

U.S. Department of  
Homeland Security

United States  
Coast Guard



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# LIGHT LIST

Volume VII

## GREAT LAKES

Great Lakes and the St. Lawrence River  
above the St. Regis River

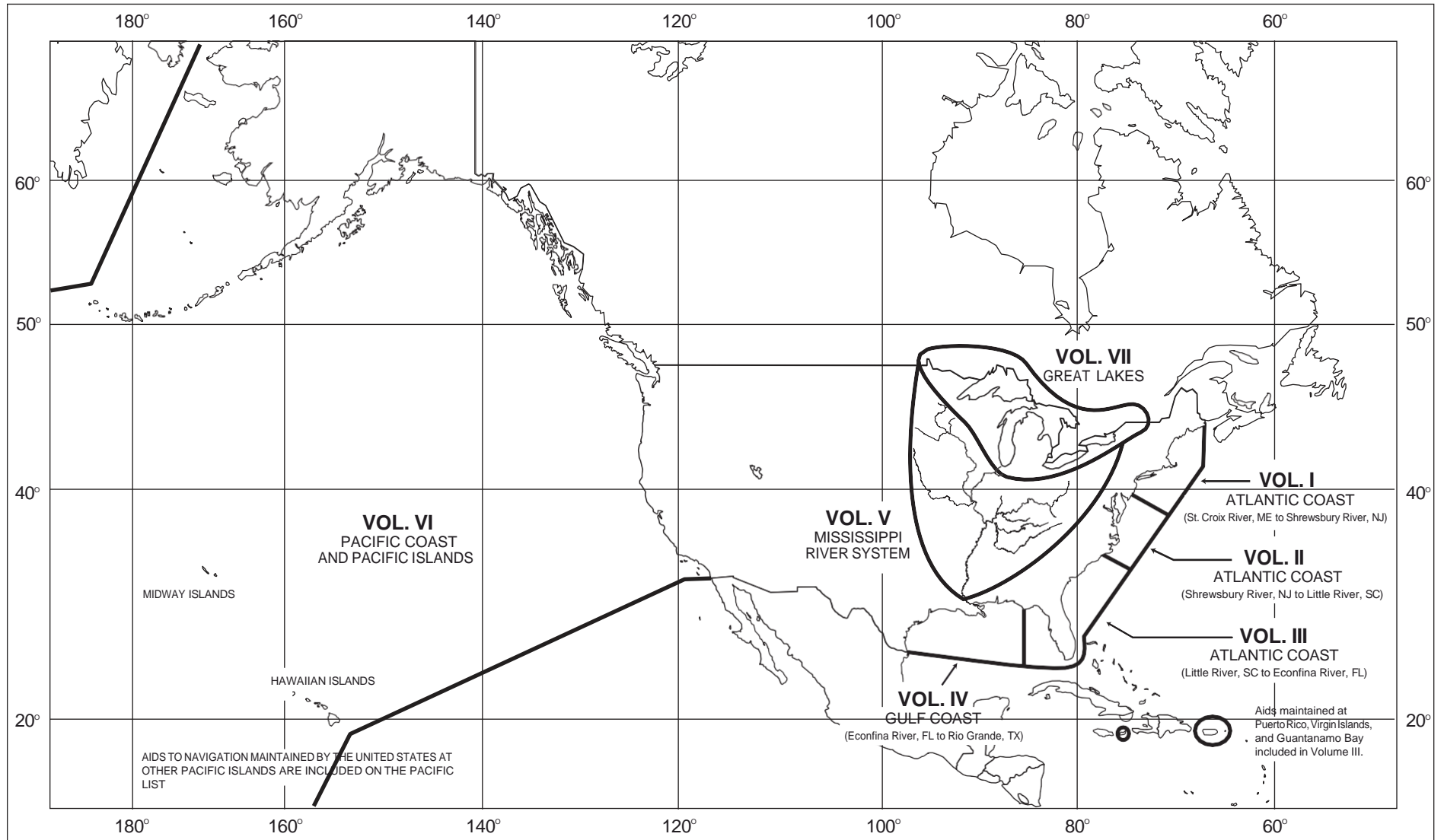
This publication contains a list of lights, sound signals, buoys,  
daybeacons, and other aids to navigation.

**IMPORTANT**  
**THIS PUBLICATION SHOULD BE CORRECTED EACH WEEK**  
**FROM THE LOCAL NOTICES TO MARINERS OR NOTICES**  
**TO MARINERS AS APPROPRIATE.**

2024

COMDTPUB P16502.7

# LIMITS OF LIGHT LISTS PUBLISHED BY U.S. COAST GUARD





# U.S. AIDS TO NAVIGATION SYSTEM

## on navigable waters except Western Rivers

### LATERAL SYSTEM AS SEEN ENTERING FROM SEAWARD

<p><b>PORT SIDE ODD NUMBERED AIDS</b></p> <p>GREEN LIGHT ONLY          FLASHING (2)          FLASHING          OCCULTING          QUICK FLASHING          ISO</p> <p>Light: FI G 6s          Lighted Buoy: G "9" FI G 4s          Can: G C "9"          Daybeacon: G "5"</p>	<p><b>PREFERRED CHANNEL NO NUMBERS - MAY BE LETTERED</b></p> <p>PREFERRED CHANNEL TO STARBOARD          TOPMOST BAND GREEN</p> <p>GREEN LIGHT ONLY</p> <p>COMPOSITE GROUP FLASHING (2+1)</p> <p>Lighted Buoy: GR "A" FI (2+1) G 6s          Can U: GR "U"          Can S: GR C "S"</p>	<p><b>PREFERRED CHANNEL NO NUMBERS - MAY BE LETTERED</b></p> <p>PREFERRED CHANNEL TO PORT          TOPMOST BAND RED</p> <p>RED LIGHT ONLY</p> <p>COMPOSITE GROUP FLASHING (2+1)</p> <p>Lighted Buoy: RG "B" FI (2+1) R 6s          Nun C: RG N "C"          Light G: RG "G"</p>	<p><b>STARBOARD SIDE EVEN NUMBERED AIDS</b></p> <p>RED LIGHT ONLY          FLASHING (2)          FLASHING          OCCULTING          QUICK FLASHING          ISO</p> <p>Light: FI R 6s          Lighted Buoy: R "8" FI R 4s          Nun 6: R N "6"          Daybeacon: R "2"</p>
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### AIDS TO NAVIGATION HAVING NO LATERAL SIGNIFICANCE

<p><b>ISOLATED DANGER NO NUMBERS - MAY BE LETTERED</b></p> <p>WHITE LIGHT ONLY</p> <p>FI (2) 5s</p> <p>Lighted: BR "A" FI (2) 5s          Unlighted: BR "C"</p>	<p><b>SAFE WATER NO NUMBERS - MAY BE LETTERED</b></p> <p>WHITE LIGHT ONLY MORSE CODE</p> <p>Mo (A)</p> <p>Lighted and/or sound: RW "N" Mo (A)          MR: RW "A"          Spherical: SP "B"          Unlighted and/or sound: RW "N"</p>
<p><b>DAYBOARDS - MAY BE LETTERED</b></p> <p>WHITE LIGHT ONLY</p> <p>NR: RW Bn          NG: GW Bn          NB: BW Bn</p>	<p><b>RANGE DAYBOARDS MAY BE LETTERED</b></p>
<p><b>SPECIAL MARKS - MAY BE LETTERED</b></p> <p>YELLOW LIGHT ONLY          FIXED FLASHING</p> <p>Unlighted: C "A", N "C"          Lighted: Y "B" FI</p> <p>SHAPE OPTIONAL - BUT SELECTED TO BE APPROPRIATE FOR THE POSITION OF THE MARK IN RELATION TO THE NAVIGABLE WATERWAY AND THE DIRECTION OF BUOYAGE.</p>	

Aids to Navigation marking the Intracoastal Waterway (ICW) display unique yellow symbols to distinguish them from aids marking other waters. Yellow triangles indicate aids should be passed by keeping them on the starboard (right) hand of the vessel. Yellow squares indicate aids should be passed by keeping them on the port (left) hand of the vessel. A yellow horizontal band provides no lateral information, but simply identifies aids as marking the ICW.

**TYPICAL INFORMATION AND REGULATORY MARKS**

INFORMATION AND REGULATORY MARKERS  
 WHEN LIGHTED, INFORMATION AND REGULATORY MARKS MAY DISPLAY ANY WHITE LIGHT RHYTHM EXCEPT QUICK FLASHING, Mo(A), AND FLASHING (2)

MOORING BUOY: WHITE WITH BLUE BAND. MAY SHOW WHITE REFLECTOR OR LIGHT.

SWIM AREA: EXPLANATION MAY BE PLACED OUTSIDE THE CROSSED DIAMOND SHAPE, SUCH AS DAM, RAPIDS, WRECK, SHOAL, DAM, ETC.

ROCK: THE NATURE OF DANGER MAY BE INDICATED INSIDE THE DIAMOND SHAPE, SUCH AS ROCK, WRECK, SHOAL, DAM, ETC.

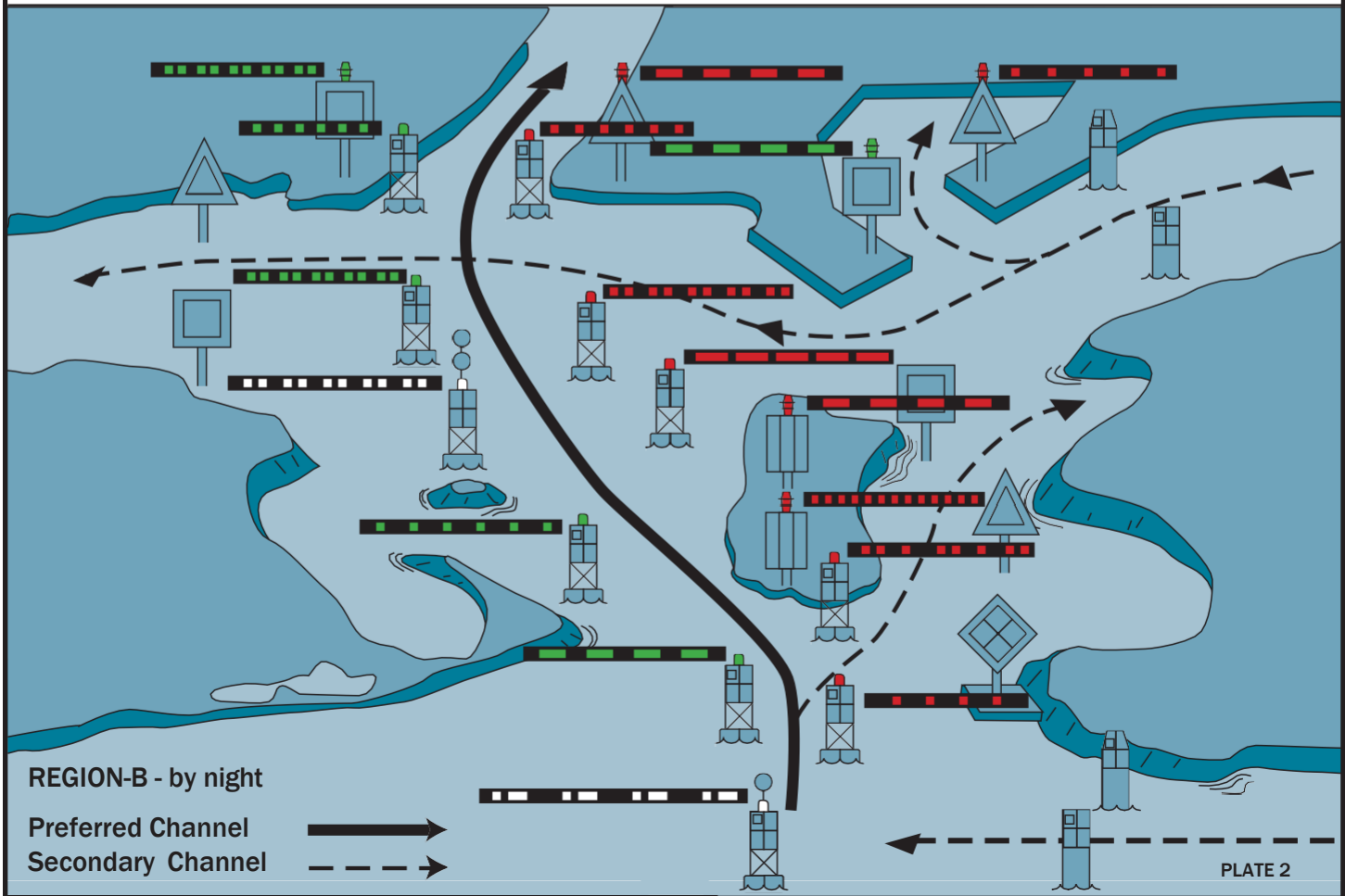
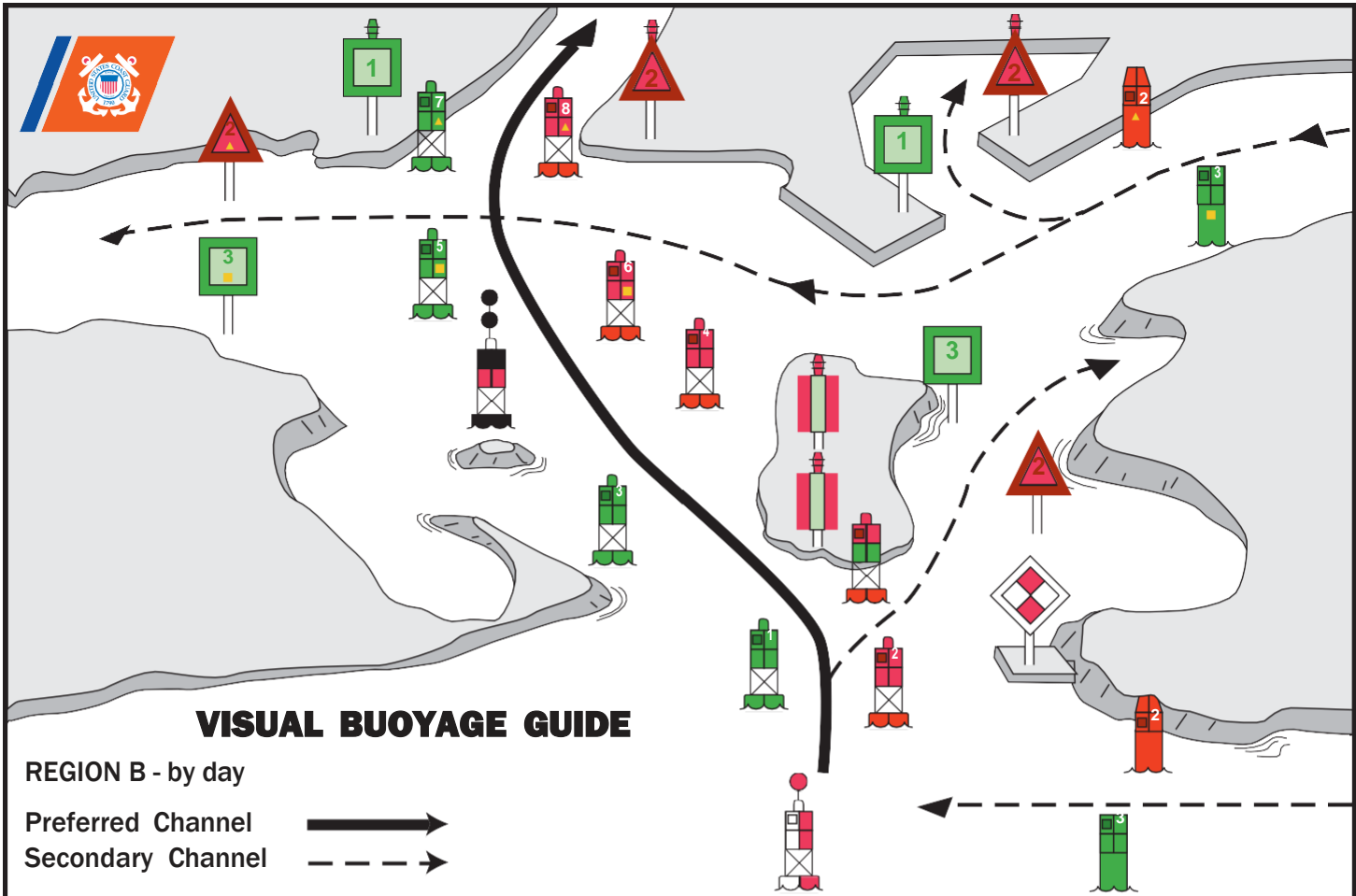
DANGER: TYPE OF CONTROL IS INDICATED IN THE CIRCLE, SUCH AS SLOW, NO WAKE, ANCHORING, ETC.

CONTROLLED AREA: BUOY USED TO DISPLAY REGULATORY MARKERS.

INFORMATION: FOR DISPLAYING INFORMATION SUCH AS DIRECTIONS, DISTANCES, LOCATIONS, ETC.

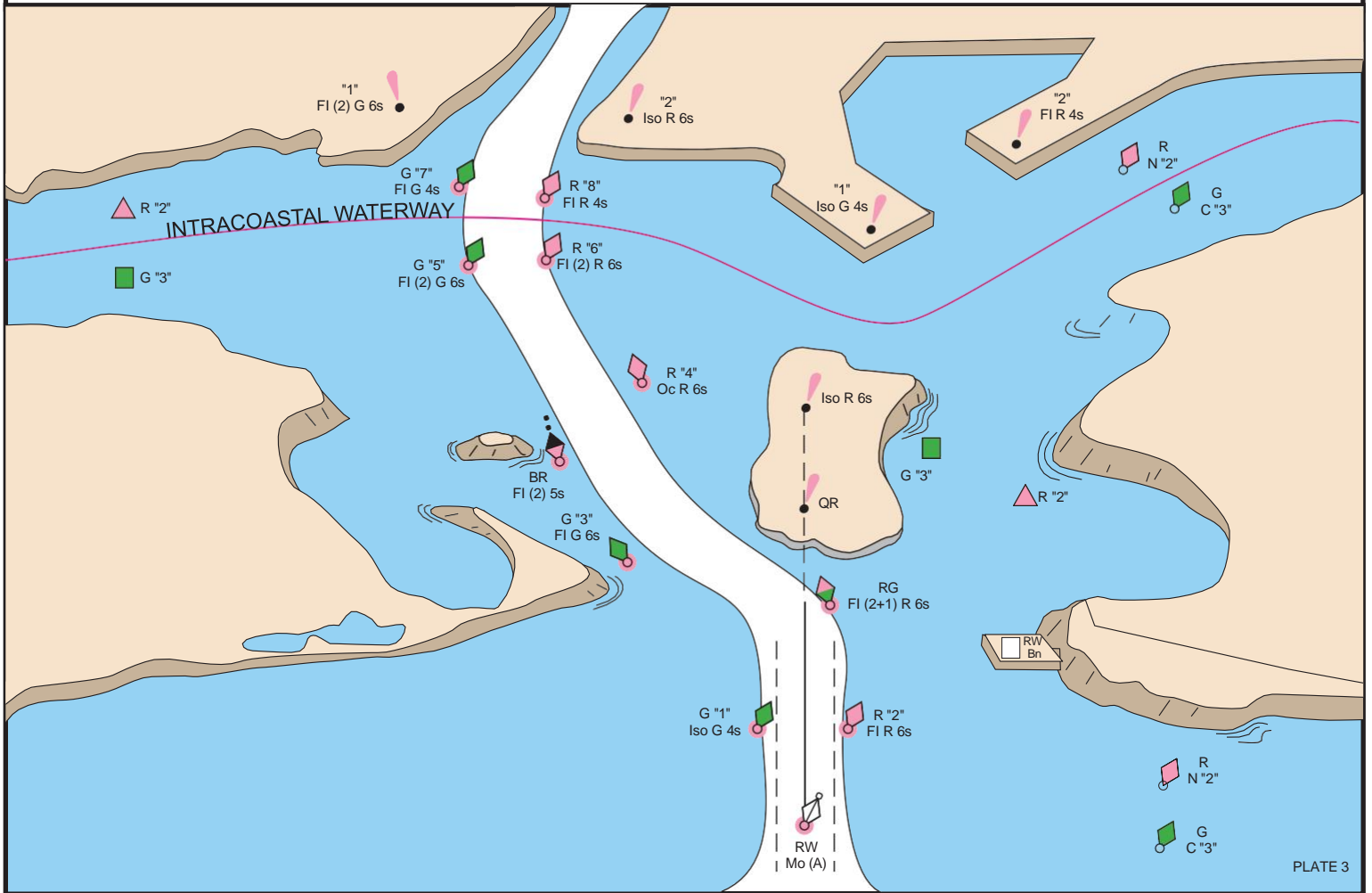
BUOY WITH REGULATORY MARKERS: MAY SHOW WHITE LIGHT. MAY BE LETTERED.

BUOY WITH SPEED LIMIT: MAY SHOW WHITE LIGHT. MAY BE LETTERED.





# FICTITIOUS NAUTICAL CHART





# U.S. AID TO NAVIGATION SYSTEM

## on the Western River System

### AS SEEN ENTERING FROM SEAWARD

<p><b>PORT SIDE</b> OR RIGHT DESCENDING BANK</p> <p>GREEN OR WHITE LIGHTS</p> <p>FLASHING ISO</p> <p>LIGHT LIGHTED BUOY CAN</p> <p>SG CNG</p> <p>PASSING DAYBEACON CROSSING DAYBEACON</p> <p>176.9 MILE BOARD</p>	<p><b>PREFERRED CHANNEL</b> MARK JUNCTIONS AND OBSTRUCTIONS COMPOSITE GROUP FLASHING (2+1)</p> <p>PREFERRED CHANNEL TO STARBOARD TOPMOST BAND GREEN FI (2+1) G</p> <p>JG</p> <p>PREFERRED CHANNEL TO PORT TOPMOST BAND RED FI (2+1) R</p> <p>JR</p> <p><b>DAYBOARDS HAVING NO LATERAL SIGNIFICANCE</b></p> <p>MAY BE LETTERED</p> <p>WHITE LIGHT ONLY</p> <p>NB</p>	<p><b>STARBOARD SIDE</b> OR LEFT DESCENDING BANK</p> <p>RED OR WHITE LIGHTS</p> <p>FLASHING (2) ISO</p> <p>LIGHT LIGHTED BUOY NUN</p> <p>TR CNR</p> <p>PASSING DAYBEACON CROSSING DAYBEACON</p> <p>123.5 MILE BOARD</p>
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**SPECIAL MARKS--MAY BE LETTERED**

UNLIGHTED LIGHTED

SHAPE: OPTIONAL--BUT SELECTED TO BE APPROPRIATE FOR THE POSITION OF THE MARK IN RELATION TO THE NAVIGABLE WATERWAY AND THE DIRECTION OF BUOYAGE.

YELLOW LIGHT ONLY

FIXED FLASHING

MOORING BUOY  
WHITE WITH BLUE BAND  
MAY SHOW WHITE REFLECTOR OR LIGHT

**TYPICAL INFORMATION AND REGULATORY MARKS**

INFORMATION AND REGULATORY MARKERS

WHEN LIGHTED, INFORMATION AND REGULATORY MARKS MAY DISPLAY ANY LIGHT RHYTHM EXCEPT QUICK FLASHING, Mo(a) AND FLASHING (2)

NW WHITE LIGHT ONLY

BOAT EXCLUSION AREA

SWIM AREA

ROCK DANGER

CONTROLLED AREA

SLOW NO WAKE

INFORMATION

MULLET LAKE  
BLAC K R IVER

EXPLANATION MAY BE PLACED OUTSIDE THE CROSSED DIAMOND SHAPE, SUCH AS DAM, RAPIDS, SWIM AREA, ETC.

THE NATURE OF DANGER MAY BE INDICATED INSIDE THE DIAMOND SHAPE, SUCH AS ROCK, WRECK, SHOAL, DAM, ETC.

TYPE OF CONTROL IS INDICATED IN THE CIRCLE, SUCH AS SLOW, NO WAKE, ANCHORING, ETC.

FOR DISPLAYING INFORMATION SUCH AS DIRECTIONS, DISTANCES, LOCATIONS, ETC.

BUOY USED TO DISPLAY REGULATORY MARKERS

MAY SHOW WHITE LIGHT  
MAY BE LETTERED

**STATE WATERS**

INLAND (STATE) WATER OBSTRUCTION MARK

MAY SHOW WHITE REFLECTOR OR QUICK FLASHING WHITE LIGHT

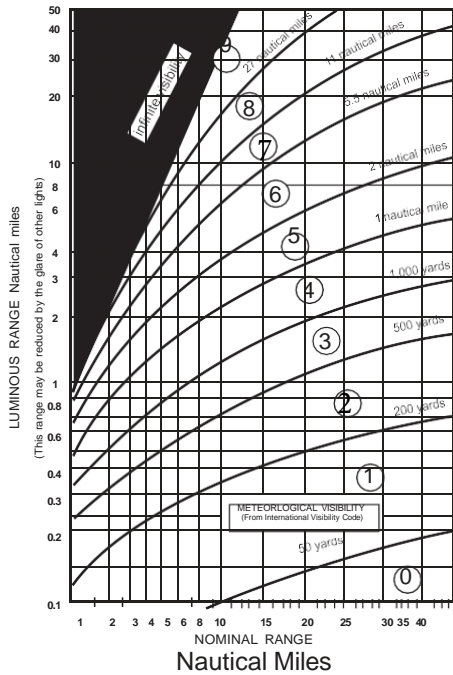
BLACK-STRIPED WHITE BUOY

Used to indicate an obstruction to navigation, extends from the nearest shore to the buoy. This means "do not pass between the buoy and the nearest shore." This aid is replacing the red and white striped buoy within the USWMS, but cannot be used until all red and white striped buoys on a waterway have been replaced.

# LUMINOUS RANGE DIAGRAM

The nominal range given in this Light List is the maximum distance a given light can be seen when the meteorological visibility is 10 nautical miles. If the existing visibility is less than 10 NM, the range at which the light can be seen will be reduced below its nominal range. And, if the visibility is greater than 10 NM, the light can be seen at greater distances. The distance at which a light may be expected to be seen in the prevailing visibility is called its luminous range.

This diagram enables the mariner to determine the approximate luminous range of a light when the nominal range and the prevailing meteorological visibility are known. The diagram is entered from the bottom border using the nominal range listed in column 6 of this book. The intersection of the nominal range with the appropriate visibility curve (or, more often, a point between two curves) yields, by moving horizontally to the left border, the luminous range



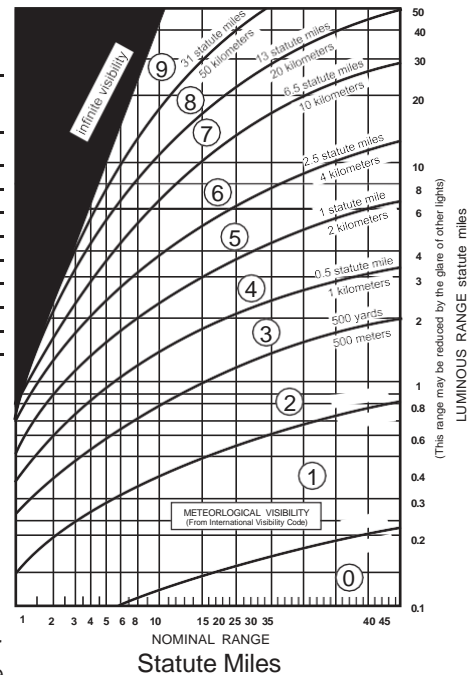
## METEOROLOGICAL VISIBILITY (From International Visibility Code)

Code	Metric	Nautical (approximate)
0	less than 50 meters	less than 50 yards
1	50-200 meters	50-200 yards
2	200-500 meters	200-500 yards
3	500-1,000 meters	500-1,000 yards
4	1-2 kilometers	1,000-2,000 yards
5	2-4 kilometers	1-2 nautical miles
6	4-10 kilometers	2-5.5 nautical miles
7	10-20 kilometers	5.5-11 nautical miles
8	20-50 kilometers	11-27 nautical miles
9	greater than 50 km	greater than 27 nm

### CAUTION

When using this diagram it must be remembered that:

1. The ranges obtained are approximate.
2. The transparency of the atmosphere may vary between observer and light.
3. Glare from background lighting will reduce the range that lights are sighted.
4. The rolling motion of a vessel and/or of a lighted aid may reduce the distance that lights can be detected or identified.



# GEOGRAPHIC RANGE TABLE

The following table gives the approximate geographic range of visibility for an object which may be seen by an observer at sea level. It is necessary to add to the distance for the height of any object the distance corresponding to the height of the observer's eye above sea level.

Height Feet/Meters	Distance Nautical Miles(NM)	Height Feet/Meters	Distance Nautical Miles(NM)	Height Feet/Meters	Distance Nautical Miles (NM)
5/1.5	2.6	70/21.3	9.8	250/76.2	18.5
10/3.1	3.7	75/22.9	10.1	300/91.4	20.3
15/4.6	4.5	80/24.4	10.5	350/106.7	21.9
20/6.1	5.2	85/25.9	10.8	400/121.9	23.4
25/7.6	5.9	90/27.4	11.1	450/137.2	24.8
30/9.1	6.4	95/29.0	11.4	500/152.4	26.2
35/10.7	6.9	100/30.5	11.7	550/167.6	27.4
40/12.2	7.4	110/33.5	12.3	600/182.9	28.7
45/13.7	7.8	120/36.6	12.8	650/198.1	29.8
50/15.2	8.3	130/39.6	13.3	700/213.4	31.0
55/16.8	8.7	140/42.7	13.8	800/243.8	33.1
60/18.3	9.1	150/45.7	14.3	900/274.3	35.1
65/19.8	9.4	200/61.0	16.5	1000/304.8	37.0

Example: Determine the geographic visibility of an object, with a height above water of 65 feet, for an observer with a height of eye of 35 feet.

Enter above table;  
 Height of object 65 feet= 9.4 NM  
 Height of observer 35 feet= 6.9 NM  
 Computed geographic visibility= 16.3 NM

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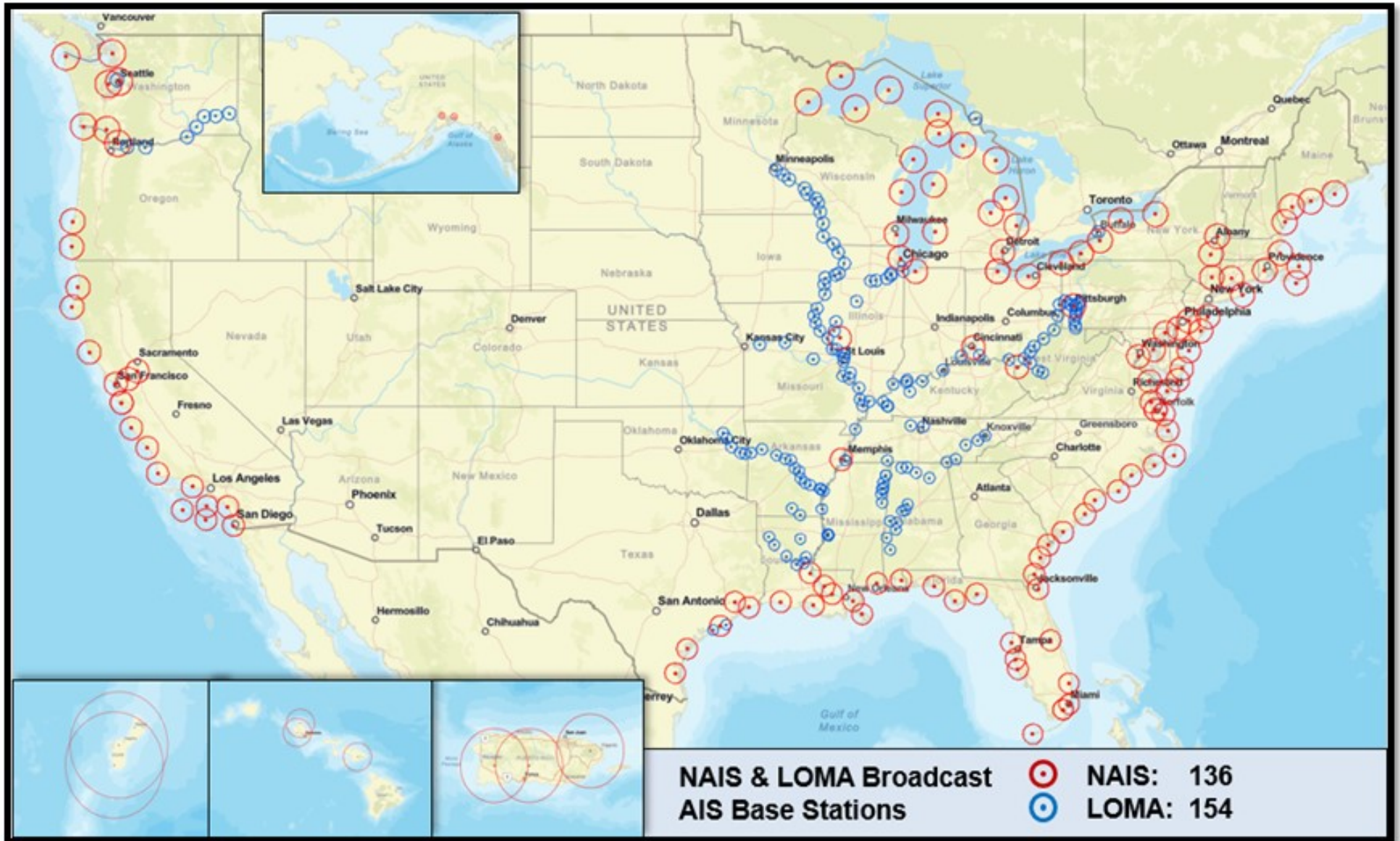


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# Federal AIS ATON Broadcast Sites



The following is a description of the geographic coverage of each volume:

Volume	Coast Guard District(s)	Geographic Description
I	<b>First Coast Guard District</b> 408 Atlantic Avenue Boston, MA 02110-3350 Tel: 617-223-8356 <a href="http://www.uscg.mil/d1">http://www.uscg.mil/d1</a>	Maine, New Hampshire, Massachusetts, Vermont (Lake Champlain), Rhode Island, Connecticut and New York to Shrewsbury River, New Jersey.
II	<b>Fifth Coast Guard District</b> Federal Building 431 Crawford Street Portsmouth, VA 23704-5004 Tel: (757)398-6486 (757) 398-6552 <a href="http://www.uscg.mil/d5">http://www.uscg.mil/d5</a>	Shrewsbury River, New Jersey to Little River South Carolina.
III	<b>Seventh Coast Guard District</b> Brickell Plaza Federal Building 909 SE 1st Avenue; Rm:406 Miami, FL 33131-3050 Tel: (305) 415-6752 or (305) 415-6800 <a href="http://www.uscg.mil/d7">http://www.uscg.mil/d7</a>	South Carolina, Georgia, Florida to Econfina River (083°50' W), and Puerto Rico and the U.S. Virgin Islands.
IV	<b>Eight Coast Guard District</b> Hale Boggs Federal Building 500 Poydras Street New Orleans, LA 70130-3310 Tel: (504) 671-2327 (504) 671-2137 <a href="http://www.uscg.mil/d8">http://www.uscg.mil/d8</a>	Econfina River (083°50' W), Florida to Rio Grande, Texas.
V		Mississippi River system and its navigable tributaries, Tenn-Tom Waterway, Alabama, Atchafalaya, and the Apalachicola-Chattahoochee-Flint River Systems.
VI	<b>Eleventh Coast Guard District (California, Nevada, Utah, Arizona)</b> Coast Guard Island Building 50-2 Alameda, CA 94501-5100 Tel: (510) 437-2975 <a href="http://www.uscg.mil/d11">http://www.uscg.mil/d11</a>  <b>Thirteenth Coast Guard District (Oregon, Washington, Idaho, Montana)</b> Federal Building, 915 Second Ave, Suite 3510 Seattle, WA 98174-1067 Tel: (206) 220-7280 (206) 220-7001 <a href="http://www.uscg.mil/d13">http://www.uscg.mil/d13</a>  <b>Fourteenth Coast Guard District (Hawaiian, American Samoa, Marshall, Marianas, and Caroline Islands)</b> Prince Kalaniana'ole Federal Bldg. 300 Ala Moana Blvd 9th Floor, Room 9-220 Honolulu, HI 96850-4982 Tel: (808) 535-3409 (808) 535-3414 <a href="http://www.uscg.mil/d14">http://www.uscg.mil/d14</a>  <b>Seventeenth Coast Guard District (Alaska)</b> PO Box 25517 Juneau, AK 99802-5517 Tel: (907) 463-2269 <a href="http://www.uscg.mil/d17">http://www.uscg.mil/d17</a>	Pacific Coast, Pacific Islands, and the Coast of Alaska.
VII	<b>Ninth Coast Guard District</b> 1240 East 9th Street Cleveland, OH 44199-2060 Tel: (216)902-6060 or (216) 902-6117 <a href="http://www.uscg.mil/d9">http://www.uscg.mil/d9</a>	Great Lakes and the St. Lawrence River above the St. Regis River.

## U. S. COAST GUARD NINTH DISTRICT

### UNIT LISTING

#### AIDS TO NAVIGATION TEAMS

<p><b>ANT BUFFALO</b>                  1 Furmann Blvd.                  Buffalo, NY 4203-3189                  Tel: (716) 843-9551</p>	<p><b>ANT DETROIT</b>                  110 Mt. Elliott Ave                  Detroit, MI 48207-4380                  Tel: (313) 568-9538</p>	<p><b>ANT DULUTH</b>                  1201 Minnesota Ave                  Duluth, MN 55802-2492                  Tel: (218) 529-3115</p>
<p><b>ANT TWO RIVERS</b>                  13 East Street                  Two Rivers, WI 54241                  Tel: (920) 793-2260</p>	<p><b>ANT SAULT STE MARIE</b>                  1732 West 22nd St                  Sault Ste. Marie, MI 49783                  Tel: (906) 632-7290</p>	<p><b>ANT MUSKEGON</b>                  1453 Beach St.                  Muskegon, MI 49441-1082                  Tel: (231) 759-8581</p>
<p><b>ANT SAGINAW RIVER</b>                  2405 Weadock Road                  Essexville, MI 48732-9602                  Tel: (989) 894-0412</p>		

#### BUOY TENDERS

<p><b>USCGC SPAR (WLB-206)</b>                  1201 Minnesota Ave                  Duluth, MN 55802-2492                  Tel: (218) 529-3131</p>	<p><b>USCGC BRISTOL BAY (WTGB-102)</b>                  110 Mt. Elliott Ave                  Detroit, MI 48207-4380                  Tel: (313) 568-9548</p>
<p><b>USCGC BUCKTHORN (WLI-642)</b>                  337 Water St.                  Sault Ste. Marie, MI 49783-9501                  Tel: (906) 635-3288/89</p>	<p><b>USCGC SEQUOIA (WLB-215)</b>                  2700 Omar St                  Port Huron, MI 48060-8519                  Tel: (810) 982-2684/86</p>
<p><b>USCGC MACKINAW (WLBB-30)</b>                  632 Coast Guard Dr.                  Cheboygan, MI 49721-1299                  Tel: (231) 597-2030</p>	<p><b>USCGC MOBILE BAY (WTGB-103)</b>                  P.O. Box 287                  Sturgeon Bay, WI 54235-0287                  Tel: (920) 743-2646</p>

## Light List Volume VII

This Light List is corrected through Coast Guard District Local Notice to Mariners No. 53/23, and National Geospatial-Intelligence Agency (NGA) Notice to Mariners No. 53/23.

The 2024 edition supersedes the 2023 edition.

### RECORD OF CORRECTIONS YEAR 2024

1/24	2/24	3/24	4/24	5/24	6/24	7/24	8/24
9/24	10/24	11/24	12/24	13/24	14/24	15/24	16/24
17/24	18/24	19/24	20/24	21/24	22/24	23/24	24/24
25/24	26/24	27/24	28/24	29/24	30/24	31/24	32/24
33/24	34/24	35/24	36/24	37/24	38/24	39/24	40/24
41/24	42/24	43/24	44/24	45/24	46/24	47/24	48/24
49/24	50/24	51/24	52/24	53/24			

## PREFACE

Lights and other marine aids to navigation maintained by or under authority of the U.S. Coast Guard and located on waters used by general navigation are described in the 7 volumes of the U.S. Light List. The Light List describes many aids to navigation owned or maintained by private entities; however, not all such aids are described.

The following is a description of the geographic coverage of each volume:

Volume	Coast Guard District(s)	Geographic Description
I	<b>First Coast Guard District</b> 408 Atlantic Avenue Boston, MA 02110-3350 Tel: 617-223-8356 <a href="http://www.uscg.mil/d1">http://www.uscg.mil/d1</a>	Maine, New Hampshire, Massachusetts, Vermont (Lake Champlain), Rhode Island, Connecticut and New York to Shrewsbury River, New Jersey.
II	<b>Fifth Coast Guard District</b> Federal Building 431 Crawford Street Portsmouth, VA 23704-5004 Tel: (757)398-6486 (757) 398-6552 <a href="http://www.uscg.mil/d5">http://www.uscg.mil/d5</a>	Shrewsbury River, New Jersey to Little River South Carolina.
III	<b>Seventh Coast Guard District</b> Brickell Plaza Federal Building 909 SE 1st Avenue; Rm:406 Miami, FL 33131-3050 Tel: (305) 415-6752 or (305) 415-6800 <a href="http://www.uscg.mil/d7">http://www.uscg.mil/d7</a>	South Carolina, Georgia, Florida to Econfina River (083°50' W), and Puerto Rico and the U.S. Virgin Islands.
IV	<b>Eight Coast Guard District</b> Hale Boggs Federal Building 500 Poydras Street New Orleans, LA 70130-3310 Tel: (504) 671-2327 (504) 671-2137 <a href="http://www.uscg.mil/d8">http://www.uscg.mil/d8</a>	Econfina River (083°50' W), Florida to Rio Grande, Texas.
V		Mississippi River system and its navigable tributaries, Tenn-Tom Waterway, Alabama, Atchafalaya, and the Apalachicola-Chattahoochee-Flint River Systems.
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VII	<b>Ninth Coast Guard District</b> 1240 East 9th Street Cleveland, OH 44199-2060 Tel: (216)902-6060 or (216) 902-6117 <a href="http://www.uscg.mil/d9">http://www.uscg.mil/d9</a>	Great Lakes and the St. Lawrence River above the St. Regis River.

***CAUTION: Mariners attempting to pass a buoy close aboard risk collision with a yawing buoy or with the obstruction that the buoy marks. Mariners must not rely on buoys alone for determining their positions due to factors limiting buoy reliability.***

## **PRIVATE AIDS TO NAVIGATION**

Class I aids to navigation: These are aids located on marine structures or other works that the owners are legally obligated to establish, maintain, and operate as prescribed by the Coast Guard. These are included in the Light List.

Class II aids to navigation: These are aids, exclusive of Class I, that are located in waters used by general navigation. These are included in the Light List.

Class III aids to navigation: These are aids, exclusive of Class I and Class II that are located in waters not ordinarily used by general navigation. These are not included in the Light List.

## **LIGHT LIST AVAILABILITY**

This Light List is annually published in electronic format and is intended to furnish more information concerning aids to navigation than can be conveniently shown on charts (U.S. Coast Guard Light List volumes can be found US Coast Guard Navigation Center website ([USCG Light Lists](#))). This Light List is not intended to be used in place of charts or the [United States Coast Pilot®](#). Charts should be consulted for the location of all aids to navigation. It may be dangerous to use aids to navigation without reference to charts.

**Note:** NOAA has announced the phased shutdown of its traditional paper and raster chart production system. Cancellation of traditional NOAA paper nautical charts, RNCs, and other associated raster chart products will begin in 2021 and will be completed by January 2025. Use NOAA ENC's for the most up-to-date information.

This list is corrected to the date of the notices to mariners shown on the title page. Changes to aids to navigation during the year are advertised in U.S. Coast Guard Local Notices to Mariners and National Geospatial-Intelligence Agency (NGA) Notices to Mariners. Important changes to aids to navigation may also be broadcast through Coast Guard or Naval radio stations and NAVTEX. Mariners should keep their Light Lists corrected from these notices and should consult all notices issued after the date of publication of this Light List. Additionally, the U.S. Coast Guard maintains weekly updated Light Lists corrected through the current LNM week and are available in **XML** and **PDF** on the [Weekly Light List Page](#) of the U.S. Coast Guard Navigation Center (NAVCEN) website.

**IMPORTANT:** A summary of corrections for this publication, which includes corrections from the dates shown on the title page to the date of availability, is advertised in the Local Notice to Mariners and the Notice to Mariners. These corrections must be applied to bring the Light List up to date. Additionally, this publication should be corrected weekly from the Local Notices to Mariners or the Notices to Mariners, as appropriate.

Mariners and others are requested to bring any apparent errors or omissions in these lists to the attention of the cognizant U.S. Coast Guard District or NAVCEN at [TIS-PF-NISWS@USCG.MIL](mailto:TIS-PF-NISWS@USCG.MIL)



# INTRODUCTION

## How the Light List is Arranged

Aids to navigation on the Coastal United States are listed in geographic order clockwise from north to south along the Atlantic coast, east to west along the Gulf of Mexico, and south to north along the Pacific coast. On the Great Lakes, aids to navigation are listed from east to west and from south to north, except on Lake Michigan, which is listed from north to south. Seacoast aids to navigation are listed first, followed by entrance and harbor aids to navigation, which are listed in the order proceeding towards the head of navigation from seaward.

Names of aids to navigation are printed as follows to help distinguish immediately the type of aid to navigation.

### **Seacoast/Lake Coast Lights**

### **Secondary Lights, RACONS**

### **Sound Signals**

### **RIVER, HARBOR, OTHER LIGHTS, V-AIS**

### *Lighted Buoys*

### Daybeacons, Unlighted Buoys

Light List numbers are assigned to all Federal and Private aids to navigation for reference in the Light List. Aids to navigation are generally numbered by fives in accordance with their order of appearance in each volume of the Light List. Other numbers and decimal fractions are assigned where newly established aids to navigation are listed between previously numbered aids to navigation. The Light Lists are renumbered periodically to assign whole numbers to all aids to navigation.

International numbers are assigned to certain aids to navigation in cooperation with the International Hydrographic Organization. They consist of an alphabetic character followed by three or four numeric characters. A cross reference listing appears after the index.

## **Description of Columns**

Column (1): Light List Number.

Column (2): Name and location of the aid to navigation.

Bearings are in degrees true, read clockwise from 000° through 359°.

Bearings on range lines are given in degrees and tenths where applicable.

(C) indicates Canadian aid to navigation.

Note: A dash (-) is used to indicate the bold heading is part of the name of the aid to navigation. When reporting discrepancies or making references to such an aid to navigation in correspondence, the full name of the aid including the geographic heading, should be given.

- Column (3): Geographic position (WGS-84) of the aid to navigation in latitude and longitude.
- Column (4): Light characteristic for lighted aids to navigation.
- Column (5): Height above water from the focal plane of the fixed light to mean high water, listed in feet. -For Volume 5 (Western Rivers), height above water is not indicated for aids to navigation. Clearances for bridges, etc. are contained in the remarks column and indicate water level for each instance.
- For Volume 7 (Great Lakes), height above water from the focal plane of the fixed light to low water datum, listed in feet and meters.
- Column (6): Nominal range of lighted aids to navigation, in nautical miles, listed by color for sector and passing lights. Nominal Range is not listed for ranges, directional lights, or private aids to navigation.
- For Volume 7 (Great Lakes), nominal range is expressed in statute miles.
- Column (7): The structural characteristic of the aid to navigation, including: dayboard (if any), description of fixed structure, color and type of buoy, height of structure above ground for major lights.
- Column (8): Aid remarks, sound signal characteristics, including: VHF-FM channel if remotely activated, RACON characteristic, light sector arc of visibility, radar reflector, emergency lights, seasonal remarks, and private aid to navigation identification. AIS specific information may include its unique Maritime Mobile Service Identity (MMSI), the MMSI(s) of its source AIS transmission, and the application identifier of any Application Specific Messages (ASM) it may also be transmitting.

## **U.S. Coast Guard Light List Distribution**

U.S. Regulations require that most commercial vessels maintain on board a currently corrected copy or pertinent extract of the U.S. Coast Guard Light Lists, which are available for free and are updated weekly on the Coast Guard Navigation Center's website at [USCG NAVCEN](http://USCG.NAVCEN). For our policy on the use of electronic publications and charts, see Navigation and Vessel Inspection Circular (NVIC) 01-16 CH-2 which can be found here: <https://www.dco.uscg.mil/Our-Organization/NVIC/Year/2010/>.

## **Nautical Charts & Publications**

Nautical charts covering the coastal waters of the United States and its territories are produced by the National Oceanic and Atmospheric Administration (NOAA). These chart products include the NOAA electronic navigational chart (NOAA ENC<sup>®</sup>), NOAA raster navigational chart (NOAA RNC<sup>®</sup>), and traditional paper nautical charts. Information about ENCs may be found here: <https://nauticalcharts.noaa.gov/charts/noaa-enc.html>. Information about paper nautical charts and associated raster chart products may be found here: <https://nauticalcharts.noaa.gov/charts/noaa-raster-charts.html>.

ENCs, RNCs, and traditional chart images may be downloaded from the NOAA Chart Locator at: <https://www.charts.noaa.gov/InteractiveCatalog/nrnc.shtml>. Paper copies of traditional nautical charts may be purchased from any of the NOAA certified chart agents listed at: <https://www.nauticalcharts.noaa.gov/publications/print-agents.html#paper-charts>.

**Note:** NOAA has announced the phased shutdown of its traditional paper and raster chart production system. Cancellation of traditional NOAA paper nautical charts, RNCs, and other associated raster chart products will begin in 2021 and will be completed by January 2025. Use NOAA ENC's for the most up-to-date information.

Inland Electronic Navigational Charts (IENC) and chart books are published by the U.S. Army Corps of Engineers (USACE) and are available online at <https://www.agc.army.mil/echarts>

Tide Tables and Tidal Current Tables are no longer printed or distributed by NOAA. NOAA Tide and Current predictions are available online at [NOAA Tides & Currents](#). Commercially printed versions that use NOAA data are also available.

## Notices to Mariners

Several maritime information products produced by the U. S. Government use some version of the name “Notice to” or “Notice to Mariners”. This section will describe each and explain how they can be obtained or accessed.

**U.S. Notice to Mariners**, published weekly by the National Geospatial Intelligence Agency (NGA), is prepared jointly by the NGA, the U. S. Coast Guard, and the National Ocean Service. Its purpose is to provide corrections to U. S. nautical charts used by ocean-going vessels, and corrections for a variety of publications, including the U. S. Coast Pilot, NGA List of Lights, and the USCG Light List, among others. The Notice to Mariners also catalogues recent maritime safety information that has been distributed for the benefit of oceangoing vessels. These include NAVAREA Warnings, HYDROLANTS, HYDROPACS, and HYDROARCS. Visit NGA at <https://msi.nga.mil/NTM> to obtain the latest and previous U. S. Notice to Mariners. For more information about such information is distributed worldwide through the Global Maritime Distress and Safety System (GMDSS), refer to NGA Publication 117: <https://msi.nga.mil/Publications/RNA>

**Local Notice to Mariners** are published weekly by each of the nine U. S. Coast Guard Districts, and provide the following information for waters within the District: the status of federal and private aids to navigation (such as discrepancies or temporary or proposed changes); special notices about maritime events, operations, and hazards; information about bridges; and, chart corrections for all National Ocean Service Charts in the District. Current and previous Local Notice to Mariners for each CG District can be found at the Coast Guard Navigation Center Website: <https://www.navcen.uscg.gov/?pageName=lnmMain>

**U.S. Army Corps of Engineers (USACE) Notice to Navigation Interests ([NTNI Notices](#))** website contains navigation notices and policies issued by USACE Districts with a waterway navigation mission. These documents are disseminated to inform mariners of information describing events that affect waterway navigation such as maintenance projects, hazards to navigation, and other pertinent information. The notices are removed from the page seven days past the end date on the latest amendment. The site also has Policy Notices that remain in place until superseded. This site does not contain all notices such as those published by other agencies.

**Broadcast Notices to Mariners (BNM)** are transmitted using voice over VHF radio (channel 22) by each Coast Guard District to communicate local information about hazards, emergent situations, and the status of federal aids to navigation. Broadcasts occur at scheduled times, or as needed, and are normally announced first on VHF channel 16, before transmission on channel 22. BNMs provide in near real-time much of the same information that will later be published in the Local Notice to Mariners. The Coast Guard is enhancing the delivery and accessibility of Broadcast Notices to Mariners (BNMs) by initiating email distribution service. In addition to traditional methods, mariners can now receive BNMs directly to their email, ensuring timely and convenient updates. Furthermore, BNMs are being archived on the website [www.navcen.gov](http://www.navcen.gov), making them readily available for access via wireless mobile devices. This nationwide service will improve the reach and efficiency of maritime safety information and communications. To subscribe to the email service, mariners can visit the following link: <https://www.navcen.uscg.gov/subscribe-email-rss-feeds>.

Urgent broadcasts applicable to situations or locations beyond the range of VHF land stations and out to approximately 100 miles have also been broadcast via the medium frequency NAVTEX system.

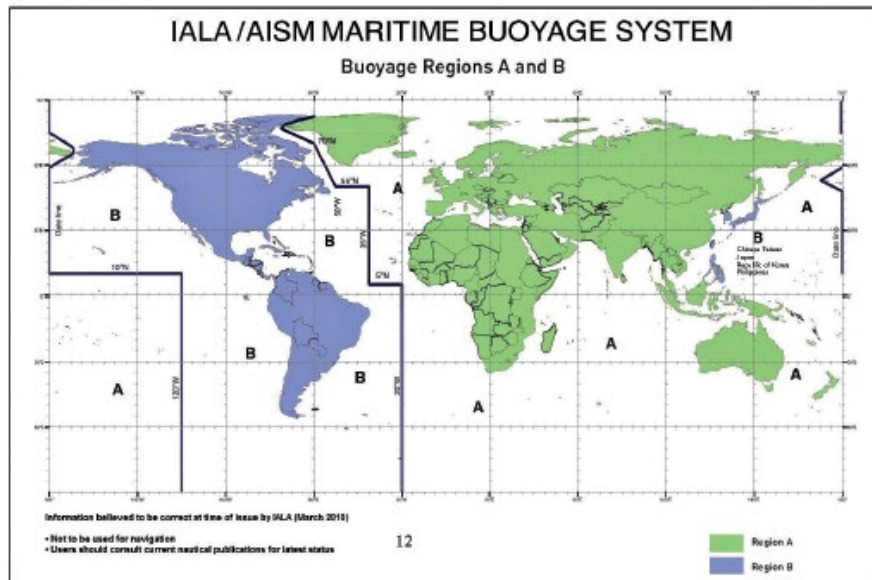
### **Discrepancies to Aids to Navigation**

The U.S. Aids to Navigation System is a publicly monitored system that relies on mariners to inform U.S. Coast Guard units of observed discrepancies or outages. Therefore, for the safety of all mariners, anyone who observes an aid to navigation that is either off station or exhibiting characteristics other than those listed in the Light Lists should promptly notify the nearest Coast Guard unit. Radio messages should be prefixed “COAST GUARD” and transmitted on VHF-FM channel 16. In addition to notifying the nearest Coast Guard unit by radio, a discrepant aid to navigation can be reported online at <http://www.navcen.uscg.gov/?pageName=atonOutageReport>, or by calling (703) 313-5900, or emailing the Navigation Information Service (NIS) watch at [TIS-SMB-NISWS@USCG.MIL](mailto:TIS-SMB-NISWS@USCG.MIL).

## **GENERAL**

### **U.S. AIDS TO NAVIGATION SYSTEM**

The navigable waters of the United States are marked to assist navigation using the U.S. Aids to Navigation System, a system consistent with the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) Maritime Buoyage System. The IALA Maritime Buoyage System is followed by most of the world’s maritime nations and improves maritime safety by encouraging conformity in buoyage systems worldwide. IALA buoyage is divided into two regions made up of Region A and Region B. All navigable waters of the United States follow IALA Region B, except U.S. possessions west of the International Date Line and south of 10° north latitude, which follow Region A. Lateral aids to navigation in Region A vary from those located within Region B. Non-lateral aids to navigation in Region A are the same as those used in Region B. Appropriate nautical charts and publications should be consulted to determine whether the Region A or Region B marking schemes are in effect for a given area.



Aids to navigation are developed, established, operated, and maintained by the U.S. Coast Guard to accomplish the following:

1. Assist navigators in determining their position,
2. Assist the navigator in determining a safe course,
3. Warn the navigator of dangers and obstructions,
4. Promote the safe and economic movement of commercial vessel traffic, and
5. Promote the safe and efficient movement of military vessel traffic, and cargo of strategic military importance.

The U.S. Aids to Navigation System is designed for use with nautical charts. Nautical charts portray the physical features of the marine environment, which include soundings, landmarks, hazards to navigation, and aids to navigation. To best understand the purpose of a specific aid to navigation, mariners should consult the associated nautical chart, which illustrates the relationship of the aid to navigation to channel limits, obstructions, hazards to navigation, and to the aids to navigation system as a whole. Seasonal aids to navigation are placed into service, withdrawn, or changed at specified times of the year. The dates shown in the Light Lists are approximate and may vary due to adverse weather or other conditions. These aids will be changed on Electronic Navigational Charts (ENC) based on Light List dates and electronic navigation system settings.

Mariners should maintain and consult suitable publications and navigation equipment depending on the vessel's requirements. This shipboard navigation equipment is separate from the aids to navigation system but is often essential to its use.

The Coast Guard establishes, maintains, and operates a system of aids to navigation consisting of visual, audible, and electronic signals designed to assist the prudent mariner in the process of navigation. The U.S. Aids to Navigation System is primarily a lateral system, which employs a simple arrangement of colors, shapes, numbers, and light characteristics to mark the limits of navigable routes. This lateral system is supplemented with electronic signals such as AIS-ATON and non-lateral aids to navigation where appropriate.

The U.S. Aids to Navigation System contains the following subsystems:

1. **Intracoastal Waterway:** The aids to navigation marking the Intracoastal Waterway are arranged geographically from north to south on the Atlantic Coast and generally east to west on the coast of the Gulf of Mexico. Red lights (if so equipped), even numbers, and red buoys or triangle shaped daymarks are located on the southbound/westbound starboard waterway boundary. Green lights (if so equipped), odd numbers, and green buoys or square shaped daymarks are on the southbound/westbound port waterway boundary.
2. **Western Rivers:** The Western Rivers System is employed on the Mississippi River System, in addition to the Tennessee-Tombigbee Waterway and the Alabama, Atchafalaya, and Apalachicola-Chattahoochee-Flint River Systems. The Western Rivers System consists of the following characteristics:
  - a. Buoys are not numbered.
  - b. Numbers on beacons do not have lateral significance, but rather indicate mileage from a fixed point (normally the river mouth).
  - c. Diamond shaped non-lateral dayboards, red and white or green and white as appropriate, are used to indicate where the river channel crosses from one bank to the other.
  - d. Lights on green aids to navigation show a single-flash characteristic, which may be green or white.
  - e. Lights on red aids to navigation show a group-flash characteristic, which may be red or white.
  - f. Isolated danger marks are not used.
3. **Bridge Markings:** Bridges across navigable waters are marked with red, green and/or white lights for nighttime navigation. Red lights mark piers and other parts of the bridge. Red lights are also placed on drawbridges to show when they are in the closed position. Green lights are placed on drawbridges to show when they are in the open position. The location of these lights will vary according to the bridge structure. Green lights are also used to mark the centerline of navigable channels through fixed bridges. If there are two or more channels through the bridge, the preferred channel is also marked by three white lights in a vertical line above the green light.

Red and green retro-reflective panels may be used to mark bridge piers and may also be used on bridges not required to display lights. Lateral red and green lights and dayboards may mark main channels through bridges. Adjacent piers are marked with fixed yellow lights when the main channel is marked with lateral aids to navigation. Centerlines of channels through fixed bridges may be marked with a safe water mark and an occulting white light when lateral marks are used to mark main channels.

The centerline of the navigable channel through the draw span of floating bridges may be marked with a special mark. The mark will be a yellow diamond with yellow retro-reflective panels and may exhibit a yellow light that displays a Morse code "B" (a long flash followed by three short flashes). AIS-ATON and RACONs may be placed on the bridge structure to mark the centerline of the navigable channel through the bridge.

Vertical clearance gauges may be installed to enhance navigation safety. The gauges are located on the right channel pier or pier protective structure facing approaching vessels. Clearance gauges indicate the vertical distance between "low steel" of the bridge channel span (in the closed to navigation position for drawbridges) and the level of the water, measured to the bottom of the foot marks, read from top to bottom.

Drawbridges equipped with radiotelephones display a blue and white sign which indicates what VHF radiotelephone channels should be used to request bridge openings.

4. **Private** aids to navigation include aids to navigation that are either operated by private persons and organizations, or that are operated by states. Private aids to navigation are classified into three categories:
  - a. **Class I:** Aids to navigation on marine structures or other works that the owners are legally obligated to establish, maintain, and operate as prescribed by the U.S. Coast Guard.
  - b. **Class II:** Aids to navigation that, exclusive of Class I aids, are in waters used by general navigation.
  - c. **Class III:** Aids to navigation that, exclusive of Class I and Class II aids, are in waters not ordinarily used by general navigation.

Authorization for the establishment of a Class II or Class III private aid to navigation by the U.S. Coast Guard imposes no legal obligation that the aid be established and operated. It only specifies the location and operational characteristics of the aid for which the authorization was requested. Once the aid is established, however, the owner is legally obligated to maintain it in good working order and properly painted.

5. **Lights and sound signals on oil wells or other offshore structures** in navigable waters are private aids to navigation and are generally not listed in the Light List unless they are equipped with a RACON or AIS-ATON. Where space allows, the structures are shown on the appropriate nautical charts. Information concerning the location and characteristics of those structures which display lights and sound signals not located in obstruction areas are published in Local and/or weekly Notices to Mariners. In general, during the nighttime, a series of white lights are displayed extending from the platform to the top of the derrick when drilling operations are in progress. At other times, structures are usually marked with one or more quick flashing white, red, or yellow lights, visible for at least one nautical mile during clear weather. Obstructions, which are a part of the appurtenances to the main structure, such as mooring piles, anchors, and mooring buoys, etc., are not normally lighted. In addition, some structures are equipped with a sound signal that produces a single two-second blast every 20 seconds.
6. **Lighting and Marking of Windfarm Structures.** The United States follows the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) Guideline G1162 on The Lighting and Marking of Offshore Man-Made Structures, except as follows: Uniform Alphanumeric Marking of Installations, Facilities and Structures (IFSs): Each IFS in an OREI lease area should be marked with its unique alphanumeric character, a National Oceanic and Atmospheric Administration charted designator, enabling quick recognition and reference for search and rescue, law enforcement, and other purposes. Markings on each IFS should be at least 8 feet (ft.) (2.5 meters (m)) and as close to 10 ft. (3 m) in height as possible, posted between 30 to 50 ft. above Mean Higher High water, such that they are visible all-round (360-degree arc) from the water's surface. Use of retro-reflective paint or materials for lettering and numbering is highly recommended. Each IFS' unique marking should be duplicated on top of its nacelle to aid identification from the air. Lighting and Sound Signals of Significant Peripheral Structure (SPS), normally a corner structure and other significant points on the boundary of the wind farm.

The following guidance provides additional information to augment compliance with lighting and marking of OREIs on the Outer Continental Shelf (OCS). Lighting and Marking: The nominal distance between SPSs and any adjacent SPS or Intermediate Peripheral Structure should not exceed 3 nautical miles (NM). In addition to its marking, each SPS should be fitted with the following:

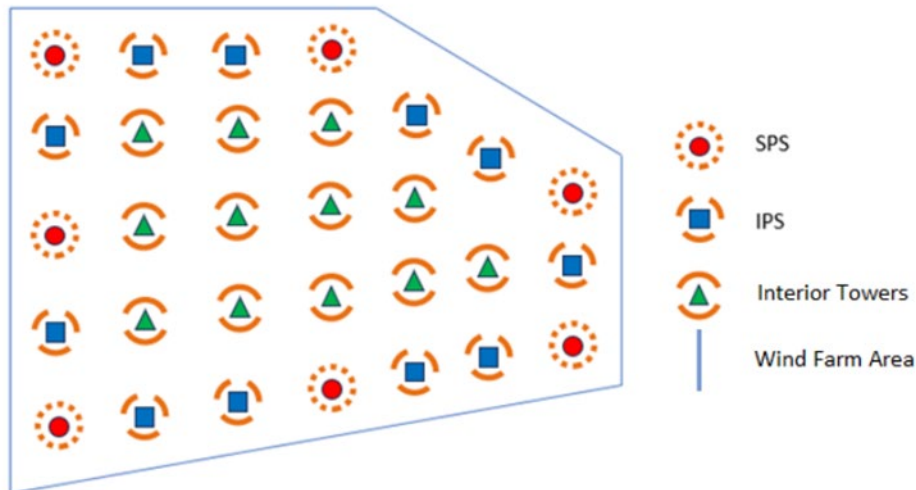
- Quick flashing yellow light (QY, 0.3s on/0.7s off) that is visible at least 5NM and synchronized with all other SPS lights; and
- Sound signal that produces a 4s blast every 30s with rated range of 2NM when the visibility in any direction is less than 5NM or when activated by keying marine VHF-FM Channel 1083 (157.175 MHz, previously 83A) five times within ten seconds—Mariner Radio Activated Sound Signal (MRASS).

Lighting of Intermediate Peripheral Structures: Outer boundary non-SPS IFS are called Intermediate Peripheral Structures (IPS). IPS should be fitted with a 2.5 second flashing yellow light (FL Y 2.5s, 1.0s on/1.5s off) that is visible at least 3NM away and synchronized with all other IPS lights.

Lighting of IFS: Interior IFS should be fitted with a 6 second flashing yellow light (FL Y 6s, 1.0s on/5.0s off) or a 10 second flashing yellow light (FL Y 10s, 1.0s on/9.0s off) that is visible at least 2NM and should be synchronized with all other Interior IFS lights.

Lighting of SPS: SPS should be Quick Flashing Yellow 5 NM IPS Flashing 2.5 Seconds Yellow 3 NM Interior Towers Flashing 6, 10 or 15 Sec. Yellow 2NM. Each SPS, and IPS adjacent to a fairway or used to identify a designated vessel transit route through the farm or closely adjacent farms, shall be identified by a properly encoded AIS Message 21. These broadcasts shall be made autonomously and continuously (99 percent availability), at least every 6 minutes, alternating on AIS channel 1 and 2, at sufficient power to provide a relatively uniform coverage recommended to extend at least 8NM beyond the periphery of the wind farm to allow sufficient time for ship operators to detect and make any necessary course or speed alterations. IPS, or other IFS within the farm, may be additionally marked with physical or synthetic AIS Message 21 if circumstances warrant; but not such to overload the VHF data link in or near congested waters. Additionally, AIS Message 21 broadcasts should indicate current “ATON status” (i.e., good health, light discrepancies, etc.). ATON status “alarms” may be accompanied by an AIS Safety Related Broadcast (AIS Message 14). Use of AIS requires submission of a USCG AIS Private ATON Application (see Form CG-4143) and subsequent Federal Communications Commission licensing.





Example of SPS and IPS identified in a windfarm layout (not to scale).

## BUOYS, BEACONS, AND AIS-ATON

The primary components of the U.S. Aids to Navigation System are buoys, beacons, and AIS-ATON.

**Buoys** are floating aids to navigation used extensively throughout U.S. waters. They are moored to sinkers by varying lengths of chain and may shift due to sea conditions and other causes. Buoys may also be carried away, capsized, or sunk. Prudent mariners will not rely solely on any single aid to navigation, particularly floating aids.

Buoy positions represented on nautical charts are approximate position only, due to the practical limitations of positioning and maintaining buoys and their sinkers in precise geographical locations.

Positions of Federal buoys are verified during periodic maintenance visits. Between visits, environmental conditions such as atmospheric and sea conditions or seabed slope and composition may shift buoys off their charted positions. Buoys may also be dragged off station, sunk, or capsized by a collision with a vessel.

**Beacons** are aids to navigation which are permanently fixed to the earth's surface. They range from large lighthouses to small single-pile structures and may be located on land or in the water. Lighted beacons are called lights; unlighted beacons are called daybeacons. Lighthouses are placed on shore or on marine sites and most often do not indicate lateral significance. Lighthouses with no lateral significance exhibit a white light.

Beacons exhibit a daymark. For small structures, these are colored geometric shapes that make an aid to navigation readily visible and easily identifiable against background conditions. Generally, the daymark conveys to the mariner during daylight hours the same significance as the aid's light or reflector does at night. The daymark of towers, however, consists of the structure itself. As a result, these daymarks do not imply lateral significance.

**Ranges (Leading Lights)** are non-lateral aids to navigation composed of two beacons, which when sighted in line with one another, define a particular bearing or course. The appropriate nautical chart must be consulted when using ranges to determine whether the range marks the centerline of the

navigable channel and what section of the range may be safely traversed. Ranges typically display rectangular dayboards of various colors and are generally, but not always lighted. Ranges may display lights during daylight and at night. When lighted, ranges may display lights of any color.

**Caution:** Vessels should not pass beacons close aboard due to the danger of collision with riprap or structure foundations, or with the obstruction or danger being marked.

**Automatic Identification System (AIS)** is a maritime navigation safety communications protocol defined by the International Telecommunication Union and adopted by the International Maritime Organization for the autonomous and continuous exchange of pertinent navigation information between seagoing ships and other mandated vessels, such as identity, call-sign, position, dimensions, type, and navigation status. In addition to ship-to-ship broadcasts, AIS may communicate between ship and shore stations and be used for other navigation safety purpose, such as augmenting the presence (on radar) and/or providing the status of an existing ATON.

**Automatic Identification System-ATON (AIS-ATON)** ATON may be enhanced using AIS communications protocol. AIS-ATON can be used to autonomously and at fixed intervals broadcast the name, position, dimensions, type, characteristics, and status from or concerning an aid to navigation. AIS-ATON information can only be “seen” on AIS capable navigation display systems, such as those that meet IEC 62288 Navigation Presentation standards or are supported by other proprietary means used by non-IEC compliant manufacturers. The figures below show how some are represented on AIS compliant navigation displays. AIS-ATON reports may have lateral significance and thus are charted to mimic a physical buoy or beacon. They may also be used to provide other marine safety information, such as when a charted restricted area is open or closed, or to highlight a temporary condition that may not be charted, e.g., rocket launch areas. AIS, as provided by the U.S. Army Corp of Engineers, can also provide reports on environmental conditions, wind speed and direction, current data, lock status, etc.

AIS-ATON reports are characterized in one of three ways: **physical** (meaning the AIS transmitter is physically located on the aid to navigation it is associated with, such as a ATON), **synthetic** (meaning the AIS message or symbol associated with a particular ATON or beacon is being broadcast from a different physical location, such as from an AIS antenna on shore), or **virtual** (meaning no physical ATON or beacon exists, but that an AIS message or symbol is being broadcast in order to be portrayed in a particular location). In the Light List, physical and virtual aids will be listed as such in column (8), the remarks section. If an AIS-ATON listed in the Light List does not have the words “physical” or “virtual” in the remarks section, it should be presumed by the mariner to be a synthetic AIS-ATON. Column (8) will also identify the source Maritime Mobile Service Identity (MMSI) of the broadcast station(s). For example:

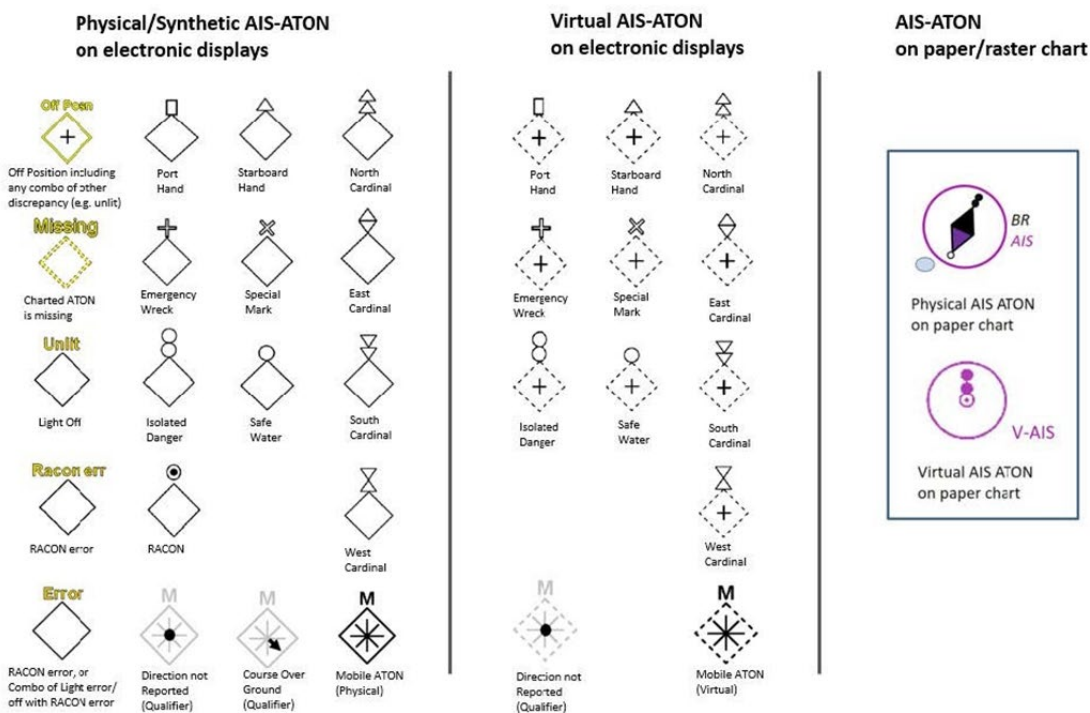
(8) Remarks
[Physical/Virtual] AIS AIS: 993666 X <sub>1</sub> X <sub>2</sub> X <sub>3</sub> X <sub>4</sub> SOURCE AIS: 00366X <sub>1</sub> X <sub>2</sub> X <sub>3</sub> X <sub>4</sub> , ASM: 8/67:33v3 [If more than 1 source station] 00366 X <sub>1</sub> X <sub>2</sub> X <sub>3</sub> X <sub>4</sub>

**Caution:** When encountering an AIS-ATON, especially one associated with an ATON, mariners should consult the Light List carefully to understand whether the AIS transmitter is located on the aid or not. This is critical information necessary for interpreting the situation. For example, if the AIS transmitter is located on the ATON it is associated with (physical AIS-ATON), the location of the AIS signal will always correspond to the ATON’s actual position. If off-station, its broadcasted report will state so (i.e., off-position indicator, 0 = on position, 1 = off position); and additionally, will broadcast an AIS safety-related text message stating: ATON OFF- POSITION. These ATON are usually charted and denoted by a magenta circle and “AIS” label.

Synthetic AIS-ATON do not have this capability; when employed with a ATON, synthetic AIS- ATON always appear on the ATON’s assigned (charted) position, even if the ATON is off- station, damaged, missing, etc.

**Caution:** Mariners may find it difficult to distinguish between a synthetic and physical AIS- ATON by examining only the chart. Physical AIS-ATON is encircled in magenta, while synthetic AIS-ATON is not. Charts may not necessarily reflect the existence of a Synthetic AIS- ATON, nor its source station. If unsure, the Light List should be consulted. Virtual AIS-ATON are always listed as “VAIS” on the chart.

For virtual and synthetic AIS-ATON, the Light List may list the Maritime Mobile Service Identity (MMSI) of its (source) broadcast station. Where provided, this information is intended to aid mariners in determining whether they are near enough for their equipment to detect such AIS-ATON. For voyage planning purposes, mariners should note that an ATON’s broadcasted position may be up to 25 nautical miles away from the source station.



As per current IEC 62288:2021 & IHO S-52

The technology associated with AIS-ATON allows for other types of information to be broadcast to the mariner. Examples could include information about the health or status of AIS-ATON, environmental or other safety information, navigation warnings, or information about the status of bridges. Mariners

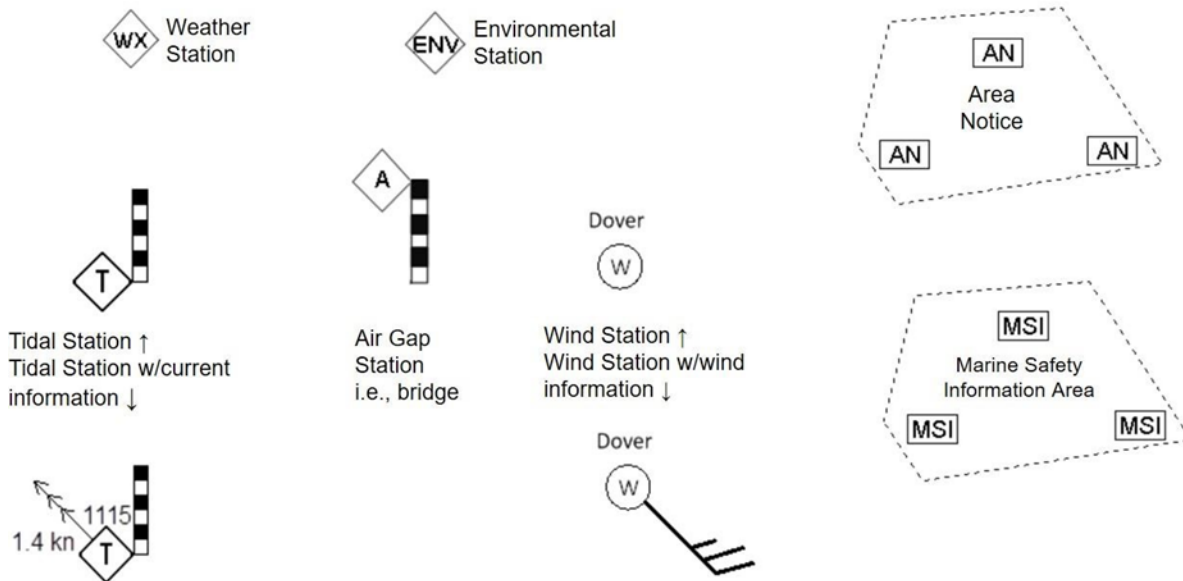
should look for updates to the Light List to understand how the Coast Guard is implementing this technology. Although all existing AIS mobile devices can receive AIS ATON Reports and Application Specific Messages (ASM), they may not readily appear on an AIS Minimal Keyboard Display or other shipboard navigational display systems (Radar), which would require software updates to make these systems compliant with international navigation presentation standards (i.e., IEC 62288 (series), IHO S-52 (series)). The data content of AIS Application Specific Messages can be found at <https://www.iala-aism.org/asm>.

They are identified by their: AIS message number (i.e. 6, 8, 25 or 26), Designated Area Code (DAC), Function Identifier (FI), and Version Number.

Application Specific Message ASM:X/YYYY.ZZ.V, where:  
 X identifies the AIS message number (i.e. 6, 8, 25 or 26),  
 YYYY its Designated Area Code (DAC),  
 ZZ its Function Identifier (FI), and V its Version Number,

e.g. ASM:8/367.22.2 denotes U.S. Geographic Notice, Application Specific Message 8, DAC = 367, FL = 22, Version =2.

## Symbology used for Application Specific Messages per International Navigation Displays Standard (IEC 62288)



**Nationwide Automatic Identification System (NAIS)** consists of approximately 200 VHF receiver sites located throughout the coastal continental United States, inland rivers, Alaska, Hawaii, Puerto Rico, and Guam. NAIS couples AIS technology with a comprehensive network infrastructure to achieve ship to-shore and shore-to-ship data transmission throughout the navigable waters of the United States. The system enables AIS-equipped vessels to receive important marine information such as safety and

security messages, weather alerts, and electronic aids to navigation. A list of NAIS Base Stations and their corresponding MMSI numbers can be found in the table at the end of this section.

NAIS is designed to collect safety and security data from AIS-equipped vessels in navigable waters of the United States and share that data with Coast Guard operators and other government and port partners. The primary goal of NAIS is to increase situational awareness through data dissemination via a network infrastructure, particularly focusing on improving maritime security, marine and navigational safety, search and rescue, and environmental protection services. Collected AIS data improves the safety of vessels and ports through collision avoidance and the safety of the nation through detection, identification, and classification of vessels. NAIS broadcasts navigation enhancing safety related messages such as Synthetic AIS ATON Reports and Application Specific Messages.

For more information about AIS see:

- AIS messages at: [NAVCEN AIS Messages](#)
- IMO Safety of Navigation Circular 289 and 290 regarding Application Specific Messages (ASM) at: [NAVCEN AIS References](#)
- IALA AIS ASM Catalog at: [www.e-navigation.nl/asm](http://www.e-navigation.nl/asm), and
- USCG Special Notice 14-02 regarding AIS Aids to Navigation at: [NAVCEN AIS FAQ #21](#)

The U.S. Army Corps of Engineers (USACE) operates AIS-ATONs extensively throughout the Western Rivers, Columbia River and at the Sault Ste Marie lock and dam. USACE AIS Stations broadcast a variety of information including ATON, Environmental, and Geographic Notices in support of navigation safety and efficient movement of vessels through U.S. inland waterways through their Lock Operations and Management Application (LOMA).

The Marine Exchange of Alaska (MXAK) is a nonprofit maritime organization based in Juneau, Alaska. The organization was established to broker information, that aids safe, secure, efficient, and environmentally sound maritime operations in Alaska. MXAK operates a network of Automatic Identification System (AIS) Stations to broadcast a variety of information including ATON, Environmental, and Geographic Notices in support of navigation safety and efficient movement of vessels throughout Alaska.

The U.S. Coast Guard and some other approved entities (i.e., U.S. Army Corps of Engineers, National Oceanic and Atmospheric Administration, Marine Exchange of Alaska, etc.) have been transmitting [AIS ATON Reports](#) and marine safety information via AIS since 2014 (see our [Special Notice 01-2014](#)). The exact content, location, and times of these transmissions are announced in the Coast Guard Local Notices to Mariners ([LNM](#)) and denoted in Coast Guard [Light List](#).

Note, AIS ATON stations operated in the U.S., other than by the U.S. Coast Guard, require Federal Communications Commission (FCC) or National Telecommunication Information Agency (NTIA) radio determination service licensing/authorization; which they will not grant without prior approval from the U.S. Coast Guard. Requests for such approvals may be sent to [cgnav@uscg.mil](mailto:cgnav@uscg.mil) via a USCG Private Aid to Navigation (PATON) application (either CG Form [2554](#) or [4143](#)) and this [Addendum](#). For further information on AIS ATON see our AIS Frequently Asked Question [21](#) and the International Association of Marine Aid to Navigation and Lighthouse Authorities' ([IALA](#)) publications on the subject.

For further information on AIS ATON, please refer to the various [IALA Guidelines and Recommendations](#) and their uses. The U.S. Coast Guard and some other approved entities (i.e., U.S. Army Corps of Engineers, National Oceanic and Atmospheric Administration, Marine Exchange of Alaska, etc.) have been transmitting AIS ATON Reports and marine safety information via AIS since 2014 (see our Special Notice 01-2014). The exact content, location, and times of these transmissions are announced in the Coast Guard Local Notices to Mariners (LNM) and denoted in Coast Guard Light List.

## TYPES OF SIGNALS

**Lighted** aids to navigation are, for the most part, equipped with daylight controls which automatically cause the light to operate during darkness and to be extinguished during daylight. These devices are not of equal sensitivity; therefore, all lights do not come on or go off at the same time. Mariners should ensure correct identification of aids to navigation during twilight periods when some lighted aids to navigation are lit while others are not. The lighting apparatus is serviced at periodic intervals to assure reliable operation, but there is always possibility of a light being extinguished or operating improperly.

Only aids to navigation with green or red lights have lateral significance and exhibit either flashing, quick flashing, group flashing, occulting, or isophase light rhythms. When proceeding in the conventional direction of buoyage, the mariner in IALA Region B, may see the following lighted aids to navigation:

Green lights on aids to navigation mark port sides of channels and locations of wrecks or obstructions that must be passed by keeping these lighted aids to navigation on the port hand of a vessel. Green lights are also used on preferred channel marks where the preferred channel is to starboard (i.e., aid to navigation left to port when proceeding in the conventional direction of buoyage). Red lights on aids to navigation mark starboard sides of channels and locations of wrecks or obstructions that must be passed by keeping these lighted aids to navigation on the starboard hand of a vessel. Red lights are also used on preferred channel marks where the preferred channel is to port (i.e., aid to navigation left to starboard when proceeding in the conventional direction of buoyage).

White and yellow lights have no lateral significance. The shapes, colors, letters, and light rhythms may determine the purpose of aids to navigation exhibiting white or yellow lights.

Different colored light emitting diode (LED) lights used in conjunction or sectors of colored glass are placed in the lanterns of some lights to produce a system of light sectors of different colors. In general, red sectors are used to mark shoals or to warn the mariner of other obstructions to navigation or of nearby land. Such lights provide approximate bearing information since observers may note the change of color as they cross the boundary between sectors. These boundaries are indicated in the Light List (Col. 8) and by dotted lines on charts. These bearings, as all bearings referring to lights, are given in true degrees from 000° to 359°, as observed from a vessel toward the light.

When navigating, mariners should not rely on a line of bearing defined by the boundary between light sectors. These sectors are not designed to define an accurate observed line of bearing. Using a compass bearing to the light is recommended as more accurate. Be guided instead by the correct compass bearing to the light and do not rely on being able to accurately observe the point at which the color changes. This is difficult to determine because the edges of a colored sector cannot be cut off sharply. On either side of the line of demarcation between white, red, or green sectors, there is always a small arc of uncertain color. Moreover, when haze or smoke is present in the intervening atmosphere, a white sector might have a reddish hue.

The arc drawn on charts around a light is not intended to give information as to the distance at which it can be seen. The arc indicates the bearings between which the variation of visibility or obstruction of the light occurs.

Most aids to navigation are fitted with retro reflective material to increase their visibility in darkness. Colored reflective material is used on aids to navigation that, if lighted, will display lights of the same color.

Preferred channel marks exhibit a composite group-flashing light rhythm of two flashes followed by a single flash.

Safe water marks exhibit a white Morse code “A” rhythm (a short flash followed by a long flash).

Isolated danger marks exhibit a white flashing (2) rhythm (two flashes repeated regularly).  
Special marks exhibit yellow lights and exhibit a flashing or fixed rhythm.

Information and regulatory marks exhibit a white light with any light rhythm except quick flashing, flashing (2) and Morse code “A.”

For situations where lights require a distinct cautionary significance, as at sharp turns, sudden channel constrictions, wrecks, or obstructions, a quick flashing light rhythm will be used.

### **Conditions which may affect a Light**

The condition of the atmosphere has a considerable effect upon the distance at which lights can be seen. Sometimes lights are obscured by fog, haze, dust, smoke, or precipitation which may be present at the light, or between the light and the observer, and which is possibly unknown by the observer. Atmospheric refraction may cause a light to be seen farther than under ordinary circumstances.

A light of low intensity will be easily obscured by unfavorable conditions in the atmosphere and little dependence can be placed on it being seen. For this reason, the intensity of a light should always be considered when expecting to sight it in reduced visibility. Haze and distance may reduce the apparent duration of the flash of a light. In some atmospheric conditions, white lights may have a reddish hue. Lights placed at high elevations are more frequently obscured by clouds, mist, and fog than those lights located at or near sea level.

In regions where ice conditions prevail in the winter, the lantern panes of lights may become covered with ice or snow, which will greatly reduce the visibility of the lights and may also cause colored lights to appear white.

The increasing use of brilliant shore lights for advertising, illuminating bridges, and other purposes, may cause marine navigational lights, particularly those in densely inhabited areas, to be outshone and difficult to distinguish from the background lighting. Mariners are requested to report such cases in order that steps may be taken to improve the conditions.

The “loom” (glow) of a powerful light is often seen beyond the limit of visibility of the actual rays of the light. The loom may sometimes appear sufficiently sharp enough to obtain a bearing. At short distances, some flashing lights may show a faint continuous light between flashes.

The distance of an observer from a light cannot be estimated by its apparent intensity. Mariners should always check the characteristics of lights to avoid mistaking powerful lights, visible in the distance, for nearby lights (such as those on lighted buoys) showing similar characteristics of low intensity. If lights are not sighted within a reasonable time after prediction, a dangerous situation may exist, requiring prompt resolution or action to ensure the safety of the vessel.

The characteristic of a light can appear to change based on the observer's distance from it. Consider the case of a light with a rather complex characteristic: Fixed white with an alternating red and white. From a distance the light might appear to only be a flashing white. At a shorter distance it may look like an alternating red and white. Only up close might an observer be able to see the true characteristic. Fixed white with an alternating red and white.

If a vessel has considerable vertical motion due to pitching in heavy seas, a light sighted on the horizon may alternatively appear and disappear. This may lead the unwary to assign a false characteristic and hence, to error in its identification. The true characteristic will be evident after the distance has been sufficiently decreased or by increasing the height of eye of the observer.

Similarly, the effect of wave motion on lighted buoys may produce the appearance of incorrect light phase characteristics when certain flashes occur but are not viewed by the mariner. In addition, buoy motion can reduce the distance at which buoy lights are detected.

**Shapes** are used to provide easy identification on certain unlighted buoys and dayboards on beacons. These shapes are laterally significant only when associated with laterally significant colors. In IALA Region B, cylindrical buoys (referred to as "can buoys") and square dayboards mark the port side of a channel when proceeding in the conventional direction of buoyage. These aids to navigation are associated with solid green or green and red-banded marks where the topmost band is green. Conical buoys (referred to as "nun buoys") and triangular dayboards mark the starboard side of the channel when proceeding from seaward. These aids to navigation are associated with solid red or red and green-banded marks where the topmost band is red.

Unless fitted with topmarks; lighted, sound, pillar, and spar buoys have no shape significance. Their numbers, colors, and light characteristics convey their meanings.

**Dayboards** throughout the U.S. Aids to Navigation System are described using standard designations that describe the appearance of each dayboard. A brief explanation of the designations and of the purpose of each type of dayboard in the system is given below, followed by a verbal description of the appearance of each dayboard type.

Designations:

1. First Letter – Shape or Purpose

C: Crossing (Western Rivers only) diamond-shaped, used to indicate the points at which the channel crosses the river.

J: Junction (square or triangle) used to mark (preferred channel) junctions or bifurcations in the channel, or wrecks or obstructions which may be passed on either side; color of top band has lateral significance for the preferred channel.



K: Range (rectangular) when both the front and rear range dayboards are aligned on the same bearing, the observer is on the azimuth of the range, usually used to mark the center of the channel.

M: Safe Water (octagonal) used to mark the fairway or middle of the channel.

N: No lateral significance (diamond or rectangular) used for special purpose, warning, distance, or location markers.

S: Square used to mark the port side of channels when proceeding from seaward.

T: Triangle used to mark the starboard side of channels when proceeding from seaward.

## 2. Second Letter – Key Color

B – Black      G – Green      R – Red      W – White      Y – Yellow

## 3. Third Letter – Color of Center Stripe (Range Dayboards Only)

## 4. Additional Information after a (-)

-I: Intracoastal Waterway; a yellow reflective horizontal band on a dayboard; indicates the aid to navigation marks the Intracoastal Waterway.

-SY: Intracoastal Waterway; a yellow reflective square on a dayboard; indicates the aid to navigation is a port hand mark for vessels traversing the Intracoastal Waterway. May appear on a triangular daymark where the Intracoastal Waterway coincides with a waterway having opposite conventional direction of buoyage.

-TY: Intracoastal Waterway; a yellow reflective triangle on a dayboard; indicates the aid to navigation is a starboard hand mark for vessels traversing the Intracoastal Waterway. May appear on a square daymark where the Intracoastal Waterway coincides with a waterway having opposite conventional direction of buoyage.

### Descriptions:

CNG: Diamond-shaped dayboard divided into four diamond-shaped colored sectors with the sectors at the side corners white and the sectors at the top and bottom corners green, with green reflective diamonds at the top and bottom corners and white reflective diamonds in the side corners (Western Rivers only).

CNR: Diamond-shaped dayboard divided into four diamond-shaped colored sectors with the sectors at the side corners white and the sectors at the top and bottom corners red, with red reflective diamonds at the top and bottom corners and white reflective diamonds in the side corners (Western Rivers only).

JG: Dayboard bearing horizontal bands of green and red, green band topmost, with corresponding reflective borders.

- JG-I: Square dayboard bearing horizontal bands of green and red, green band topmost, with corresponding reflective borders and a yellow reflective horizontal band.
- JG-SY: Square dayboard bearing horizontal bands of green and red, green band topmost, with corresponding reflective borders and a yellow reflective square.
- JG-TY: Square dayboard bearing horizontal bands of green and red, green band topmost, with corresponding reflective borders and a yellow reflective triangle.
- JR: Dayboard bearing horizontal bands of red and green, red band topmost, with corresponding reflective borders.
- JR-I: Triangular dayboard bearing horizontal bands of red and green, red band topmost, with corresponding reflective borders and a yellow reflective horizontal band.
- JR-SY: Triangular dayboard bearing horizontal bands of red and green, red band topmost, with corresponding reflective borders and a yellow reflective square.
- JR-TY: Triangular dayboard bearing horizontal bands of red and green, red band topmost, with corresponding reflective borders and a yellow reflective triangle.
- KBG: Rectangular black dayboard bearing a central green stripe.
- KBG-I: Rectangular black dayboard bearing a central green stripe and a yellow reflective horizontal band.
- KBR: Rectangular black dayboard bearing a central red stripe.
- KBR-I: Rectangular black dayboard bearing a central red stripe and a yellow reflective horizontal band.
- KBW: Rectangular black dayboard bearing a central white stripe.
- KBW-I: Rectangular black dayboard bearing a central white stripe and a yellow reflective horizontal band.
- KGB: Rectangular green dayboard bearing a central black stripe.
- KGB-I: Rectangular green dayboard bearing a central black stripe and a yellow reflective horizontal band.
- KGR: Rectangular green dayboard bearing a central red stripe.
- KGR-I: Rectangular green dayboard bearing a central red stripe and a yellow reflective horizontal band.
- KGW: Rectangular green dayboard bearing a central white stripe.
- KGW-I: Rectangular green dayboard bearing a central white stripe and a yellow reflective horizontal band.

- KRB: Rectangular red dayboard bearing a central black stripe.
- KRB-I: Rectangular red dayboard bearing a central black stripe and a yellow reflective horizontal band.
- KRG: Rectangular red dayboard bearing a central green stripe.
- KRG-I: Rectangular red dayboard bearing a central green stripe and a yellow reflective horizontal band.
- KRW: Rectangular red dayboard bearing a central white stripe.
- KRW-I: Rectangular red dayboard bearing a central white stripe and a yellow reflective horizontal band.
- KWB: Rectangular white dayboard bearing a central black stripe.
- KWB-I: Rectangular white dayboard bearing a central black stripe and a yellow reflective horizontal band.
- KWG: Rectangular white dayboard bearing a central green stripe.
- KWG-I: Rectangular white dayboard bearing a central green stripe and a yellow reflective horizontal band.
- KWR: Rectangular white dayboard bearing a central red stripe.
- KWR-I: Rectangular white dayboard bearing a central red stripe and a yellow reflective horizontal band.
- MR: Octagonal dayboard bearing stripes of white and red, with a white reflective border.
- MR-I: Octagonal dayboard bearing stripes of white and red, with a white reflective border and a yellow reflective horizontal band.
- NB: Diamond-shaped dayboard divided into four diamond-shaped colored sectors with the sectors at the side corners white and the sectors at the top and bottom corners black, with a white reflective border.
- ND: Rectangular white mileage marker with black numerals indicating the mile number (Western Rivers only).
- NG: Diamond-shaped dayboard divided into four diamond-shaped colored sectors with the sectors at the side corners white and the sectors at the top and bottom corners green, with a white reflective border.
- NL: Rectangular white location marker with an orange reflective border and black letters indicating the location.

- NR: Diamond-shaped dayboard divided into four diamond-shaped colored sectors with the sectors at the side corners white and the sectors at the top and bottom corners red, with a white reflective border.
- NW: Diamond-shaped white dayboard with an orange reflective border and black letters describing the information or regulatory nature of the mark.
- NY: Diamond-shaped yellow dayboard with yellow reflective border.
- SG: Square green dayboard with a green reflective border.
- SG-I: Square green dayboard with a green reflective border and a yellow reflective horizontal band.
- SG-SY: Square green dayboard with a green reflective border and a yellow reflective square.
- SG-TY: Square green dayboard with a green reflective border and a yellow reflective triangle.
- SR: Square red dayboard with a red reflective border. (IALA Region “A”)
- TG: Triangular green dayboard with a green reflective border. (IALA Region “A”)
- TR: Triangular red dayboard with a red reflective border.
- TR-I: Triangular red dayboard with a red reflective border and a yellow reflective horizontal band.
- TR-SY: Triangular red dayboard with a red reflective border and a yellow reflective square.
- TR-TY: Triangular red dayboard with a red reflective border and a yellow reflective triangle. These abbreviated descriptions are used in column (7) and may also be found on the illustrations of the U.S. Aids to Navigation System.

**Numbers** are used to provide easy identification of aids to navigation. In IALA Region B, all solid red and solid green aids are numbered, except for buoys located on the Western Rivers. Red aids to navigation have even numbers and green aids to navigation have odd numbers. The numbers for each increase from seaward when proceeding in the conventional direction of buoyage. Numbers are kept in approximate sequence on both sides of the channel by omitting numbers where necessary.

Letters may be used to augment numbers when lateral aids to navigation are added to channels with previously completed numerical sequences. Letters will increase in alphabetical order, proceeding in the conventional direction of buoyage, and are added to numbers as suffixes. Letters are not used for buoys on the Western Rivers. No other aids to navigation are numbered. Preferred channel, safe water, isolated danger, special marks, and information and regulatory aids to navigation may be lettered, but not numbered.

**Sound signal** is a generic term used to describe aids to navigation that produce an audible signal designed to assist the mariner in periods of reduced visibility. These aids to navigation can be activated by several means e.g., manually, remotely, or automatically (as in the case of a fog detector). The Coast Guard is replacing many fog detectors with mariner radio activated sound signals (MRASS). To activate, mariners key their VHF-FM radio a designated number of times on a designated VHF- FM channel. The sound signal is activated for a period of 15, 30, 45, or 60 minutes after which the activated assistance automatically turns off. In cases where a fog detector is in use, there may be a delay in the automatic activation of the signal. Additionally, fog detectors may not be capable of detecting patchy fog conditions.

Sound signals are distinguished by their tone and phase characteristics. Devices producing sound, e.g., diaphones, diaphragm horns, sirens, whistles, bells, and gongs emit a distinct sound.

Phase characteristics are defined by the signal's sound pattern, i.e., the number of blasts and silent periods per minute and their durations. Signals sounded from fixed structures generally produce a specific number of blasts and silent periods each minute when operating. Sound signals installed on buoys are generally activated by the motion of the sea and therefore do not emit a regular signal characteristic. It is common, in fact, for a buoy to produce no sound signal when seas are calm.

The characteristic of a sound signal is listed in column (8) of the Light List. If the sound signal is remotely activated, column (8) will contain the VHF-FM channel and number of times the VHF- FM radio should be keyed. All waterway users equipped with a VHF-FM radio may activate the sound signal, but they are not required to do so. Unless the light list indicates that the sound signal "operates continuously," or the signal is a bell, gong, or whistle on a buoy, mariners can assume that the sound signal only operates during times of fog, reduced visibility, or adverse weather.

***Caution:** Mariners should not rely on sound signals to determine their position. Distance cannot be accurately determined by sound intensity. Occasionally, sound signals may not be heard in areas close to their location. Signals may not sound in cases where fog exists close to, but not at, the location of the sound signal.*

**Radar Beacons (RACONS)** are radar transponders that when triggered by an X-band radar produce a coded response from its location, which is portrayed radially as a series of dots and dashes on the triggering radar. Although RACONS may be used on both laterally significant and non-laterally significant aids to navigation, their signal should just be used for identification purposes only.

RACONS have a typical output of 600 milliwatts and are considered a short-range aid to navigation. Reception varies from a nominal range of 6 to 8 nautical miles (when mounted on a buoy) to as much as 17 nautical miles for a RACON mounted on a fixed structure. It must be understood that these nominal ranges are dependent upon many factors.

The beginning of the RACON presentation occurs about 50 yards beyond the RACON's actual position and will persist for a number of revolutions of the radar antenna (depending on its rotation rate).

Radar operators may notice some broadening or spoking of the RACON presentation when their vessel approaches closely to the source of the RACON. This effect can be minimized by adjusting the IF gain or sweep gain control of the radar. If desired, the RACON presentation can be virtually eliminated by operation of the FTC (fast time constant) controls of the radar.

**Radar Reflectors** are special fixtures, incorporated into both lighted and unlighted aids to navigation, to enhance the reflection of radar energy. These fixtures make equipped ATON more detectable. However, they do not positively identify a radar target as an ATON.

## **GPS and Navigation – Related Services Operated by the US Coast Guard**

**Global Positioning System (GPS)** is a satellite-based navigation system, operated and controlled by the Department of Defense (DOD) under U.S. Air Force management, which provides precise, worldwide, three-dimensional navigation capabilities. The system was originally designed for military application; however, it is now available to all and used almost ubiquitously. The United States is committed to maintaining the availability of at least 24 operational GPS satellites, in six precise orbital planes, each of which complete a circular 10,900 nautical mile orbit of the earth once every 12 hours. At least three satellites are required for a two-dimensional solution. However, GPS does not provide integrity information and mariners should exercise extreme caution when using GPS in restricted waterways. Ideally, a minimum of four satellites will be visible from any position on the earth and will provide positions with a global horizontal accuracy within 3 meters, 95% percent of the time. Whenever possible, advance notice of when GPS satellites should not be used will be provided by the DOD and made available by the US Coast Guard through GPS status messages.

**Navigation Information Service (NIS):** The U.S. Coast Guard Navigation Center (NAVCEN) is the official government source of information for civil users of the Global Positioning System (GPS). The Navigation Information Service (NIS) is available 24 hours a day, seven days a week, for all Radio Navigation and maritime related needs via phone, fax or e-mail. The NIS provides users the ability to access real time or archived GPS, and LNM information at [WWW.NAVCEN.USCG.gov](http://WWW.NAVCEN.USCG.gov), as well as subscribe to an automated list service which enables users to receive GPS status messages and Notice to NAVSTAR User (NANU) messages via direct Internet e-mail. The NAVCEN also disseminates GPS safety advisory broadcast messages through USCG broadcast stations utilizing VHF-FM voice, HF-SSB voice, and NAVTEX broadcasts. The broadcasts provide the GPS user in the marine environment with the status of the navigation systems, as well as any planned/unplanned system outages that could affect GPS navigational accuracy.

To comment on any of these services or ask questions about the service offered, contact the NAVCEN at:

Commanding Officer U.S. Coast Guard NAVCEN (NIS) MS 7310  
7323 Telegraph Road Alexandria, VA 20598-7310  
Phone: (703) 313-5900  
FAX: (703) 313-5920  
<http://www.navcen.uscg.gov>

**USCG Navigation Center Website:** The USCG Navigation Center (NAVCEN) operates a website that provides the maritime public with marine safety information (MSI) dissemination and reporting services. The NAVCEN website is [www.navcen.uscg.gov](http://www.navcen.uscg.gov). NAVCEN MSI dissemination services include GPS status messages, Notice Advisory to NAVSTAR Users (NANU) messages, Local Notice to Mariners, Broadcast Local Notice to Mariners, and the USCG Light List. Methods of MSI dissemination include VHF, NAVTEX, MF/HF SSB broadcasts, RSS feeds, and email subscription services. NAVCEN reporting services include web-based form discrepancy reporting for aids to navigation (ATON), global positioning system (GPS), automatic identification system (AIS), and Long Range Identification System (LRIT).

## ABBREVIATIONS

Various abbreviations are utilized in Broadcast Notices to Mariners, Local Notices to Mariners, on charts, and in the Light Lists. Refer to the following list.

<b><u>Light Characteristics</u></b>		<b><u>Sound Signal Characteristics</u></b>	
Alternating Characteristic	AL CHAR	Blast Every Seconds	BL EV S
Composite Group-Flashing	FL (2+1)	Silent	SI
Composite Group-Occulting	OC (2+1)	<b><u>Colors*</u></b>	
Continuous Quick-Flashing	Q	Black	B
Eclipse Fixed and Flashing	EC FFL	Blue	BU
Fixed	F	Green	G
Group-Flashing	FL (3)	Orange	OR
Group-Occulting	OC (2)	Red	R
Interrupted Quick-Flashing Isophase	IQ ISO	White	W
Morse Code	MO (A)	Yellow	Y
Occulting	OC	*NOTE: Color refers to characteristics of aids to navigation only.	
Single-Flashing	FL	<b><u>Aids to Navigation</u></b>	
<b><u>Organizations</u></b>		Aeronautical Radiobeacon	AERO RBN
Commander, Coast Guard District	CCGD (#)	Automatic Identification System	AIS
Coast Guard	CG	Daybeacon	DBN
U.S. Army Corps of Engineers	USACE	Destroyed	DESTR
National Geospatial-Intelligence Agency	NGA	Discontinued	DISCONTD
		Established	ESTAB
		Exposed Location Buoy	ELB
		Extinguished	EXT
		Fog Signal Station	FOG SIG

National Ocean Service	NOS	Light List Number	LLNR		
National Weather Service	NWS	Light	LT		
<b><u>Vessels</u></b>		Lighted Bell Buoy	LBB		
Aircraft	A/C	Lighted Buoy	LB		
Fishing Vessel	F/V	Lighted Gong Buoy	LGB		
Liquefied Natural Gas Carrier	LNG	Lighted Horn Buoy	LHB		
Motor Vessel (includes Steam Ship, Container Ship, Cargo Vessel, Tanker etc)	M/V	Lighted Whistle Buoy	LWB		
Pleasure Craft	P/C	Mariner Radio Activated Sound Signal	MRASS		
Research Vessel	R/V	Ocean Data Acquisition System	ODAS		
Sailing Vessel	S/V	Privately Maintained	PRIV MAINTD		
<b><u>Various</u></b>		Radar Reflector	RA REF		
Anchorage	ANCH	Radar Responder Beacon	RACON		
Anchorage Prohibited	ANCH PROHIB	Remote Radio Activated Sound Signal	RRASS		
Approximate	APPROX	Single Point Mooring Buoy	SPM		
Atlantic	ATL	Sound Signal	SS		
Authorized	AUTH	Temporarily Replaced by Lighted Buoy	TRLB		
Average	AVG	Temporarily Replaced by Unlighted Buoy	TRUB		
Bearing	BRG	Topmark	TMK		
Breakwater	BKW	Virtual AIS Aid to Navigation Whistle	V-AIS WHIS		
Broadcast Notice to Mariners	BNM				
Canadian Aid	(C)	<b><u>Days of the Week</u></b>	<b><u>Compass Directions</u></b>		
Captain of the Port	COTP	Monday	MON	North	N
Channel	CHAN	Tuesday	TUE	South	S
Code of Federal Regulations	CFR	Wednesday	WED	East	E
Continue	CONT	Thursday	THU	West	W
Degrees (temp, geo, pos)	DEG	Friday	FRI	Northeast	NE
Diameter	DIA	Saturday	SAT	Northwest	NW
Edition	ED	Sunday	SUN	Southeast	SE
Effect/Effective	EFF			Southwest	SW
Entrance	ENTR				



Explosive Anchorage	EXPLOS ANCH	<b><u>Months</u></b>	
Fathom(s)	FM(S)	January	JAN
Foot/Feet	FT	February	FEB
Harbor	HBR	March	MAR
Height	HT	April	APR
Hertz	HZ	May	MAY
Horizontal Clearance	HOR CL	June	JUN
Hour	HR	July	JUL
International Regulations for Preventing Collisions at Sea	COLREGS	August	AUG
Kilohertz	KHZ	September	SEP
Kilometer	KM	October	OCT
Knot(s)	KT(S)	November	NOV
Minute (time, geo, pos)	MIN	December	DEC
Megahertz	MHZ		
Maritime Mobile Service Identity	MMSI	<b><u>Countries and States</u></b>	
Moderate	MOD	Alabama	AL
Mountain, Mount	MT	Alaska	AK
Nautical Mile(s)	NM	American Samoa	AS
Notice to Mariners	NTM	Arizona	AZ
Obstruction	OBSTR	Arkansas	AR
Occasion/ Occasionally	OCCASION	California	CA
Operating Area	OPAREA	Canada	CN
Pacific	PAC	Colorado	CO
Point(s)	PT(S)	Connecticut	CT
Position	POS	Delaware	DE
Position Approximate	PA	District of Columbia	DC
Pressure	PRES	Florida	FL
Private, Privately	PRIV	Georgia	GA
Prohibited	PROHIB	Guam	GU
Publication	PUB	Hawaii	HI
Range	RNG	Idaho	ID
Reported	REP	Illinois	IL
Restricted	RESTR	Indiana	IN
		Iowa	IA
		Kansas	KS
		Kentucky	KY
		Louisiana	LA
		Maine	ME
		Maryland	MD
		Marshall Islands	MH
		Massachusetts	MA

River	RIV	Missouri	MO
Rock	RK	Mississippi	MS
Saint	ST	Mexico	MX
Second (time, geo, pos)	SEC	Michigan	MI
Signal Station	SIG STA	Minnesota	MN
Station	STA	Montana	MT
Statute Mile(s)	SM	Nebraska	NE
Storm Signal Station	S SIG STA	Nevada	NV
Temporary	TEMP	New Hampshire	NH
Thunderstorm	TSTORM	New Jersey	NJ
Through	THRU	New Mexico	NM
True	T	New York	NY
Uncovers, Dries	UNCOV	North Carolina	NC
Universal Coordinate Time	UTC	North Dakota	ND
Urgent Marine Information Broadcast	UMIB	Northern Marianas	MP
Velocity	VEL	Ohio	OH
Vertical Clearance	VERT CL	Oklahoma	OK
Vessel Traffic Service	VTS	Oregon	OR
Visibility	VIS	Pennsylvania	PA
Yard(s)	YD	Puerto Rico	PR
Warning	WARN	Rhode Island	RI
Weather	WX	South Carolina	SC
Wreck	WK	South Dakota	SD
		Tennessee	TN
		Texas	TX
		United States	US
		Utah	UT
		Vermont	VT
		Virgin Islands	VI
		Washington	WA
		West Virginia	WV
		Wisconsin	WI
		Wyoming	WY

## GLOSSARY OF AIDS TO NAVIGATION TERMS

**Adrift:** Afloat and unattached in any way to the shore or seabed.

**Aid to Navigation:** Any device external to a vessel or aircraft specifically intended to assist navigators in determining their position or safe course, or to warn them of dangers or obstructions to navigation.

**Automatic Identification System Aid to Navigation (AIS-ATON):** An aid to navigation signal that is broadcast through AIS. They can be physical, synthetic, or virtual.

**Alternating Lights:** A rhythmic light showing light of alternating colors.

**Arc of Visibility:** The portion of the horizon over which a lighted aid to navigation is visible from seaward.

**Articulated Beacon:** A beacon-like buoyant structure, tethered directly to the seabed and having no watch circle. Called articulated light or articulated daybeacon, as appropriate.

**Assigned Position:** The latitude and longitude position for an aid to navigation.

**Beacon:** A lighted or unlighted fixed aid to navigation attached directly to the earth's surface. (Lights and Daybeacons both constitute beacons.)

**Bearing:** The horizontal direction of a line of sight between two objects on the surface of the earth.

**Bell:** A sound signal producing bell tones by means of a hammer actuated by electricity on fixed aids and by sea motion on buoys.

**Bifurcation:** The point where a channel divides when proceeding from seaward. The place where two tributaries meet.

**Broadcast Notice to Mariners:** A radio broadcast designed to provide important marine information.

**Buoy:** A floating object of defined shape and color, which is anchored at a given position and serves as an aid to navigation.

**Characteristic:** The audible, visual, or electronic signal displayed by an aid to navigation to assist in the identification of an aid to navigation. Characteristic refers to lights, sound signals, RACONS, and Daybeacons.

**Commissioned:** The action of placing a previously discontinued aid to navigation back in service.

**Composite Group Flashing Light:** A group flashing light in which the flashes are combined in successive groups of different numbers of flashes.

**Composite Group-Occulting Light:** A light like a group occulting light except that the successive groups in a period have different numbers of eclipses.

**Conventional Direction of Buoyage:** The general direction taken by the mariner when approaching a harbor, river, estuary, or other waterway from seaward, or proceeding upstream or in a direction of the main stream of flood tide, or in the direction indicated in appropriate nautical documents (normally, following a clockwise direction around land masses).

**Daybeacon:** An unlighted fixed structure which is equipped with a dayboard for daytime identification.

**Dayboard:** The daytime identifier of an aid to navigation presenting one of several standard shapes (square, triangle, rectangle) and colors (red, green, white, orange, yellow, or black).

**Daymark:** The daytime identifier of an aid to navigation. (See column 7 of the Light List)

**Diaphone:** A sound signal which produces sound by means of a slotted piston moved back and forth by compressed air. A “two- tone” diaphone produces two sequential tones with a second tone of lower pitch.

**Directional Light:** A light illuminating a sector or very narrow angle and intended to mark a direction to be followed.

**Discontinued:** To remove from operation (permanently or temporarily) a previously authorized aid to navigation.

**Discrepancy:** Failure of an aid to navigation to maintain its position or function as prescribed in the Light List.

**Discrepancy Buoy:** An easily transportable buoy used to temporarily replace an aid to navigation not watching properly.

**Dolphin:** A minor aid to navigation structure consisting of a number of piles driven into the seabed or riverbed in a circular pattern and drawn together with rope.

**Eclipse:** An interval of darkness between appearances of a light.

**Emergency Light:** A light of reduced intensity displayed by certain aids to navigation when the main light is extinguished.

**Establish:** To place an authorized aid to navigation in operation for the first time.

**Extinguished:** A lighted aid to navigation which fails to show a light characteristic.

**Fixed Light:** A light showing continuously and steady, as opposed to a rhythmic light. (Do not confuse with

“fixed” as used to differentiate from “floating”.)

**Flash:** A relatively brief appearance of a light, in comparison with the longest interval of darkness in the same characteristic.

**Flash tube:** An electronically controlled high-intensity discharge lamp with a very brief flash duration.

**Flashing Light:** A light in which the total duration of the light in each period is clearly shorter than the total duration of the darkness and in which the flashes of light are all of equal duration. (Commonly used for a single-flashing light which exhibits only single flashes which are repeated at regular intervals.)

**Floating Aid to Navigation:** A buoy, secured in its assigned position by a mooring.

**Fog Detector:** An electronic device used to automatically determine conditions of visibility which warrant the activation of a sound signal or additional light signals.

**Fog Signal:** See sound signal.

**Geographic Range:** The greatest distance the curvature of the earth permits an object of a given height to be seen from a particular height of eye without regard to luminous intensity or visibility conditions.

**Global Positioning System (GPS):** A satellite-based radio-navigation system providing continuous worldwide coverage. It provides navigation, position, and timing information to air, marine, and land users.

**Gong:** A wave actuated sound signal on buoys which uses a group of saucer- shaped bells to produce different tones.

**Group Flashing Light:** A flashing light in which a group of flashes, specified in number, is regularly repeated.

**Group Occulting Light:** An occulting light in which a group of eclipses, specified in number, regularly repeated.

**Horn:** A sound signal which uses electricity or compressed air to vibrate a disc diaphragm.

**Inoperative:** Sound signal or electronic aid to navigation out of service due to a malfunction.

**Intermediate Peripheral Structure:** are structures on the edge of a wind farm.

**Interrupted Quick Flash:** A quick flashing light in which the rapid alternations are interrupted at regular intervals by eclipses of long duration.

**Isolated Danger Mark:** A mark erected on, or moored above or very near, an isolated danger which has navigable water all around it.

**Isophase Light:** A rhythmic light in which all durations of light and darkness are equal.

**Junction:** The point where a channel divides when proceeding seaward. The place where a distributary departs from the mainstream.

**Lateral System:** A system of aids to navigation in which characteristics of buoys and beacons indicate the sides of a channel or route relative to a Conventional Direction of Buoyage (usually upstream).

**Light:** The signal emitted by a lighted aid to navigation. The illuminating apparatus used to emit the light signal. A lighted aid to navigation on a fixed structure.

**Light Sector:** The arc over which a light is visible, described in degrees true, as observed from seaward towards the light. May be used to define distinctive color difference of two adjoining sectors, or an obscured sector.

**Lighted Ice Buoy (LIB):** A lighted buoy without a sound signal and designed to withstand the forces of shifting and flowing ice. Used to replace a conventional buoy when that aid to navigation is endangered by ice.

**Lighthouse:** A lighted beacon of major importance.

**Local Notice to Mariners:** A written document issued by each U.S. Coast Guard district to

disseminate important information affecting aids to navigation, dredging, marine construction, special marine activities, and bridge construction on waterways within that district.

**Luminous Range:** The greatest distance a light can be expected to be seen given its nominal range and the prevailing meteorological visibility.

**Mariner Radio Activated Sound Signal (MRASS):** A system that allows the mariner to activate an ATON sound signal or light signal if the aid is so equipped. Once activated, the signal will continue to sound or remain lit for a period of time noted in the Light List before shutting down and going into standby mode again. The signal is activated by keying the microphone 5 consecutive times on VHF/FM channel 81A/157.075Mhz.

**Mark:** A visual aid to navigation. Often called navigational mark, including floating marks (buoys) and fixed marks (beacons).

**MATON:** A Mobile Aid to Navigation in which a mark is attached to floating objects which may be a collision hazard. A MATON has a defined light characteristic of three flickering flashes, followed by two regular flashes.

**Meteorological Visibility:** The greatest distance at which a black object of suitable dimension could be seen and recognized against the horizon sky by day, or in case of night observations, could be seen and recognized if the general illumination were raised to the daylight level.

**Mileage Number:** A number assigned to aids to navigation which gives the distance in sailing miles along the river from a reference point to the aid to navigation. The number is used principally in the Mississippi River

**Nominal Range:** The maximum distance a light can be seen in clear weather (meteorological visibility of 10 nautical miles). Listed for all lighted aids to navigation except range lights, directional lights, and private aids to navigation.

**Occulting Light:** A light in which the total duration of light in each period is clearly longer than the total duration of the darkness and in which the intervals of darkness (occultations) are all of equal duration. Commonly used for single occulting light which exhibits only single occultation which are repeated at regular intervals.

**Ocean Data Acquisition System (ODAS):** Certain large buoys in deep water for the collection of oceanographic and meteorological information. All ODAS buoys are yellow in color and display a yellow light.

**Offshore Tower:** Monitored light stations built on exposed marine sites to replace lightships.

**Off Station:** A floating aid to navigation that is not on its assigned position.

**Passing Light:** A low intensity light which may be mounted on the structure of another light to enable the mariner to keep the latter light in sight when passing out of its beam during transit.

**Period:** The interval of time between the commencements of two identical successive cycles of the characteristic of the light or sound signal.

**Physical AIS-ATON:** AIS-ATON message broadcast from a transponder affixed to the corresponding buoy and beacon.

**Pile:** A long, heavy steel, concrete or timber driven into the seabed or riverbed to serve as a support for an ATON.

**Port Hand Mark:** A buoy or beacon which is left to the port hand when proceeding in the “Conventional Direction of Buoyage”.

**Preferred Channel Mark:** A lateral mark indicating a channel junction or bifurcation, or a wreck or other obstruction which after consulting a chart, may be passed on either side.

**Primary Aid to Navigation:** An aid to navigation established for the purpose of making landfalls and coastwise passages from headland to headland.

**Quick Light:** A light exhibiting very rapid regular alternations of light and darkness, normally 60 flashes per minute.

**RACON:** A radar beacon which produces a coded response or radar paint, when triggered by a radar signal.

**Radar:** An electronic system designed to transmit radio signals and receive reflected images of those signals from a “target” in order to determine the bearing and distance to the “target”.

**Radar Reflector:** A special fixture fitted to or incorporated into the design of certain aids to navigation to enhance their ability to reflect radar energy. In general, these fixtures will materially improve the aid to navigation for use by vessels with radar.

**Range:** A line formed by the extension of a line connecting two charted points.

**Range lights:** Two lights associated to form a range which often, but not necessarily, indicates the channel centerline. The front range light is the lower of the two, and nearer to the mariner using the range. The rear light is higher and further from the mariner.

**Rebuilt:** A fixed aid to navigation, previously destroyed, which has been restored as an aid to navigation.

**Regulatory Marks:** A white and orange aid to navigation with no lateral significance. Used to indicate a special meaning to the mariner, such as danger, restricted operations, or exclusion area.

**Relighted:** An extinguished aid to navigation returned to its advertised light characteristics.

**Replaced:** An aid to navigation previously off station, adrift, or missing, restored by another aid to navigation of the same type and characteristics.

**Replaced (temporarily):** An aid to navigation previously off station, adrift, or missing restored by another aid to navigation of a different type and/or characteristic.

**Reset:** A floating aid to navigation previously off station, adrift or missing, returned to its assigned position (station).

**Rhythmic Light:** A light showing intermittently with a regular periodicity.

**Sector:** See light sector.

**Setting a Buoy:** The act of placing a buoy on assigned position in the water.

**Significant Peripheral Structure (SPS):** normally a corner structure and other significant points on the boundary of a wind farm.

**Siren:** A sound signal which uses electricity or compressed air to actuate either a disc or a cup shaped rotor.

**Skeleton Tower:** A tower, usually of steel, constructed of heavy corner members and various horizontal and diagonal bracing members.

**Sound Signal:** A device which transmits sound, intended to provide information to mariners during periods of restricted visibility and foul weather.

**Starboard Hand Mark:** A buoy or beacon which is right to the starboard hand when proceeding in the Conventional Direction of Buoyage.

**Synthetic AIS-ATON:** AIS ATON message broadcast (typically from shore) to an assigned position with a corresponding buoy or beacon.

**Top mark:** One or more relatively small objects of characteristic shape and color placed on aid to identify its purpose.

**Traffic Separation Scheme:** Shipping corridors marked by buoys which separate incoming from outgoing vessels. Improperly called SEA LANES.

**Virtual AIS-ATON:** AIS ATON message broadcast (typically from shore) to an assigned position with no corresponding buoy or beacon.

**Watching Properly:** An aid to navigation on its assigned position exhibiting the advertised characteristics in all respects.

**Whistle:** A wave actuated sound signal on buoys which produces sound by emitting compressed air through a circumferential slot into a cylindrical bell chamber.

**Wind Farm:** A grouping of structures in a designated area used for wind power generation.

**Winter Marker:** An unlighted buoy without a sound signal, used to replace a conventional buoy when an aid to navigation is endangered by ice.

**Winter Light:** A light which is maintained during those winter months when the regular light is extinguished. It is of lower candlepower than the regular light, but usually the same characteristic.

**Withdrawn:** The discontinuance of an aid to navigation or equipment on an aid to navigation during severe ice conditions or for the winter season.

# CHARACTERISTICS OF LIGHTS

Illustration	Type Description	Abbreviation
	<p>1. <b>FIXED.</b> A light showing continuously and steadily.</p>	F
	<p>2. <b>OCCULTING.</b> A light in which the total duration of light in a period is longer than the total duration of darkness and the intervals of darkness (eclipses) are usually of equal duration</p>	Oc
	<p>2.1 <b>Single-occluding.</b> An occulting light in which an eclipse is regularly repeated.</p>	Oc (2)
	<p>2.2 <b>Group-occluding.</b> An occulting light in which a group of eclipses, specified in numbers, is regularly repeated.</p>	Oc (2+1)
	<p>2.3 <b>Composite group-occluding.</b> A light, similar to a group-occluding light, except that successive groups in a period have different numbers of eclipses.</p>	Iso
	<p>3. <b>ISOPHASE.</b> A light in which all durations of light and darkness are equal.</p>	Iso
	<p>4. <b>FLASHING.</b> A light in which the total duration of light in a period is shorter than the total duration of darkness and the appearances of light (flashes) are usually of equal duration.</p>	Fl
	<p>4.1 <b>Single-flashing.</b> A flashing light in which a flash is regularly repeated (frequency not exceeding 30 flashes per minute).</p>	Fl (2)
	<p>4.2 <b>Group-flashing.</b> A flashing light in which a group of flashes, specified in number, is regularly repeated.</p>	Fl (2+1)
	<p>4.3 <b>Composite group-flashing.</b> A light similar to a group flashing light except that successive groups in the period have different numbers of flashes.</p>	Q
	<p>5. <b>QUICK.</b> A light in which flashes are produced at a rate of 60 flashes per minute.</p>	IQ
	<p>5.1 <b>Continuous quick.</b> A quick light in which a flash is regularly repeated.</p>	Mo (A)
	<p>5.2 <b>Interrupted quick.</b> A quick light in which the sequence of flashes is interrupted by regularly repeated eclipses of constant and long duration.</p>	F Fl
	<p>6. <b>MORSE CODE.</b> A light in which appearances of light of two clearly different durations (dots and dashes) are grouped to represent a character or characters in the Morse code.</p>	Al RW
	<p>7. <b>FIXED AND FLASHING.</b> A light in which a fixed light is combined with a flashing light of higher luminous intensity.</p>	Al RW
	<p>8. <b>ALTERNATING.</b> A light showing different colors alternately</p>	Al RW



**LIST OF NAIS AND LOMA BROADCAST BASE STATIONS AND THEIR LOCATIONS**

*(Table sorted by MMSI)*

<b>AIS BASE STATION TYPE</b>	<b>MMSI</b>	<b>LOCATION</b>	<b>LATITUDE</b>	<b>LONGITUDE</b>
LOMA	TBD	Red Bud	38-11-20.544N	89-53-25.260W
LOMA	100553	Lexington	39-9-29.844N	93-54-44.244W
LOMA	101135	Knoxville - TVA	35-57-58.032N	83-55-14.088W
LOMA	830361	Port of Decatur	34-37-12.342N	86-59-15.709W
LOMA	3660554	Mississippi L&D 22	39-38-9.624N	91-14-58.618W
LOMA	3660556	MVD Test Site	32-20-55.194N	90-52-53.220W
NAIS	3660608	Bethany	41-24-17.399N	072-59-58.301W
NAIS	3660609	Shinnecock	40-50-52.800N	072-30-10.501W
NAIS	3660610	Cohasset	42-14-35.999N	070-50-11.000W
NAIS	3660611	Greenbury Point	38-58-44.501N	076-27-15.199W
NAIS	3660612	Alexandria	38-45-14.090N	077-07-35.692W
NAIS	3660613	Ongunquit	43-14-51.690N	070-38-21.640W
NAIS	3660614	Swans Island	44-09-41.918N	068-25-21.788W
NAIS	3660615	Westbrook	43-44-38.000N	070-20-03.001W
NAIS	3660616	Putnam Valley	41-25-54.901N	073-52-49.598W
NAIS	3660617	Troy	42-47-08.999N	073-37-41.002W
NAIS	3660618	Miacomet	41-15-05.050N	070-07-43.900W
NAIS	3660619	Orleans	41-47-29.699N	069-59-35.999W
NAIS	3660620	Warwick	41-39-53.302N	071-31-18.300W
NAIS	3660622	Buxton	35-14-43.879N	075-32-02.609W
NAIS	3660623	Mamie	36-08-08.830N	075-49-27.131W
NAIS	3660624	Stacy	34-52-24.920N	076-24-53.890W
NAIS	3660625	Sneads Ferry	34-31-05.081N	077-26-53.059W
NAIS	3660626	Southport	33-56-56.000N	078-00-42.001W
NAIS	3660627	Carnigan	31-27-52.898N	081-29-05.690W
NAIS	3660628	Garden City	33-36-03.218N	079-03-04.342W
NAIS	3660629	McClellanville	33-05-21.502N	079-29-25.001W
NAIS	3660630	Port Royal	32-25-11.410N	080-28-30.360W
NAIS	3660631	Jacksonville	30-16-35.000N	081-33-51.998W
NAIS	3660632	Saint Cloud	28-16-45.300N	081-01-23.999W
NAIS	3660633	Princeton	25-32-23.798N	080-28-06.499W
NAIS	3660634	Truman Annex	24-33-01.102N	081-48-20.902W
NAIS	3660635	Lake Worth	26-35-21.199N	080-12-43.279W
NAIS	3660636	Monte Del Estado	18-09-07.999N	066-59-26.999W
NAIS	3660637	Cerro Maravilla	18-09-10.810N	066-33-14.830W
LOMA	3660638	Dardanella L&D (#10)	35-15-0.360N	93-10-4.908W
LOMA	3660641	Ozark L&D (#11)	35-28-18.582N	93-48-44.338W
LOMA	3660643	Murray L&D (7)	34-47-26.292N	92-21-30.240W
LOMA	3660650	Marmet L&D	38-15-17.646N	81-33-57.222W

<b>AIS BASE STATION TYPE</b>	<b>MMSI</b>	<b>LOCATION</b>	<b>LATITUDE</b>	<b>LONGITUDE</b>
LOMA	3660657	Fort Loudoun L&D	35-47-22.560N	84-14-30.120W
LOMA	3660658	Wheeler Gen Joe L&D	34-48-50.724N	87-22-59.412W
LOMA	3660661	Thatcher L&D	33-18-23.568N	92-29-0.060W
LOMA	3660667	Thomas J. Obrien L&D	41-39-5.724N	87-34-3.000W
LOMA	3660669	Red River L&D 3	31-31-18.036N	92-43-39.000W
LOMA	3660670	Dashiels L&D	40-32-55.752N	80-12-23.868W
LOMA	3660673	Mississippi L&D 10	42-47-9.708N	91-5-45.359W
LOMA	3660674	Mississippi L&D 2	44-45-35.868N	92-52-9.358W
LOMA	3660675	Mississippi L&D 4	44-19-33.600N	91-55-8.278W
LOMA	3660676	Mississippi L&D 5	44-9-36.792N	91-48-46.019W
LOMA	3660677	Mississippi L&D 6	44-0-1.326N	91-26-15.180W
LOMA	3660678	Mississippi L&D 7	43-51-57.726N	91-18-36.299W
LOMA	3660679	Mississippi L&D 8	43-34-15.120N	91-13-46.319W
LOMA	3660682	Dresden L&D	41-23-51.720N	88-16-56.172W
LOMA	3660683	Emsworth L&D	40-30-18.000N	80-5-18.708W
LOMA	3660684	Melvin Price L&D	38-52-16.061N	90-9-5.940W
LOMA	3660687	La Grange L&D	39-56-28.284N	90-32-5.208W
LOMA	3660688	Mississippi L&D 11	42-32-26.808N	90-38-33.180W
LOMA	3660689	Mississippi L&D 12	42-15-38.874N	90-25-22.559W
LOMA	3660690	Mississippi L&D 13	41-53-51.912N	90-9-15.959W
LOMA	3660691	Mississippi L&D 14	41-34-25.398N	90-24-11.819W
LOMA	3660692	Mississippi L&D 15	41-31-3.228N	90-33-48.838W
LOMA	3660693	Mississippi L&D 16	41-25-29.940N	91-0-35.100W
LOMA	3660694	Mississippi L&D 17	41-11-32.688N	91-3-26.158W
LOMA	3660695	Mississippi L&D 18	40-52-54.504N	91-1-25.198W
LOMA	3660696	Mississippi L&D 19	40-23-48.192N	91-22-29.460W
LOMA	3660697	Mississippi L&D 20	40-8-38.376N	91-30-56.459W
LOMA	3660698	Mississippi L&D 21	39-54-11.772N	91-25-43.079W
LOMA	3660699	Mississippi L&D 24	39-22-25.530N	90-54-22.619W
LOMA	3660700	Mississippi L&D 25	39-0-11.388N	90-41-22.258W
LOMA	3660701	Lockport L&D	41-34-6.402N	88-4-37.618W
LOMA	3660702	Marseilles L&D	41-19-42.031N	88-45-11.880W
LOMA	3660703	Peoria L&D	40-37-55.626N	89-37-27.480W
LOMA	3660704	Columbia L&D	32-10-0.588N	92-6-36.720W
LOMA	3660706	Old Hickory L&D	36-17-43.998N	86-39-23.998W
LOMA	3660709	Wilson L&D	34-48-17.106N	87-37-40.620W
LOMA	3660710	Felsenthal L&D	33-3-34.560N	92-7-22.332W
LOMA	3660711	Waggoner Jr., Joe D. L&D	32-14-59.496N	93-29-46.680W
LOMA	3660712	John H. Overton L&D	31-11-16.152N	92-17-32.820W
LOMA	3660713	Jonesville L&D	31-28-58.512N	91-51-37.188W

<b>AIS BASE STATION TYPE</b>	<b>MMSI</b>	<b>LOCATION</b>	<b>LATITUDE</b>	<b>LONGITUDE</b>
LOMA	3660714	Lindy Claiborne Boggs L&D	31-15-14.591N	91-57-32.544W
LOMA	3660715	Russell B. Long L&D (L&D 4)	31-56-23.111N	93-16-13.966W
LOMA	3660717	Allegheny L&D 4	40-36-49.464N	79-43-10.272W
LOMA	3660726	Terry, David D. L&D (6)	34-39-58.272N	92-9-20.999W
LOMA	3660727	Emmett Sanders L&D	34-14-50.064N	91-54-20.412W
LOMA	3660728	James W. Trimble L&D (13)	35-20-54.744N	94-17-52.908W
LOMA	3660729	Joe Hardin L&D (3)	34-9-50.004N	91-40-40.728W
LOMA	3660730	Norrell L&D (1)	34-1-11.988N	91-11-43.019W
LOMA	3660731	R. S. Kerr Lake L&D (15)	35-20-52.998N	94-46-43.979W
LOMA	3660732	Toad Suck Ferry L&D (#8)	35-4-34.998N	92-32-21.959W
LOMA	3660733	W. D. Mayo L&D (14)	35-18-52.998N	94-33-34.978W
LOMA	3660734	Webbers Falls Lake L&D (16)	35-33-16.002N	95-10-4.980W
LOMA	3660738	Starved Rock L&D	41-19-28.782N	88-59-7.980W
LOMA	3660744	Ensley Engineering Yard	35-4-12.011N	90-7-21.396W
LOMA	3660839	Green River L&D 2	37-31-54.084N	87-15-55.188W
LOMA	3660842	Kaskaskia River Nav. L&D	37-59-3.012N	89-56-47.256W
LOMA	3660846	Mississippi L&D 3	44-36-35.838N	92-36-39.298W
LOMA	3660848	Gray's Landing L&D	39-49-28.956N	79-55-13.656W
LOMA	3660850	Monongahela R L&D 3	40-15-50.268N	79-53-56.699W
LOMA	3660851	Monongahela R L&D 4 (Charleroi)	40-8-49.986N	79-53-56.159W
LOMA	3660854	Point Marion L&D	39-43-41.243N	79-54-44.748W
LOMA	3660855	Hannibal L&D	39-39-54.900N	80-51-57.060W
LOMA	3660856	John T. Myers L&D	37-47-41.640N	87-59-33.108W
LOMA	3660858	Olmsted L&D	37-11-0.918N	89-3-49.799W
LOMA	3660859	Markland L&D	38-46-27.642N	84-57-58.032W
LOMA	3660860	McAlpine L&D	38-16-44.562N	85-47-28.464W
LOMA	3660861	Montgomery L&D (OH)	40-38-52.710N	80-23-6.958W
LOMA	3660862	New Cumberland L&D	40-31-32.928N	80-37-41.340W
LOMA	3660863	Newburgh L&D	37-55-56.034N	87-22-26.098W
LOMA	3660865	Smithland L&D	37-9-59.216N	88-25-41.506W
LOMA	3660870	USACE AREC	38-35-25.800N	90-12-21.960W
LOMA	3660872	St. Mary's (Soo Locks)	46-30-9.529N	84-20-56.314W
LOMA	3660875	Fulton L&D	34-15-27.396N	88-25-26.544W
LOMA	3660876	Glover Wilkins L&D	34-3-53.536N	88-25-33.118W
LOMA	3660877	Howell Heflin L&D	32-50-13.344N	88-8-10.392W
LOMA	3660878	Stennis John C. L&D	33-31-3.828N	88-29-22.488W
LOMA	3660879	G.V. "Sonny" Montgomery L&D (TT)	34-31-18.840N	88-19-24.240W
LOMA	3660881	Bevill, Tom L&D	32-12-37.008N	88-17-13.992W
LOMA	3660882	Whitten, Jamie L&D	34-31-18.768N	88-19-24.420W
LOMA	3660886	Newt Graham L&D (18)	36-3-33.000N	95-32-10.979W

<b>AIS BASE STATION TYPE</b>	<b>MMSI</b>	<b>LOCATION</b>	<b>LATITUDE</b>	<b>LONGITUDE</b>
LOMA	3660890	Montgomery Point L&D	33-56-42.048N	91-5-15.058W
LOMA	3660891	Wilbur D. Mills L&D (2)	34-1-35.166N	91-14-48.538W
LOMA	3661113	Glasgow	39-14-27.852N	92-47-18.384W
NAIS	3669100	Burlington	39-58-13.300N	074-53-55.601W
NAIS	3669101	Cape May	38-56-40.981N	074-53-02.069W
NAIS	3669102	Manasquan	40-06-55.879N	074-02-00.910W
NAIS	3669135	Cape Mendocino	40-26-31.499N	124-23-46.788W
NAIS	3669136	Point Arena	38-53-52.800N	123-37-52.788W
NAIS	3669137	Walker Ridge	41-05-57.682N	124-07-36.624W
NAIS	3669138	Cambria	35-31-06.701N	121-03-35.784W
NAIS	3669139	Catalina Island	33-22-46.402N	118-24-58.896W
NAIS	3669140	Honda Ridge	34-35-17.498N	120-36-20.016W
NAIS	3669141	Laguna Peak	34-06-26.302N	119-03-54.000W
NAIS	3669142	Point Loma	32-40-13.400N	117-14-24.900W
NAIS	3669143	Eagle Rock	37-08-08.491N	122-11-46.932W
NAIS	3669144	Post Ranch	36-13-44.339N	121-46-05.041W
NAIS	3669145	Presidio	37-47-39.458N	122-27-53.064W
NAIS	3669146	Walnut Grove	38-14-22.900N	121-30-05.970W
NAIS	3669147	Elkhorn Mountain	45-44-21.901N	122-22-20.892W
NAIS	3669148	Kelso Notch	46-09-49.460N	122-51-09.576W
NAIS	3669149	Megler Mountain	46-15-43.999N	123-53-18.312W
NAIS	3669150	Rogue River	42-26-24.170N	124-25-02.200W
NAIS	3669151	Bahokus Peak	48-22-14.401N	124-40-22.692W
NAIS	3669152	Gold Mountain	47-32-55.930N	122-47-07.440W
NAIS	3669153	Mount Erie	48-27-14.290N	122-37-34.300W
NAIS	3669154	Seattle	47-36-56.999N	122-18-32.004W
NAIS	3669155	Mount Alutom	13-25-58.501N	144-42-45.299E
NAIS	3669156	Kawela	21-39-53.750N	158-00-00.910W
NAIS	3669157	Mauna Kapu	21-24-12.630N	158-05-52.640W
NAIS	3669158	Anchorage	61-16-09.420N	149-38-19.000W
NAIS	3669163	Proctor	35-06-02.185N	090-17-29.231W
NAIS	3669164	Ft Thomas	39-03-47.966N	084-26-29.868W
NAIS	3669165	Huntington	38-23-30.343N	082-29-29.760W
NAIS	3669166	Pittsburgh PA	40-28-19.056N	079-59-39.635W
NAIS	3669167	Imperial	39-23-18.377N	090-22-20.100W
NAIS	3669168	Bristol	43-54-59.003N	069-29-05.400W
NAIS	3669169	Catskill	42-12-34.160N	073-53-57.220W
NAIS	3669170	Montgomery	31-56-31.900N	081-07-17.490W
NAIS	3669171	Brunswick	30-49-39.800N	081-44-26.400W
NAIS	3669172	Palmetto	27-32-43.100N	082-34-27.330W

<b>AIS BASE STATION TYPE</b>	<b>MMSI</b>	<b>LOCATION</b>	<b>LATITUDE</b>	<b>LONGITUDE</b>
NAIS	3669173	Caney Creek	28-50-40.210N	095-39-29.130W
NAIS	3669175	Baton Rouge	30-22-50.040N	091-03-16.500W
NAIS	3669176	Grammercy	30-04-25.200N	090-42-13.900W
NAIS	3669181	Bay City	43-32-33.100N	083-39-37.000W
NAIS	3669182	Maumee Bay	41-38-13.400N	083-22-01.600W
NAIS	3669183	Gulliver	46-03-26.000N	085-58-42.000W
NAIS	3669184	San Nicolas Island	33-14-22.000N	119-30-18.100W
NAIS	3669185	San Clemente Island	32-53-29.500N	118-27-33.900W
NAIS	3669186	San Onofre Peak	33-21-43.800N	117-29-45.800W
NAIS	3669187	Bush Bluff	37-08-08.260N	122-11-47.800W
NAIS	3669188	Pittsburg	37-58-09.000N	121-54-15.000W
NAIS	3669189	Seven Devils	43-16-27.000N	124-22-12.000W
NAIS	3669190	Merizo	13-16-51.400N	144-40-26.400E
NAIS	3669191	Biscayne Bay	25-32-24.972N	080-28-06.492W
NAIS	3669192	Miami	25-45-33.000N	080-11-30.800W
NAIS	3669193	Wilmette	42-04-37.850N	087-41-03.070W
NAIS	3669743	Swedesboro	39-43-32.498N	075-20-39.599W
NAIS	3669744	Tuckerton	39-37-54.910N	074-21-12.850W
NAIS	3669745	Merrick	37-33-27.202N	075-49-43.000W
NAIS	3669746	Nokomis	27-09-04.000N	082-27-50.000W
NAIS	3669747	Tarpon Springs	28-10-57.670N	082-46-04.330W
NAIS	3669748	Chincoteague	37-55-52.871N	075-22-56.759W
NAIS	3669749	Farnham	37-53-15.000N	076-37-59.999W
NAIS	3669750	Berlin	38-19-39.740N	075-11-48.080W
NAIS	3669751	Newport News	37-09-49.000N	076-32-08.050W
NAIS	3669752	Pungo	36-43-48.698N	076-00-32.400W
NAIS	3669753	El Yunque	18-18-38.002N	065-47-34.001W
NAIS	3669754	Sunset Bay	43-30-30.170N	076-22-16.050W
NAIS	3669755	Avon Lake	41-28-54.599N	082-01-25.201W
NAIS	3669756	Port St Joe	29-49-09.360N	085-15-33.870W
NAIS	3669757	Robertsdale	30-36-45.430N	087-38-41.660W
NAIS	3669758	Santa Rosa	30-22-28.200N	086-11-20.198W
NAIS	3669759	Shell Point	30-04-35.198N	084-18-05.198W
NAIS	3669760	Van Cleave	30-29-10.050N	088-42-53.260W
NAIS	3669761	North East	39-33-41.400N	075-55-46.801W
NAIS	3669762	Reggio	29-48-32.320N	089-45-45.950W
NAIS	3669764	C3CEN LAB TOP	36-52-53.7594N	076-21-33.480W
NAIS	3669765	C3CEN LAB TRANS	36-52-53.7594N	076-21-33.480W
NAIS	3669766	Bachelor	30-52-20.701N	091-40-23.700W
NAIS	3669767	Bayou Salle	29-38-18.600N	091-31-02.399W

<b>AIS BASE STATION TYPE</b>	<b>MMSI</b>	<b>LOCATION</b>	<b>LATITUDE</b>	<b>LONGITUDE</b>
NAIS	3669768	Conneaut	41-55-00.520N	080-32-57.008W
NAIS	3669769	Ripley	42-14-11.900N	079-39-33.901W
NAIS	3669770	Eden	42-39-03.701N	078-49-28.402W
NAIS	3669771	Venice	29-17-59.399N	089-22-28.499W
NAIS	3669772	Hamlin	43-18-09.601N	077-54-53.798W
NAIS	3669773	Lake Port	43-07-27.998N	082-31-37.999W
NAIS	3669774	Baytown	29-46-06.899N	095-01-04.598W
NAIS	3669775	High Island	29-33-56.902N	094-23-19.201W
NAIS	3669776	Port Austin	44-01-44.480N	083-00-04.250W
NAIS	3669777	Grand Chenier	29-46-22.699N	092-59-10.100W
NAIS	3669778	Wayne	42-17-04.700N	083-08-24.000W
NAIS	3669779	Ellison Bay	45-14-04.499N	087-05-27.600W
NAIS	3669780	Point Beach	44-12-22.309N	087-36-24.750W
NAIS	3669781	Aransas Pass	27-56-40.171N	097-07-54.451W
NAIS	3669782	Kenedy	26-59-24.270N	097-39-46.020W
NAIS	3669783	Oak Creek	42-51-21.499N	087-50-44.401W
NAIS	3669784	Michigan City	41-38-33.100N	086-59-52.700W
NAIS	3669785	Agnew	42-56-25.300N	086-08-19.100W
NAIS	3669786	Arcadia	44-27-02.300N	086-12-15.800W
NAIS	3669787	Alpena	45-12-42.001N	083-25-59.999W
NAIS	3669788	Bliss	45-41-13.999N	084-53-57.998W
NAIS	3669789	Porcupine Mountain	46-48-45.202N	089-40-08.000W
NAIS	3669792	Larsmont	47-00-17.540N	091-45-54.970W
NAIS	3669795	Maple Hill	47-47-42.000N	090-19-43.000W
NAIS	3669796	Grand Marais	46-38-29.000N	085-59-35.999W
NAIS	3669798	Marquette	41-38-13.190N	083-22-01.460W
NAIS	3669799	Eagle Harbor	47-22-11.399N	088-11-02.501W
LOMA	993661108	Prices Landing	37-1-33.384N	89-21-23.184W
LOMA	993660555	Cannelton L&D	37-53-58.884N	86-42-22.968W
LOMA	993660557	Bonneville L&D	45-38-13.092N	121-56-58.812W
LOMA	993660642	Ormond, Arthur L&D (9)	35-7-27.264N	92-47-8.268W
LOMA	993660644	Barkley L&D	37-1-9.120N	88-13-29.928W
LOMA	993660645	Ballard L&D (Chittenden)	47-39-55.872N	122-23-49.128W
LOMA	993660646	Belleville L&D	39-7-1.056N	81-44-34.188W
LOMA	993660647	Meldahl, Captain Anthony L&D	38-47-50.424N	84-10-21.108W
LOMA	993660648	Greenup L&D	38-38-52.620N	82-51-40.212W
LOMA	993660649	London L&D	38-11-37.296N	81-22-6.359W
LOMA	993660651	Robert C Byrd L&D	38-40-58.002N	82-11-4.978W
LOMA	993660652	Willow Island L&D	39-21-36.870N	81-19-17.638W
LOMA	993660653	Winfield L&D	38-31-39.966N	81-54-55.199W

<b>AIS BASE STATION TYPE</b>	<b>MMSI</b>	<b>LOCATION</b>	<b>LATITUDE</b>	<b>LONGITUDE</b>
LOMA	993660654	Chain of Rocks L&D (Lock 27)	38-42-10.584N	90-10-49.692W
LOMA	993660655	Cheatham L&D	36-19-14.988N	87-13-18.948W
LOMA	993660656	Chickamauga L&D	35-6-21.708N	85-13-41.232W
LOMA	993660659	Guntersville L&D	34-25-35.256N	86-23-29.472W
LOMA	993660660	Kentucky L&D	37-0-54.972N	88-15-55.548W
LOMA	993660662	Ice Harbor L&D	46-15-3.744N	118-52-50.880W
LOMA	993660663	Little Goose L&D	46-34-55.732N	118-1-39.648W
LOMA	993660664	Lower Granite L&D	46-39-36.564N	117-25-42.060W
LOMA	993660665	Lower Monumental L&D	46-33-51.012N	118-32-24.180W
LOMA	993660666	McNary L&D	45-56-26.304N	119-17-58.416W
LOMA	993660668	Braddock, Monongahela R L&D 2	40-23-32.568N	79-51-34.452W
LOMA	993660672	Mississippi L&D 1	44-54-50.658N	93-12-8.280W
LOMA	993660680	Mississippi L&D 9	43-12-42.708N	91-5-54.298W
LOMA	993660685	Racine L&D	38-55-6.162N	81-54-40.558W
LOMA	993660686	Brandon Road L&D	41-30-12.600N	88-6-12.168W
LOMA	993660705	Nickajack L&D	35-0-19.668N	85-37-9.178W
LOMA	993660707	Pickwick Landing L&D	35-3-53.286N	88-15-1.559W
LOMA	993660708	Watts Bar L&D	35-37-19.998N	84-46-45.959W
LOMA	993660716	Allegheny L&D 2	40-29-16.080N	79-54-58.752W
LOMA	993660723	Allegheny L&D 3	40-32-9.996N	79-48-57.960W
LOMA	993660725	Maynard, Col. Charles D. L&D (5)	34-24-46.908N	92-6-4.212W
LOMA	993660737	Black Rock L&D	42-56-2.112N	78-54-18.360W
LOMA	993660738	Bankhead L&D (John Hollis)	33-27-11.052N	87-21-27.072W
LOMA	993660739	Holt L&D	33-15-11.124N	87-26-57.228W
LOMA	993660740	Oliver L&D (William Bacon)	33-12-36.876N	87-35-36.240W
LOMA	993660741	Selden L&D	32-46-29.359N	87-49-50.520W
LOMA	993660753	The Dalles L&D	45-36-56.556N	121-8-15.360W
LOMA	993660835	Brazos East & West L&D	28-53-46.986N	95-23-17.642W
LOMA	993660836	Colorado River East & West L&D	28-41-2.004N	95-58-24.960W
LOMA	993660838	Green River L&D 1	37-51-33.084N	87-24-31.068W
LOMA	993660845	Trailer #1	32-17-56.400N	90-51-55.080W
LOMA	993660855	Gasconade	38-39-51.696N	91-32-21.696W
LOMA	993660864	Pike Island L&D	40-8-52.866N	80-42-4.799W
LOMA	993660873	Aberdeen L&D	33-49-48.450N	88-31-12.990W
LOMA	993660874	Amory L&D	34-0-39.996N	88-29-18.960W
LOMA	993660883	Coffeeville L&D	31-45-23.076N	88-7-42.672W
LOMA	993660884	Demopolis L&D	32-31-9.660N	87-52-46.992W
LOMA	993660885	Chouteau L&D (17)	35-51-25.992N	95-22-14.988W
LOMA	993661101	Maxwell L&D	40-0-4.176N	79-57-39.924W
LOMA	993661103	Vicksburg Bridge	32-18-52.312N	90-54-27.360W

<b>AIS BASE STATION TYPE</b>	<b>MMSI</b>	<b>LOCATION</b>	<b>LATITUDE</b>	<b>LONGITUDE</b>
LOMA	993661104	Greenville Bridge	33-17-8.117N	91-9-21.157W
LOMA	993661106	Brickeys	38-4-30.000N	90-13-23.988W
LOMA	993661107	Florence	39-37-57.904N	90-36-27.677W
LOMA	993661108	Pere Marquette	38-59-50.788N	90-31-3.104W
LOMA	993661110	Grand Tower	37-39-28.872N	89-30-45.108W
LOMA	993661111	Grays Point	37-14-58.812N	89-27-50.303W
LOMA	993661112	Caruthersville	36-11-35.016N	89-40-39.972W
LOMA	993661113	ERDC CHL TEST	32-17-59.755N	90-51-57.694W