.

2. Fairway Anchorages

A fairway anchorage is an anchorage area contiguous to and associated with a fairway. Fixed structures may be permitted within certain spacing limitations, as described for specific areas in 33 CFR 166. The limits of such an anchorage are shown by a solid 0.5-mm magenta line.

REVISED APRIL 30, 2002



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

MAY 1, 2002

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: Nautical Chart Manual: Page Header Number and Section Number
Revisions; Correction Pages - Pages 5-33 through 5-40

Effective immediately, the following attachment replaces pages 5-35 through 5-41 in the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition.

The attachment:

1. Improves the legibility of all Vessel Traffic Services (VTS) notes, and
2. Revises section numbers 5.9.2 and 5.9.2.1 to 5.10.2 and 5.10.2.1, respectively, and
3. Revises all page header numbers accordingly.

Pages 5-33 through 5-40 are to be inserted into the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition immediately after page 5-32 (provided in Memorandum dated April 30, 2002).

Attachment

5.10.2 Traffic Schemes

The USCG is responsible for the design and development of routing systems under guidelines established by the [IMO](#). Routing schemes adopted for international use by the IMO are published in Ships' Routing along with a description, geographic positions, and a map. A copy of Ships' Routing with current amendments is maintained in MCD.

The purpose of routing systems is to improve the safety of navigation in converging areas and in areas where the density of traffic is great or where the freedom of movement of shipping is inhibited by restricted sea room, the existence of obstructions to navigation, limited depths, or unfavorable meteorological conditions. The precise objective of any routing system will depend upon the particular hazardous circumstances which it is intended to alleviate. All traffic schemes described below shall be charted in magenta with magenta labels and notes.

5.10.2.1 Vessel Traffic Service Areas

Vessel Traffic Services (VTS), operated by the United States Coast Guard, enhances navigation, vessel safety, and environmental protection, and promotes safe vessel movement by reducing the potential for collisions, rammings, and groundings, and the loss of life and property associated with these incidents.

VTS provides the mariner with information related to safe navigation. This information coupled with the mariner's compliance with the provisions set forth in 33 CFR, Part 161, Vessel Traffic Management, enhances the safe routing of vessels through congested and hazardous seaways. Some of the information provided covers hazardous conditions, traffic density, aids to navigation status, anticipated vessel encounters, anchorage availability, temporary measures, and harbor operations.

The Marine Chart Division is responsible for identifying, labeling, and referencing VTS information on its nautical products.

CHART PORTRAYAL: VTS notes and labels will be included on all affected charts as new editions are printed. When appropriate, a Notice to Mariners will be issued.

BOUNDARIES AND GEOGRAPHIC AREAS. VTS boundaries are not recommended. Instead, VTS labels are judiciously located within VTS areas on the nautical chart. 33 CFR, 161.25 through 161.60 should be consulted for location of these areas. VTS Special Areas can be defined with a magenta dashed line: 0.2/2.0/0.75mm. Only the VTS Special Area labels should reference the CFR Section number.

MONITORING AREAS are not charted. Radio frequencies or call signs are not referenced except as written in VTS notes for San Francisco and Puget Sound.

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All Radio **REPORTING POINTS** (Calling-in Points) showing direction(s) of vessel movement with designation shall be charted. Charts displaying the reporting points shall include a "call-in point" note. See Section 5.10.2.2, Traffic Separation Schemes, Calling-in Points for example notes.

Individual references to VTS CFR sections should not be charted in Precautionary Areas, Traffic Separation Schemes, and VTS labels. Individual references to VTS CFR sections should be charted in VTS Special Areas.

Notes and labels shall be magenta. Notes shall be 7 point Swiss Light and set 2 ½" wide. Labels should be Swiss Regular Italic, 7-10 points.

PUGET SOUND VTS NOTES

On Charts approaching the Strait of Juan de Fuca, 531, 18003, 18007, 18400, 18460, 18480, 18485, add:

NOTE _

The U.S. Coast Guard operates a mandatory Vessel Traffic Services (VTS) system in this area (Call Sign Seattle Traffic). The western boundary for VTS Puget Sound area is at 48° 23' 08"N, 124° 43' 37"W to 48° 23' 30"N, 124° 44' 12"W, then due west to the territorial sea boundary, thence northward to its intersection with the United States / Canadian International Boundary line. Vessel operating procedures and designated radiotelephone frequencies are published in 33 CFR 161, the U.S. Coast Pilot, and/or the VTS User's Manual.

On charts with both U.S. and Canadian waters, 18421, 18423, 18431, 18432, 18433, 18465, add:

NOTE _

The U.S. Coast Guard operates a mandatory Vessel Traffic Services (VTS) system in the U.S. waters covered by this chart. Vessel operating procedures and designated radio-telephone frequencies are published in 33 CFR 161, the U.S. Coast Pilot, and/or the VTS User's Manual.

On charts approaching Strait of Juan De Fuca and with both US and Canadian waters, 18400, 18421, 18423, 18431, 18432, 18433, 18460, 18465, 18480, 18485, add:

NOTE _

A Cooperative Vessel Traffic Services (CVTS) system has been established by the United States and Canada within the adjoining waters in the Juan de Fuca Region. The appropriate Vessel Traffic Center (VTC) (Tofino Traffic, Seattle Traffic, Vancouver Traffic) administers the rules issued by both nations, however, it will enforce only its own set of rules within its jurisdiction.

Add label:

COOPERATIVE VESSEL TRAFFIC SERVICES
(see note _)

REVISED MAY 1, 2002

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On charts with US waters exclusively 18424, 18427, 18428, 18429, 18430, 18434, 18441, 18443, 18444, 18445, 18446, 18447, 18448, 18449, 18450, 18452, 18453, 18456, 18457, 18458, 18464, 18468, 18471, 18473, 18474, 18476, 18477, 18484, add:

NOTE _

The U.S. Coast Guard operates a mandatory Vessel Traffic Services (VTS) system in the Puget Sound area. Vessel operating procedures and designated radiotelephone frequencies are published in 33 CFR 161, the U.S. Coast Pilot, and/or the VTS User's Manual. The entire area of the chart falls within the Vessel Traffic Services (VTS) system.

Add label to all affected charts.

*PUGET SOUND
VESSEL TRAFFIC SERVICES AREA
(see note _)*

Add Special Area labels to charts 18400, 18421, 18423, 18427, 18429, 18430, 18431.

*ROSARIO STRAIT
VTS Special Area: 161.55 (c)
(see note _)*

*GUEMES CHANNEL
VTS Special Area: 161.55 (c)
(see note _)*

PRINCE WILLIAM SOUND VTS NOTES

Charts partly covered by VTS, 16709, 16700, add:

NOTE _

The U.S. Coast Guard operates a mandatory Vessel Traffic Services (VTS) system in Prince William Sound. Vessel operating procedures and designated radiotelephone frequencies are published in 33 CFR 161, the U.S. Coast Pilot, and/or the VTS User's Manual. Mariners should consult these sources for applicable rules and reporting requirements. Although mandatory VTS participation is limited to the navigable waters of the United States, certain vessels are encouraged or may be required, as a condition of port entry, to report beyond this area to facilitate traffic management within the VTS area.

Charts completely covered by VTS, 16707, 16708, add:

NOTE _

The U.S. Coast Guard operates a mandatory Vessel Traffic Services (VTS) system in Prince William Sound. Vessel operating procedures and designated radiotelephone frequencies are published in 33 CFR 161, the U.S. Coast Pilot, and/or the VTS User's Manual. The entire area of the chart falls within the Vessel Traffic Services (VTS) system.

REVISED MAY 1, 2002

Section 5.10.2.1

NAUTICAL CHART MANUAL

Add label to all affected charts.

*PRINCE WILLIAM SOUND
VESSEL TRAFFIC SERVICES AREA
(see note _)*

Add Special Area label to charts 16707 and 16708.

*VALDEZ NARROWS
VTS Special Area: 161.60 (c)
(see note _)*

SAN FRANCISCO BAY VTS NOTES

Charts approaching San Francisco and partly covered by VTS, 18645, 18647, 18649, add:

NOTE _

The U.S. Coast Guard operates a mandatory Vessel Traffic Services (VTS) system in the San Francisco Bay and surrounding areas. Vessel operating procedures and designated radiotelephone frequencies are published in 33 CFR 161, the U.S. Coast Pilot, and/or the VTS User's Manual. Mariners should consult these sources for applicable rules and reporting requirements. Although mandatory VTS participation is limited to the navigable waters of the United States, certain vessels are encouraged or may be required, as a condition of port entry, to report beyond this area to facilitate advance vessel traffic management within the VTS area.

The U. S. Coast Guard operates a Vessel Traffic Service Offshore Vessel Movement Reporting System covering the seaward approaches to San Francisco Bay. Vessels are requested to monitor VTSSF on Channel 12 at 15 and 45 minutes past each hour for broadcast reports of known shipping traffic in the area.

Charts completely covered by VTS, 18650, 18653, 18656, 18657, 18658, 18659, 18661, 18663, add:

NOTE _

The U.S. Coast Guard operates a mandatory Vessel Traffic Services (VTS) system in the San Francisco Bay and surrounding areas. Vessel operating procedures and designated radiotelephone frequencies are published in 33 CFR 161, the U.S. Coast Pilot, and/or the VTS User's Manual. The entire area of the chart falls within the Vessel Traffic Services (VTS) system.

REVISED MAY 1, 2002

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Section 5.10.2.1

Charts partly covered by VTS, 18651, 18652, 18654, 18655, 18662, 18664, add:

NOTE _

The U.S. Coast Guard operates a mandatory Vessel Traffic Services (VTS) system in the San Francisco Bay and surrounding areas. Vessel operating procedures and designated radiotelephone frequencies are published in 33 CFR 161, the U.S. Coast Pilot, and/or the VTS User's Manual.

Charts with Petaluma River Entrance Channel, 18652, 18654, attach to the above notes:

All of the San Pablo Bay is within the VTS area with the exception of the Petaluma River Entrance Channel.

Add label to all affected charts.

**SAN FRANCISCO BAY
VESSEL TRAFFIC SERVICES AREA
(see note _)**

ST. MARY'S RIVER VTS NOTES

Charts approaching St. Mary's River and partly covered by VTS, 14880, 14881, 14882, 18884, 14962, add:

NOTE _

The U.S. Coast Guard operates a mandatory Vessel Traffic Services (VTS) system in the St. Mary's River. Vessel operating procedures and designated radiotelephone frequencies are published in 33 CFR 161, the U.S. Coast Pilot, and/or the VTS User's Manual. Mariners should consult these sources for applicable rules and reporting requirements. Although mandatory VTS participation is limited to the navigable waters of the United States, certain vessels are encouraged or may be required, as a condition of port entry, to report beyond this area to facilitate traffic management within the VTS area.

Chart completely covered by VTS, 14883, add:

NOTE _

The U.S. Coast Guard operates a mandatory Vessel Traffic Services (VTS) system in the St. Mary's River. Vessel operating procedures and designated radiotelephone frequencies are published in 33 CFR 161, the U.S. Coast Pilot, and/or the VTS User's Manual.

REVISED MAY 1, 2002

Section 5.10.2.1

NAUTICAL CHART MANUAL

Add label to all affected charts.

*ST. MARY'S RIVER
VESSEL TRAFFIC SERVICES AREA
(see note _)*

HOUSTON/GALVESTON VTS NOTES

Charts approaching Houston/Galveston waterways and partly covered by VTS, 11323, 11324, 11330, 11340, 11300, add:

*NOTE _
The U. S. Coast Guard operates a mandatory Vessel Traffic Services (VTS) system in the Houston and Galveston waterways. Vessel operating procedures and designated radiotelephone frequencies are published in 33 CFR 161, the U.S. Coast Pilot, and/or the VTS User's Manual. Mariners should consult these sources for applicable rules and reporting requirements. Although mandatory VTS participation is limited to the navigable waters of the United States, certain vessels are encouraged or may be required, as a condition of port entry, to report beyond this area to facilitate advance vessel traffic management within the VTS area.*

Charts completely covered by VTS, 11322A, 11326A, 11327, 11328, 11329A, B, add:

*NOTE _
The U.S. Coast Guard operates a mandatory Vessel Traffic Services (VTS) system in the Houston and Galveston waterways. Vessel operating procedures and designated radiotelephone frequencies are published in 33 CFR 161, the U.S. Coast Pilot, and/or the VTS User's Manual.*

Add label to all affected charts.

*HOUSTON / GALVESTON
VESSEL TRAFFIC SERVICES AREA
(see note _)*

REVISED MAY 1, 2002

BERWICK BAY VTS NOTES

Charts approaching Berwick Bay and partly covered by VTS, 11351, 11352, 11354, 11355, add:

NOTE _

The U.S. Coast Guard operates a mandatory Vessel Traffic Services (VTS) system in Berwick Bay waterways.. Vessel operating procedures and designated radiotelephone frequencies are published in 33 CFR 161, the U.S. Coast Pilot, and/or the VTS User's Manual. Mariners should consult these sources for applicable rules and reporting requirements. Although mandatory VTS participation is limited to the navigable waters of the United States, certain vessels are encouraged or may be required, as a condition of port entry, to report beyond this area to facilitate traffic management within the VTS area.

Add label to all affected charts.

*BERWICK BAY
VESSEL TRAFFIC SERVICES AREA
(see note _)*

Add Special Area label to charts 11354, 11355.

*BERWICK BAY
VTS Special Area: 161.40 (b)
(see note _)*

NEW YORK BAY VTS NOTES

Charts partly covered by VTS, 11350, 12324A, 12326, 12327, 12331, 12335, 12337, 12401, 12402, add:

NOTE _

The U.S. Coast Guard operates a mandatory Vessel Traffic Services (VTS) system in the New York Bay and surrounding areas. Vessel operating procedures and designated radiotelephone frequencies are published in 33 CFR 161, the U.S. Coast Pilot, and/or the VTS User's Manual. Mariners should consult these sources for applicable rules and reporting requirements. Although mandatory VTS participation is limited to the navigable waters of the United States, certain vessels are encouraged or may be required, as a condition of port entry, to report beyond this area to facilitate vessel traffic management within the VTS area.

Section 5.10.2.1

NAUTICAL CHART MANUAL

Chart completely covered by VTS, 12333, 12334, add.

NOTE _

The U.S. Coast Guard operates a mandatory Vessel Traffic Services (VTS) system in the New York Bay and surrounding areas. Vessel operating procedures and designated radiotelephone frequencies are published in 33 CFR 161, the U.S. Coast Pilot, and/or the VTS User's Manual. The entire area of the chart falls within the Vessel Traffic Services (VTS) system.

Add label to all affected charts.

*NEW YORK
VESSEL TRAFFIC SERVICES AREA
(see note _)*

(The remainder of this page is intentionally blank.)

REVISED MAY 1, 2002



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

MAY 2, 2002

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: Nautical Chart Manual: Page Header Number and Section Number
Revisions; Correction Pages - Pages 5-41 through 5-44

Effective immediately, the following attachment replaces pages 5-42 through 5-44 in the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition.

The attachment revises section 5.9.2.2 to Section 5.10.2.2 and serves to correct the following illegible items and cartographic error introduced to the Nautical Chart Manual during its conversion to digital format:

Nautical Chart Manual Volume	Nautical Chart Manual Page	Illegible Item/Error Introduced during Digital Conversion
1	5-42	Quality of Traffic Lane Example Distorted
	5-43	Quality of Sailing Directions Note Example Distorted
	5-44	Quality of Calling-in Points Graphics Distorted
	5-44	VTs Note (containing numeric and alphabetic designators): -- vital information concerning voluntary calling-in points is missing -- erroneous information provided for mandatory calling-in points.

Pages 5-41 though 5-44 are to be inserted into the Nautical Chart Manual, Volume 1, Part I, Seventh (1992) Edition immediately after page 5-40 (provided in Memorandum dated May 1, 2002).

Attachment

5.10.2.2 Traffic Separation Schemes

A traffic separation scheme is a routing measure aimed at the separation of opposing streams of traffic by the establishment of traffic lanes. It may include inshore traffic zones or deep water routes.

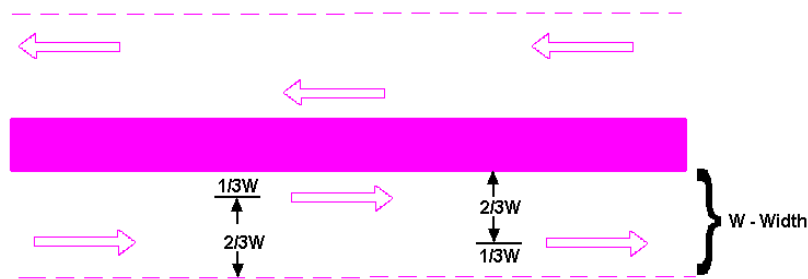
A separation zone or line separates the traffic lanes in which ships are proceeding in opposite or nearly opposite directions, separates a traffic lane from the adjacent sea area, or separates traffic lanes designated for particular classes of ships proceeding in the same direction. Separation lines shall be represented by a magenta-screened (20 percent, 120 LPI) line at least 3 mm wide.

Traffic Lanes ([M 13](#))

A traffic lane is an area within defined limits in which one-way traffic is established. Natural obstacles, including those forming separation zones, may constitute a boundary. Arrows are shown in the traffic lanes to indicate the direction of traffic.

In traffic lanes wider than 5.0 mm at chart scale, arrows shall be staggered within the lane one-third the width from each side of the lane (see below).

In traffic lanes 5.0 mm or less in width at chart scale, arrows shall be placed in the center of the lane.

**Roundabouts ([M 21](#), [M d](#))**

This is a routing measure comprising a separation point or circular separation zone and a circular traffic lane within defined limits. Traffic within the roundabout is separated by moving in a counterclockwise direction around the separation point or zone.

Precautionary Areas ([M 16](#), [M 24](#))

This is a routing measure comprising an area within defined limits where ships must navigate with particular caution and within which the direction of traffic flow may be recommended.

Areas to Be Avoided ([M 29](#))

These are areas which are not recommended for navigation because of shoal hydrography, obstructions, or local and Federal regulations.

Pilot Boarding Areas

Pilot boarding areas represent meeting or boarding places where vessels pick up or disembark pilots. A pilot vessel may either cruise in the area continuously or may be on call. The limits of pilot areas are usually charted with a 2.5-mm magenta-screened (20 percent, 120-LPI) band. The outside edge of the band must coincide with the 5.9.2 limiting positions published for the area. These areas shall be labeled as recommended by the authorized source. The legend "Pilot Boarding Area" is preferred if a labeling recommendation is not clear.

Alternatively, pilot areas may be shown only by the magenta symbol [T 1.1](#) if the chart scale is too small to clearly show the area band or if only a single position location is authorized. The charting of pilot stations was described in [Section 3.9, Miscellaneous Stations](#).

Course Lines

Some Great Lakes charts show course lines that are an unofficial traffic separation scheme devised by shipping interests for their own benefit. These course lines were not established by the USCG nor are the regulations published in the CFR.

The course lines are charted with a black dashed line on traditional charts and a magenta dashed line on metric charts. In either case, the labels for the course lines shall be magenta. The labels shall include distance (in statute miles and nautical miles) and bearings along the course. The point where a course changes direction is shown with a black dashed line to a point of land or object ashore. The bearing of the line and the distance offshore of the turning point are included in a black label along the dashed line.

The following sailing directions note shall be included on Great Lakes metric charts with Mercator projections that include course lines:

SAILING DIRECTIONS. Bearings of sailing courses are true and distances given thereon are in statute miles (St M) and nautical miles (NM) between points of departure. The true bearing between any two points on this chart may be determined by connecting the two points with a straight line and measuring the angle of its intersection with a meridian line.

This note shall be in black, 7 pt. Swiss Light type, set 3½" wide. This note shall be included in the group of notes aligned under the chart title.

Calling-in Points ([M 40](#))

Calling-in Points, requiring vessels to report to a traffic control center, have been established in certain waterways and port approaches to assist in traffic control. These calling-in points shall be shown on nautical charts with a magenta circle, designator if applicable, and an arrowhead or arrowheads as follows:



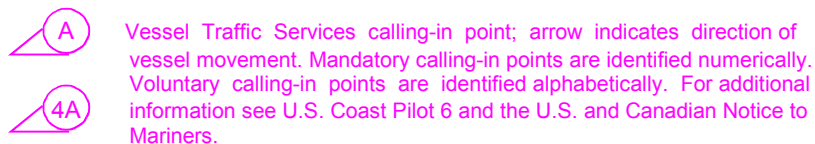
The arrowhead(s) shall be oriented to indicate the direction(s) of vessel movement. The single arrowhead indicates that a report is required only when a vessel is bound in that direction. The double arrowhead indicates a requirement to report in each of the directions designated.

The location of the symbol shall be in the center of the waterway if not otherwise specified. If the calling-in point has an alphanumeric designator, it shall be shown within the circle where each country has its own designator, the U.S. designator takes precedence. However, the Canadian designator shall be shown if no U.S. designator exists. Designators may be numerical, alphabetic, or alphanumeric. Generally numeric or alphanumeric designators indicate mandatory calling-in points while alphabetic designators indicate voluntary calling-in points.

Whenever numeric or alphanumeric designators are charted, the following note shall be added in 7 pt. Swiss Light type. Both the symbol and the note shall be in magenta.



In areas where both numeric and alphabetic designators are used, the following note shall be shown:





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

MAY 1, 2002

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: Nautical Chart Manual: Section Number Revisions - Pages 5-45
through 5-50

Effective immediately, the following attachment replaces pages 5-45 through 5-50 in the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition.

The attachment:

1. Revises section numbers 5.9.3, 5.9.3.1, 5.9.3.2 and 5.9.3.3 to 5.10.3, 5.10.3.1, 5.10.3.2 and 5.10.3.3, respectively.

Pages 5-45 though 5-50 are to be inserted into the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition immediately after page 5-44.

Attachment

5.10.3 Ferries: ([M 50](#), [M 51](#))

Definition: A FERRY is a transportation system designed to carry passengers, vehicles or cargo across a body of water.

5.10.3.1 Ferry Slip:

Definition: A FERRY SLIP is a berthing space for a ferryboat between two [piers](#); a [dock](#) for a ferryboat.

Definition: A FERRY TERMINAL is a destination for a ferryboat, consisting of one or more ferry slips.

General Requirements:

Piers used by ferries shall be classified as "[essential](#)" piers and shall be charted.

Roads, streets and highways connecting with ferry slips shall be charted.

Individual [piles](#), [dolphins](#), etc., associated with ferry slips shall be charted, if the scale of the chart allows.

Only those ferry slip lights and/or fog signals listed in the U.S. Coast Guard Light List shall be charted. If the aids are established and maintained by private interests, they shall be labeled "Priv."

Feature Removal from the Chart:

A charted ferry slip shall not be removed until an established authority provides conclusive evidence that the ferry does not exist in the charted position. Non-authoritative sources (e.g. U.S. Power Squadron and U.S. Coast Guard Auxiliary Reports, photo revisions without field edit) do not have sufficient authority to declare ferry service non-existent.

In cases where non-authoritative sources identify a ferry as not operating in its charted position, the feature shall be retained as charted until removal has been confirmed by an established authority (e.g., Field Investigations by the National Ocean Service (NOS), U.S. Army Corps of Engineers (USACE), U.S. Coast Guard (USCG) Local Notice to Mariners, a harbor master or port authority or the company that operated the ferry).

Feature Recommendation for Notice to Mariners:

A newly applied, revised, or deleted ferry slip shall be evaluated for a [Notice to Mariners](#).

Line Type and Weight:

Ferry slips charted to scale shall be shown with a solid line: 0.15 mm (0.006").

Ferry piers less than 0.3 mm wide at chart scale shall be shown with a single solid line: 0.25mm (0.010").

Location and Orientation on the Chart:

Ferry slips shall be charted in their exact geographic positions.

Size and Shape:

Ferry slips shall be charted to scale and show actual shapes.

Labels and Notes:

Ferry slips shall be labeled "Ferry" with 6 point Swiss Light.

The label abbreviation "Fy" may be used where space is limited.

When lights or fog signals are associated with a ferry slip, appropriate aid characteristics shall be charted with 7 point Swiss Regular.

Roads, streets and highways connecting with ferry slips shall be labeled in black with 5 point Swiss Light.

Color and Screening:

Ferry slips and associated labels shall print in black.

5.10.3.2 Cable Ferry

Definition: A Cable Ferry is a ferry guided across navigable waters by a cable attached to each shoreline.

General Requirements:

All cable ferries shall be charted in navigable waters.

Cable ferries are considered hazardous features. In order to increase the mariner's awareness of cable ferries, the Chart No. 1 symbol [[M 51](#)] shall be supplemented with a warning screen and note.

Feature Removal from Chart:

A charted cable ferry shall not be removed until an established authority provides conclusive evidence that the cable ferry does not exist in the charted position. Non-authoritative sources (e.g. U.S. Power Squadron and U.S. Coast Guard Auxiliary Reports, photo revisions without field edit) do not have sufficient authority to declare a cable ferry non-existent.

In instances where non-authoritative sources identify a cable ferry not operating in its charted position, the feature shall be retained as charted until its removal has been confirmed by an established authority (e.g. , Field Investigations by the National Ocean Service (NOS), U.S. Army Corps of Engineers (USACE), U.S. Coast Guard (USCG) Local Notice to Mariners, a harbor master or port authority or the company that operated the ferry).

Feature Recommendation for [Notice to Mariners](#):

A newly applied, revised or deleted cable ferry shall be recommended for a Notice to Mariners.

Line Type and Weight:

Cable ferry crossings shall be charted with a dashed line: 0.15 mm thick /1.25 mm long dash/ with a 0.50 mm long space between dashes. (0.006/0.050/0.020").

Size and Shape:

Cable ferry crossings shall indicate actual courses.

Labels and Notes:

The following label shall be charted with 7 point Swiss Light:

Cable Ferry
(see note)

The following note shall be charted with 7 point Swiss Light, set either 2" or 3" wide:

CABLE FERRY
Cable across the river may be at or near the water surface.
Mariners should exercise caution when navigating in this area.

Color and Screening:

Cable ferry crossings, associated labels and notes shall be charted with black.

Cable ferries are considered hazardous features. To emphasize the possibility of collision with the cable, which is raised when the ferry is in operation, a 2.0 mm wide 20% 120 LPI magenta screened band shall be centered on the cable position.

5.10.3.3 Ferry Routes

Definition: A FERRY ROUTE is the path depicted on nautical charts to aid the mariner in avoiding lanes of regular transit of ferries.

General Requirements:

Ferry routes shall be charted when requested, in order to aid the mariner in avoiding accidents with these craft. Data and recommendations for charting shall originate from one or more of the following authoritative sources: federal, local or state agencies; private companies that provide ferry service or from pilot groups.

Ferry routes may be charted for short distances out from the slip or terminal. This alerts the mariner to the existence of ferry operations in the area. A ferry route shall be charted in its entirety when considered of navigational significance and recommended for charting by an authoritative source.

The Marine Chart Division shall not actively solicit ferry routing information unless charting has been recommended by an authoritative source. All ferry routing information shall be obtained via the Nautical Data Branch.

The routes of ferries that operate on a seasonal basis may be charted, subject to the guidelines above.

Ferry routes shall not be charted in areas where hydrography is not charted.

Ferry routes shall be charted with a dashed line [\[M50\]](#).

Traffic flow directional arrows may be charted at regular intervals along the line, if recommended by one of the above authorities. A two-way track shall have opposing pairs of arrows charted at regular intervals.

Ferry routes may be shown at any scale. The optional symbol also shown in Chart No. 1 (M50) may be used when appropriate on small-scale charts.

Feature Removal from the Chart:

A charted ferry route shall not be removed until an established authority provides conclusive evidence that the ferry does not exist in the charted position. Non-authoritative sources (e.g., U.S. Power Squadron and U.S. Coast Guard Auxiliary Reports, photo revisions without field edit) do not have sufficient authority to declare a ferry route non-existent.

In instances where non-authoritative sources identify a ferry as not operating in its charted position, the ferry shall be retained as charted until removal has been confirmed by an established authority (e.g., Field investigations by the National Ocean Service (NOS), U.S. Army Corps of Engineers ([USACE](#)), U.S. Coast Guard (USCG) [Local Notice to Mariners](#), a harbor master or port authority or the company that operated the ferry).

Feature Recommendation for Notice to Mariners:

A newly applied or revised ferry route shall be evaluated for a [Notice to Mariners](#). In general, a Notice to Mariners shall be generated if the ferry route crosses major shipping lanes or dredged channels, enters congested ports or is identified as a safety hazard by the requesting authority.

Line Type and Weight:

Ferry routes shall be charted with a dashed line: 0.15 mm thick / 1.25 mm long dash/ with a 0.50 mm long space between dashes (0.006/0.050/0.020"). Directional arrows, when used, shall be charted with a solid line, 0.15 mm thick.

Size and Shape:

Ferry routes shall indicate actual courses.

Labels and Notes:

A ferry route shall be labeled "Ferry Route" and charted with 7 pt. Swiss Light Italic. See exceptions below.

A high speed ferry route shall be labeled "High Speed Ferry Route (see note ____)" and charted with 7 pt. Swiss Light Italic. This label shall also be used at appropriate points on a chart where a high speed ferry is known to operate, has been recommended by an authoritative source as being of navigational significance, but the route is not charted. A standard definition of "high speed" is under development by the [International Maritime Organization \(IMO\)](#), but to date, no standard definition of "high speed" is generally accepted by the IMO or U.S. Coast Guard. For the time being, the term, "high speed" shall be used when a ferry is identified as a high speed ferry by the requesting authority.

Section 5.10.3.3

NAUTICAL CHART MANUAL

Charts displaying labels identifying high speed ferry service shall carry a note which must be customized to suit the needs of the local operators, authorities and chart users. Each note shall print in 7pt. Swiss Light , set either 2" or 3 1/2" wide. The note shall be modified, when necessary, from the following standard text:

NOTE ____

High speed ferries operate between _____ and _____.
Mariners are cautioned that these craft move very rapidly and may transit
waterways at angles to the normal direction of traffic. Ferries may deviate
from published routes.

The blanks in the note shall be replaced with the appropriate geographic names.

When charted, the small-scale symbol for ferry crossings shall not be labeled.

Color and Screening:

Ferry routes, labels and notes shall be charted with magenta.

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