U.S. Coast Guard Auxiliary SE District

ATON

FEDERAL SHORT-RANGE AIDS TO NAVIGATION

D7NS 30001.4

FEBRUARY 2026

COMDTINST 16500.71 02 MAR 2005

Aids to Navigation Manual Administration

Aid to Navigation:

Any device, external to a vessel, intended to assist navigators to:

- Determine their position
- Determine a safe course
- Warn them of dangers or obstructions to navigation

33 CFR 62

The Coast Guard administers the U.S. Aids to Navigation System. The system consists of:

- Federal aids to navigation operated by the Coast Guard
- Private aids to navigation operated by the other armed services
- Private aids to navigation operated by other entities or persons.

ATON

Federal Short-Range Aid to Navigation

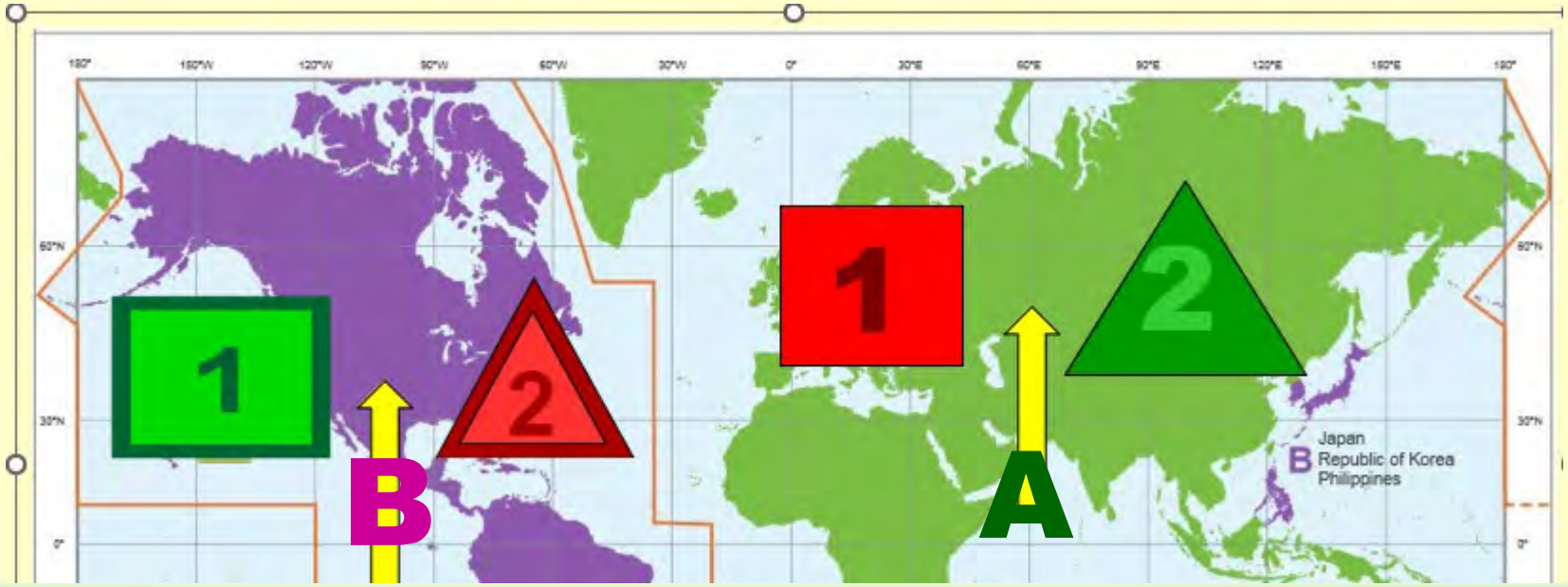
Aids established and maintained by the United States Coast Guard as authorized by 14 U.S.C. § 81.

IALA

International Organization for Marine Aids to Navigation

- Harmonize standards for aids to navigation systems worldwide;
- Facilitate the safe and efficient movement of shipping and enhance the protection of the maritime environment.

IALA REGIONS A & B



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IALA REGION B

33 CFR 62

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° degrees north latitude, which follow IALA Region A.

Red Right Returning from the sea

DIRECTION OF BUOYAGE

- **Local Direction of Buoyage:**
  - From seaward into estuary, river, harbor or other waterway
- **Conventional Direction of Buoyage:**
  - Clockwise around continents:
    - South down the Atlantic Coast
    - North then west on the Gulf Coast
    - North on the Pacific Coast
    - Applies to Intracoastal Waterway

IALA Maritime Buoyage Systems

Lateral marks indicate the edge of a channel

Cardinal marks indicate the direction of safe water at a dangerous spot.

Safe water marks indicate the deep water and open end of a channel.

Special marks indicate a special feature or restriction.

Isolated danger marks indicate a hazard to shipping.

IALA Maritime Buoyage Systems

Lateral marks indicate the edge of a channel

Lateral marks always have numbers

When an aid is added between two existing aids with consecutive numbers, a letter (A, B, C) is added.

This buoy was added between 10 and 11, so it is labelled 10A.

Starboard Lateral Marks

Color: Red

Shapes: Triangular→

Conical (nuns)→

Pillar→

Character:

EVEN Number

2

Light: Red

9

Port Lateral Marks

Color: **Green**

Shapes: **Square→**

Cylindrical (cans)→

Pillar→

Character:

ODD Numbers

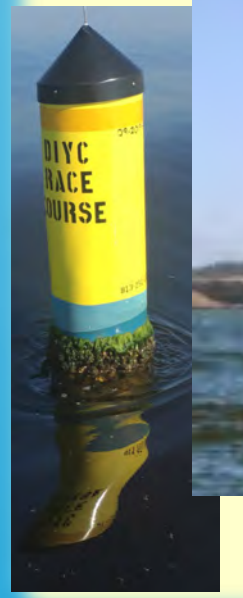
1

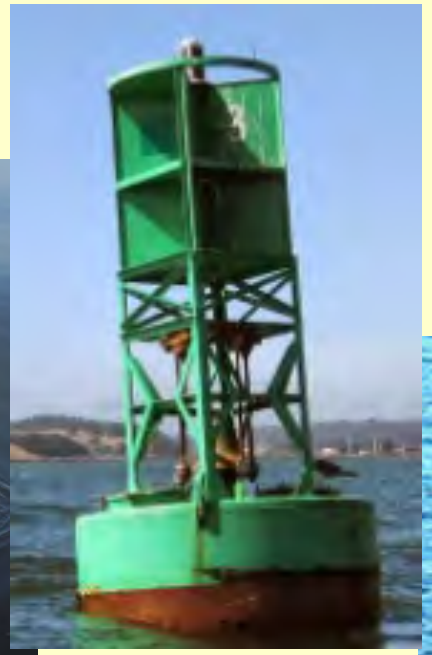
Light: **Green**

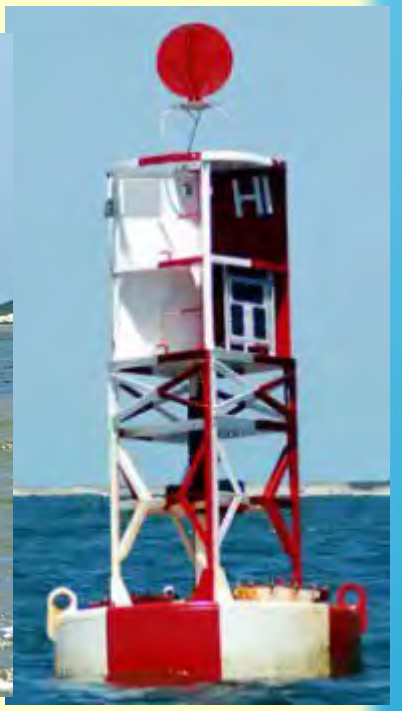
9

Definition of a Buoy

Any unmanned, floating aid to navigation that is moored to the seabed. (*May be lighted or unlighted*)

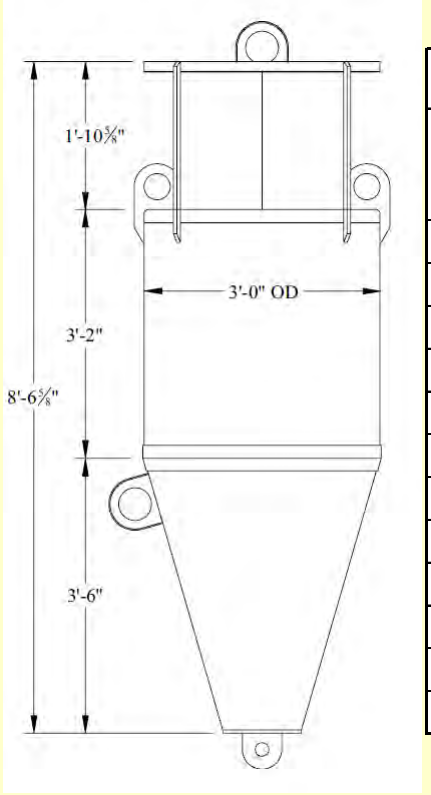






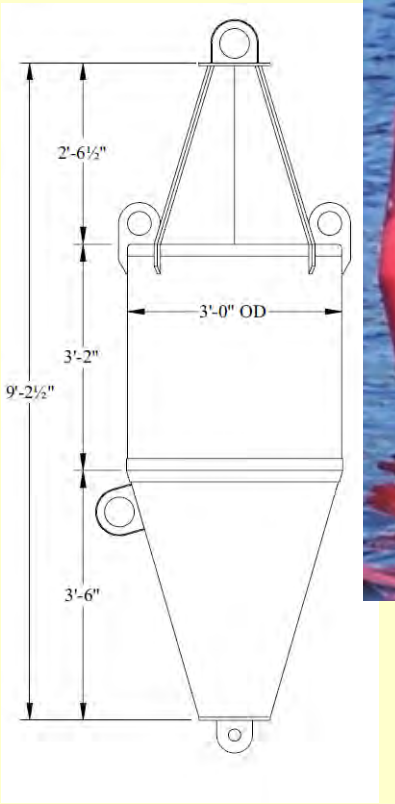
Standard Unlighted Buoys

can



3CR

STANDARD UNLIGHTED BUOYS					
Type	Diameter	Height	Weight (lb)	Draft	Mooring Depth (ft min)
1CR	5' - 0"	18' - 8⅝"	6,100	8' - 7"	15
1NR	5' - 0"	10' - ½"	6,000	8' - 4"	15
2CR	4' - 0"	13' - 8"	2,800	6' - 3"	15
2NR	4' - 0"	14' - 6½"	2,600	6' - 1"	15
3CR	3' - 0"	8' - 6⅝"	1,200	4' - 4"	10
3NR	3' - 0"	9' - 2½"	1,175	4' - 4"	10
4CR	2' - 3"	9' -3"	465	5' - 0"	10
4NR	2' - 3"	10' - 5¼"	470	5' - 0"	10
5CR	2' - 0"	8' - 8¾"	710	5' - 1"	10
5NR	2' - 0"	9' -10¼"	710	5' - 1"	10
6CR	1' - 6"	7' - 3"	160	3' - 10"	6
6NR	1' - 6"	8' - 8½"	165	3' - 10"	6

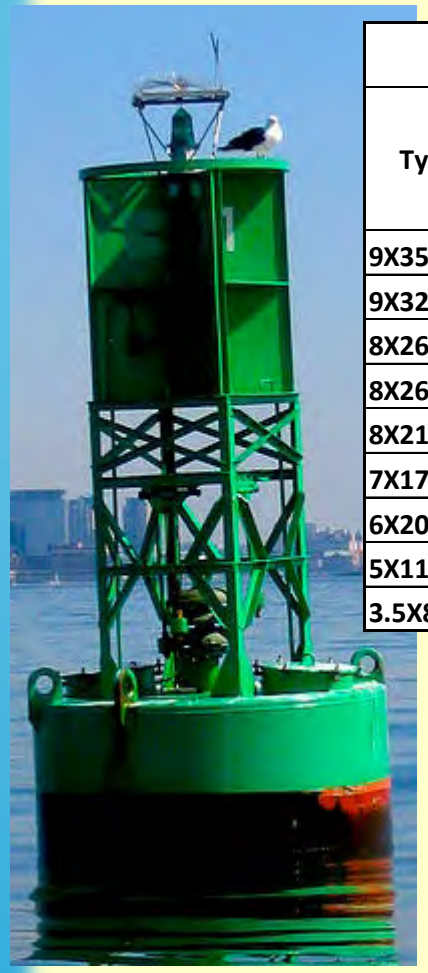


3NR

nun

COMDTINST M16500.3A
AIDS TO NAVIGATION MANUAL - TECHNICAL

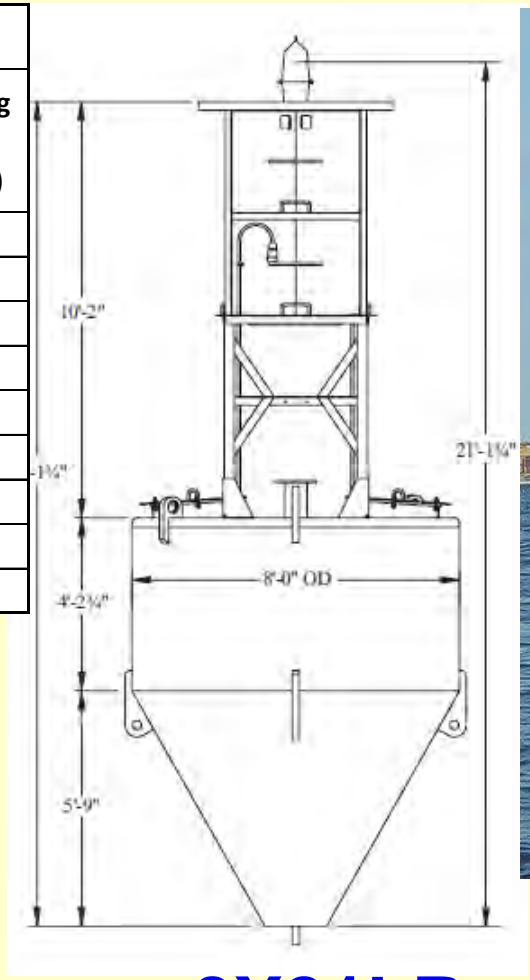
Standard Lighted Buoys



pillar

STANDARD LIGHTED BUOYS						
Type	Diameter	Height	Weight (lb)	Draft	Focal Height of Lamp	Mooring Depth (ft min)
9X35LWR	9' - 0"	35' - 5½"	18,500	15' - 10"	20' - 7"	35
9X32LR	9' - 0"	31' - 9"	17,500	11' - 7"	21' - 2"	30
8X26LR	8' - 0"	25' - 3¼"	11,800	10' - 4"	15' - 11"	25
8X26LWR	8' - 0"	25' - 3¼"	12,100	10' - 5"	15' - 10"	25
8X21LR	8' - 0"	10' - 1¾"	13,900	7' - 9"	13' - 4"	18
7X17LR	7' - 0"	15' - 11"	7,800	5' - 6"	11' - 5"	17
6X20LR	6' - 0"	18' - 9½"	6,500	9' - 0"	10' - 9"	20
5X11LR	5' - 0"	10' - 8 5/8"	3,000	3' - 9"	8' - 0"	13
3.5X8LR	3' - 6"	7' - 2 11/16"	1,500	2' - 9"	5' - 7"	11

COMDTINST M16500.3A
AIDS TO NAVIGATION MANUAL - TECHNICAL

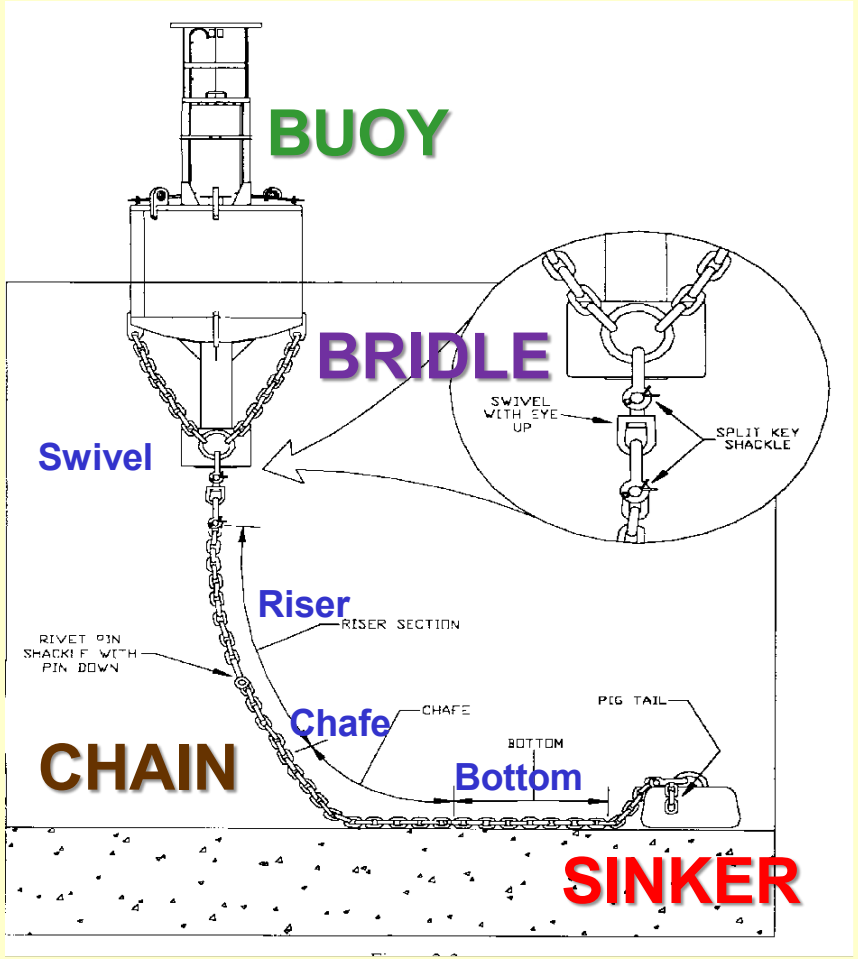


8X21LR

pillar

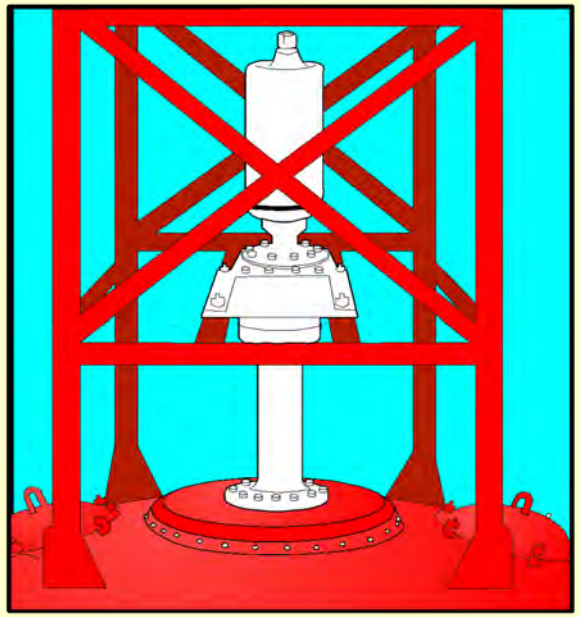
Buoy Moorings

- The **CHAIN** connects the **BUOY** to the **SINKER**.
- The **BRIDLE** distributes the load and minimizes heel angle
- The location of the **SINKER** is the Assigned Position of the **BUOY**



Whistle Buoy

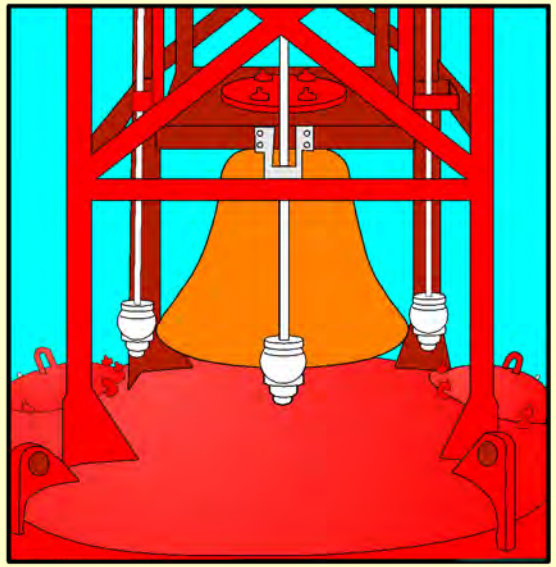
Whistle is made of cast bronze and mounted inside the cage.



As air is forced through the device it makes the familiar high-pitched whistle sound.

Bell Buoy

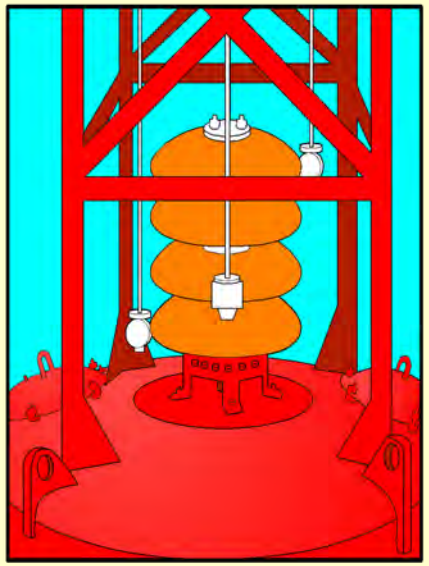
Bells – used on lighted and unlighted buoys and are made of a copper silicon alloy.



External tappers impact the fixed bell when wave motion causes the buoy to roll.

Gong Buoy

- Gongs - used on lighted & unlighted buoys and are made of a copper-silicon alloy.
- External tappers impact the fixed gongs as the buoy rolls.
- Each gong emits a different tone distinguishing gong from a bell.



Definition of a Beacon

- Any ***fixed*** aid to navigation
  (can be on shore or water.)

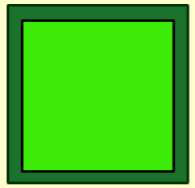
- ***Beacons*** without lights are called Daybeacons.

- ***Lighted*** beacons are called Lights.

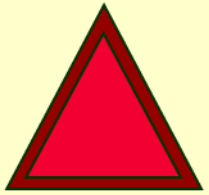
Dayboard

The letter in the Light List structure column refers to the *shape* or *purpose* of the dayboard.

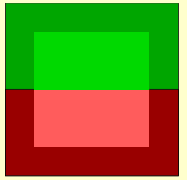
Dayboards are Mounted on beacons



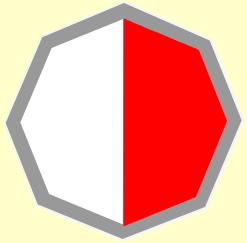
S-Square



T-Triangle



J-Junction / Preferred Channel



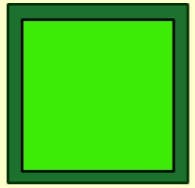
M-Mid Channel Safe Water

K-Range

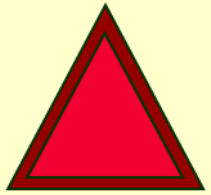
N-No lateral Significance

Dayboard

The subsequent letter(s) in the Light List structure column refer to the color(s) of the dayboard.

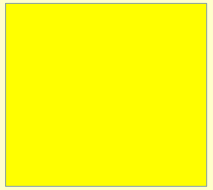


G - Green



R-Red

W-White



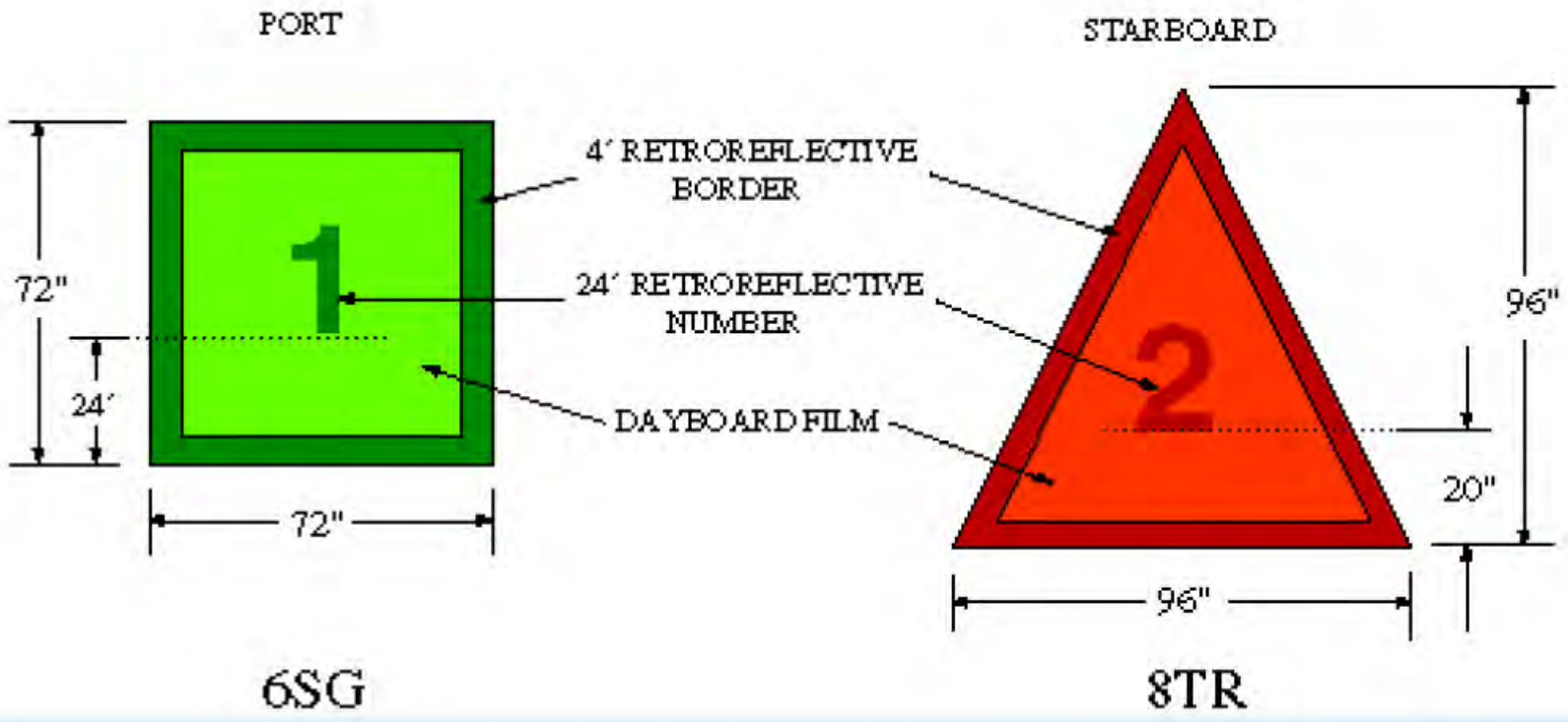
Y-Yellow

General Use Lateral Marks- Example

Range:

3 nm

System: General Use.
Function: Laterally significant port and starboard marks.
Nominal Range: 3 nm.
Additional Data: For three numerals on a 6SG, use 16-inch characters at a height of 28 inches from the base. For three numerals on an 8TR, use 16-inch characters at a height of 14 inches.



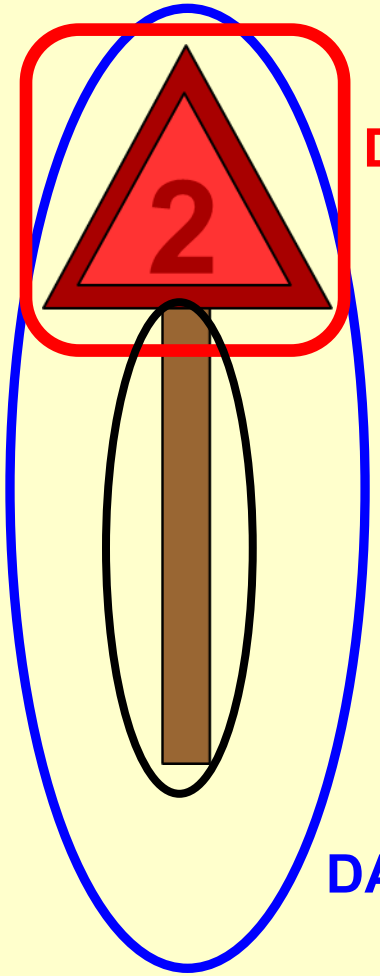
Beacons

Combining the shape, color, and structure gives the full description of a *numbered lateral mark beacon*

(**T**riangle – **R**ed)

Single Pile

“TR on pile”



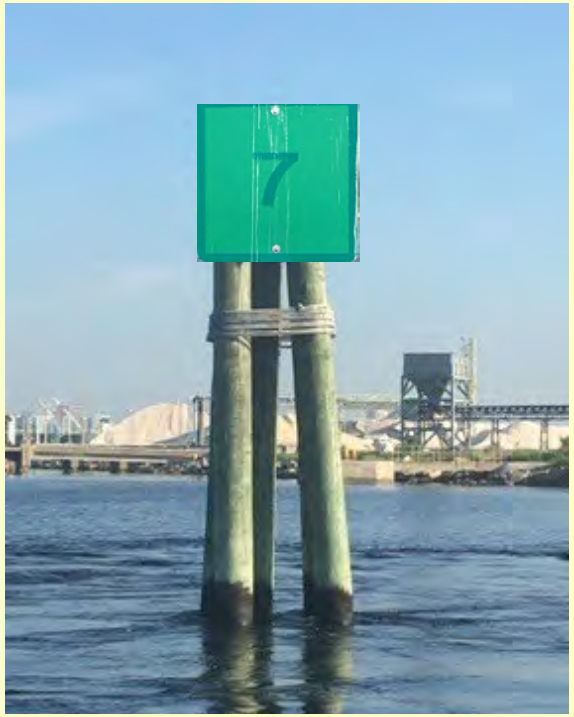
DAYBOARD

PILING

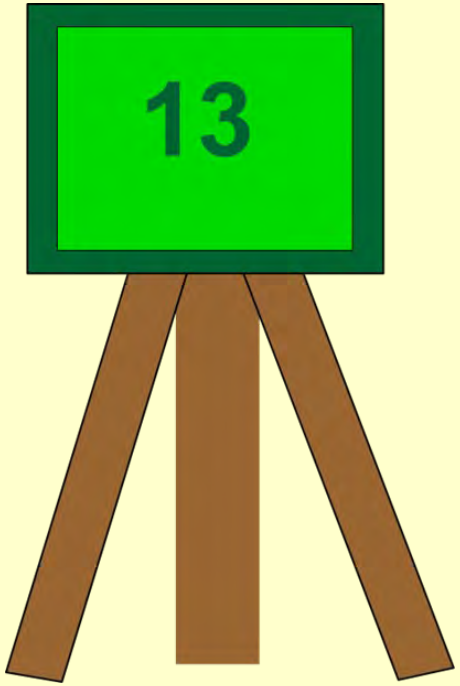
- **Wood**
- **Metal**
- **Concrete**

DAYBEACON

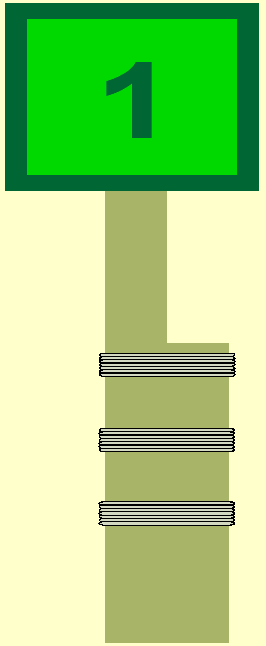
Beacon Structures



Dolphin
3 or more piles



Dolphin
Cluster pile

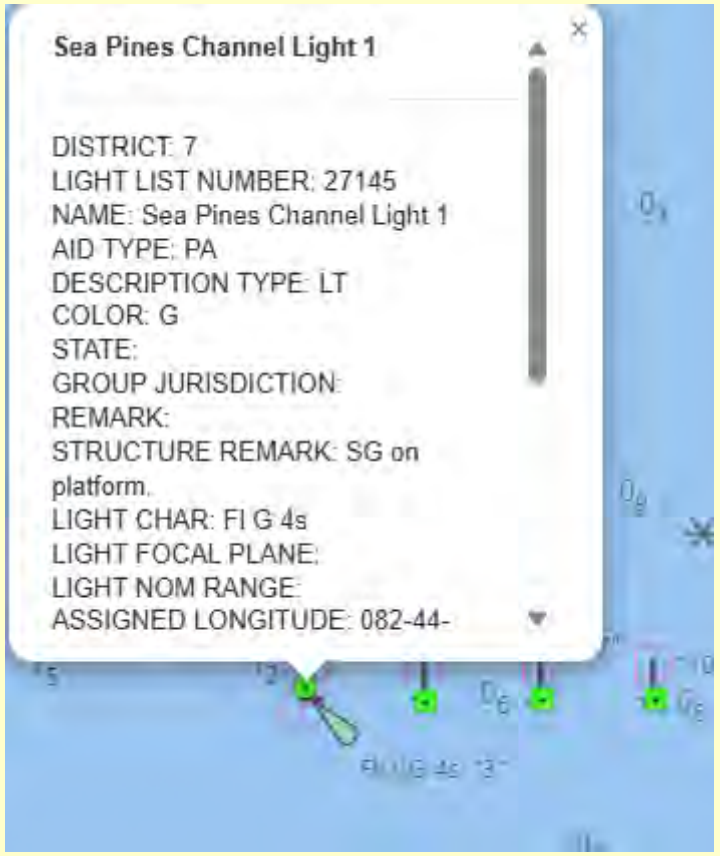


“SG on dolphin”

Beacon Structures

Platform

"SG on platform"



Lighted Beacons

Preferred Channel Marks

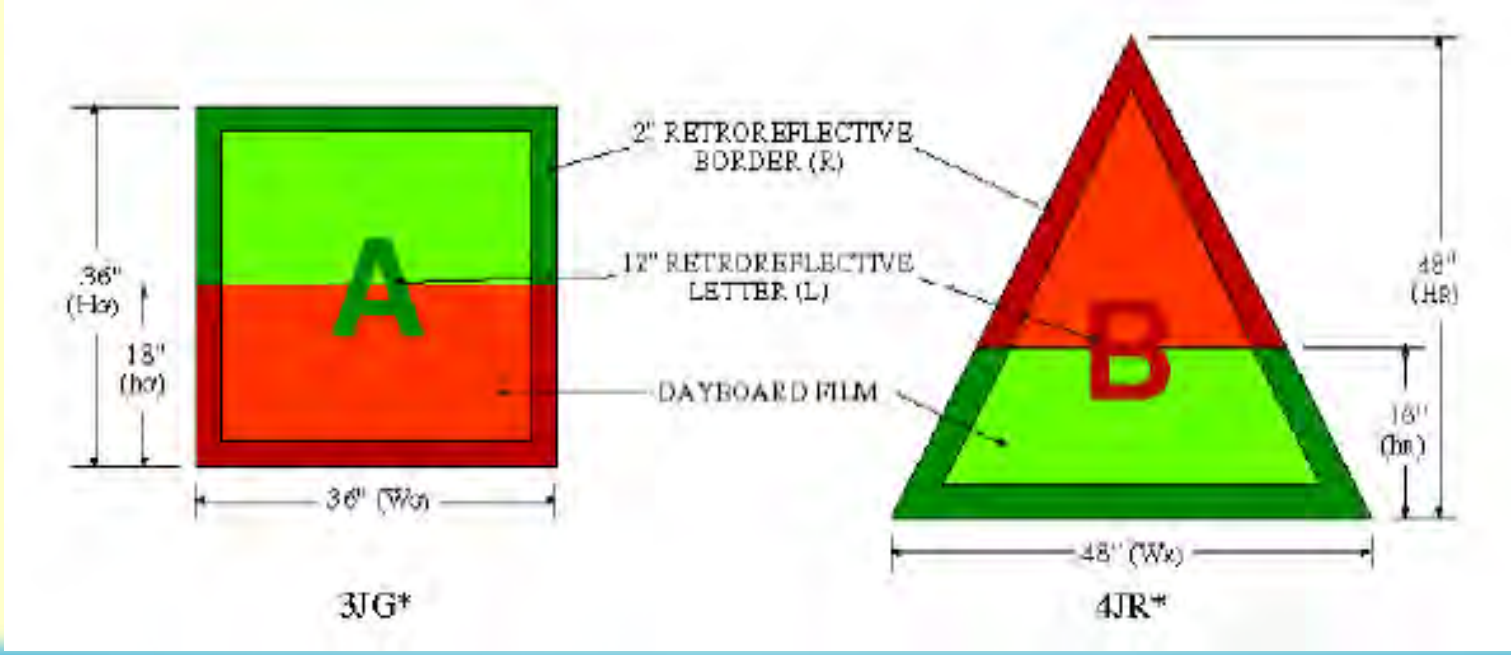
Purpose: Marks junctions/bifurcations

Color: Red & Green horizontally banded (top color is preferred channel)

Shape: Same as preferred channel (uppermost band is preferred channel)

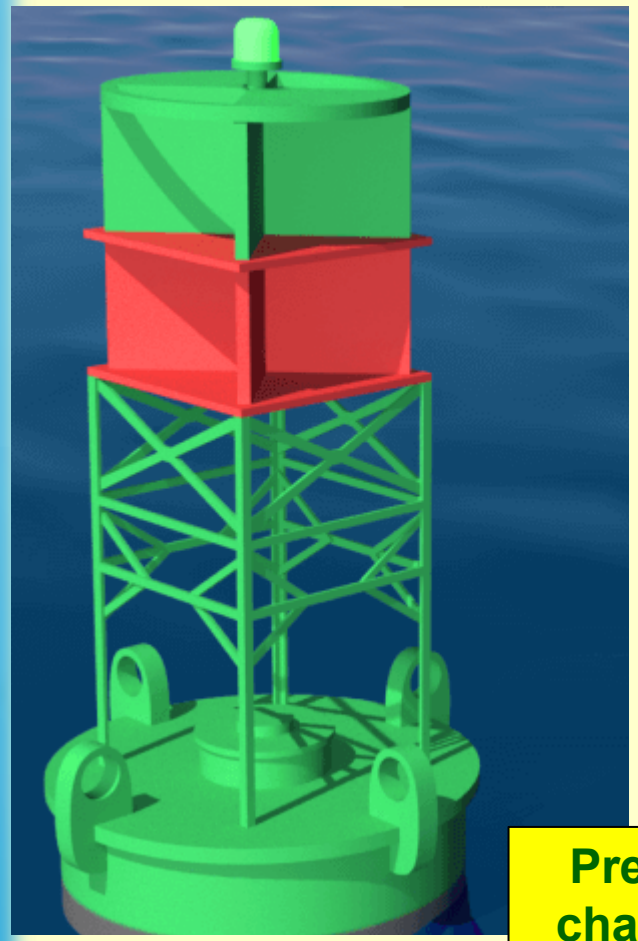
Character: Letter not number.

Preferred channel to Starboard



Preferred channel to Port

Preferred Channel Marks



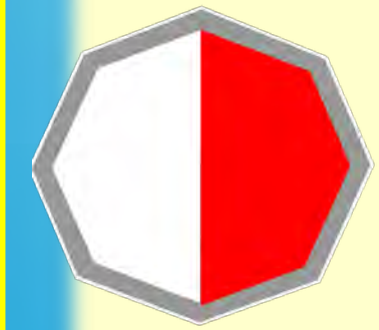
Preferred channel to Starboard

Light:
Same color as uppermost band

Light Characteristic:
Composite Gp Fl (2+1) 6s

Preferred channel to Port

Safe Water Mark



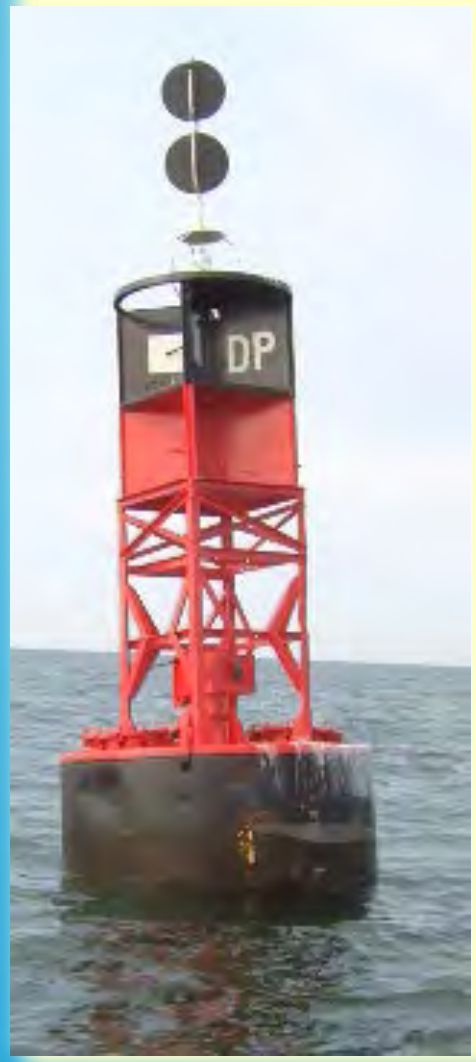
- **Purpose:** **Indicates navigable water all around the mark.**
  - **Located seaward of marked channel**
  - **Description:**
    - **Color:** **Red** and **White** vertically striped.
    - **Shape:** Sphere or Buoy with Topmark.
    - **Character:** **White** letters (ex. “NC” North Channel)
    - **Light Color:** **White**: **Mo(A)**

Lighted Safe Water Mark

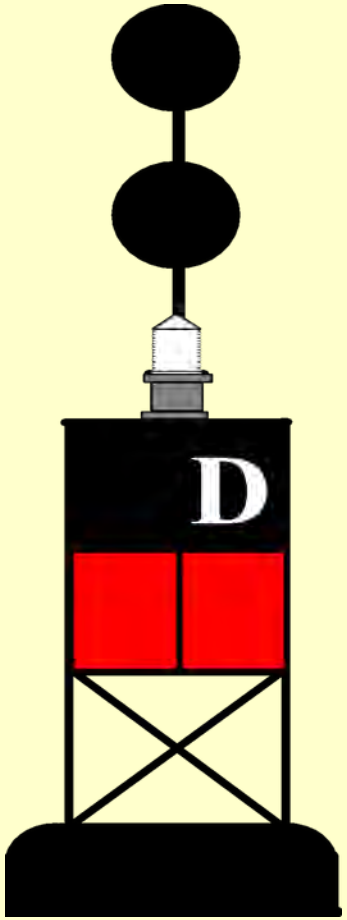
Light: White

Light Characteristic:
Mo (A)

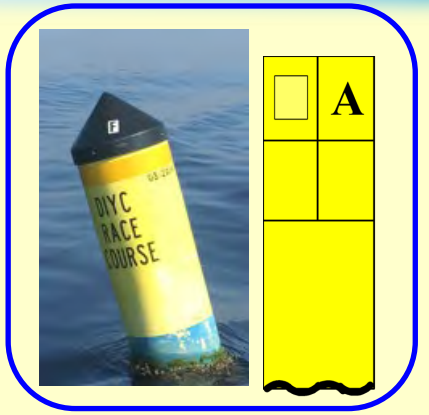
Isolated Danger Mark



- **Purpose**: **Marks isolated dangers or obstructions that can be passed on all sides**
- **Description**:
  - **Color:** Black and Red horizontal bands
  - **Shape**: Buoy with two black top marks
  - **Character:** White Lettering – no numbers
  - **Light:** White
  - **Top mark** is two round shapes
  - **Light Characteristic**:**Gp Fl (2) 5s**



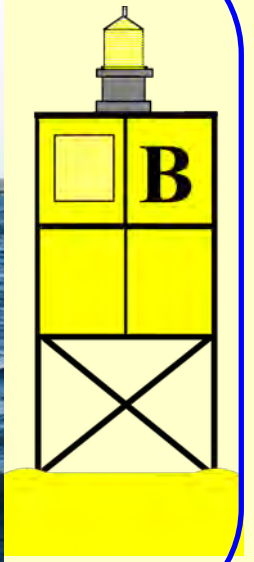
Special Purpose Marks

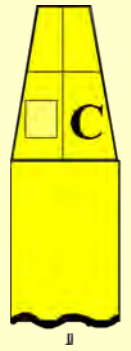


Purpose: **Not intended to assist safe navigation but to indicate special areas marked on charts (anchorages, traffic separation schemes, data gathering, etc)**

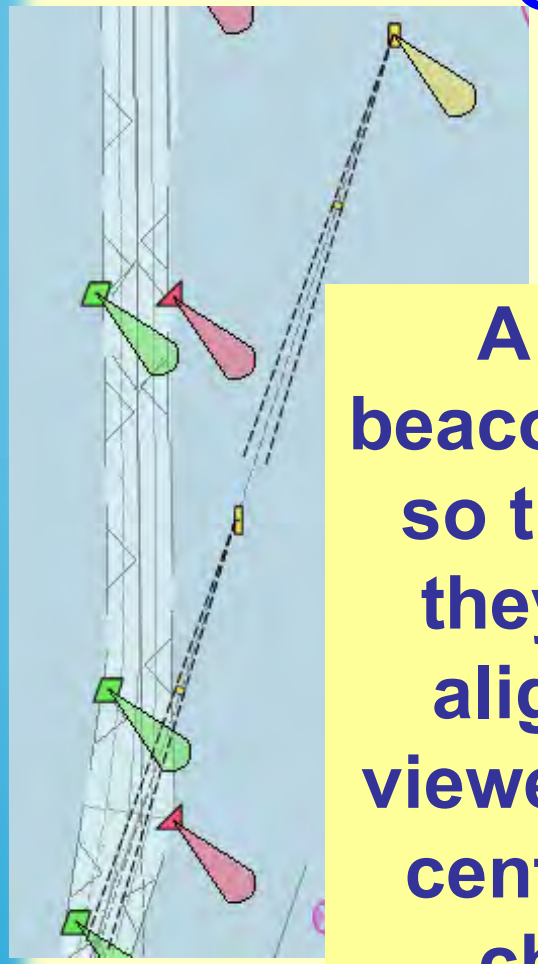
Description:

- **Aid Color: Yellow.**
- **Aid Shape:** Various.
- **Characters:** Black lettering, no numbers.
- **Light Color: Yellow**
- **Light Characteristic: Fixed, Flashing** (except **Mo A, 2+1, Q)(Any slow flashing not otherwise observed.)**





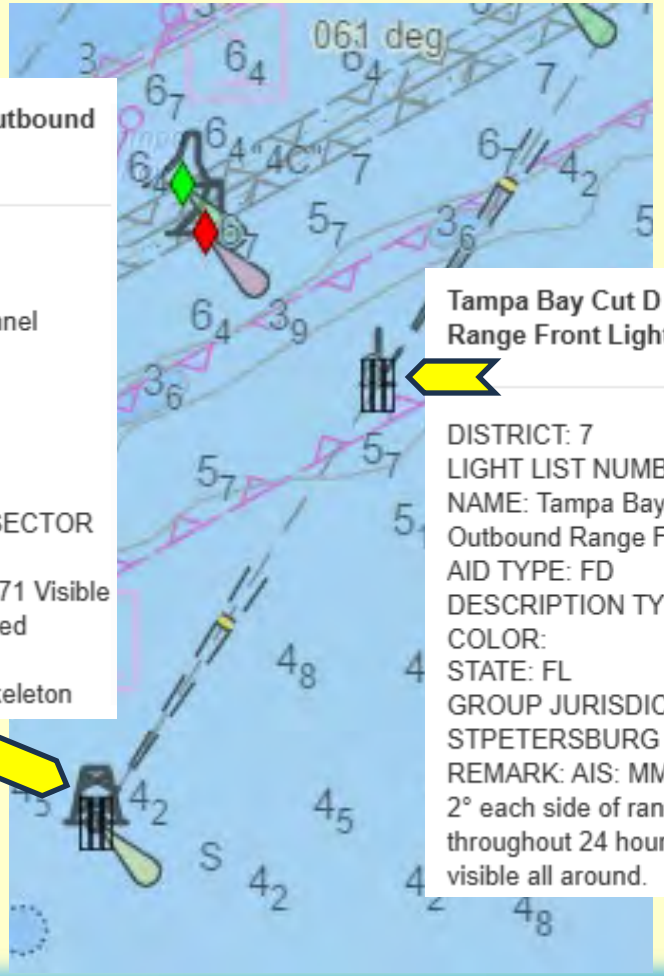
Ranges



A pair of beacons placed so that when they appear aligned the viewer is in the center of the channel.

Tampa Bay Cut D Channel Outbound Range Rear Light

DISTRICT: 7
LIGHT LIST NUMBER: 22715
NAME: Tampa Bay Cut D Channel Outbound Range Rear Light
AID TYPE: FD
DESCRIPTION TYPE: RR
COLOR:
STATE: FL
GROUP JURISDICTION: CG SECTOR STPETERSBURG
REMARK: AIS: MMSI 993672971 Visible 2° each side of rangeline. Lighted throughout 24 hours.
STRUCTURE REMARK: On skeleton



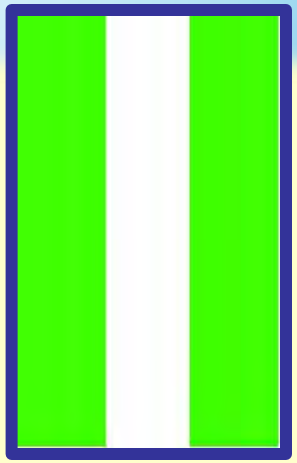
Tampa Bay Cut D Channel Outbound Range Front Light

DISTRICT: 7
LIGHT LIST NUMBER: 22710
NAME: Tampa Bay Cut D Channel Outbound Range Front Light
AID TYPE: FD
DESCRIPTION TYPE: RF
COLOR:
STATE: FL
GROUP JURISDICTION: CG SECTOR STPETERSBURG
REMARK: AIS: MMSI 993672635 Visible 2° each side of rangeline. Lighted throughout 24 hours. Passing light visible all around.

Ranges

Some have tricolored dayboards as well as lights

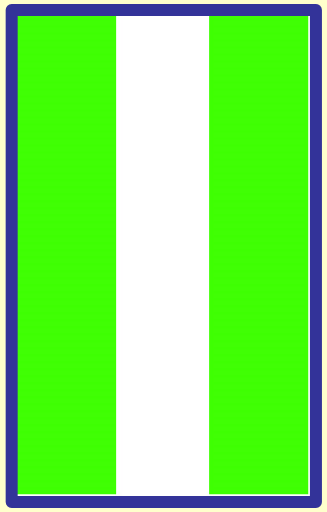
Range Dayboards



Description:

Aid Color: They may have colored panels equal in size with vertical stripes.

Aid Shape: Rectangle with tall side up.



KGW = Range, Green, with a White Stripe.

Colors (Red/Green/White) are chosen to stand out against the predominant background color

Wreck Marks

<u>Purpose</u>: To alert the mariner to wrecks.

<u>Description</u>:

- ***Color*:** Appropriate to side of channel.
- ***Shape*:** Appropriate to side of channel.
- ***Light*:** Same as buoy color. ***Quick Flashing*** **(**unless aid is a preferred channel aid**)**
- ***Lettering:*** **White "WR",** numbered in sequence with channel **(WR2).**

Location Marks

NR = Red + White

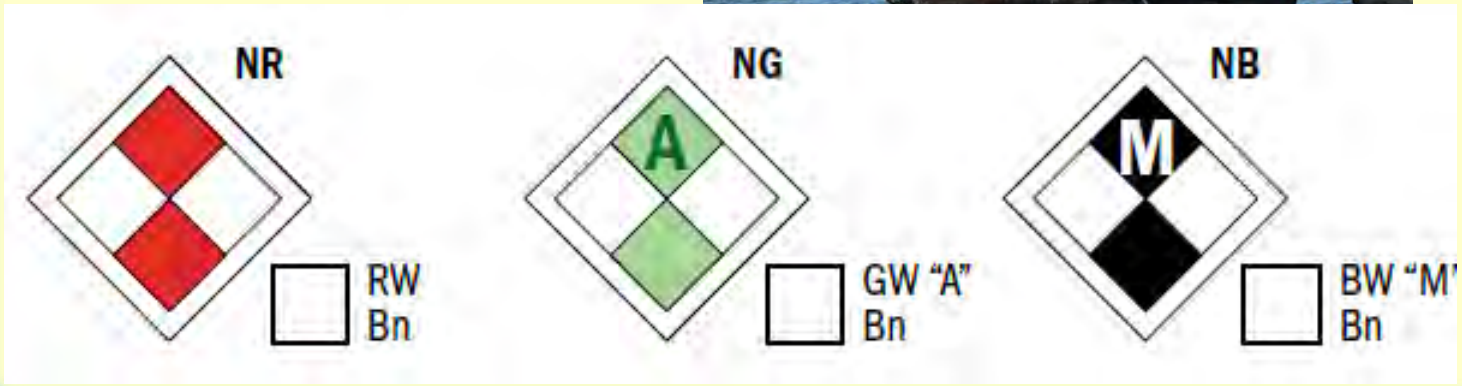
NG = Green + White

NB = Black + White

"N" = non lateral

Diamond-shaped beacons help determine location.

They may or may not have a letter.



Light Structures

Major lighthouses are named

Sanibel Light.

Egmont Key Light.

Light Structures

Minor lights (on buoys & beacons) use LED bulbs

- Available in required colors
- Pattern is programmable
- Intensity drops with time
- Service life 8-12 years

Self-contained 2nm range LED suitable for use on PATONs

Light Patterns

Fixed (F) – continuous, unblinking light

Flashing (Fl) – light duration shorter than darkness. Frequency not greater than 30 per minute.

Quick Flashing (Q) – light duration shorter than darkness. Frequency is at least 60 per minute.

Very Quick Flashing (VQ) – light duration shorter than darkness. Frequency is at least 100 per minute.

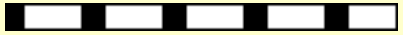
Interrupted Quick Flashing (IQ) – like quick flashing but having a brief, extended darkness period.

Isophase (Iso) – Light has equal duration between light and darkness. Period consists of both light and dark interval. Also called Equal Interval (E Int).

Group (GP) – Group of 2 or more flashes with longer dark interval

Light Patterns

Composite Group Flashing (Fl (2+3) – Combination of two patterns in one period, i.e. 2 flashes followed by three flashes.



Occulting (Occ) – Opposite of flashing – light is on more than it is off.

Alternating (AL) – Alternating light changes color. Special purpose light for situations requiring significant caution. Example shows AL.WG…alternating white and green light.

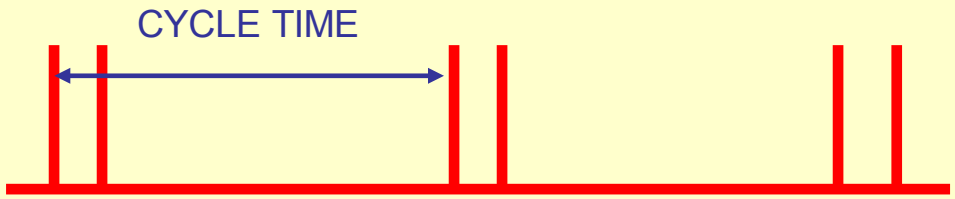
Morse (Mo) – Morse code light signal. Example is Morse "U" which is two short flashes followed by one prolonged flash then a period of darkness. Shown as (Mo(U)) on charts.

Long Flashing (LFL) – One long flash in a period with lighted period of at least 2 seconds.

Understanding Light Patterns

Learn how to time a light.

1. **Time multiple light cycles.**
   - For example, 40 seconds for a 4 sec cycle.
2. **Divide the time by the number of cycles.**



Rules for Lights on Federal Aids

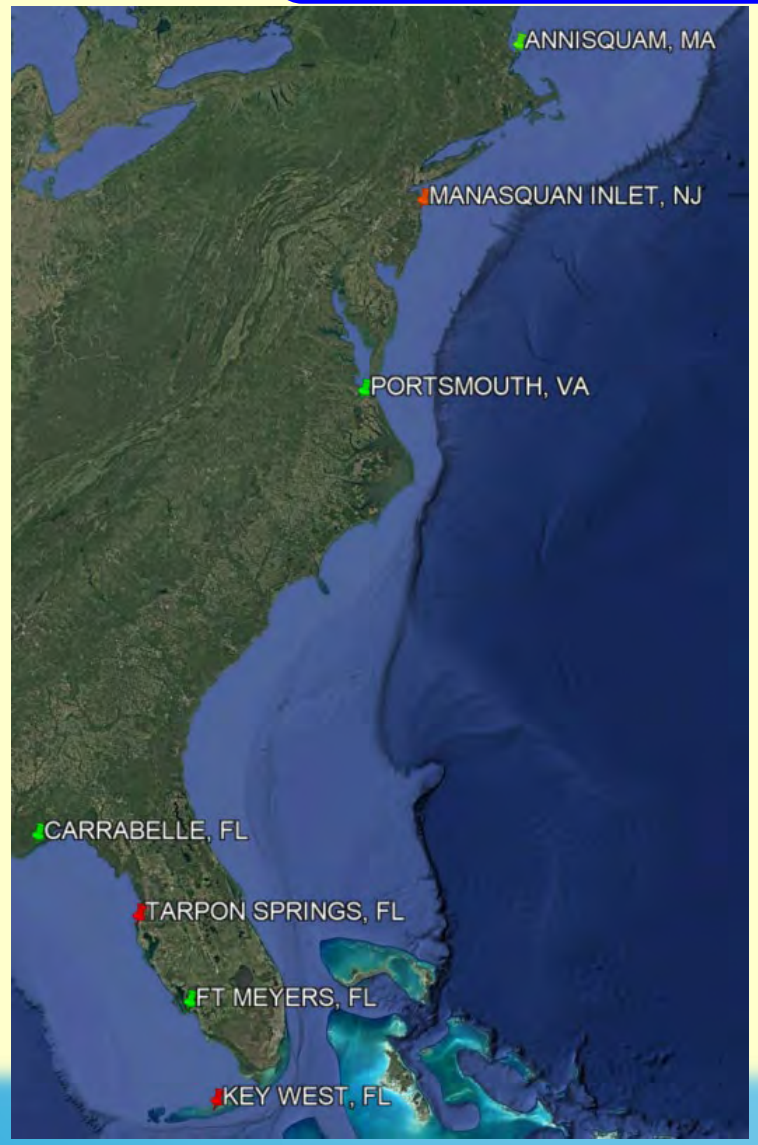
	COLOR	RHYTHM			
Safe Water	White	Mo(A)			
Isolated Danger	White	Fl(2) 5s			
Lateral Starboard	Red	Fl 2.5s	Fl 4s	Fl 6s	Fl (2) 5s
		Fl (2) 6s	Q	Oc	Iso
Lateral Port	Green	Fl 2.5s	Fl 4s	Fl 6s	Fl (2) 5s
		Fl (2) 6s	Q	Oc	Iso
Preferred Channel to Port	Red	Fl (2+1) 6s			
Preferred Channel to Starboard	Green	Fl (2+1) 6s			
Special	Yellow	Fl 2.5s	Fl 4s	FL 6s	

Light Patterns

RHYTHM	ON (sec)	OFF (sec)	Pattern Repeats /minute	Flashes /minute
Q	0.3	0.7	60	60
MO (A)	0.4	0.6	7.5	15
	2.0	5.0		
FL 2.5	0.3	2.2	24	24
FL 4.0	0.4	3.6	15	15
FL 6.0	0.6	5.4	10	10
FL (2) 5	0.4	0.6	12	24
	0.4	3.6		

RHYTHM	ON (sec)	OFF (sec)	Pattern Repeats /minute	Flashes /minute
FL (2) 6	1.0	1.0	10	20
	1.0	3.0		
FL (2+1) 6	0.3	0.4	10	30
	0.3	1.2		
	0.3	3.5		
IOS 6	0.3	2.2	24	10
OC 4	0.3	2.2	24	15
F (fixed)	Always ON		Continuous	

Atlantic & Gulf Intracoastal Waterway



- South from Annisquam, MA, to Manasquan Inlet, NJ
- South from Portsmouth, VA to Key West, FL.
- North from Ft Meyers to Tarpon Springs, FL.
- West from Carrabelle, FL to Brownsville, TX.

Intracoastal Waterway

The **RED** lateral aids are on the mainland side.

Intracoastal Waterway

Green Daymark/ Minor Light with ICW Mark

ICW Square

Red Daymark/ Minor Light with ICW Mark

ICW Triangle

Dual Purpose Marks

This buoy is

DUAL PURPOSE.

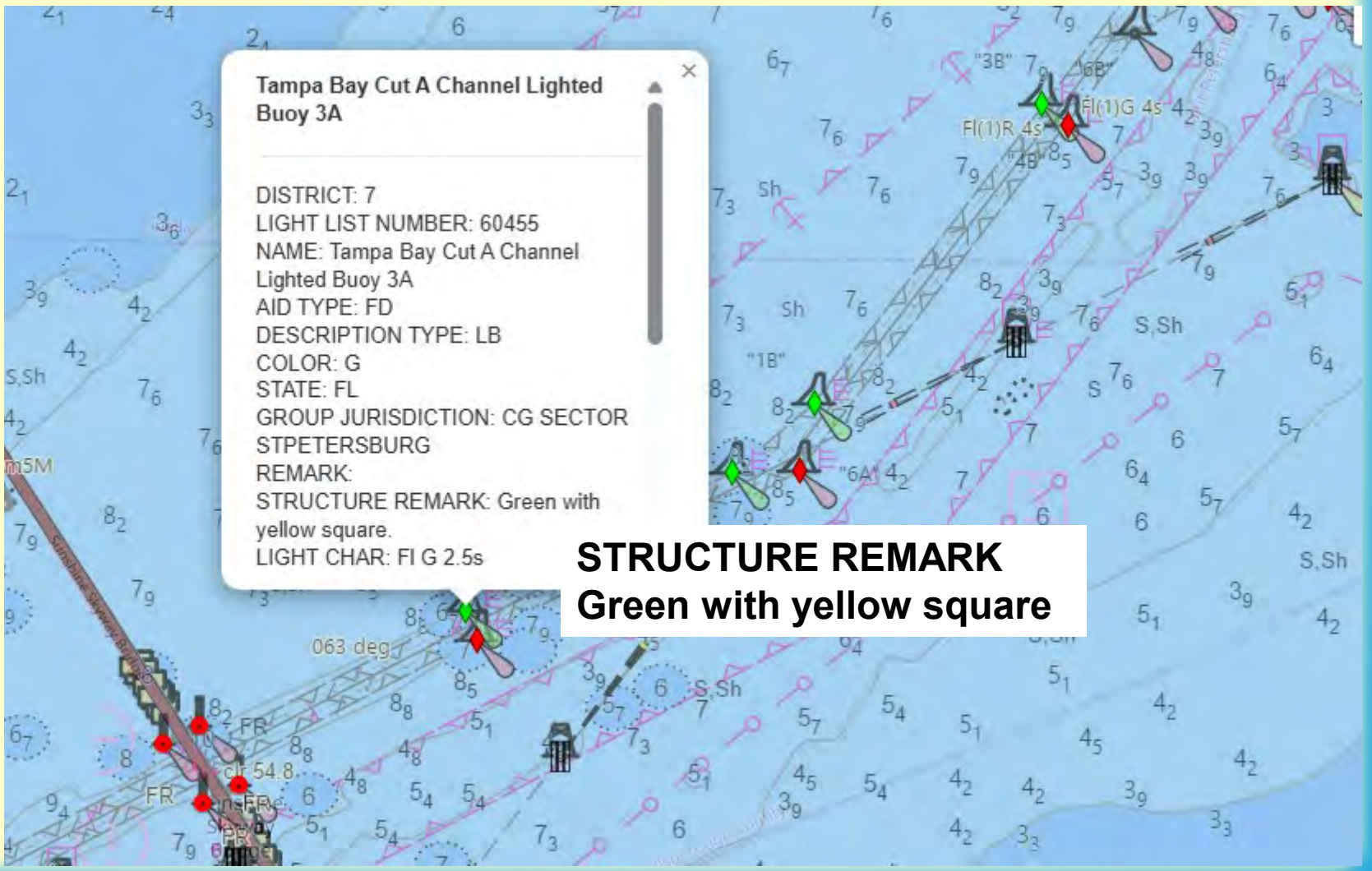
It marks the

eastbound channel

from the sea,

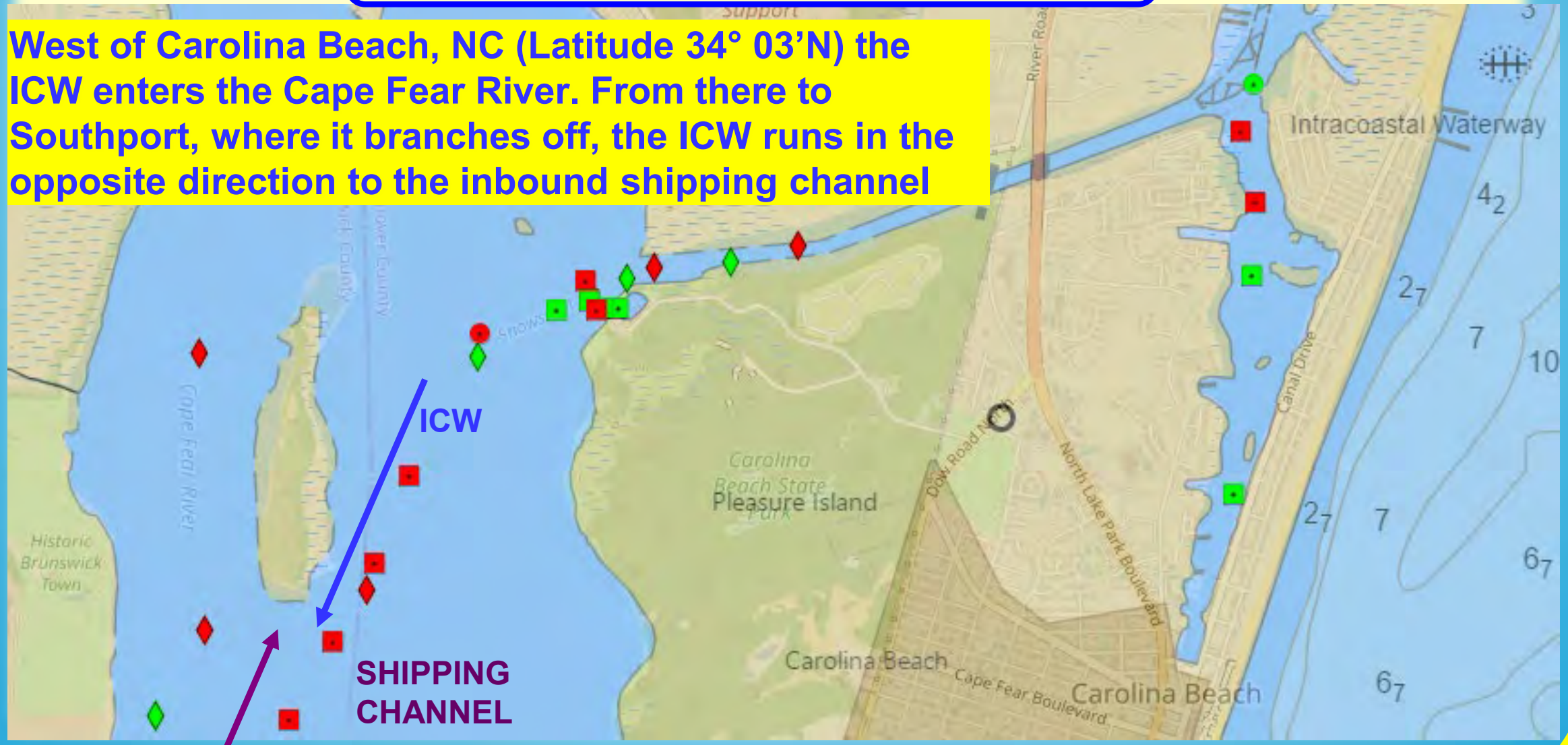
and the

northbound ICW.



Dual Purpose Marks

West of Carolina Beach, NC (Latitude 34° 03'N) the ICW enters the Cape Fear River. From there to Southport, where it branches off, the ICW runs in the opposite direction to the inbound shipping channel



Dual Purpose Marks

When the ICW runs in the ***opposite*** direction to the harbor channel:

- The **yellow triangle**  will be on **green** aids.
- The **yellow square**  will be on **red** aids.

In the **ICW**, follow the **yellow marks**.

When following the harbor channel, use the **RED-RIGHT-RETURNING** rule.

Dual Purpose Marks

30475 Cape Fear River Channel Lighted Buoy 19 Fl G 4s
Green with yellow triangle

0480 Cape Fear River Channel Lighted Buoy 20 Fl R 4s
Red with yellow square

Cape Fear River Channel Lighted Buoy 19

DISTRICT: 5
LIGHT LIST NUMBER: 30475
NAME: Cape Fear River Channel Lighted Buoy 19
AID TYPE: FD
DESCRIPTION TYPE: LB
COLOR: G
STATE: NC
GROUP JURISDICTION: CG SECTOR N CAROLINA
REMARK: Marks pile of stone ballast.
STRUCTURE REMARK: Green with yellow triangle.
LIGHT CHAR: Fl G 4s

Cape Fear River Channel Lighted Buoy 20

DISTRICT: 5
LIGHT LIST NUMBER: 30480
NAME: Cape Fear River Channel Lighted Buoy 20
AID TYPE: FD
DESCRIPTION TYPE: LB
COLOR: R
STATE: NC
GROUP JURISDICTION: CG SECTO
N CAROLINA
REMARK:
STRUCTURE REMARK: Red with yellow square.
LIGHT CHAR: Q R

Federal Aid Missions

An Auxiliarist cannot certify that a Federal Aid is Watching Properly.

Any Auxiliarist can report a discrepancy of a Federal Aid.

Auxiliarists (not necessarily Verifiers) can be given orders to check a Federal channel, especially after a hurricane.

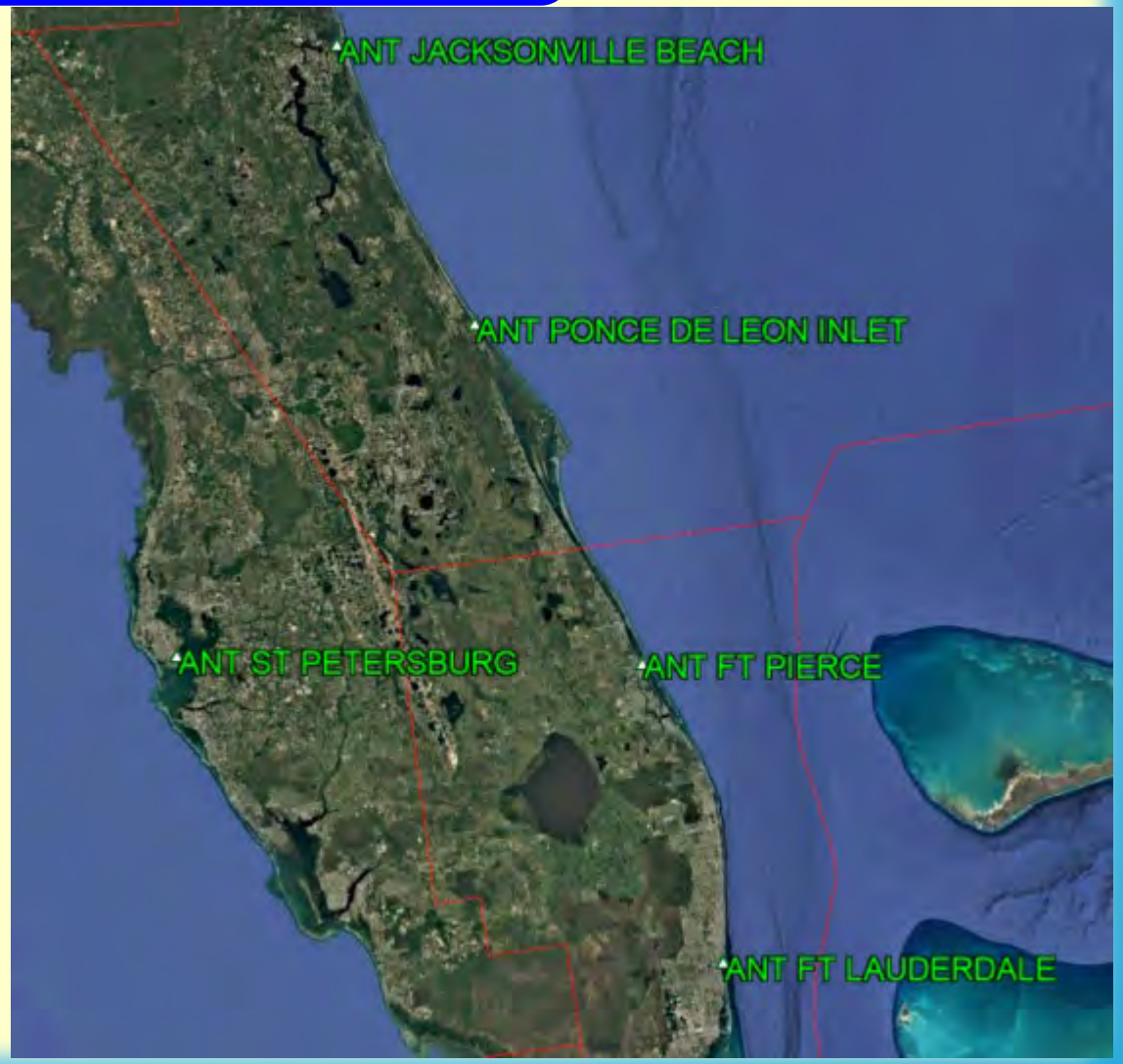
Federal Aid Missions

For a
Federal Aid discrepancy

FOLLOW

LOCAL

PROCEDURE



Federal Aid Missions

Sector issues a BNM (Broadcast Notice to Mariners) for each discrepancy

SAFETY/ANCLOTE KEYS TO CRYSTAL RIVER/ATON/SEC STP BNM 0151-24 Inbox ×

U.S. Coast Guard
to me

United States Coast Guard
U.S. Department of Homeland Security

CHASSAHOWITZKA DBN 17 (LLNR 28305) IS RPTD DESTROYED.
ALL MARINERS ARE ADVISED TO TRANSIT THE AREA WITH CAUTION.
CANCEL AT//082359Z MAY 24//

BT

Federal Aid Missions

ANT responds to the discrepancy

Federal Aid Missions

A certified AV can send a 7054 up the Auxiliary chain for record-keeping, but the local report process is what triggers the Coast Guard response.

Federal Aid Missions

The most important issue in reporting a Federal Aid is correctly identifying the aid:

Light List Number (LLNR)
Aid name from Light List

Federal Aid Missions

Auxiliarist Observes a Federal Aid discrepancy at any time:

1. Determine the discrepancy
2. Take a photograph clearly showing the discrepancy
3. Identify the aid:
   a) Light List Number.
   b) Full name of aid.
   c) Confirm it is a Federal Aid.
   d) Check the aid is not already in the LNM (Local Notice to Mariners) or BNM (Broadcast Notice to Mariners) *(More about this in the Publications session.)*
   e) All Federal Aid discrepancies must be reported <u>immediately.</u>

f) Check the procedure in your AOR. If in doubt, call Sector Ops 24 hr. number.

g) Follow the procedure in your AOR to advise Auxiliary NS.

Federal Aid Discrepancies

Your AOR may have specific criteria for what is a Federal Aid discrepancy and for post-storm reports.

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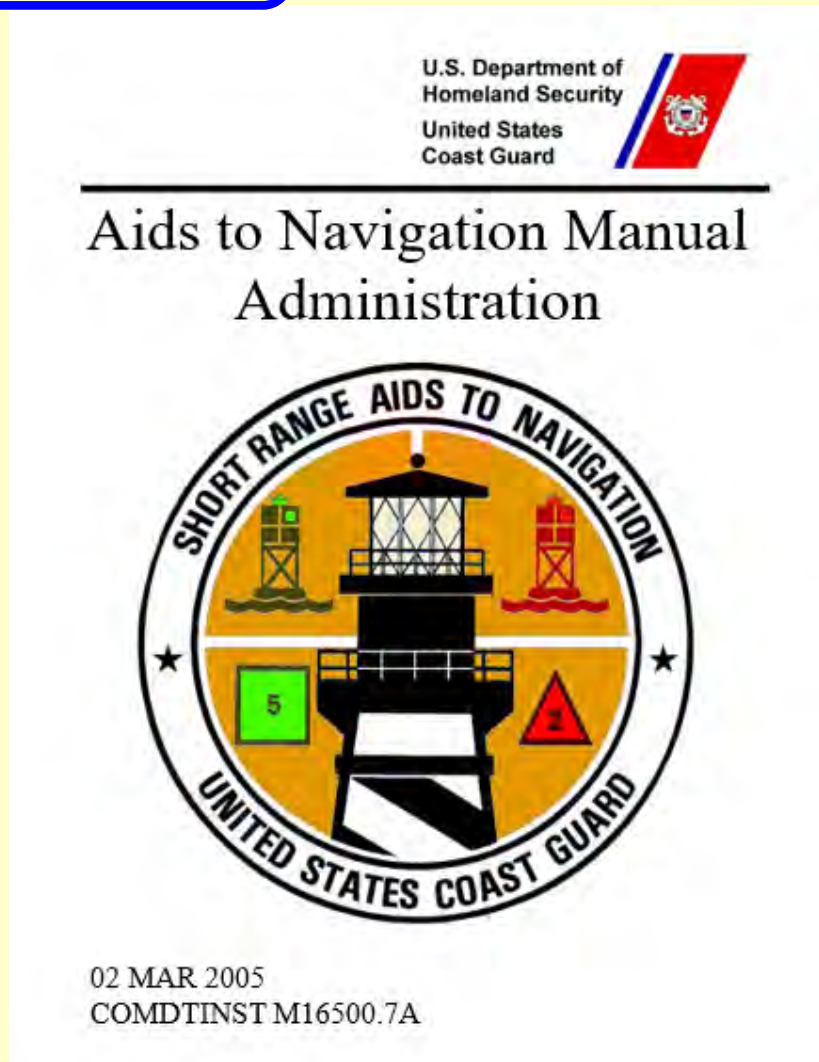
Key Reference Material

- **COMDINST M16500.3A**
  AIDS TO NAVIGATION MANUAL – TECHNICAL

- **COMDINST M16500.7A**
  AIDS TO NAVIGATION MANUAL – ADMINISTRATION

- **COMDINST M16500.25A**
  AIDS TO NAVIGATION MANUAL – STRUCTURES



Federal Aid Discrepancies

WE

Save Lives

US COAST GUARD AUXILIARY