U.S. Department of
Homeland Security

United States
Coast Guard

# LIGHT LIST

## Volume II

## ATLANTIC COAST

Shrewsbury River, New Jersey to Little River, South Carolina

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

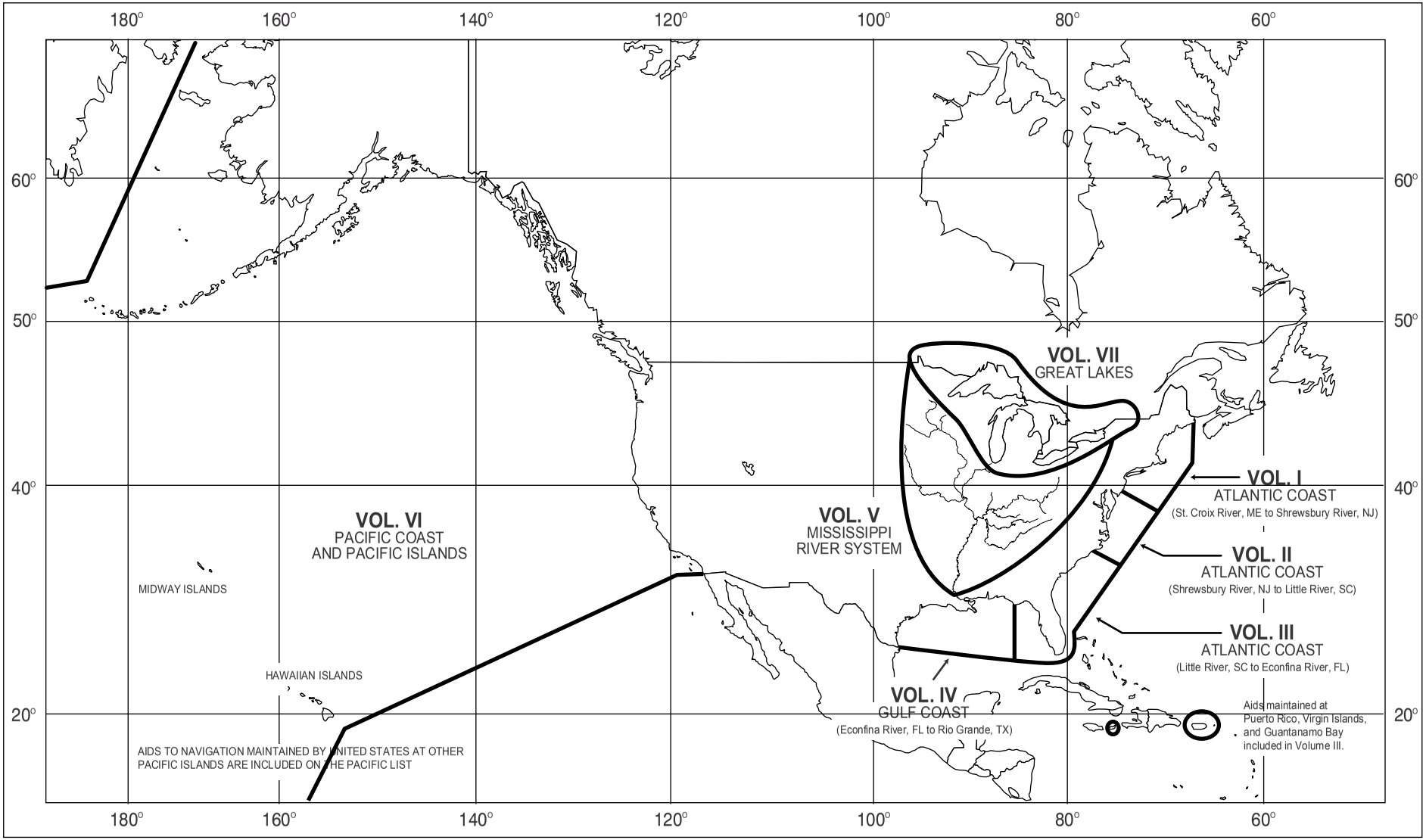
**IMPORTANT**
**THIS LIGHT LIST SHOULD BE CORRECTED**
**EACH WEEK FROM THE LOCAL NOTICES TO MARINERS**
**OR NOTICES TO MARINERS AS APPROPRIATE.**

2016

COMDTPUB P16502.2

LIMITS OF LIGHT LISTS PUBLISHED BY

# U.S. COAST GUARD



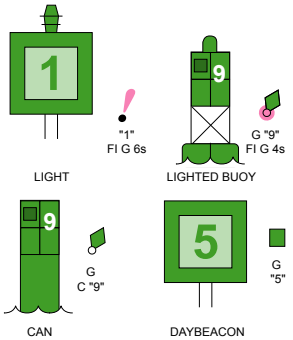
# U.S. AIDS TO NAVIGATION SYSTEM
## on navigable waters except Western Rivers

## LATERAL SYSTEM AS SEEN ENTERING FROM SEAWARD

### PORT SIDE
### ODD NUMBERED AIDS

GREEN LIGHT ONLY

FLASHING (2)
FLASHING
OCCULTING
QUICK FLASHING
ISO

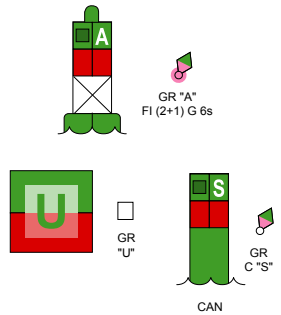



### PREFERRED CHANNEL
### NO NUMBERS - MAY BE LETTERED

PREFERRED
CHANNEL TO
STARBOARD
TOPMOST BAND
GREEN

GREEN LIGHT ONLY

COMPOSITE GROUP FLASHING (2+1)

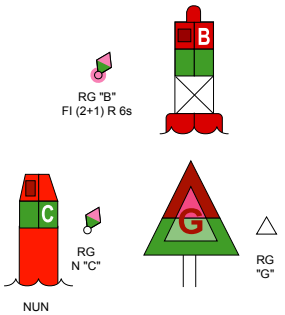



### PREFERRED CHANNEL
### NO NUMBERS - MAY BE LETTERED

PREFERRED
CHANNEL TO
PORT
TOPMOST BAND
RED

RED LIGHT ONLY

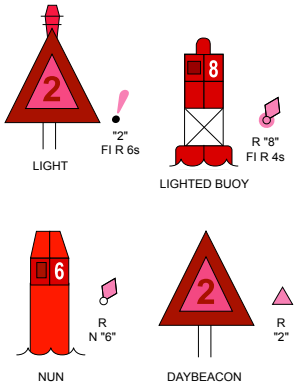
COMPOSITE GROUP FLASHING (2+1)




### STARBOARD SIDE
### EVEN NUMBERED AIDS

RED LIGHT ONLY

FLASHING (2)
FLASHING
OCCULTING
QUICK FLASHING
ISO

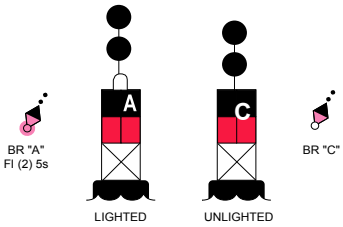



## AIDS TO NAVIGATION HAVING NO LATERAL SIGNIFICANCE

### ISOLATED DANGER
### NO NUMBERS - MAY BE LETTERED

WHITE LIGHT ONLY

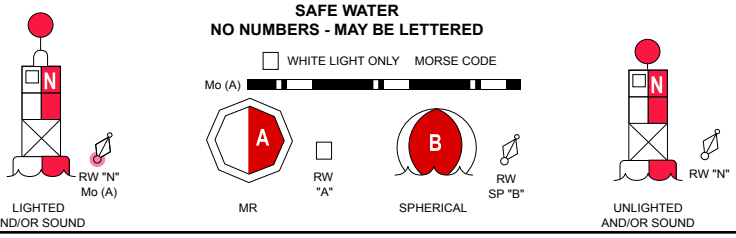
Fl (2) 5s



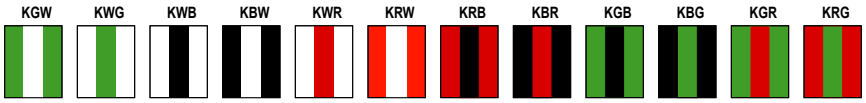

### SAFE WATER
### NO NUMBERS - MAY BE LETTERED

WHITE LIGHT ONLY MORSE CODE

Mo (A)

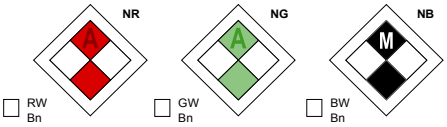



### RANGE DAYBOARDS MAY BE LETTERED




### DAYBOARDS - MAY BE LETTERED

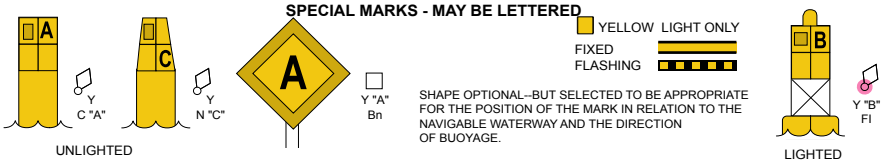
WHITE LIGHT ONLY




### SPECIAL MARKS - MAY BE LETTERED

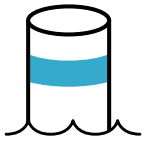
YELLOW LIGHT ONLY

FIXED
FLASHING




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

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.



MOORING
BUOY

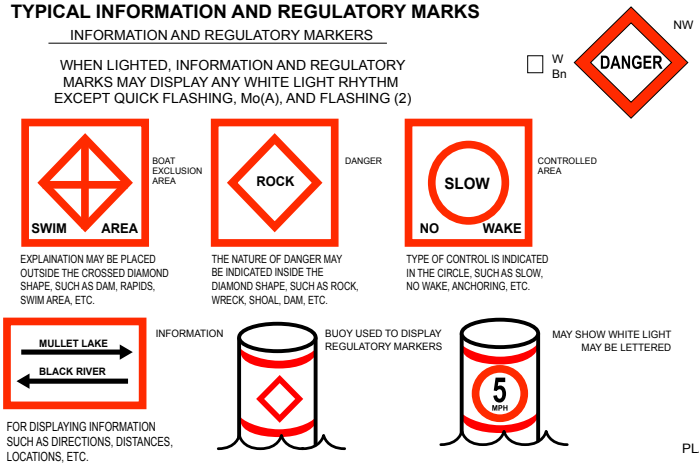
WHITE WITH BLUE BAND

MAY SHOW WHITE
REFLECTOR OR LIGHT

### TYPICAL INFORMATION AND REGULATORY MARKS

INFORMATION AND REGULATORY MARKERS

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




EXPLAINATION 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.

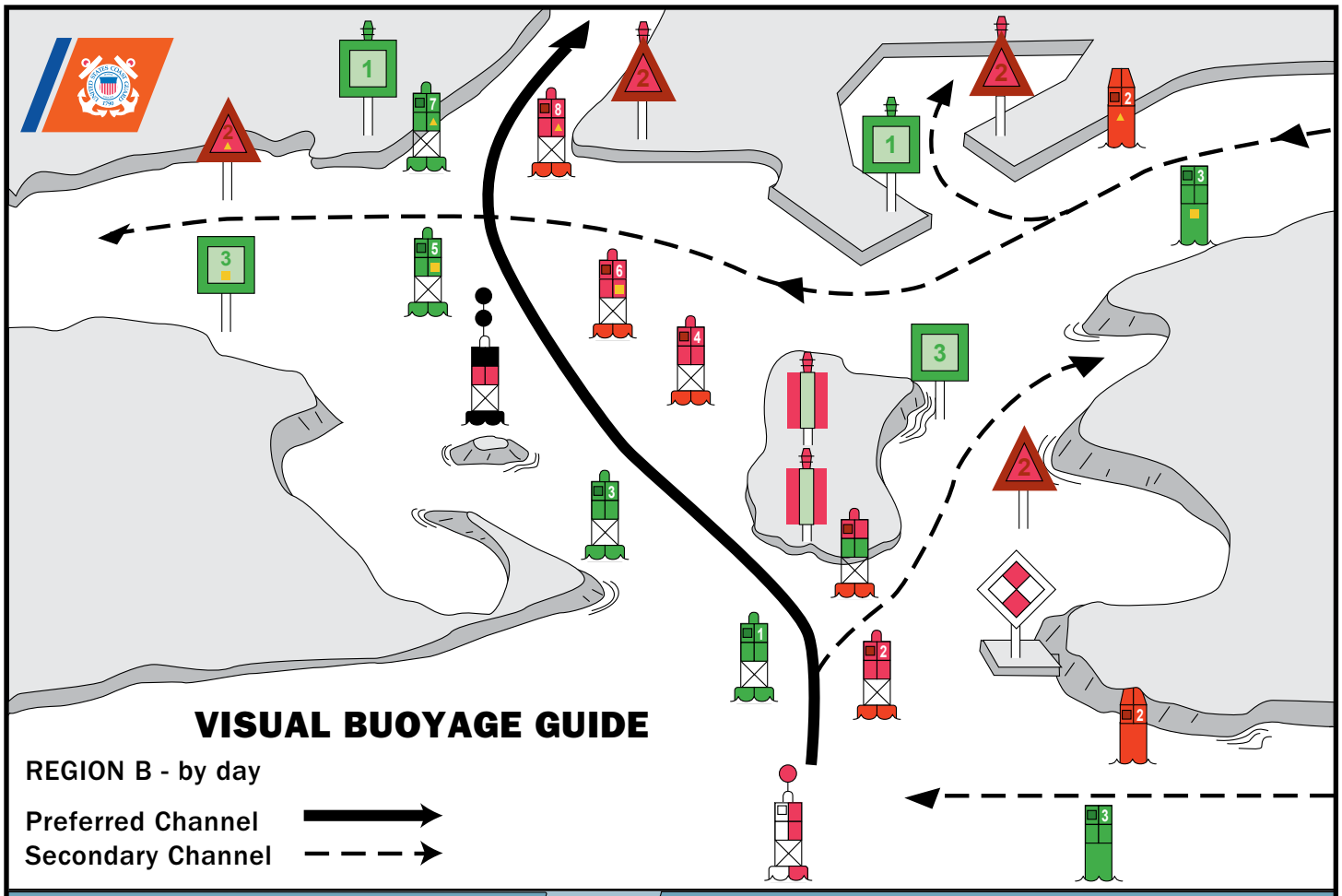
TYPE OF CONTROL IS INDICATED IN THE CIRCLE, SUCH AS SLOW, NO WAKE, ANCHORING, ETC.

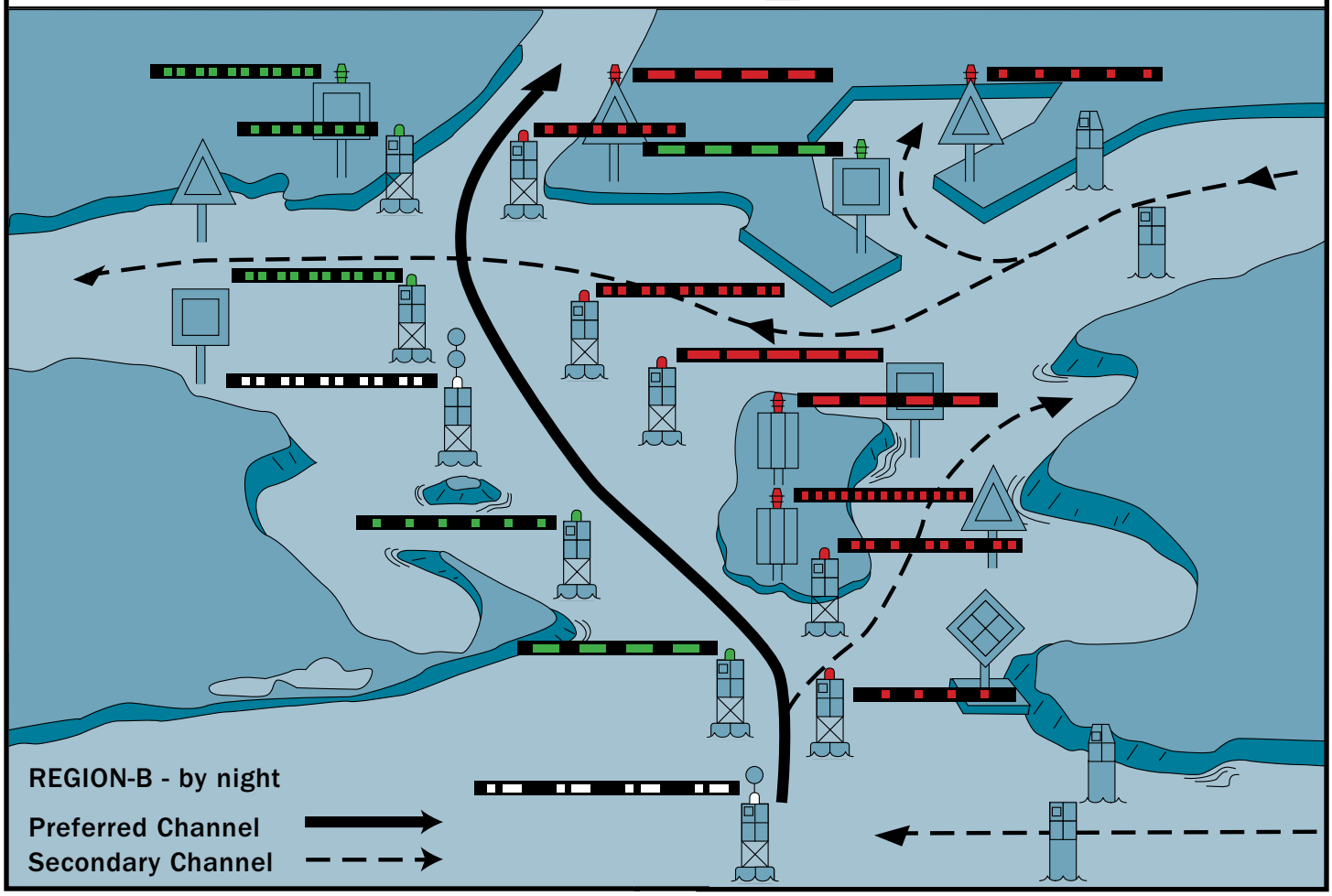
FOR DISPLAYING INFORMATION SUCH AS DIRECTIONS, DISTANCES, LOCATIONS, ETC.

BUOY USED TO DISPLAY REGULATORY MARKERS

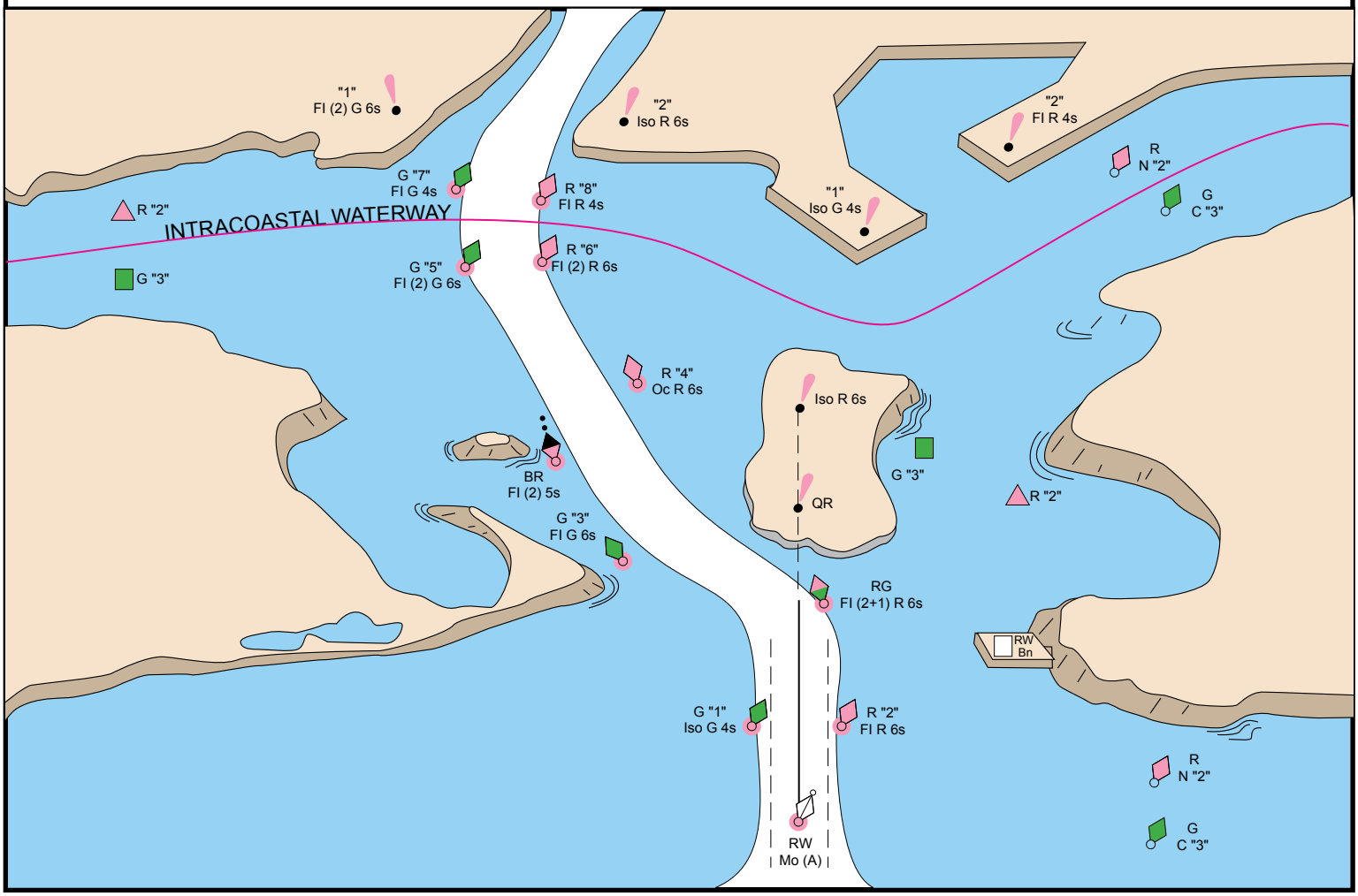
MAY SHOW WHITE LIGHT
MAY BE LETTERED

PLATE 1


VISUAL BUOYAGE GUIDE
REGION B - by day
Preferred Channel
Secondary Channel


REGION-B - by night
Preferred Channel
Secondary Channel

# FICTITIOUS NAUTICAL CHART



# U.S. AIDS TO NAVIGATION SYSTEM

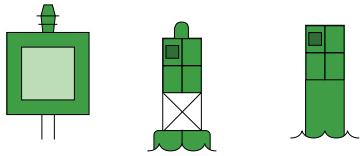
## on the Western River System

## AS SEEN ENTERING FROM SEAWARD

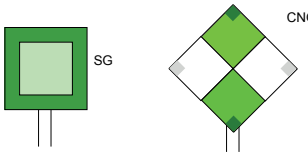
### PORT SIDE
OR RIGHT DESCENDING BANK

GREEN OR WHITE LIGHTS

FLASHING
ISO



LIGHT LIGHTED BUOY CAN



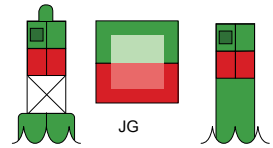

PASSING DAYBEACON CROSSING DAYBEACON

176.9

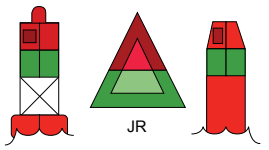
MILE BOARD

### PREFERRED CHANNEL
MARK JUNCTIONS AND OBSTRUCTIONS
COMPOSITE GROUP FLASHING (2+1)

PREFERRED CHANNEL
TO STARBOARD
TOPMOST BAND GREEN
FI (2+1) G

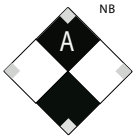



PREFERRED CHANNEL
TO PORT
TOPMOST BAND RED
FI (2+1) R




### DAYBOARDS HAVING NO LATERAL SIGNIFICANCE

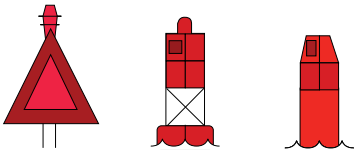
MAY BE LETTERED WHITE LIGHT ONLY



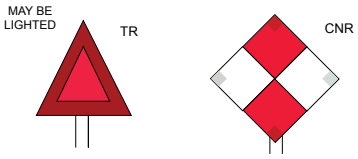

### STARBOARD SIDE
OR LEFT DESCENDING BANK

RED OR WHITE LIGHTS

FLASHING (2)
ISO



LIGHT LIGHTED BUOY NUN

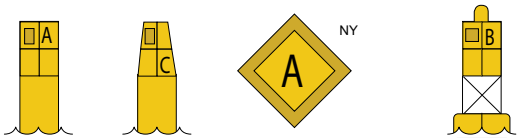



PASSING DAYBEACON CROSSING DAYBEACON

123.5

MILE BOARD

### 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

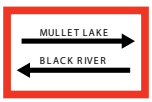
EXPLAINATION MAY BE PLACED OUTSIDE THE CROSSED DIAMOND SHAPE, SUCH AS DAM, RAPIDS, SWIM AREA, ETC.

DANGER

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

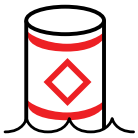
CONTROLLED
AREA

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




INFORMATION

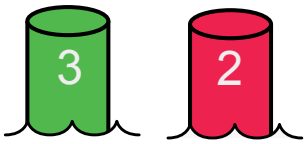
FOR DISPLAYING INFORMATION SUCH AS DIRECTIONS, DISTANCES, LOCATIONS, ETC.



BUOY USED TO DISPLAY REGULATORY MARKERS

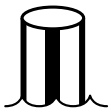
MAY SHOW WHITE LIGHT
MAY BE LETTERED

### STATE WATERS




INLAND (STATE) WATERS OBSTRUCTION MARK

MAY SHOW WHITE
REFLECTOR OR QUICK FLASHING WHITE LIGHT



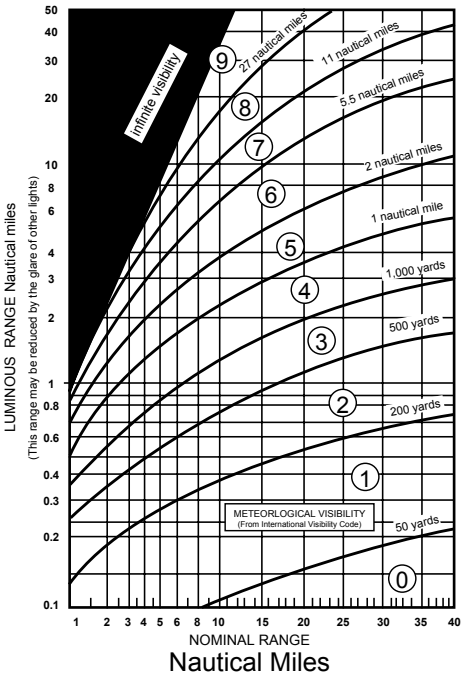
BLACK-STRIPED
WHITE BUOY

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.



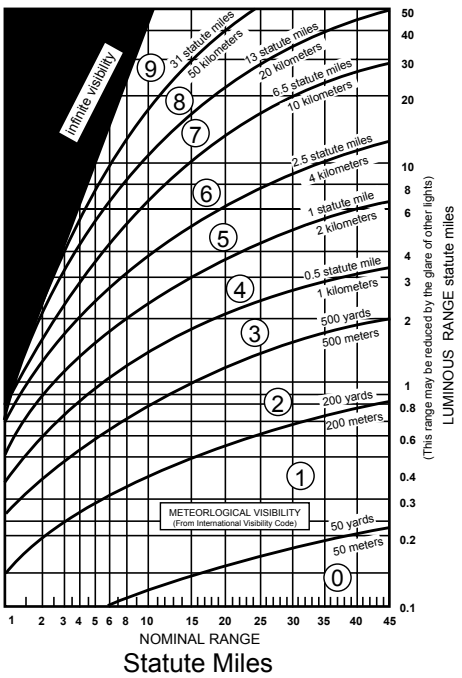

METEOROLOGICAL VISIBILITY
(From International Visibility Code)

| 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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# TABLE OF CONTENTS

Light List Regions ..... Inside Front Cover

U.S. DGPS Sites ..... i

USCG Contact Information ..... ii

Preface ..... v

Introduction ..... vi

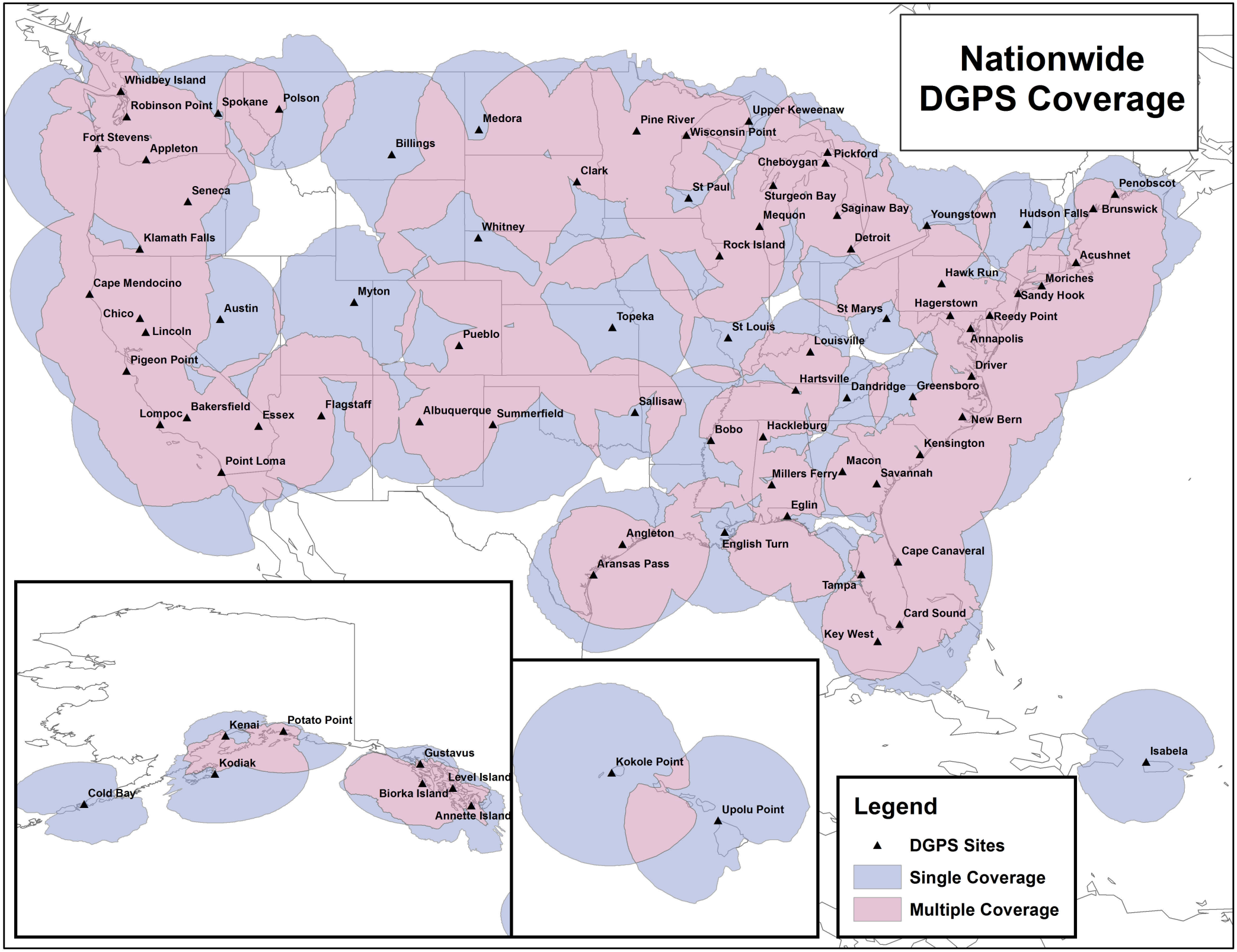
SEACOAST
- Atlantic Ocean ..... 1
- New Jersey ..... 1
- Delaware ..... 2
- Maryland ..... 2
- Virginia ..... 3
- North Carolina ..... 5

BAYS, RIVERS, AND HARBORS
- Cape May Harbor ..... 13
- Delaware Bay and River ..... 13
- Philadelphia ..... 33
- Chincoteague Bay ..... 48
- Chesapeake Bay Entrance ..... 62
- Upper Chesapeake Channel ..... 76
- Hampton Roads ..... 87
- James River ..... 107
- York River ..... 123
- Rappahannock River ..... 131
- Potomac River ..... 144
- Annapolis Harbor ..... 172
- Baltimore Harbor ..... 182
- Tangier Sound ..... 195
- Head of Chesapeake Bay ..... 228
- Oregon Inlet ..... 231
- Cape Hatteras ..... 238
- New River ..... 246
- Cape Fear River ..... 252
- Pamlico Sound ..... 274
- Intracoastal Waterway – New Jersey ..... 304
- Intracoastal Waterway – Virginia ..... 318
- Intracoastal Waterway – North Carolina ..... 319

INDEX ..... Index 1

CROSS REFERENCE ..... Cross Reference 1

# Nationwide DGPS Coverage



# COAST GUARD DISTRICT COMMANDERS

| DISTRICT | ADDRESS | WATERS OF JURISDICTION |
|---|---|---|
| FIRST | 408 Atlantic Avenue<br>Boston, MA 02110-3350<br>Tel: (617) 223-8351<br>http://www.uscg.mil/d1 | Maine, New Hampshire, Massachusetts, Vermont (Lake Champlain), Rhode Island, Connecticut, New York, to Shrewsbury River, New Jersey. |
| FIFTH | Federal Building<br>431 Crawford Street<br>Portsmouth, VA 23704-5004<br>Tel: (757) 398-6486<br>(757) 398-6552<br>http://www.uscg.mil/d5 | Shrewsbury River, New Jersey to Delaware, Maryland, Virginia, District of Columbia, and North Carolina. |
| SEVENTH | Brickell Plaza Federal Building<br>909 SE 1st Avenue; Rm:406<br>Miami, FL 33131-3050<br>Tel: (305) 415-6752<br>(305) 415-6800<br>http://www.uscg.mil/d7 | South Carolina, Georgia, Florida to 83°50'W, and Puerto Rico and adjacent islands of the United States. |
| EIGHTH | Hale Boggs Federal Building<br>500 Poydras Street<br>New Orleans, LA 70130-3310<br>Tel: (504) 671-2327<br>(504) 671-2137<br>http://www.uscg.mil/d8 | Florida westward from 83°50'W, Alabama, Mississippi, Louisiana, Texas, the Mississippi River System except that portion of the Illinois River north of Joliet, Illinois. |
| NINTH | 1240 East 9th Street<br>Cleveland, OH 44199-2060<br>Tel: (216) 902-6060<br>(216) 902-6117<br>http://www.uscg.mil/d9 | Great Lakes and St. Lawrence River above St. Regis River. |
| ELEVENTH | Coast Guard Island Building 50-2<br>Alameda, CA 94501-5100<br>Tel: (510) 437-2975<br>http://www.uscg.mil/d11 | California, Nevada, Utah, Arizona. |
| THIRTEENTH | Federal Building<br>915 Second Avenue 35th Floor, Rm 3510<br>Seattle, WA 98174-1067<br>Tel: (206) 220-7270<br>(206) 220-7004<br>http://www.uscg.mil/d13 | Oregon, Washington, Idaho, and Montana. |
| FOURTEENTH | Prince Kalanianaole Federal Bldg.<br>300 Ala Moana Blvd<br>9th Floor, Room 9-220<br>Honolulu, HI 96850-4982<br>Tel: (808) 535-3409<br>(808) 535-3414<br>http://www.uscg.mil/d14 | Hawaiian, American Samoa, Marshall, Marianas, and Caroline Islands. |
| SEVENTEENTH | PO Box 25517<br>Juneau, AK 99802-5517<br>Tel: (907) 463-2029<br>(907) 463-2269<br>http://www.uscg.mil/d17 | Alaska. |

# U. S. COAST GUARD
# FIFTH DISTRICT ATON UNIT LISTING

## AIDS TO NAVIGATION TEAMS

**ANT Baltimore**
2401 Hawkins Point Rd.
Baltimore, MD 21226
Tel: (410) 576-2646

**ANT Cape May**
C/O Training Center
1 Munro Ave.
Cape May, NJ 08204
Tel: (609) 898-6987

**ANT Chincoteague**
3823 Main Street
Chincoteague, VA 23333
Tel: (757) 336-2872

**ANT Crisfield**
810 Norris Harbor Drive
Crisfield, MD 21817
Tel: (410) 968-0971

**ANT Fort Macon**
2301 E. Fort Macon Rd.
Atlantic Beach, NC 28512
Tel: (252) 240-8440

**ANT Hampton Roads**
4000 Coast Guard Blvd.
Portsmouth, VA 23703
Tel: (757) 483-8520

**ANT Milford Haven**
59 Mill Point Rd.
Hudgins, VA 23076
Tel: (804) 725-5932

**ANT Oak Island**
300-B Caswell Beach Road
Oak Island, NC 28465-8443
Tel: (910) 278-6933

**ANT Philadelphia**
1 Washington Ave.
Philadelphia, PA 19147
Tel: (215) 271-4847/4913

**ANT Potomac**
PO Box 8
St Inigoes, MD 20684
Tel: (301) 872-4036

**ANT Wanchese**
PO Box 908 Harbor Rd.
Wanchese, NC 27959
Tel: (252) 473-1531

## BUOY TENDERS

**USCGC BAYBERRY (WLI 65 400)**
PO BOX 1150
Long Beach, NC 28465
Tel: (910) 278-6933

**USCGC ELM (WLB 204)**
2301 E. Fort Macon Rd.
Atlantic Beach, NC 28512
Tel: (252) 240-8360

**USCGC FRANK DREW (WLM 557)**
4000 Coast Guard Blvd.
Portsmouth, VA 23703
Tel: (757) 483-8760/8761/8762

**USCGC JAMES RANKIN (WLM 555)**
2401 Hawkins Point Rd.
Baltimore, MD 21226
Tel: (410) 576-2640

**USCGC KENNEBEC (WLIC 802)**
4000 Coast Guard Blvd.
Portsmouth, VA 23703
Tel: (757) 483-8775

**USCGC SLEDGE (WLIC 75303)**
2401 Hawkins Point Rd.
Baltimore, MD 21226
Tel: (410) 576-2635

**USCGC SMILAX (WLIC 315)**
2301 E. Fort Macon Rd.
Atlantic Beach, NC 28512
Tel: (252) 247-4596

**USCGC WILLIAM TATE (WLM 560)**
1 Washington Ave.
Philadelphia, PA 19147
Tel: (215) 271-4954/4955/4956

# USCG NAVIGATION CENTER
# 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, NDGPS, DGPS, and LNM information at 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, and DGPS safety advisory broadcast messages through USCG broadcast stations utilizing VHF-FM voice, HF-SSB voice, and NAVTEX broadcasts. The broadcasts provide the GPS and DGPS user in the marine environment with the current status of the navigation systems, as well as any planned/unplanned system outages that could affect GPS, and DGPS 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
Internet: http://www.navcen.uscg.gov

**This Light List is corrected through Fifth Coast Guard District Local Notice to Mariners No. 52/15**

**and through National Geospatial-Intelligence Agency (NGA) Notice to Mariners No. 52/15**

**The 2016 edition supersedes the 2015 edition.**

## RECORD OF CORRECTIONS

### YEAR 2016

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

### YEAR 2017

| | | | | |
|---|---|---|---|---|
| 1..... | 2..... | 3..... | 4..... | 5..... |
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| 41..... | 42..... | 43..... | 44..... | 45..... |
| 46..... | 47..... | 48..... | 49..... | 50..... |
| 51..... | 52..... | | | |

# 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 Light List. This volume includes aids located between Shrewsbury River, New Jersey and Little River South Carolina.

Included are all Coast Guard aids to navigation used for general navigation such as lights, sound signals, buoys, daybeacons, and other aids to navigation. Not included are some buoys having no lateral significance, such as special purpose, anchorage, fish net, and dredging.

**Aids to Navigation Link:** http://www.uscgboating.org

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

## PRIVATE AIDS TO NAVIGATION

Included: Class I aids to navigation on marine structures or other works which the owners are legally obligated to establish, maintain, and operate as prescribed by the Coast Guard.

Included: Class II aids to navigation exclusive of Class I, located in waters used by general navigation.

Not included: Class III aids to navigation exclusive of Class I and Class II, located in waters not ordinarily used by general navigation.

This Light List is published annually and is intended to furnish more complete information concerning aids to na-vigation than can be conveniently shown on charts. This Light List is not intended to be used in place of charts or Coast Pilots. Charts should be consulted for the location of all aids to navigation. It may be dangerous to use aids to navigation without ref-erence to charts.

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 are also broadcast through Coast Guard or Naval radio stations and NAVTEX. Mariners should keep their Light Lists, charts and other nautical publications corrected from these notices and should consult all notices issued after the date of publication of this Light List.

The electronic version of this publication is available at: http://www.navcen.uscg.gov/index.php?pageName=lightLists

A weekly-updated electronic copy of this publication is also available at:
http://www.navcen.uscg.gov/index.php?pageName=lightListWeeklyUpdates

**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 in order 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:

**Commander (dpw)**
**Fifth Coast Guard District**
**431 Crawford Street**
**Portsmouth, VA 23704-5004**

or

**USCG Navigation Center**
**Charting Branch**
**MS 7310**
**7323 Telegraph Road**
**Alexandria, VA 20598-7310**
**Email: TIS-PF-NISWS@USCG.MIL**

## INTRODUCTION

**Arrangement.** Aids to navigation on the coasts are arranged 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 arranged from east to west and from south to north, except on Lake Michigan which is arranged from north to south. Seacoast aids to navigation are listed first, followed by entrance and harbor aids to navigation, listed from seaward to the head of navigation.

Names of aids to navigation are printed as follows to help distinguish at a glance the type of aid to navigation listed:

**Seacoast/Lake coast Lights and Secondary Lights**
**RACONS**
**Sound Signals**
RIVER, HARBOR, AND OTHER LIGHTS
*Lighted Buoys*
Daybeacons and Unlighted Buoys

Light List Numbers are assigned to all Federal aids to navigation and many private aids to navigation for reference in the Light List. Aids to navigation are 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 of the aid to navigation.
A dash (–) is used to indicate the bold heading is part of the name of the aid to navigation. When reporting discrepancies or making reference to such aids to navigation in correspondence, the full name of the aid, including the geographic heading, should be given.

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

Bearings on rangelines are given in degrees and tenths.

Column (3): Geographic position of the aid to navigation in latitude and longitude. Positions are approximate and only intended to facilitate locating the aid on a chart.

Column (4): Light characteristic for lighted aid to navigation.

Column (5): Height above water from the focal plane of the fixed light to mean high water, listed in feet.

Column (6): Nominal range of lighted aids to navigation, in nautical miles, listed by color for alternating sector and passing lights. Not listed for ranges, directional lights, or private aids to navigation.

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 characteristic including the VHF-FM channel if remotely activated, RACON, light sector arc of visibility, radar reflector, emergency lights, seasonal remarks, and Private AtoN identification.

**Abbreviations used in the Light Lists.**

Al - Alternating
bl - blast
C - Canadian
ec - Eclipse
ev - Every
F - Fixed
fl - flash
Fl - Flashing
Fl(2) - Group flashing
I - Interrupted
Iso - Isophase (Equal interval)
kHz - Kilohertz
LFl - Long Flash
lt - Lighted
Y - Yellow
MHz - Megahertz
Mo - Morse Code
Oc - Occulting
ODAS - Anchored Oceanographic Data Buoy
Q - Quick (Flashing)
Ra ref - Radar reflector
s - seconds
si - silent
SPM - Single Point Mooring Buoy
SS -Sound Signal
W - White

### U.S. COAST GUARD LIGHT LISTS

Electronic Light Lists are available on the Coast Guard Navigation Center's (NAVCEN) website at http://www.navcen.uscg.gov/?pageName=lightLists. Complete versions of the Light Lists are updated weekly on the NAVCEN website at http://www.navcen.uscg.gov/?pageName=lightListWeeklyUpdates. Mariners should download applicable copies and updates as needed. Electronic nautical publications are authorized for use on commercial vessels. To keep current on Light List changes, subscribe to http://www.navcen.uscg.gov/?pageName=listServerForm

### NOTICES TO MARINERS

**Broadcast Notices to Mariners** are made by the Coast Guard through Coast Guard and Navy radio stations. These broadcast notices, which are broadcast on VHF-FM, NAVTEX, and other maritime frequencies, are navigational warnings that contain information of importance to the safety of navigation. Included are reports of deficiencies and changes to aids to navigation, the positions of ice and derelicts, and other important hydrographic information.

Radio stations broadcasting Notices to Mariners are listed in the National Ocean Service Coast Pilots and in the National Geospatial-Intelligence Agency publication Radio Navigational Aids (CDPUBRA117).

**Local Notice to Mariners** (U.S. regional coverage) are another means by which the Coast Guard disseminates navigation information for the United States, its territories,

and possessions. A Local Notice to Mariners is issued by each Coast Guard district and is used to report changes and discrepancies to aids to navigation maintained by and under the authority of the Coast Guard. Local Notice to Mariners contain other marine information such as channel depths, naval operations, regattas, etc., which may affect vessels and waterways within the jurisdiction of each Coast Guard district. Reports of channel conditions, obstructions, menaces to navigation, danger areas, new chart editions, etc., are also included in the Local Notice to Mariners.

These notices are essential to all navigators for the purposes of keeping charts, Light Lists, Coast Pilots, and other nautical publications up-to-date. These notices are published as often as required, but usually weekly. They may be obtained via the U.S. Coast Guard Navigation Center Website.

Vessels operating in ports and waterways in several districts will have to obtain the Local Notice to Mariners from each district in order to be fully informed.

**Weekly Notice to Mariners** are prepared jointly by the National Geospatial-Intelligence Agency, the U.S. Coast Guard, and the National Ocean Service, and are published weekly by National Geospatial-Intelligence Agency.

The Weekly Notice to Mariners advise mariners of important matters affecting navigational safety including new hydrographic discoveries, changes in channels and aids to navigation. Also included are corrections to Light Lists, Coast Pilots, and Sailing Directions. Foreign marine information is also included. This notice is intended for mariners and others who have a need for information related to oceangoing operations. Because it is intended for use by oceangoing vessels, many corrections that affect small craft navigation and associated waters are not included. Information concerning small craft is contained in the Coast Guard Local Notice to Mariners only. The Weekly Notices to Mariners may be obtained free of charge via the http://www.nga.mil/portal/site/maritime or by email subscription.

### NAUTICAL CHARTS AND PUBLICATIONS

Electronic Light Lists are available on the Coast Guard Navigation Center's (NAVCEN) website at http://www.navcen.uscg.gov/?pageName=lightLists. Complete versions of the Light Lists are updated weekly on the NAVCEN website at http://www.navcen.uscg.gov/?pageName=lightListWeeklyUpdates. Mariners should download applicable copies and updates as needed. Electronic nautical publications are authorized for use on commercial vessels. To keep current on Light List changes, subscribe to: http://www.navcen.uscg.gov/?pageName=listServerForm

Maps for the Mississippi River System are published by the various U.S. Army Corps of Engineer District Engineers.

Tide Tables and Tidal Current Tables are no longer printed or distributed by NOS. Private publishing companies are printing the tables using data provided by NOS. These products may be obtained from local stores that carry marine publications.

### AIDS TO NAVIGATION DISCREPANCIES

The Coast Guard does not keep the tens of thousands of aids to navigation comprising the U.S. Aids to Navigation System under simultaneous and continuous observation. Mariners should realize that it is impossible to maintain every aid to navigation operating properly and on its assigned position at all times. Therefore, for the safety of all mariners, any person who discovers 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 directly to one of the U.S. Government radio stations listed in Chapter 3, Section 300L, Radio Navigational Aids (CDPUBRA117).

Recommendations and requests for aids to navigation and to report aids to navigation that are no longer needed should be mailed to the Coast Guard district concerned (see pg. ii).

## 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 will improve 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 IALA Region A. Lateral aids to navigation in Region A vary from those located within Region B. Non-lateral aids to navigation 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.

The U.S. Aids to Navigation System is designed for use with nautical charts. Nautical charts portray the physical features of the marine environment, including soundings and other submarine features, landmarks, and other aids necessary for the proper navigation of a vessel. This crucial information cannot be obtained from other sources, even ones such as topographic maps, aeronautical charts, or atlases. The exact meaning of an aid to navigation may not be clear to the mariner unless the appropriate chart is consulted, as the chart illustrates the relationship of the individual aid to navigation to channel limits, obstructions, hazards to navigation, and to the total aids to navigation system.

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

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 by nonlateral aids to navigation where appropriate.

**TYPES OF MARKS**

Lateral marks are buoys or beacons indicating the port and starboard sides of a route to be followed, and are used in conjunction with a conventional direction of buoyage.

Generally, lateral aids to navigation indicate on which side of a vessel an aid to navigation should be passed when the vessel is proceeding in the conventional direction of buoyage. Normally, the conventional direction of buoyage is the direction in which a vessel enters navigable channels from seaward and proceeds towards the head of navigation. In the absence of a route leading from seaward, the conventional direction of buoyage generally follows a clockwise direction around land masses.

For example, proceeding southerly along the Atlantic Coast, from Florida to Texas along the Gulf Coast, and northerly along the Pacific Coast are considered as proceeding in the conventional direction of buoyage. In some instances, this direction must be arbitrarily assigned. Where doubt exists, the mariner should consult charts and other nautical publications.

Virtually all U.S. lateral marks are located in IALA Region B and follow the traditional 3R rule of red, right, returning. A summary of the port and starboard hand lateral mark characteristics is contained in the following table.

| Characteristic | Port Hand | Starboard Hand |
|---|---|---|
| Color | Green | Red |
| Shape (buoys) | Cylindrical (can) or pillar | Conical (nun) or pillar |
| Dayboard | Green square | Red triangle |
| Topmark (if fitted) | Cylinder | Cone, point upward |
| Light Color (if | Green | Red |
| Reflector Color | Green | Red |
| Number | Odd | Even |

U.S. lateral aids to navigation at certain Pacific Islands are located within IALA Region A and thus exhibit opposite color significance. Port hand marks are red with square or cylindrical shapes while starboard hand marks are green with triangular or conical shapes.

Preferred channel marks are aids to navigation which mark channel junctions or bifurcations and often mark wrecks or obstructions. Preferred channel marks may normally be passed on either side by a vessel, but indicate to the mariner the preferred channel. Preferred channel marks are colored with red and green bands.

At a point where a channel divides, when proceeding in the conventional direction of buoyage, a preferred channel in IALA Region B may be indicated by a modified port or starboard lateral mark as follows:

| Characteristic | Preferred to starboard | Preferred to port |
|---|---|---|
| Color | Green with one broad red band | Red with one broad green band |
| Shape (buoys) | Cylindrical (can) or pillar | Conical (nun) or pillar |
| Dayboard | Green square, lower half red | Red triangle, lower half green |
| Topmark (when fitted) | Green square or cylinder | Red triangular cone, point up- |
| Light Color (if lighted) | Green | Red |
| Rhythm | Composite group flashing (2+1) | Composite group flashing (2+1) |
| Reflector color | Green | Red |

CAUTION: It may not always be possible to pass on either side of preferred channel aids to navigation. The appropriate nautical chart should always be consulted.

Non-lateral marks have no lateral significance, but may be used to supplement the lateral aids to navigation specified above. Occasionally, daybeacons or minor lights outside of the normal channel will not have lateral significance since they do not define limits to navigable waters. These aids to navigation will utilize diamond-shaped dayboards and are divided into four diamond-shaped sectors. The side sectors of these dayboards are colored white, and the top and bottom sectors are colored black, red, or green as the situation dictates.

Safe water marks are used to mark fairways, midchannels, and offshore approach points, and indicate that there is unobstructed water on all sides. They can also be used by the mariner transiting offshore waters to identify the proximity of intended landfall. Safe water marks are red and white striped and have a red spherical topmark to further aid in identification. If lighted, they display a white light with the characteristic Morse code "A".

Isolated danger marks are erected on, moored over, or placed immediately adjacent to an isolated danger that may be passed on all sides. These marks should not be approached closely without special caution.

Isolated danger marks are colored with black and red bands, and if lighted, display a group flashing (2) white light. A topmark consisting of two black spheres, one above the other is fitted for both lighted and unlighted marks.

Special marks are not primarily intended to assist safe navigation, but to indicate special areas or features referred to on charts or in other nautical publications. The feature should be described in a nautical document such as a chart, Light List, Coast Pilot or Notice to Mariner. Some areas that may be marked by these aids to navigation are spoil areas, pipelines, traffic separation schemes, jetties, or military exercise areas. Special marks are yellow in color and, if lighted, display a yellow light.

Information and regulatory marks are used to alert the mar-

iner to various warnings or regulatory matters. These marks have orange geometric shapes against a white background. The meanings associated with the orange shapes are as follows:

1. An open-faced diamond signifies danger.
2. A vertical diamond shape having a cross centered within indicates that vessels are excluded from the marked area.
3. A circular shape indicates that certain operating restrictions are in effect within the marked area.

Warnings, instructions, or explanations may be shown within the shapes.

**BUOYS AND BEACONS**

Aids to navigation are placed on shore or on marine sites to assist navigators in determining their position or safe course. They may mark limits of navigable channels, or warn of dangers or obstructions to navigation. The primary components of the U.S. Aids to Navigation System are beacons and buoys.

Buoys are floating aids to navigation used extensively throughout U.S. waters. They are moored to the seabed by sinkers with chain or other moorings of various lengths.

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

Prudent mariners will use bearings or angles from beacons or other landmarks, soundings, and various methods of electronic navigation.

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

Buoy moorings vary in length. The mooring lengths define a “watch circle”, and buoys can be expected to move within this circle. Actual watch circles do not coincide with the buoy symbols representing them on charts.

Buoy positions are normally verified during periodic maintenance visits. Between visits, environmental conditions, including atmospheric and sea conditions, seabed slope and composition, may shift buoys off their charted positions. Also buoys may 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.

Beacons exhibit a daymark. For small structures these are colored geometric shapes which 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 does the aid's light or reflector at night. The daymark of towers, however, consists of the structure itself. As a result, these daymarks do not infer lateral significance.

Vessels should not pass fixed aids to navigation close aboard due to the danger of collision with rip-rap or structure foundations, or with the obstruction or danger being marked.

**LIGHTED AIDS TO NAVIGATION**

Most lighted aids to navigation are equipped with 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 the possibility of a light being extinguished or operating improperly.

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 of 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 thick weather. 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. Always check the characteristics of lights so powerful lights, visible in the distance, are not mistaken 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 in order to ensure the safety of the vessel.

The apparent characteristic of a complex light may change with the distance of the observer. For example, a light which actually displays a characteristic of fixed white varied by flashes of alternating white and red (the rhythms having a decreasing range of visibility in the order: flashing white, flashing red, fixed white) may, when first sighted in clear weather, show as a simple flashing white light. As the vessel draws nearer, the red flash will become visible and the characteristics will apparently be alternating flashing white and red. Later, the fixed white light will be seen between the flashes and the true characteristic of the light will finally be recognized as fixed white, alternating flashing white and red (F W Al WR).

If a vessel has considerable vertical motion due to pitching in heavy seas, a light sighted on the horizon may alternately 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 effects 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.

Sectors of colored glass are placed in the lanterns of some lights in order 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.

Altering course on the changing sectors of a light or using the boundaries between light sectors to determine the bearing for any purpose is not recommended. 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 are present in the intervening atmosphere, a white sector might have a reddish hue.

The area in which a light can be observed is normally an arc with the light as the center and the range of visibility as the radius. However, on some bearings, the range may be reduced by obstructions. In such cases, the obstructed arc might differ with height of eye and distance. When adjoining land cuts off a light and the arc of visibility is given, the bearing on which the light disappears may vary with the distance of the vessel from which observed and with the height of eye. When the light is cut off by a sloping hill or point of land, the light may be seen over a wider arc by a vessel farther away than by one closer to the light.

The arc drawn on charts around a light is not intended to give information as to the distance at which it can be seen, but solely to indicate, in the case of lights, which do not show equally in all directions, the bearings between which the variation of visibility or obstruction of the light occurs.

**PRIVATE AIDS TO NAVIGATION**

Included: Class I aids to navigation on marine structures or other works which the owners are legally obligated to establish, maintain, and operate as prescribed by the Coast Guard.

Included: Class II aids to navigation exclusive of Class I, located in waters used by general navigation.

Not included: Class III aids to navigation exclusive of Class I and Class II, located in waters not ordinarily used by general navigation.

**OIL WELL STRUCTURES**

Oil well structures in navigable waters are not listed in the Light List. 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 fixed or quick flashing white or red 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., normally are not lighted. In addition, some of the structures are equipped with sound signals (bell, siren, whistle, or horn). When operating, bells sound one stroke every 15 seconds, while sirens, whistles, or horns sound a single two-second blast every 20 seconds.

## CHARACTERISTICS OF AIDS TO NAVIGATION

**LIGHT COLORS**

Only aids to navigation with green or red lights have lateral significance. When proceeding in the conventional direction of buoyage, the mariner in IALA Region B, may see the fol-

lowing 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.

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

**LIGHT RHYTHMS**

Light rhythms have no lateral significance. Aids to navigation with lateral significance exhibit flashing, quick, occulting or isophase light rhythms. Ordinarily, flashing lights (frequency not exceeding 30 flashes per minute) will be used.

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

Safe water marks show a white Morse code "A" rhythm (a short flash followed by a long flash).

Isolated danger marks show a white flashing (2) rhythm (two flashes repeated regularly).

Special marks show yellow lights and exhibit a flashing or fixed rhythm; however, a flashing rhythm is preferred.

Information and regulatory marks, when lighted, display 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.

**SHAPES**

In order to provide easy identification, certain unlighted buoys and dayboards on beacons are differentiated by shape. These shapes are laterally significant only when associated with laterally significant colors.

Cylindrical buoys (referred to as "can buoys") and square dayboards mark the left side of a channel when proceeding from seaward. 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 right 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.

**NUMBERS**

All solid red and solid green aids to navigation are numbered, with red aids to navigation bearing even numbers and green aids to navigation bearing odd numbers. The numbers for each increase from seaward, 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 from seaward, proceeding in the conventional direction of buoyage, and are added to numbers as suffix-es. Aid numbers preceded with WR indicate the aid is marking a wreck.

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.

**DAYBOARDS**

In order to describe the appearance and purpose of each dayboard used in the U.S. System, standard designations have been formulated. 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-shaped) used for special purpose, warning, distance, or location markers.

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

T: Triangle used to mark the starboard (right) 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.

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.

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

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 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 illustration of U.S. Aids to Navigation System.

**OTHER SHORT RANGE AIDS TO NAVIGATION**

Lighthouses are placed on shore or on marine sites and most often do not show lateral markings. They assist mariners in determining their position or safe course, or warn of obstructions or dangers to navigation. Lighthouses with no lateral significance usually exhibit a white light.

Occasionally, lighthouses use sectored lights to mark shoals or warn mariners of other dangers. Lights so equipped show one color from most directions and a different color or colors over definite arcs of the horizon as indicated on the appropriate nautical chart. These sectors provide approximate bearing information and the observer should note a change of color as the boundary between the sectors is crossed. Since sector bearings are not precise, they should be considered as a warning only, and used in conjunction with a nautical chart.

Seasonal aids to navigation are placed into service, withdrawn, or changed at specified times of the year. The dates shown in the Light List (Col. 8) are approximate and may vary due to adverse weather or other conditions.

Ranges are non-lateral aids to navigation employing dual beacons which, when the structures appear to be in line, assist the mariner in maintaining a safe course. The appropriate nautical chart must be consulted when using ranges to determine whether the range marks the centerline of the navigable channel and also what section of the range may be safely traversed. Ranges typically display rectangular dayboards of various colors and are generally, but not always lighted. When lighted, ranges may display lights of any color.

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 fog detector). The Coast Guard is replacing many fog detectors with remote radio activated sound signals. 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 30 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. The devices producing the sound, e.g., diaphones, diaphragm horns, sirens, whistles, bells, and gongs determine tones.

Phase characteristics are defined by the signal's sound pattern, i.e., the number of blasts and silent periods per minute and their durations. Sound signals sounded from fixed structures generally produce a specific number of blasts and silent periods each minute when operating. Buoy sound signals 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 can be located 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 is keyed. All waterway users equipped with a VHF-FM radio may activate the sound signal, but they are not required to do so. Unless it is specifically stated that a sound signal "Operates continuously", or the signal is a bell, gong, or whistle on a buoy, it can be assumed that the sound signal only operates during times of fog, reduced visibility, or adverse weather.

An emergency sound signal is sounded at some locations when the main and standby signals are inoperative. If the emergency signal is of a different type or characteristic than the main signal, its characteristic is listed in column (8) of this publication.

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.

## VARIATIONS TO THE U.S. SYSTEM

**Intracoastal Waterway** aids to navigation: The Intracoastal Waterway runs parallel to the Atlantic and Gulf coasts from Manasquan Inlet, New Jersey to the Mexican border. Aids to navigation marking these waters have some portion of them marked with yellow. Otherwise, the coloring and numbering of the aids to navigation follow the same system as that in other U.S. waterways.

In order that vessels may readily follow the Intracoastal Waterway route, special markings are employed. These marks consist of a yellow square and yellow triangle and indicate which side the aid to navigation should be passed when following the conventional direction of buoyage. The yellow square indicates that the aid to navigation should be kept on the left side and the yellow triangle indicates that the aid to navigation should be kept on the right side. A yellow horizontal band provides no lateral information, but simply identifies aids as marking the Intracoastal Waterway.

**Western Rivers aids to navigation:** The Western Rivers System, a variation of the standard U.S. Aids to Navigation System described in the preceding sections, is employed on the Mississippi River and its tributaries above Baton Rouge, LA and on certain other rivers which flow toward the Gulf of Mexico.

The Western Rivers System varies from the standard U.S. system as follows:

1. Aids to navigation are not numbered.
2. Numbers on aids to navigation do not have lateral significance, but rather indicate mileage from a fixed point (normally the river mouth).
3. Diamonds shaped crossing dayboards, red and white or green and white as appropriate, and are used to indicate where the river channel crosses from one bank to the other.
4. Lights on green aids to navigation show a single-flash characteristic, which may be green or white.
5. Lights on red aids to navigation show a group-flash characteristic, which may be red or white.
6. Isolated danger marks are not used.

**BRIDGE MARKINGS**

Bridges across navigable waters are generally 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 used on drawbridges to show when they are in the closed position.

Green lights are used 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 retroreflective 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 should be 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 retroreflective panels and may exhibit a yellow light that displays a Morse code "B"(-...).

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. They indicate the vertical clearance available under the span.

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

## ELECTRONIC AIDS TO NAVIGATION

### RACONS

Aids to navigation may be enhanced by the use of **RA**dar bea**CONS** (RACONS). RACONS, when triggered by a vessel's radar, will transmit a coded reply to the vessel's radar. This reply serves to identify the RACON station by exhibiting a series of dots and dashes which appear on the radar display radially from the RACON. This display will represent the approximate range and bearing to the RACON. Although RACONS may be used on both laterally significant and non-laterally significant aids to navigation, the RACON signal itself is for identification purposes only. RACONS are also used as bridge marks to mark the point of best passage. All RACONS operate in the radar X-band from 9,300 to 9,500 MHz. Some RACONS also operate in the 2,900 to 3,000 MHz radar S-band.

RACONS have a typical output of 100 to 300 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 with a directional antenna mounted at a height of 50 feet on a fixed structure. It must be understood that these are nominal ranges and are dependent upon many factors.

The beginning of the RACON presentation occurs about 50 yards beyond the RACON position and will persist for a number of revolutions of the radar antenna (depending on its rotation rate). Distance to the RACON can be measured to the point at which the RACON flash begins, but the figure obtained will be greater than the ship's distance from the RACON. This is due to the slight response delay in the RACON apparatus.

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 adjustment of 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

Many aids to navigation incorporate special fixtures designed to enhance the reflection of radar energy. These fixtures, called radar reflectors, help radar-equipped vessels to detect buoys and beacons, which are so equipped. They do not however, positively identify a radar target as an aid to navigation.

### GLOBAL POSITIONING SYSTEM (GPS)

GPS is a satellite based navigation system which provides precise, worldwide, three-dimensional navigation capabilities. The system was originally designed for military application, however it is also available to merchant, recreational and fishing vessels using a variety of commercial receivers. The GPS System has reached Full Operating Capability (FOC). FOC status signifies that the system meets specific requirements of performance. The GPS is operated and controlled by the Department of Defense (DOD) under U.S. Air Force management.

GPS uses a network of 24 satellites (nominal) when the system is fully operational. The satellites are placed in one of six precise orbital planes, which complete a circular 10,900 nautical mile orbit of the earth once every 12 hours. 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 17 meters, 95% percent of the time. At least three satellites are required for a two-dimensional solution. The GPS system does not provide integrity information and mariners should exercise extreme caution when using GPS in restricted waterways.

Federal Radionavigation Policy (FRP) has established that GPS will be available for civil use. Whenever possible, advance notice of when the GPS satellites should not be used will be provided by the DOD and made available by the U.S. Coast Guard GPS status messages.

### DIFFERENTIAL GPS (DGPS)

The Coast Guard has partnered with the Department of Transportation (DOT) and the Army Corps of Engineers to provide a system for marine navigation called Differential GPS (DGPS). As the newest electronic system of navigation, DGPS transmitters provide offshore coverage and an all-weather electronic aid to navigation capability. The Nationwide DGPS sites provide signal coverage to 92% of the continental United States, including the Great Lakes, complete coverage of the coastline, as well as selected portions of Alaska, Hawaii, Puerto Rico, and the inland river system. The Coast Guard's Maritime portion of the DGPS system achieved Full Operational Capability (FOC) on March 15, 1999. The network now meets the high standards of accuracy, integrity, reliability, availability and coverage required for the Harbor Entrance and Approach phase of navigation. As of November 2010, 29 DOT sites, 9 ACOE sites, and 50 USCG Sites were providing differential corrections.

### How DGPS works:

DGPS is an augmentation to the GPS signals. Each site corrects for small variations in the signals from each satellite that is in view at that time. Satellite signals can vary due to small changes in the satellite's circuitry and orbit and from changes caused by local weather conditions. Satellite corrections are transmitted to users via radio signals in the medium frequency band (285-325 kHz) previously used for marine radiobeacons. DGPS corrections and integrity information are transmitted using Minimum Shift Keying (MSK) modulation; the modulation data rate is usually 100 or 200 bits per second (bps) but can also be 50 bps. The range of DGPS transmissions is from 40 to 300 nautical miles.

DGPS is the first federal radionavigation system capable of providing the 10-meter navigation service required for the harbor entrance and approach phase of maritime navigation. DGPS provides integrity messages for signals from the GPS satellites as well as DGPS position corrections and provides absolute position accuracy of 1-5 meters.

Each DGPS site has two reference stations (which calculate the differential corrections), two integrity monitors (which ensure the differential corrections are accurate), a transmitter and communications equipment to communicate status information to and receive control commands from the control station. Each transmitter and reference station has a unique ID number that permits users to determine which site/equipment is providing their differential corrections. As distance from the transmitting site increases, the small error in the differential corrections increases; best accuracy is achieved when using the DGPS site closest to the user.

Information regarding the location of DGPS transmitters is given on the map labeled U.S. DGPS Sites & Identification Numbers on page i. Users can access additional information and DGPS system status, submit questions, and provide comments via the Navigation Information Service website or by calling the Coast Guard Navigation Center DGPS watchstander at (703) 313-5902.

**NAVIGATION INFORMATION SERVICE (NIS)**

The Coast Guard is the government interface for civil users of GPS and has established a Navigation Information Service (NIS) to meet the information needs of the civil user. The NIS is a Coast Guard facility that is manned 24 hours a day, 7 days a week, and is located at the Navigation Center (NAVCEN) in Alexandria, VA. It provides voice broadcasts, data broadcasts, facsimile, and on-line computer-based information services, which are all available 24 hours a day. The information provided includes present or future satellite outages and constellation changes, user instructions and tutorials, lists of service and receiver provider/users, and other GPS, and DGPS related information.

**NAVIGATION CENTER Internet Service (www)**

Users with access to the internet can access real time or archived GPS, NDGPS, DGPS, and LNM information at http://www.navcen.uscg.gov as well as subscribe to a list server that enables users to receive GPS status messages and Notice to NAVSTAR User (NANU) messages via direct Internet e-mail.

The NAVCEN 24 hour voice recording is a 3-line telephone answering machine. Up to 3 callers can listen to the 90 second recording at the same time.

The NAVCEN also disseminates GPS and DGPS safety advisory broadcast messages through USCG broadcast stations utilizing VHF-FM voice, HF-SSB voice, and NAVTEX broadcasts. The broadcasts provide the GPS and DGPS user in the marine environment with the current status of the navigation systems, as well as any planned/unplanned system outages that could affect GPS and DGPS 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 Navigation Center
MS 7310
7323 Telegraph Road
Alexandria, VA 22310-3998
Phone: (703) 313-5900
FAX: (703) 313-5920
Internet: http://www.navcen.uscg.gov

# 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.

**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.

**Automatic Identification System (AIS):** AIS is an internationally adopted radio communication protocol that enables the autonomous and continuous exchange of navigation safety related messages amongst vessels, lifeboats, aircraft, and, aids to navigation (ATON). AIS ATON stations broadcast via AIS message 21, their presence, identity (9-digit Marine Mobile Service Identity number), nature, position, and, status; every 3 minutes or upon a change in status. For further information on AIS and its ATON Report message visit http://www.navcen.uscg.gov/?pageName=AISmain

**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 similar to 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 of 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.

# GLOSSARY OF AIDS TO NAVIGATION TERMS

**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 flashed 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.

**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 main stream.

**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.

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

**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 System.

**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 occultations which are repeated at regular intervals.

**Ocean Data Acquisition System (ODAS)**: Certain very 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.

**Off Shore 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 commencement of two identical successive cycles of the characteristic of the light or sound signal.

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

**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.

**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 left to the starboard hand when proceeding in the Conventional Direction of Buoyage.

**Topmark**: 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.

**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.

**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.

# ABBREVIATIONS USED IN BROADCAST NOTICE TO MARINERS

**Light Characteristics**

| | |
|---|---|
| Alternating | AL |
| Characteristic | CHAR |
| Composite Group-Flashing | FL (2+1) |
| Composite Group-Occulting | OC (2+1) |
| Continuous Quick-Flashing | Q |
| Fixed and Flashing | FFL |
| Fixed | F |
| Group-Flashing | FL (3) |
| Group-Occulting | OC (2) |
| Interrupted Quick-Flashing | IQ |
| Isophase | ISO |
| Morse Code | MO (A) |
| Occulting | OC |
| Single-Flashing | FL |

**Colors***

| | |
|---|---|
| Black | B |
| Blue | BU |
| Green | G |
| Orange | OR |
| Red | R |
| White | W |
| Yellow | Y |

*NOTE: Color refers to characteristics of aids to navigation only.

**Aids to Navigation**

| | |
|---|---|
| Aeronautical Radiobeacon | AERO RBN |
| Destroyed | DESTR |
| Differential GPS | DGPS |
| Discontinued | DISCONTD |
| Established | ESTAB |
| Exposed Location Buoy | ELB |
| Extinguished | EXT |
| Fog Signal Station | FOG SIG |
| Light List Number | LLNR |
| Light | LT |
| Lighted Bell Buoy | LBB |
| Lighted Buoy | LB |
| Lighted Gong Buoy | LGB |
| Lighted Horn Buoy | LHB |
| Lighted Whistle Buoy | LWB |
| Ocean Data Acquisition System | ODAS |
| Privately Maintained | PRIV MAINTD |
| Radar Reflector | RA REF |
| Radar Responder Beacon | RACON |
| Temporarily Replaced by Lighted Buoy | TRLB |
| Temporarily Replaced by Unlighted Buoy | TRUB |
| Whistle | WHIS |

**Organizations**

| | |
|---|---|
| Commander, Coast Guard District | CCGD (#) |
| Coast Guard | CG |
| Corps of Engineers | COE |
| National Geospatial-Intelligence Agency | NGA |
| National Ocean Service | NOS |
| National Weather Service | NWS |

**Vessels**

| | |
|---|---|
| Aircraft | A/C |
| Fishing Vessel | F/V |
| Liquefied Natural Gas Carrier | LNG |
| Motor Vessel (includes Steam Ship, Container Ship, Cargo Vessel, Tanker etc) | M/V |
| Pleasure Craft | P/C |
| Research Vessel | R/V |
| Sailing Vessel | S/V |

**Compass Directions**

| | |
|---|---|
| North | N |
| South | S |
| East | E |
| West | W |
| Northeast | NE |
| Northwest | NW |
| Southeast | SE |
| Southwest | SW |

**Months**

| | |
|---|---|
| January | JAN |
| February | FEB |
| March | MAR |
| April | APR |
| May | MAY |
| June | JUN |
| July | JUL |
| August | AUG |
| September | SEP |
| October | OCT |
| November | NOV |
| December | DEC |

**Days of the Week**

| | |
|---|---|
| Monday | MON |
| Tuesday | TUE |
| Wednesday | WED |
| Thursday | THU |
| Friday | FRI |
| Saturday | SAT |
| Sunday | SUN |

**Various**

| | |
|---|---|
| Anchorage | ANCH |
| Anchorage Prohibited | ANCH PROHIB |
| Approximate | APPROX |
| Atlantic | ATL |
| Authorized | AUTH |
| Average | AVG |
| Bearing | BRG |
| Breakwater | BKW |
| Broadcast Notice to Mariners | BNM |
| Captain of the Port | COTP |
| Channel | CHAN |
| Code of Federal Regulations | CFR |
| Continue | CONT |
| Degrees (temp, geo, pos) | DEG |
| Diameter | DIA |
| Edition | ED |
| Effect/Effective | EFF |
| Entrance | ENTR |
| Explosive Anchorage | EXPLOS ANCH |
| Fathom(s) | FM(S) |
| Foot/Feet | FT |

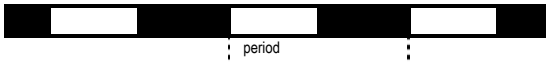
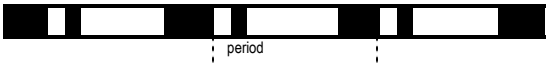
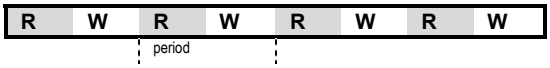
# ABBREVIATIONS USED IN BROADCAST NOTICE TO MARINERS

| | |
|---|---|
| Harbor | HBR |
| Height | HT |
| Hertz | HZ |
| Horizontal Clearance | HOR CL |
| Hour | HR |
| International Regulations for Preventing Collisions at Sea | COLREGS |
| Kilohertz | KHZ |
| Kilometer | KM |
| Knot(s) | KT(S) |
| Minute (time, geo, pos) | MIN |
| Moderate | MOD |
| Mountain, Mount | MT |
| Nautical Mile(s) | NM |
| Notice to Mariners | NTM |
| Obstruction | OBSTR |
| Occasion/Occasionally | OCCASION |
| Operating Area | OPAREA |
| Pacific | PAC |
| Point(s) | PT(S) |
| Position | POS |
| Position Approximate | PA |
| Pressure | PRES |
| Private, Privately | PRIV |
| Prohibited | PROHIB |
| Publication | PUB |
| Range | RGE |
| Reported | REP |
| Restricted | RESTR |
| Rock | RK |
| Saint | ST |
| Second (time, geo, pos) | SEC |
| Signal Station | SIG STA |
| Station | STA |
| Statute Mile(s) | SM |
| Storm Signal Station | S SIG STA |
| Temporary | TEMP |
| Thunderstorm | TSTORM |
| Through | THRU |
| True | T |
| Uncovers, Dries | UNCOV |
| Universal Coordinate Time | UTC |
| Urgent Marine Information Broadcast | UMIB |
| Velocity | VEL |
| Vertical Clearance | VERT CL |
| Visibility | VIS |
| Yard(s) | YD |
| Warning | WARN |
| Weather | WX |
| Wreck | WK |

**Countries and States**

| | |
|---|---|
| Alabama | AL |
| Alaska | AK |
| American Samoa | AS |
| Arizona | AZ |
| Arkansas | AR |
| California | CA |
| Canada | CN |
| Colorado | CO |
| Connecticut | CT |
| Delaware | DE |
| District of Columbia | DC |
| Florida | FL |
| Georgia | GA |
| Guam | GU |
| Hawaii | HI |
| Idaho | ID |
| Illinois | IL |
| Indiana | IN |
| Iowa | IA |
| Kansas | KS |
| Kentucky | KY |
| Louisiana | LA |
| Maine | ME |
| Maryland | MD |
| Marshall Islands | MH |
| Massachusetts | MA |
| Missouri | MO |
| Mississippi | MS |
| Mexico | MX |
| Michigan | MI |
| Minnesota | MN |
| Montana | MT |
| Nebraska | NE |
| Nevada | NV |
| New Hampshire | NH |
| New Jersey | NJ |
| New Mexico | NM |
| New York | NY |
| North Carolina | NC |
| North Dakota | ND |
| Northern Marianas | MP |
| Ohio | OH |
| Oklahoma | OK |
| Oregon | OR |
| Pennsylvania | PA |
| Puerto Rico | PR |
| Rhode Island | RI |
| South Carolina | SC |
| 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 |

# CHARACTERISTICS OF LIGHTS

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

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# INDEX

## A


Aberdeen Creek . . . . . 13890
Aberdeen Proving Ground Channel . . . . . 27520
Aberdeen Restricted Area . . . . 8705, 27290
Absecon Inlet . . . . . 1175
Adams Creek . . . . . 38295
Albemarle Plantation Marina . . 31545
Albemarle Sound . . . . . 31350
Alexandria Channel . . . . . 18605
Alligator River - Pungo River . 38005
Alligator River . . . . . 37835
Anacostia River . . . . . 18720
Annapolis Harbor Channel . . . . 19690
Antipoison Creek . . . . . 16005
Appomattox River . . . . . 12535
Aquia Creek . . . . . 17970
Assateague Light . . . . . 275
Avon Channel . . . . . 32250


## B


Baber Point . . . . . 17680
Back Creek - Mobjack Bay . . . 13370
Back Creek . . . . . 19010
Back Creek Channel . . . . . 9180
Back River . . . . . 12910
Back Sound . . . . . 29315
Baker Range . . . . . 2485
Balls Creek . . . . . 25540
Banks Channel . . . . . 30050
Barden Inlet . . . . . 29140
Barnegat Inlet . . . . . 880
Barnegat Light . . . . . 958
Bay Bridge Marina . . . . . 7840
Bay River . . . . . 33395, 38255
Bay Shore Channel . . . . . 1685
Beach Cove . . . . . 4685
Bear Creek . . . . . 20670
Beaufort Harbor Channel . . . . . 34805
Beaufort Inlet . . . . . 29329
Belhaven Channel . . . . . 32930
Belle Isle State Park . . . . . 15303
Bellevue Range . . . . . 3080
Bennett Creek - Poquoson River . . . . . 13260
Bennett Creek . . . . . 11045
Big Annemessex River . . . . . 23280
Big Foot Slough Channel . . . . 29025
Big Thorofare . . . . . 23012
Big Thorofare West . . . . . 23190
Bivalve Channel . . . . . 24045
Blackwalnut Harbor . . . . . 25815
Bloody Point Bar Light . . . . . 7750
Bodie Island Light . . . . . 590
Bodkin Creek . . . . . 20300
Bogue Inlet . . . . . 29495
Bogue Sound - New River . . . 39085
Bogue Sound . . . . . 38530
Bonum Creek . . . . . 16880
Bradley Creek . . . . . 39621.1
Brandywine Shoal Light . . . . . 1555
Brant Island . . . . . 32500
Breton Bay . . . . . 17055
Brewerton Channel . . . . . 8145
Brewerton Channel Eastern Extension . . . . . 8385
Broad Bay . . . . . 10395
Broad Creek . . . . . 14960
Broad Creek . . . . . 22665
Broad Creek Northern Branch . . 15005
Broad Creek Southern Branch . 15003
Browns Bay . . . . . 14230
Bulkhead Bar Range . . . . . 2875
Bulkhead Shoal Channel . . . . . 2765
Bull Bay . . . . . 31575
Burwell Bay . . . . . 11600
Bush River . . . . . 27305
Buxton Harbor . . . . . 32195
Buzzs Marina Channel . . . . . 18840


## C


Calabash Creek . . . . . 31115
Calico Creek . . . . . 34910
Cambridge Channel . . . . . 25020
Camp Lejeune Danger Zone . . 740
Cape Charles City . . . . . 21440
Cape Charles Light . . . . . 350
Cape Fear River - Little River . . . . . 40045
Cape Fear River . . . . . 30310
Cape Hatteras Light . . . . . 625
Cape Henry Light . . . . . 370
Cape Lookout Light . . . . . 670
Cape May Canal West Entrance . . . . . 1650
Cape May Harbor . . . . . 36730
Cape May Inlet . . . . . 1440
Cape May Light . . . . . 155
Cape May Village . . . . . 36777
Cape Windsor Channel . . . . . 4950
Carolina Beach Harbor . . . . . 39760
Carolina Beach Inlet . . . . . 30265
Carter Creek . . . . . 15120
Carthagena Creek . . . . . 16780
Castle Harbor Marina . . . . . 26525
Causeway Channel . . . . . 38720
Cedar Island Bay Channel . . . 34400
Chalk Point Cable Crossing . . 19260
Cherry Island Flats . . . . . 3050
Cherry Island Range . . . . . 2965
Chesapeake Bay . . . . . 12820
Chesapeake Bay Southern Approach . . . . . 410
Chesapeake Beach . . . . . 19285
Chesapeake Channel . . . . . 7030
Chesapeake Harbor . . . . . 19840
Chesapeake Light . . . . . 360
Chesapeake and Delaware Canal . . . . . 2745
Chesconessex Creek . . . . . 22120
Chester Range . . . . . 3215
Chester River . . . . . 26500
Chicamacomico Channel . . . . . 32045
Chickahominy River . . . . . 12141
Chimney Island Slough . . . . . 34907.1
Chincoteague Bay . . . . . 5150
Chincoteague Bay State Boundary Line . . . . . 5165
Chincoteague Channel . . . . . 5305
Chincoteague Inlet . . . . . 5270
Chopawamsic Creek . . . . . 18060
Choptank River . . . . . 24775
Chowan River . . . . . 31785
Christina River . . . . . 3000
Chuckatuck Creek . . . . . 11205
Claiborne Channel . . . . . 26015
Clam Creek . . . . . 1240
Clubfoot Creek . . . . . 33805
Coan River . . . . . 16575
Cohansey . . . . . 1990
Core Creek . . . . . 38385
Core Sound . . . . . 34320
Corrotoman River . . . . . 15155
Courthouse Bay . . . . . 29765
Cove Point . . . . . 7640
Cove Point Light . . . . . 7630
Cow Creek Channel . . . . . 39125
Cox Creek . . . . . 26265
Crab Alley - Little Creek . . . 26310
Crab Alley Bay . . . . . 26280
Crab Creek . . . . . 10156
Craighill Channel . . . . . 7995
Craney Island Creek . . . . . 9665
Craney Island Disposal Area . 9575
Croaker Landing . . . . . 13960
Croatan Sound . . . . . 31900
Cuckold Creek . . . . . 17620
Currituck Beach Light . . . . . 555
Currituck Sound . . . . . 31160
Curtis Bay . . . . . 20860


## D


Dames Quarter Creek . . . . . 23705
Dandy Haven Marina Entrance . 12964
Daugherty Creek . . . . . 23360
Davis Creek . . . . . 14125
Deep Creek (Via Dismal Swamp Canal) . . . . . 36935
Deep Creek . . . . . 20160
Deep Creek Channel . . . . . 11470
Deepwater Range . . . . . 2895
Delaware Bay (East Side) . . . 1945
Delaware Bay (West Side) . . . 2213
Delaware Bay . . . . . 1475
Delaware Bay Main Channel . 1535
Delaware Bay South Approach . 1495
Delaware River (Main Channel) . . . . . 2830
Delaware River . . . . . 3520
Dividing Creek . . . . . 16120
Dredge Harbor . . . . . 3779
Dukeharts Channel . . . . . 17195
Dundalk Terminal East Channel . . . . . 21000

# INDEX


Durant Point . . . . . 32320
Dymer Creek . . . . . 16030

## E

Eagle Point . . . . . 3490
East River . . . . . 14165
Eastern Bay . . . . . 26000
Eastham Creek . . . . . 33070
Eastport Harbor . . . . . 19880
Edenton Bay . . . . . 31740
Edge Creek . . . . . 25725
Eight and One Half Marina . . 38680
Elbow of Cross Ledge Light . . 1600
Elizabeth River . . . . . 9445
Elizabeth River Southern Branch . . . . . 9955, 36805
Elk River Channel . . . . . 8925
Ellyson Creek . . . . . 16430

## F

Fairfield Channel . . . . . 21175
Fairfield Piers . . . . . 21110
Fairlee Creek . . . . . 27405
Far Creek Channel . . . . . 32105
Farm Creek . . . . . 24425
Ferry Bar Channel . . . . . 21205
Fishing Bay . . . . . 24375
Fishing Creek . . . . . 19670
Fort McHenry Channel . . . . . 8215
Fountain Powerboats Factory . . . 33367.1
Four Mile Run . . . . . 18665
Fourteen Foot Bank Light . . . . 1575
Frying Pan Shoals . . . . . 820

## G

George Island . . . . . 5245
Georgetown Channel . . . . . 18770
Germantown Bay . . . . . 32750
Gibson Island . . . . . 20130
Glebe Creek . . . . . 16971
Goodwin Thorofare . . . . . 13310
Goose Creek . . . . . 38145
Goose Creek Channel . . . . . 23395
Grace Creek . . . . . 25675
Grays Creek . . . . . 20135
Great Bridge to Albemarle Sound . . . . . 37150
Great Egg Harbor Inlet . . . . . 1270
Great Machipongo Channel . . . 6890
Great Machipongo Inlet . . . . . 6805
Great Wicomico River . . . . . 16180
Greenbackville . . . . . 5455
Greens Creek . . . . . 33740
Greenvale Creek Channel . . . 15305
Greenwood Creek . . . . . 26343
Guilford Creek . . . . . 22305
Gunpowder River . . . . . 27175

## H

HAW Generating Plant Channel . . . . . 20730
HAW Generating Plant North Channel . . . . . 20775
Hampton Bar . . . . . 9380
Hampton Flats Bar Channel . . 9425
Hampton River . . . . . 10895
Hancock Creek . . . . . 33900
Harbor View . . . . . 17495
Harbor of Refuge . . . . . 2030
Harbor of Refuge Light . . . . . 1530
Harkers Island East Channel . . 29272
Harris Creek . . . . . 25870
Harris River Approach . . . . . 13045
Harts Island Channel . . . . . 27000
Hatteras Inlet . . . . . 28640
Hatteras Inlet Light . . . . . 645, 28625
Havre De Grace Yacht Basin . 27675
Hawkins Point Pier . . . . . 20788
Hereford Inlet Light . . . . . 90
Heron Island Bar Channel . . . 17175
Herring Bay . . . . . 19320
Herring Creek . . . . . 2119.01
Hodges Reef . . . . . 32395
Hog Island Cutoff . . . . . 11875
Honga River . . . . . 24450
Hooper Strait . . . . . 23605
Horn Harbor . . . . . 14445
Hoskins Creek . . . . . 15600
Hungar Creek . . . . . 21605
Hunting Creek . . . . . 22260
Huntington Park Channel . . . . . 11325

## I

Indian Creek . . . . . 16070
Indian River Channel . . . . . 4490
Indian River Inlet . . . . . 4365
Ingram Bay Marina . . . . . 16225
Inlet Watch Yacht club Harbor . 39733
Island Creek Channel . . . . . 16695
Isle of Wight Bay . . . . . 4765

## J

Jackson Creek . . . . . 14700
James River . . . . . 11240
James River . . . . . 12120
Jamestown Island . . . . . 11995
Jarvis Creek . . . . . 16145
Jenkins Creek . . . . . 22860
Jones Bay . . . . . 33380
Jones Creek- Big Annemessex River . . . . . 23305
Jones Creek-Patapsco River . . . 20505

## K

Kedges Straits . . . . . 23460
Kent Island Narrows North Approach . . . . . 26413
Kent Island Narrows South Approach . . . . . 26345
Kings Creek . . . . . 21531
Kiptopeke Beach . . . . . 21420
Kitty Hawk Bay . . . . . 31330
Knapps Narrows West Channel 25920

## L

Lafayette River Channel . . . . . 10660
Lake Conoy . . . . . 16540
Lake Ogleton . . . . . 19837
Lake Ogleton Entrance . . . . . 19815
Langford Creek . . . . . 26665
Leesylvania Park . . . . . 18165
Leeward Marina Channel . . . . 11350
Linkhorn Bay . . . . . 10435
Liston Range . . . . . 2445
Little Annemessex River . . . . 22820
Little Assawoman Bay . . . . . 4990.5
Little Choptank River . . . . . 24630
Little Creek Cove . . . . . 10550
Little Creek Harbor . . . . . 10468
Little Egg Inlet . . . . . 1105
Little Hunting Creek . . . . . 18420
Little Hunting Creek Northern Extension . . . . . 18511.1
Little Magothy River . . . . . 20092
Little Round Bay . . . . . 19970
Little Wicomico River . . . . . 16350
Locklies Creek . . . . . 15095
Lockwoods Folly Inlet . . . . . 31010
Lockwoods Folly River . . . . . 40135
Locust Point East Channel . . . 21225
Locust Point West Channel . . . 21240
Long Creek Channel . . . . . 10160
Long Creek East Channel . . . 10337
Lookout Bight . . . . . 29130
Lower Machodoc Creek . . . . . 16965
Lower Thorofare . . . . . 23495
Lowes Wharf . . . . . 25990
Lynnhaven Inlet . . . . . 10125
Lynnhaven River . . . . . 10186
Lynnhaven River Eastern Branch . . . . . 10332
Lynnhaven River Western Branch . . . . . 10188

## M

Madison Bay . . . . . 24735

# INDEX


Magothy River . . . . . 20095
Manasquan Inlet . . . . . 34931
Manasquan River . . . . . 34935
Manokin River . . . . . 23375
Manteo Channel . . . . . 28535
Mantua Creek . . . . . 3340
Marbury Point . . . . . 18655
Marcus Hook . . . . . 3170
Marcus Hook Range . . . . . 3130
Marine Pier Channel . . . . . 20641
Marshallberg . . . . . 34655
Marshelder Channel . . . . . 1140
Masonboro Inlet . . . . . 30150
Mattawoman Creek . . . . . 18125
Mattox Creek . . . . . 17475
Maurice River . . . . . 1700
Miah Maull Shoal Light . . . . . 1585
Middle River . . . . . 27110
Mifflin Range . . . . . 3370
Mile Hammock Bay . . . . . 39250
Miles River . . . . . 26165
Milford Haven . . . . . 14765
Minnesott Beach Yacht Basin . . 33870
Mispillion . . . . . 2260
Mobjack Bay . . . . . 14050
Money Island Channel . . . . . 38635
Monroe Creek . . . . . 17515
Moonlight Boat Access Channel 38775
Morattico River . . . . . 15390
Morehead City Channel . . . . . 29420
Morehead City Harbor Channel 38600
Mount Vernon Cut . . . . . 18400
Mulberry Island . . . . . 11729
Murderkill River . . . . . 2300


## N


Nandua Creek . . . . . 21765
Nanjemoy Creek . . . . . 17830
Nansemond River . . . . . 11017
Nanticoke River . . . . . 23965
Nassawadox Creek . . . . . 21630
Naval Boat Channel . . . . . 10615
Neabsco Creek . . . . . 18231
Neale Sound . . . . . 17400
Neuse River . . . . . 33580, 38260
New Castle Range . . . . . 2720
New Jersey Intracoastal Waterway . . . . . 34980
New Point Comfort Shoal . . . . 14415
New River - Cape Fear River . . . . . 39315
New River . . . . . 29735
New River Inlet . . . . . 29655
New Topsail Inlet . . . . . 29975
Newport Marshes . . . . . 38490
Newport News Channel . . . . . 10840
Newport News Middle Ground Light . . . . . 10815
Newport News Middle Ground . 10765
Nine Foot Shoal Channel . . . . 29105
Nomini Creek . . . . . 17010
Norfolk International Terminal . .9550
North Carolina Power . . . . . 31180
North Channel . . . . . 21366
North River . . . . . 14360
Northeast Cape Fear River . . . 30970
Northeast River . . . . . 27835
Northwest Harbor . . . . . 21330


## O


Oak Creek . . . . . 26205
Oak Island Channel . . . . . 30415
Oak Island Light . . . . . 810
Occohannock Creek . . . . . 21695
Occoquan River . . . . . 18265
Ocean City Inlet . . . . . 4735
Ocracoke Inlet . . . . . 28900
Ocracoke Light . . . . . 660
Old House Channel . . . . . 28233
Old Point Comfort Light . . . . . 9380
Old Road Bay . . . . . 20495
Old Topsail Creek . . . . . 30140.02
Onancock Creek . . . . . 21925
Orchard Creek Channel . . . . . 33647.01
Oregon Inlet . . . . . 600, 27970
Otter Point Creek . . . . . 27370
Oyster Creek . . . . . 32820
Oyster Creek Channel . . . . . 1073
Oyster Creek Channel . . . . . 7010


## P


Pagan River . . . . . 11375
Pamlico River . . . . . 32810
Pamlico River Approach . . . . . 32415
Pamlico Sound . . . . . 31979
Parish Creek . . . . . 19475
Parkers Creek . . . . . 21970
Parrotts Creek . . . . . 15345
Pasquotank River . . . . . 31390, 37045
Pasquotank River . . . . . 31455, 36980
Pasquotank River Entrance Light PR . . . . . 31390, 37045
Patapsco River . . . . . 20370
Patuxent River . . . . . 18870
Pea Patch Island . . . . . 2840
Peletier Creek Entrance Channel . . . . . 38820
Pembroke Creek . . . . . 31765
Pennwood Channel . . . . . 20430
Pepper Creek . . . . . 4440
Perquimans River . . . . . 31510
Perrin River . . . . . 13510
Phoebus Channel . . . . . 10995
Piankatank River . . . . . 14670
Pier Street Marina . . . . . 25330
Pierce Creek . . . . . 33690
Piney Point Oil Pier . . . . . 16860
Piscataway Creek . . . . . 18515
Pocomoke River . . . . . 22505
Pocomoke Sound . . . . . 22100
Pooles Island - West Channel 27285
Pooles Island Flats Channel . . 8645
Poplar Island Narrows . . . . . 25960
Poquoson Flats . . . . . 13145
Poquoson River . . . . . 13165
Port Mahon . . . . . 2345
Port Tobacco River . . . . . 17770
Portsmouth Marine Terminal . . .9800
Potomac Creek . . . . . 17915
Potomac River . . . . . 16490
Price Creek . . . . . 30495, 39985
Prospect Bay . . . . . 26335
Pungo River . . . . . 32855, 38140
Pungoteague Creek . . . . . 21845


## Q


Queen Creek . . . . . 13785
Queens Creek . . . . . 14815
Queenstown Harbor . . . . . 26600
Quinby Creek . . . . . 6750
Quinby Inlet . . . . . 6730


## R


Rappahannock River . . . . . .14905
Reedy Island Dike . . . . . 2525
Reedy Island Range . . . . . 2570
Rehoboth Bay . . . . . 2095
Rhode River . . . . . 19515
Rhodes Point Gut Channel . . . 22990
Roanoke River . . . . . 31670
Roanoke Sound . . . . . 28365
Rock Creek . . . . . 20375
Rock Hall Harbor . . . . . 26890
Rockhold Creek . . . . . 19395
Rollinson Channel . . . . . 28815
Roosevelt Inlet . . . . . 2065
Rose Bay . . . . . 32735
Roy Creek . . . . . 4975
Russell Slough . . . . . 34852


## S


Salem River Entrance . . . . . 2645
Salt Ponds . . . . . 12845
San Domingo Creek . . . . . 25795
Sand Shoal Channel . . . . . 6990
Sandy Point State Park . . . . . 7905
Sandy Point State Park North Beach . . . . . 7957.1
Sarah Creek . . . . . 13710
Sassafras River . . . . . 27435
Schuylkill River . . . . . 3410
Scotland Wharf Ferry . . . . . 12115
Scott Creek Channel . . . . . 9860
Scuppernong River . . . . . 31585

# INDEX


Seagirt Marine Terminal East Channel . . . . . 21045
Seagirt Marine Terminal West Channel . . . . . 21135
Second Cove . . . . . 19065
Selby Bay . . . . . 19585
Seneca Creek . . . . . 27170
Sevenfoot Knoll Light . . . . . 8120
Severn River . . . . . 14250
Severn River . . . . . 19935
Shallotte Inlet . . . . . 31055
Shallow Creek . . . . . 26950
Shallowbag Bay . . . . . 28552
Sheep Pen Gut . . . . . 23175
Ship Channel . . . . . 1325
Ship John Shoal Light . . . . . 1640
Silver Lake . . . . . 28985
Sinepuxent Bay . . . . . 4995
Skiffes Creek Channel . . . . . 11825
Slaughter Creek . . . . . 24645
Slocum Creek . . . . . 33920
Slough Creek . . . . . 16380
Smith Creek . . . . . 9890
Smith Creek Channel . . . . . 33755
Smith Point Light . . . . . 7480
Sollers Point Channel . . . . . 20705
Solomons Island . . . . . 18900
South Creek . . . . . 33110
South Herrington Harbor . . . . . 19345
South River . . . . . 33655
South River . . . . . 19560
Southern Shores . . . . . 31270
Southwest Branch . . . . . 14275
Spa Creek . . . . . 19905
Sparrows Point Steel Works Channel . . . . . 20545
Spencer Creek . . . . . 31946
Spooner Creek . . . . . 38855
St. Catherine Sound Lower Entrance . . . . . 17215
St. Catherine Sound Upper Entrance . . . . . 17270
St. Clements Bay . . . . . 17155
St. George Creek . . . . . 16735
St. Jerome Creek . . . . . 18795
St. Marys River . . . . . 16660
St. Patrick Creek . . . . . 17115
St. Peters Creek . . . . . 23435
Starling Creek . . . . . 22455
Stillpond Creek . . . . . 8805
Stony Creek . . . . . 20400
Stumpy Point . . . . . 32000
Stumpy Point Bay . . . . . 31985
Stumpy Point Harbor . . . . . 32015
Stutts Creek . . . . . 14630
Sunny Point Terminal Central Channel . . . . . 30603
Sunny Point Terminal South Entrance . . . . . 30562
Surry Power Station . . . . . 11800
Susquehanna River . . . . . 27585
Swan Creek . . . . . 26850
Swanquarter Bay . . . . . 32670
Swansboro Coast Guard Channel . . . . . 29600
Swansboro Harbor . . . . . 29590
Swantown Creek . . . . . 27475
Swash . . . . . 18925
Swash Channel . . . . . 29090


## T


Tangier Island East Channel . . 22740
Tangier Island West Channel . 22725
Tangier Sound . . . . . 22705
Tangier Sound Light . . . . . 7435, 22715
Tanker Anchorage . . . . . 2180
Tar Bay . . . . . 24577
Taylor Creek . . . . . 34085
Teaches Hole Channel . . . . . 28953
Tedious Creek . . . . . 24380
The Haven Channel . . . . . 26886
Thimble Shoal Channel . . . . . 9205
Thimble Shoal Light . . . . . 9310
Thomas Point Shoal Light . . . . 7760
Thorofare Channel . . . . . 4875
Tilghman Island . . . . . 25840
Tinicum Island . . . . . 3270
Torresdale . . . . . 3740
Totuskey Creek . . . . . 15455
Town Creek . . . . . 25375
Townsends Inlet . . . . . 1405
Tred Avon River . . . . . 25320
Trent River . . . . . 34240
Triple S. Marina . . . . . 38535
Turnagain Bay . . . . . 33627
Tyler Creek . . . . . 23125
Tylers Beach Channel . . . . . 11705


## U


Upper Chesapeake Channel . . 8320
Upper Choptank River . . . . . 25316.01
Upper Delaware River . . . . . 3650
Upper Edge Creek . . . . . 25745
Upper Elk River . . . . . 27900
Upper Gunpowder River . . . . . 27230
Upper Machodoc Creek Dahlgren Channel . . . . . 17640
Upper Pocomoke River . . . . . 22605
Upper Potomac River . . . . . 17750
Upper Thorofare . . . . . 23550
Upper York River . . . . . 13745
Urbanna Creek . . . . . 15240


## V


Virginia Inside Passage . . . . . 5525


## W


Wachapreague Channel . . . . . 6640
Wachapreague Inlet . . . . . 6605
Wallace Creek . . . . . 24560
Walter Slough . . . . . 28305
Wanchese Channel . . . . . 28440
Ward Creek . . . . . 22945
Ware River . . . . . 14310
Warehouse Creek . . . . . 16336.01
Warwick River . . . . . 11525
Webster Cove . . . . . 23795
Wells Cove . . . . . 26395
West Bay . . . . . 33495
West Branch Channel . . . . . 13585
West Neck Creek . . . . . 37215
West River . . . . . 19450
Western Branch . . . . . 11180
Western Branch . . . . . 9745
Whays Creek . . . . . 16305
White Creek . . . . . 4645
Whitehall Creek . . . . . 20065
Whitehall Shores . . . . . 31416
Whiting Creek . . . . . 15225
Whittaker Creek . . . . . 33718
Wicomico Creek . . . . . 23865
Willoughby Bay . . . . . 10575
Wilmington Marine Center . . . 30870
Windmill Point Marina . . . . . 14935
Wormley Creek Marina . . . . . 13635
Worton Creek . . . . . 27390
Wright Creek . . . . . 32865
Wrightsville Channel . . . . . 30200
Wye River . . . . . 26110
Wysocking Bay . . . . . 32150
23675


## Y


Yeocomico River . . . . . 16805
York River . . . . . 13395
York Spit Swash Channel . . . . 14100

## CROSS REFERENCE - INTERNATIONAL VS. U.S. LIGHT NUMBER

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| J1476.55 | 12130 |
| J1476.56 | 12135 |
| J1476.60 | 12235 |
| J1476.61 | 12240 |
| J1476.70 | 12285 |
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| J1476.80 | 12300 |
| J1476.85 | 12305 |
| J1476.90 | 12335 |
| J1476.95 | 12340 |
| J1477.00 | 12390 |
| J1477.05 | 12395 |
| J1477.10 | 12415 |
| J1477.11 | 12420 |
| J1477.15 | 12490 |
| J1477.20 | 12505 |
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