



**Prevention
(Marine Safety)
Department
*Navigation
Systems
Division***



**BASIC
ATON
TRAINING**



Basic ATON Training

Today's Subject Agenda

- **Basic ATON Training.**
- **ATON Discrepancy Review.**
- **Getting AUXDATA credit for AN Activity.**

AtoN Training Objectives

- 1. Review the definitions for the various Federal and Private Aids to Navigation.**
- 2. Understand why AtoNs are established.**
- 3. Understand the specific purpose of the various AtoNs.**
- 4. Become familiar with the flash characteristics used on AtoNs.**

AtoN Operational Objectives

1. A high level of professionalism required on the part of each NS Team member.
2. Accurate and complete AtoN reports to the Coast Guard.
3. A high level of quality data to increase the credibility of our AtoN Program.
3. Reports forwarded to the Coast Guard in a timely manner.

TERMINOLOGY UPDATE

AtoN – FEDERAL SHORT
RANGE AID TO NAVIGATION.

PAtoN – PRIVATE AID TO
NAVIGATION.

ATON System Definitions

IALA - International Association of
Lighthouse Authorities.

Divides the world into 2 regions:

Region “A”: Most of the World

Region “B”: North & South
America, Japan, Korea, and the
Philippines.

AtoN System Modes

Region “A”

Region “B”

Red – Even - Triangles and nuns.

Green - Odd - Squares and cans.

AtoN System Names

U.S. Marking System

**Intracoastal Waterway
System**

Western River System

U. S. Marking System

Lateral System:

Employs a simple arrangement of . . .

1. colors,

2. numbers, and

3. shapes,

and when you can't see the shape,,

light colors and light characteristics.

. . . to show on which side an aid should be passed when proceeding in the Conventional Direction of Buoyage.

“Red Right Returning from the sea”

Conventional Direction of Buoyage in channels:

- Numbering starts at seaward and increases toward the shore.
- Numbering starts at the mouth of rivers and increases upstream.
- Numbering is clockwise around islands.

Conventional Direction of Outer Buoys

- Purpose: To identify how aids should be passed in areas other than channels.
- Regions:
 - **Atlantic Coast: Southerly**
 - **Gulf Coast: North and Westerly**
 - **Pacific Coast: Northerly**
 - **Great Lakes: North and Westerly**
(Lake Michigan: Southerly)

Conventional Direction of Buoyage

Used for marking the Intracoastal Waterway (*ICW*) and the off-shore ocean buoys along the coast.



Definition of an Aid to Navigation

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

- a. Determine their position,**
- b. Determine a safe course, or**
- c. To warn them of dangers or obstructions to navigation.**

Definition of a Buoy

Any unmanned, floating aid to navigation that is moored to the seabed.

May be lighted or unlighted.

The seabed is owned by the Corps of Engineers (USACE) and is licensed to the Coast Guard who deploy ATONs and authorize private parties to deploy PATONs.

Unlighted Nun Buoy

Conical
shape

Red
Retro



White
Number

Definition of a Beacon

Any fixed aid to navigation located on a shore or marine site.

Lighted beacons are called Lights.

Unlighted beacons are called Daybeacons or Daymarks.

Definition of a Daymark

The daytime identifier of an aid to navigation presenting one of several colors, shapes, numerals or letters.

The shape may be a square, triangle, rectangle, diamond or octagon.

Unlighted Red Daymark

Is there
anything wrong
with this
daymark?



It should have
a contrasting
red number

Starboard Lateral Marks

Color: **Red**

Shape: Triangular
or conical—nuns.

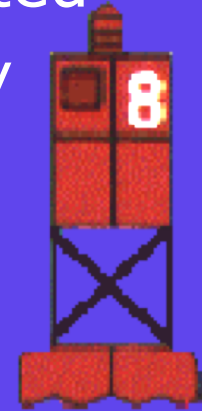
Character: Even
Numbers

Light: **Red**



Small Light

Lighted
Buoy



Nun

Daymark





Large Lighted Red Buoy

Red Daymark on Dolphin (Small Light)



Port Lateral Marks

Color: **Green**

Shape: Square /
Cans

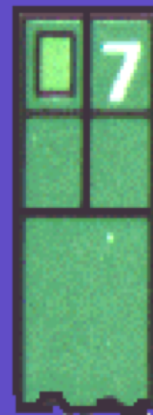
Character: Odd
Numbers

Light: **Green**



Small Light

Lighted
Buoy

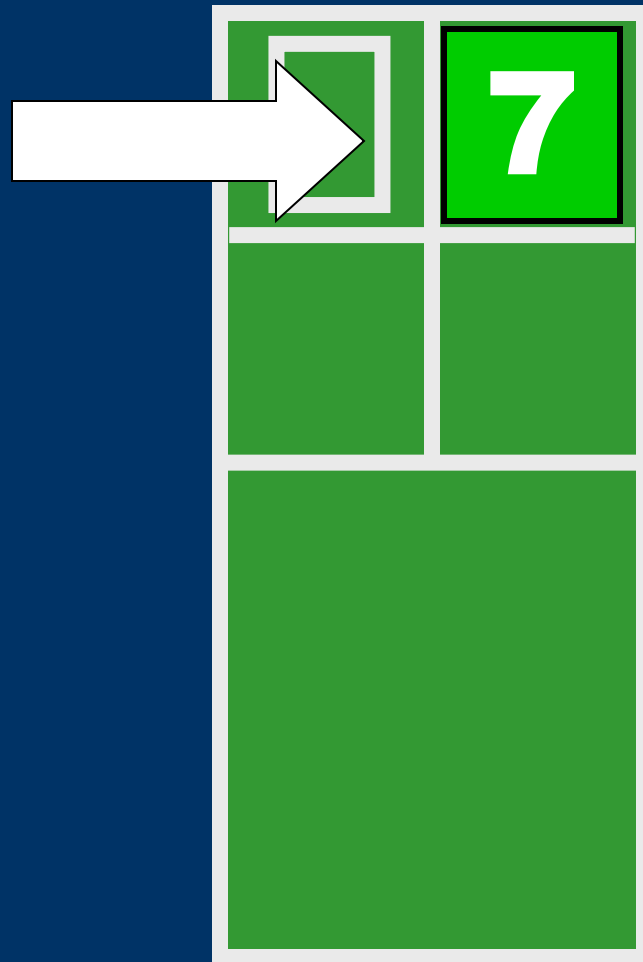


Can

Daymark



Unlighted Can Buoy



It should
have a
white
number.
Is there
anything
wrong with
this can
buoy?

Unlighted Green Can Buoy



**Most likely a
Private Aid to
Navigation.**

Lighted Green Buoy





Is there ~~anything~~ anything
coming with this **GREEN**
daymark?

**Unlighted
Green
Daymark**



If there was a post in the middle of the desert someone would hit it.....
(did you notice the name of the boat?)

An aerial photograph of a waterway with several navigational aids. At the top, a channel narrows. On the left bank, there is a green square marker with the number 9, a green square marker with the number 7, and a red triangular marker with the number 10. On the right bank, there is a green square marker with the number 1 and a red triangular marker with the number 2. In the center of the channel, there is a red cylindrical marker with the number 8. Below the main text box, the waterway continues. On the left bank, there is a green square marker with the number 3. On the right bank, there is a red triangular marker with the number 2. In the center of the channel, there are two markers: a green square marker with the number 1 and a red cylindrical marker with the number 2.

**Always operate your
boat in the channel!**

**“Lateral” systems define
the navigable channel.**

Preferred Channel Marks

Purpose: Marks junctions / bifurcations

Description:

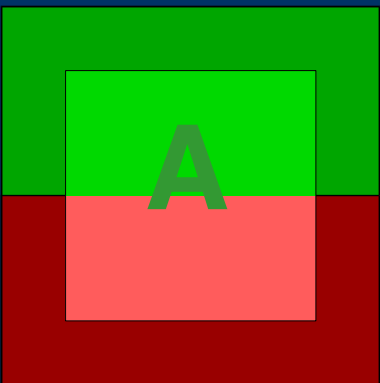
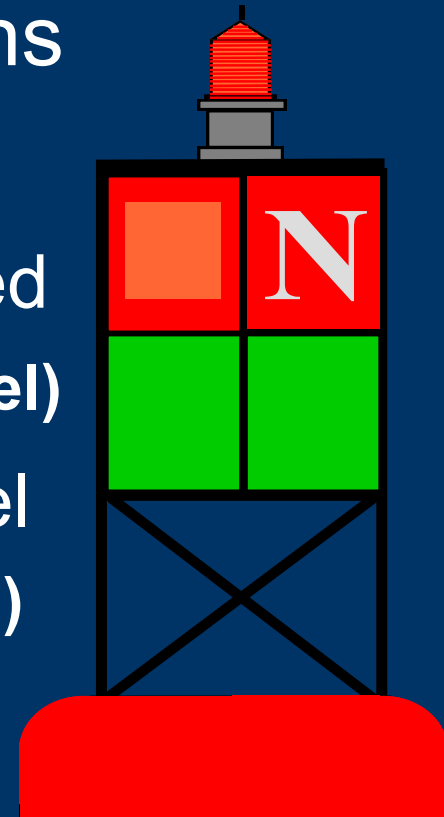
Color: **Red** & **Green** horizontally banded
(The top color band is for the preferred channel)

Shape: Same as for the preferred channel
(Use the uppermost band in preferred channel)

Character: Letter not number.

Light: Same color as uppermost band.

Characteristic: **Gp Fl (2+1) 6s**



JUNCTION

Two channels join to form one channel.
Preferred channel buoy is placed upstream.

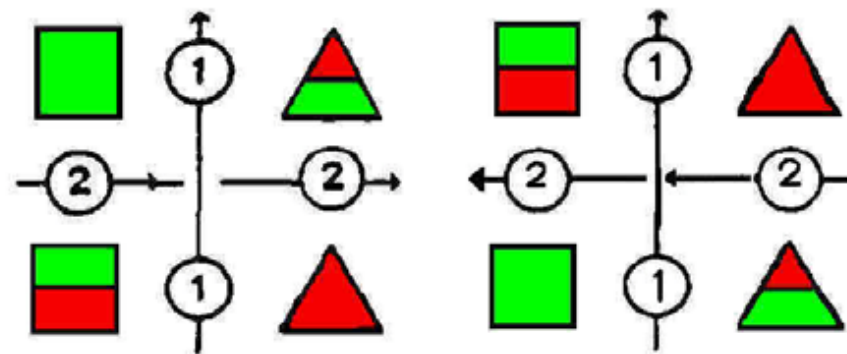
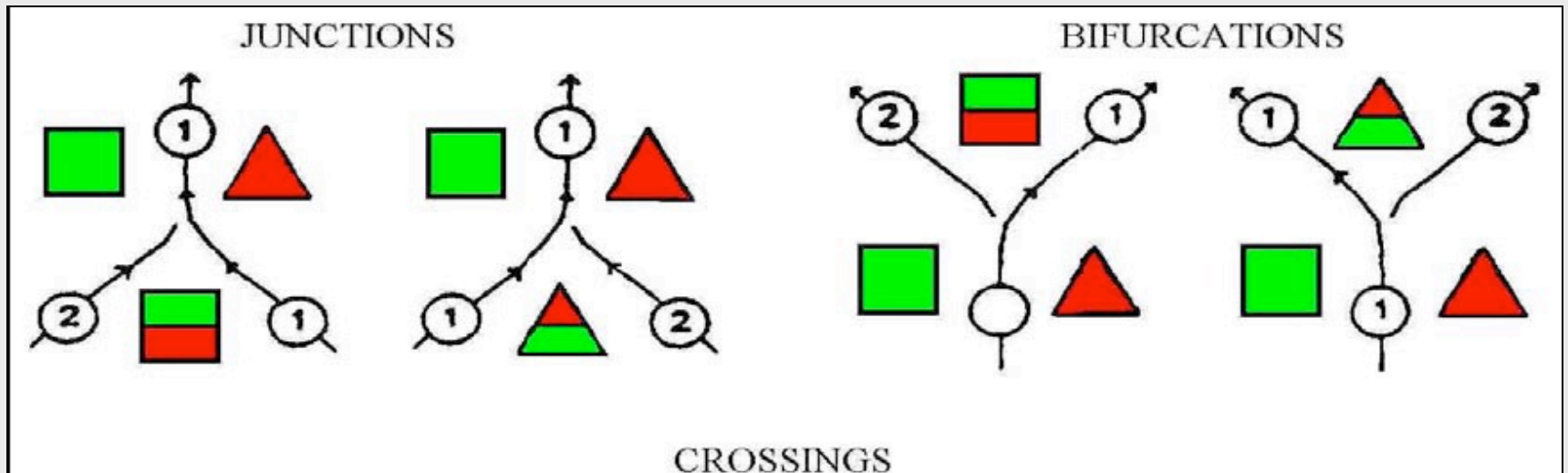
BIFURCATION

One channel splits to form two channels.
Preferred channel buoy is placed downstream.

CROSSING

One channel crosses another channel.
No requirement to mark all four corners.

Junctions and Bifurcation Patterns



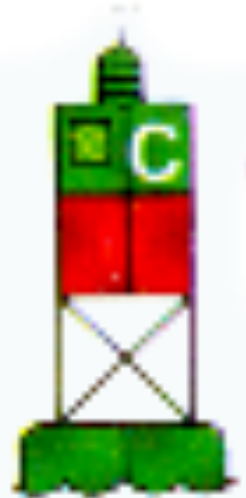
NOTE: There is no requirement to mark all three or four corners of the intersections.

In the main (primary or preferred) channel, pass these buoys on your port side (to your left) when returning from the sea.

In the secondary channel, pass these buoys on your starboard side (to your right) – “Red Right Returning from the sea.”



CAN

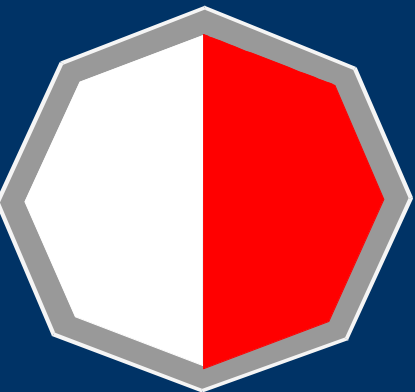
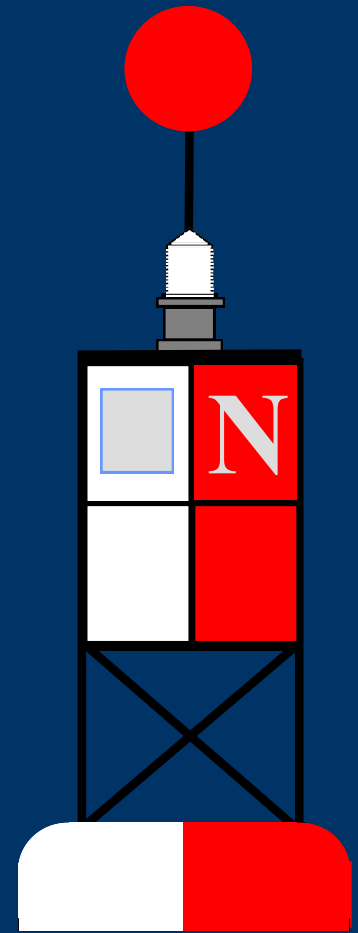


An aerial photograph of a river winding through a forested area. Several nautical markers are placed along the riverbanks: a green square with the number 9, a red triangle with the number 10, a green square with the number 7, a red triangle with the number 8, a green square with the number 1, and a red triangle with the number 2. A large red rectangular box with a white border is superimposed over the center of the image, containing the text 'Always reference your NOAA nautical chart!' in white. To the right of the word 'chart!' is the text 'BR'. Below the red box, there are illustrations of a motorboat, a sailboat, and two nautical markers: a green square with the number 1 and a red triangle with the number 2.

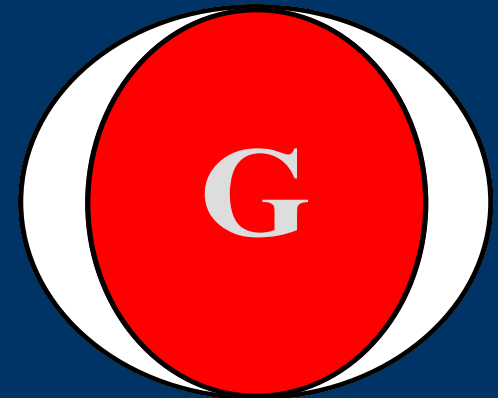
**Always reference
your NOAA nautical
chart!** BR

Safe Water Mark

- **Purpose:** Indicates navigable water all around the mark.
- **Description:**
 - **Color:** Red and White vertically striped.
 - **Shape:** Sphere or Buoy with Topmark.



- **Character:** White letters.
(ex. "NC" North Channel)
- **Light Color:** White
- **Characteristic:** Mo(A)



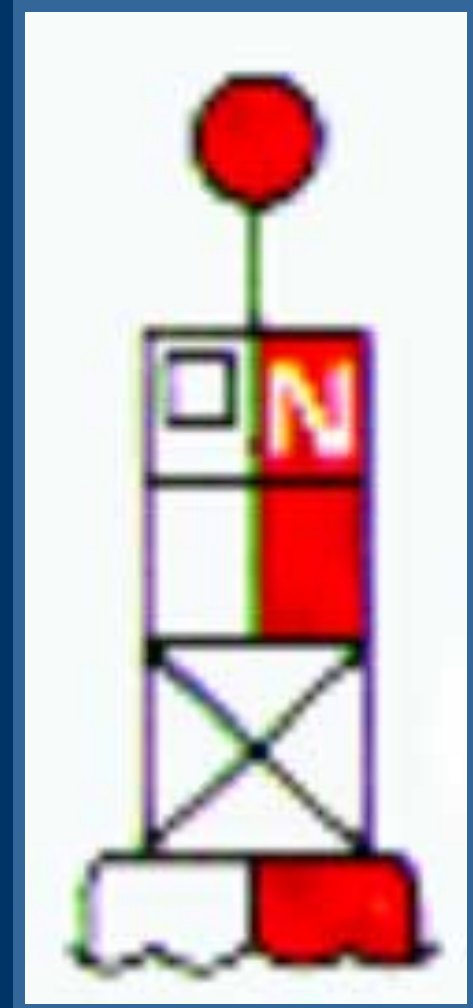
Safe Water Marks



MR



Spherical



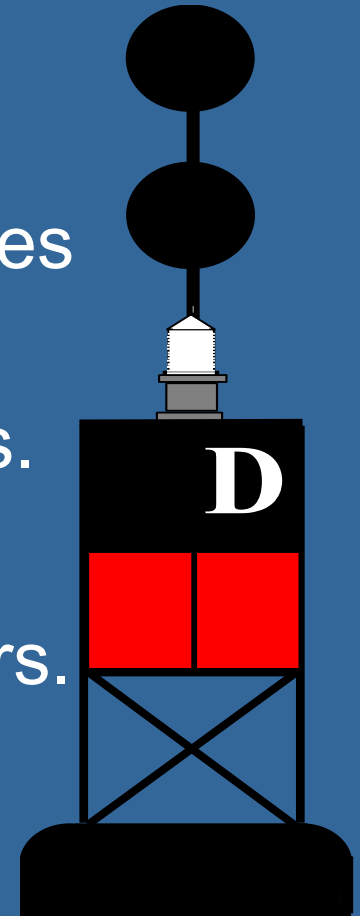
**Lighted and
or sound**

Lighted Safe Water Mark



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.
 - Light Characteristic: **Gp Fl (2) 5s.**

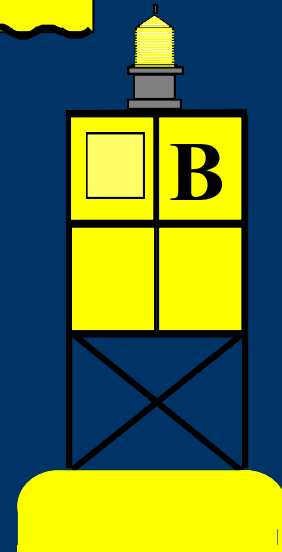
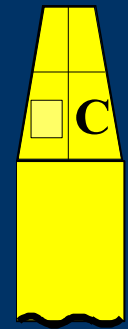
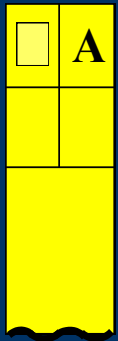


Special Purpose Aids

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, Qk**)

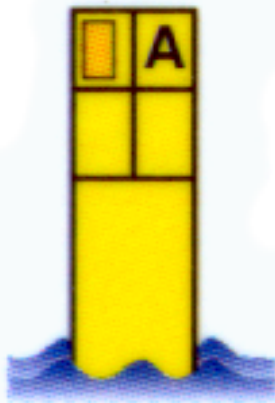


Special Purpose Aids

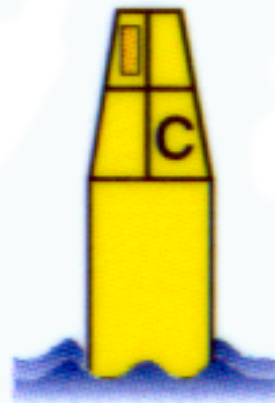
MAY BE LETTERED
(ANCHORAGE, TRAFFIC SEPARATION, FISH NET AREA, ETC.)



YELLOW LIGHT ONLY
FIXED OR FLASHING



UNLIGHTED





Regulatory and Information Marks



Purpose: Alert the mariner to such things as submerged pipes, no wake zones, etc.

Description:

Aid Color: White with **orange** band or border.

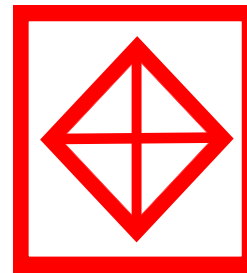
Shape: Square, Round, or Diamond.

Character: Lettering (black, usually words)

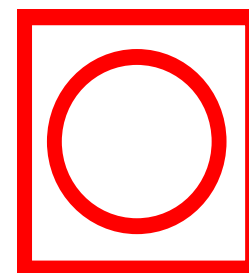
Light Color: White

Light Characteristic:

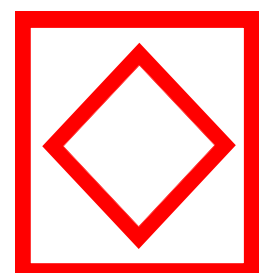
Any flash not otherwise already reserved.



**EXCLUSION
AREA**



**RESTRICTED
OPERATIONS**



DANGER

Regulatory and

Diamond - means danger and words may appear explaining the danger.

Called a **Danger Buoy**

Circle - means restricted operations.

Speed Buoys (5 MPH) or **No Wake Buoys**.

Diamond with a Cross - tells you that vessels are not allowed in the area.

Called **Exclusion Buoys**

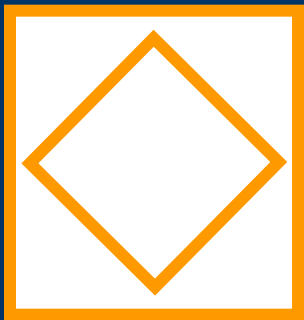
Square - contains directions for the boater.

Bridge **Regulatory Signs**.

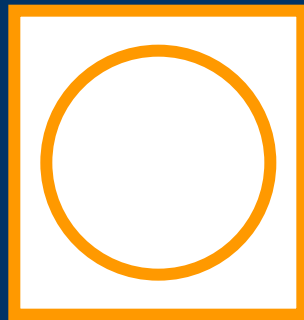
Reg

What's wrong
with this picture?

Marks



Exclusion
Area



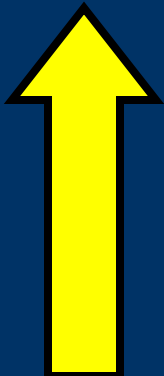
Restricted
Operations



DANGER



If lighted
White only



No Cross inside
the diamond

Restricted Operations - Minimum Wake



Restricted Operations - Manatee Zone

Bridge
Discrepancy
Report



D A N G E R



Restricted Operations - No Wake



Check the
structure
and piles!

Restricted Operations Area

These are non-lateral aids.

The accuracy of the location of these aids is usually not a major issue.

The location of these aids in the navigable channel is considered a reportable discrepancy.

These aids are normally “Private.”

Restricted Operations - No Wake



Exclusion Area - No Anchoring



Definition of a Range

A pair of beacons arranged so that, when they are aligned, they indicate the navigable center line of the channel.

Range Marks

Purpose: Indicate the navigable center line of a channel when they are in line (aligned) as you traverse the channel.

Description:

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

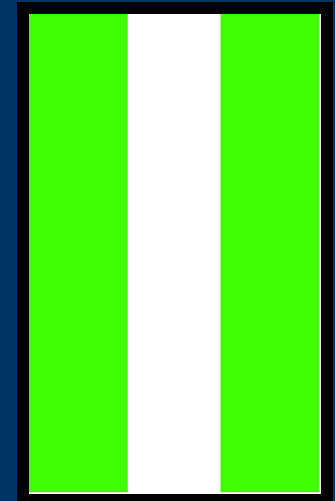
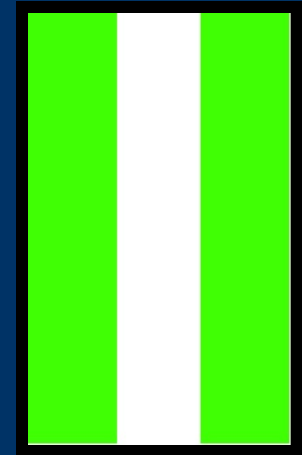
Aid Shape: Rectangle with tall side up.

Aid Light - Green, Red, White or Yellow.

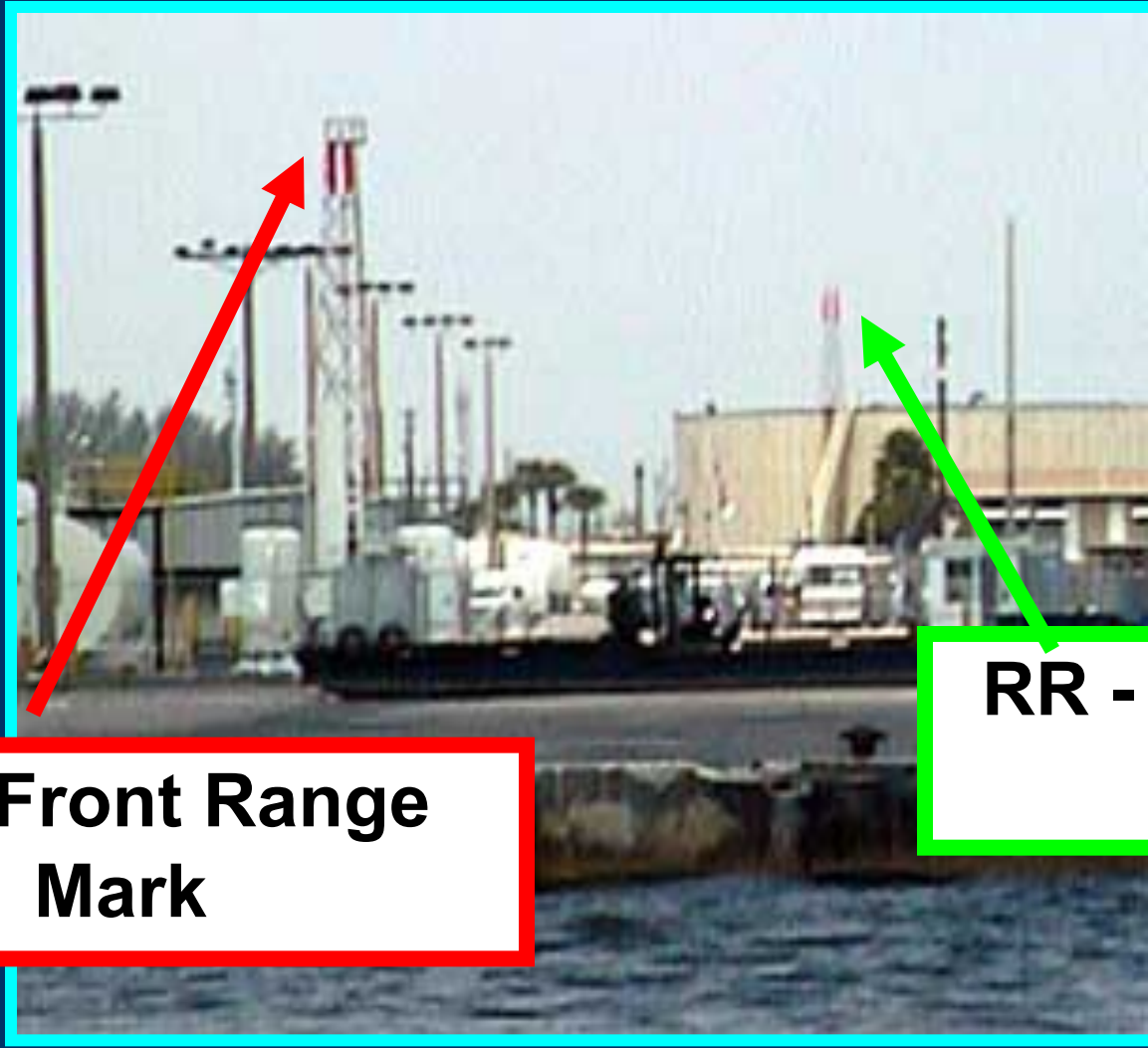
Front range light is lower of the two.

Rear range light is higher and further from the mariner.

KGW = Range, Green, with a White Stripe.



Range Marks



**FR – Front Range
Mark**

**RR - Rear Range
Mark**

WRECK MARKS

Purpose: To alert the mariner to wrecks.

Description:

Aid Color: Appropriate to side of channel.

Aid Shape: Appropriate to side of channel.

Character: **White** lettering “**WR**”, numbered
in sequence with channel (**WR2**).

Aid Light: Same as buoy color.

Light Characteristic: **Quick Flashing**

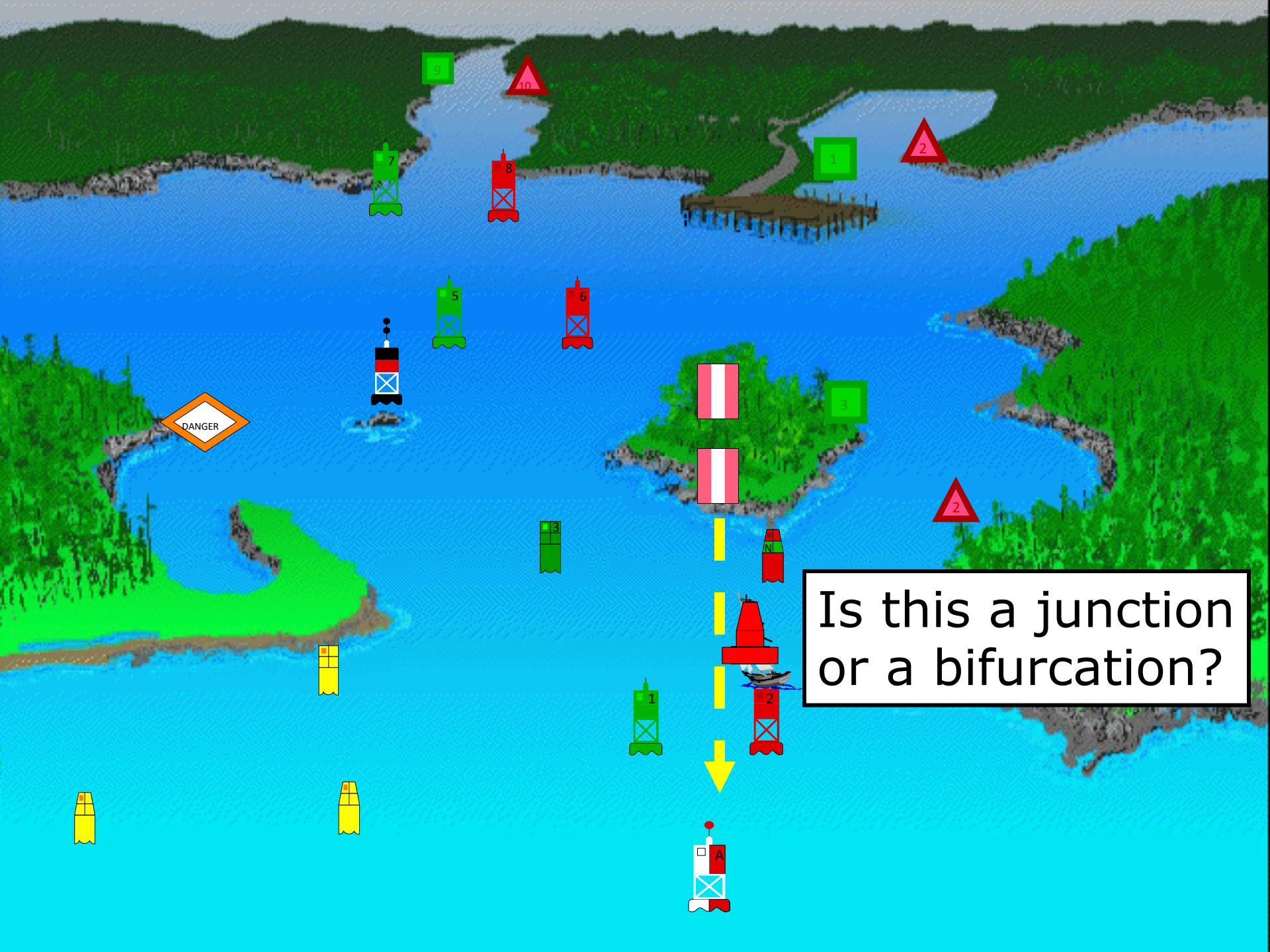
(unless aid is a preferred channel aid)



LOCATION MARK

Some markers will have no lateral significance. They are not designed to indicate the channel but rather, to help you determine where you are.





Is this a junction
or a bifurcation?

Light Structures

Major Lighthouses

- Are named. e.g. Boston Light
- Symbol is large exclamation point.
- Fixed position

Minor Lights

- Not named
- Same symbol
- Fixed position



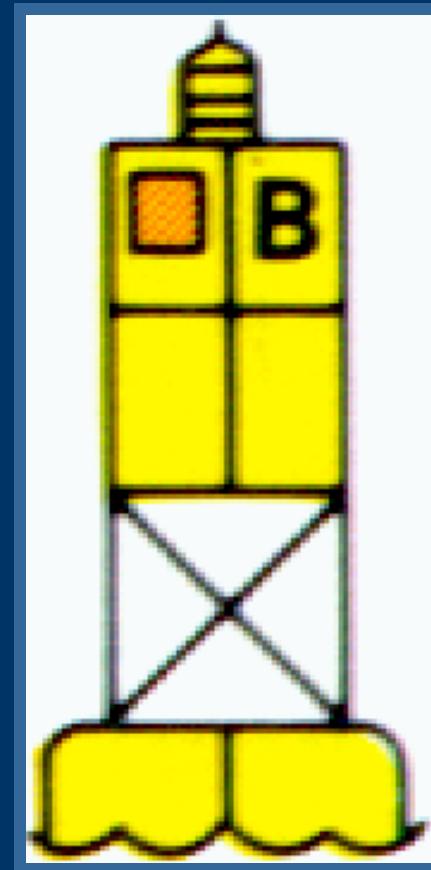
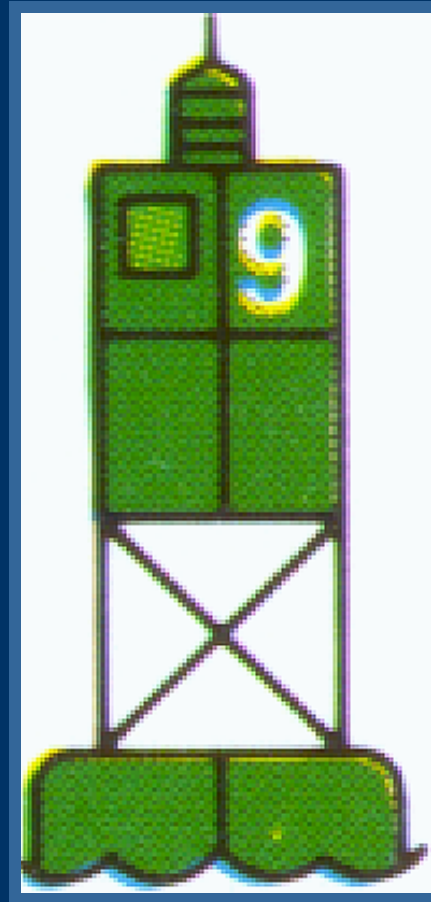
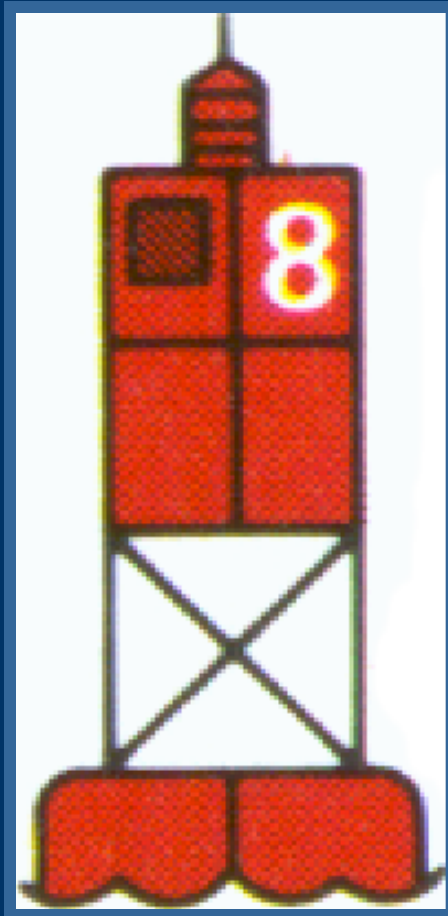
Boston Light





Inside the Boston Light tower.

Other Lights



Understanding Light Patterns

Learn how to time a light.

1. Time multiple light cycles.
2. Divide the time by the number of cycles.

Light Patterns



Fixed (F) – continuous, unblinking light



Flashing (FI) – 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).

Light Patterns



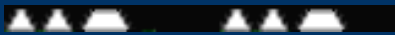
Group Flashing (Gp Fl (x+x)) – Combination of two patterns in one period, i.e. 2 flashes followed by three flashes.



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.



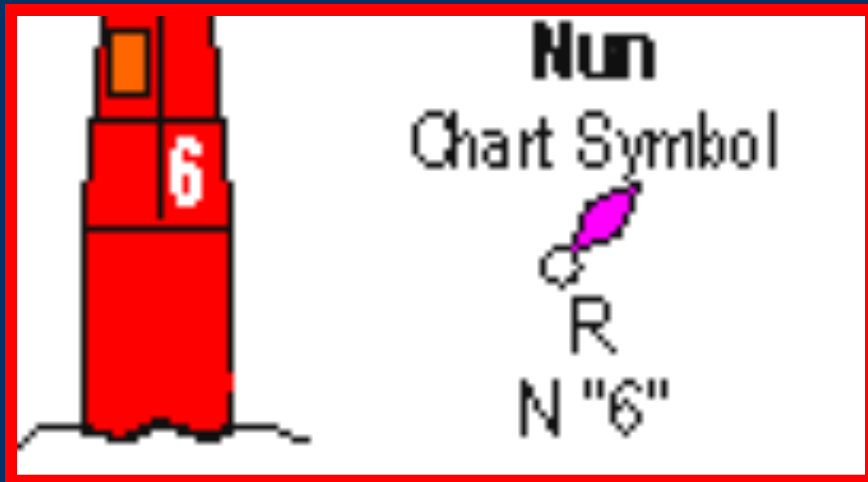
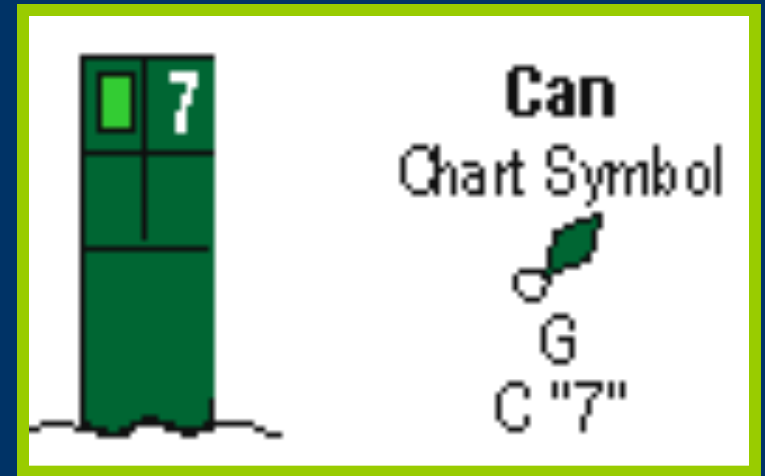
Long Flashing (LFL) – One long flash in a period with lighted period of at least 2 seconds.

Review the symbols and abbreviations on your NOAA chart for every aid that you check.

Check any discrepancies to the Coast Guard and visit our map update tool NOAA observations of the aid.

Chart Symbols

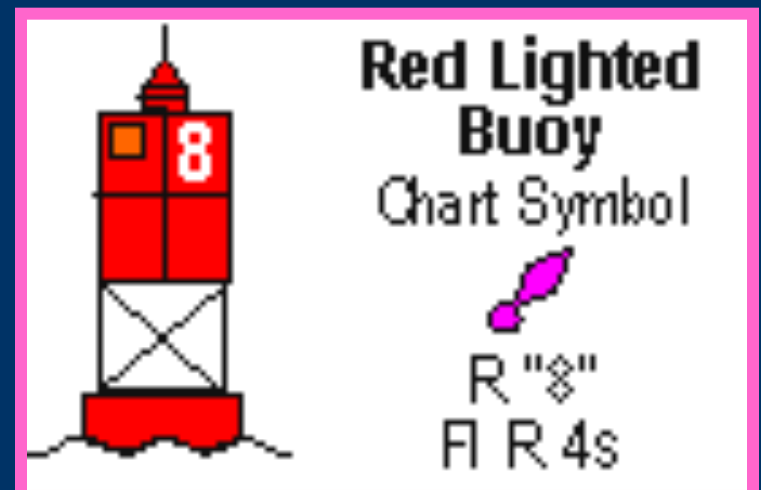
CAN - Green Diamond with small watch circle



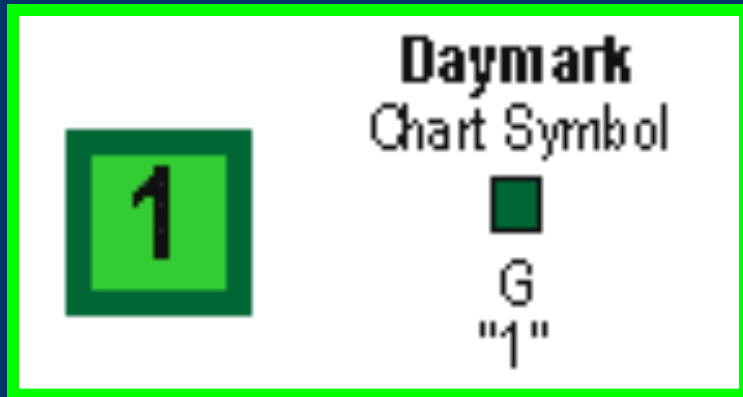
NUN – Red diamond with small watch circle.

Watch circle overprinted with magenta when lighted.

Italics used for buoys and other floating aids.

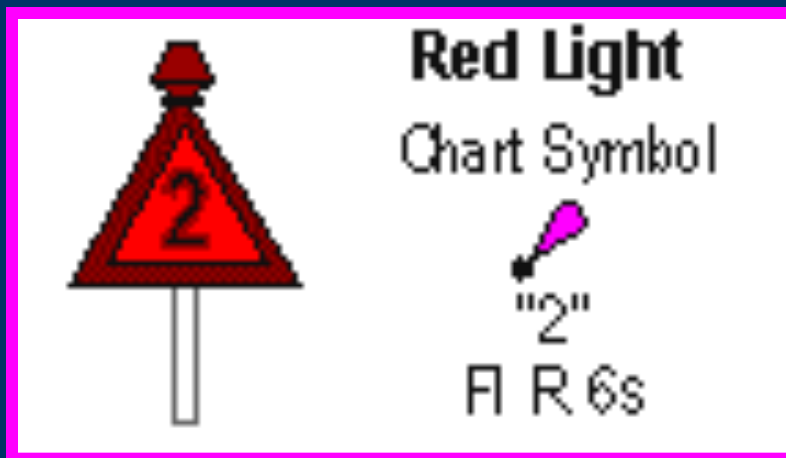
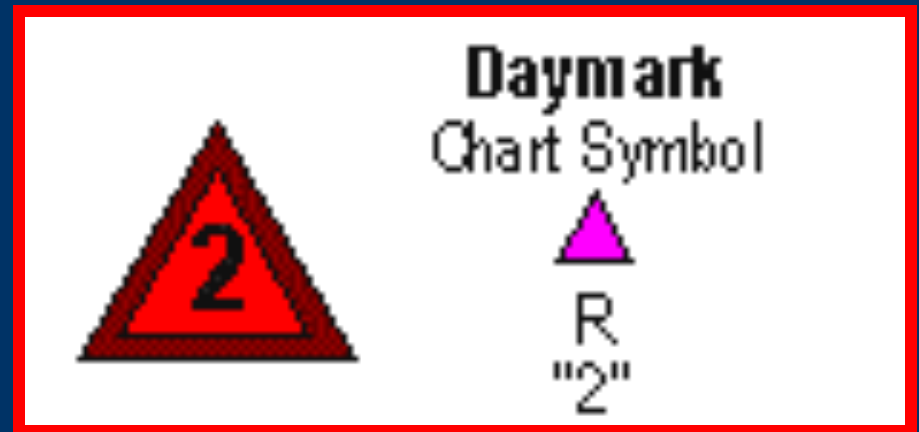


Symbols - Daymarks and Minor Lights



Green Daymark
Green square.

Red Daymark
Red triangle



Minor Light - **Magenta**
exclamation mark
(teardrop with black dot)
Note the vertical letters
used for fixed marks

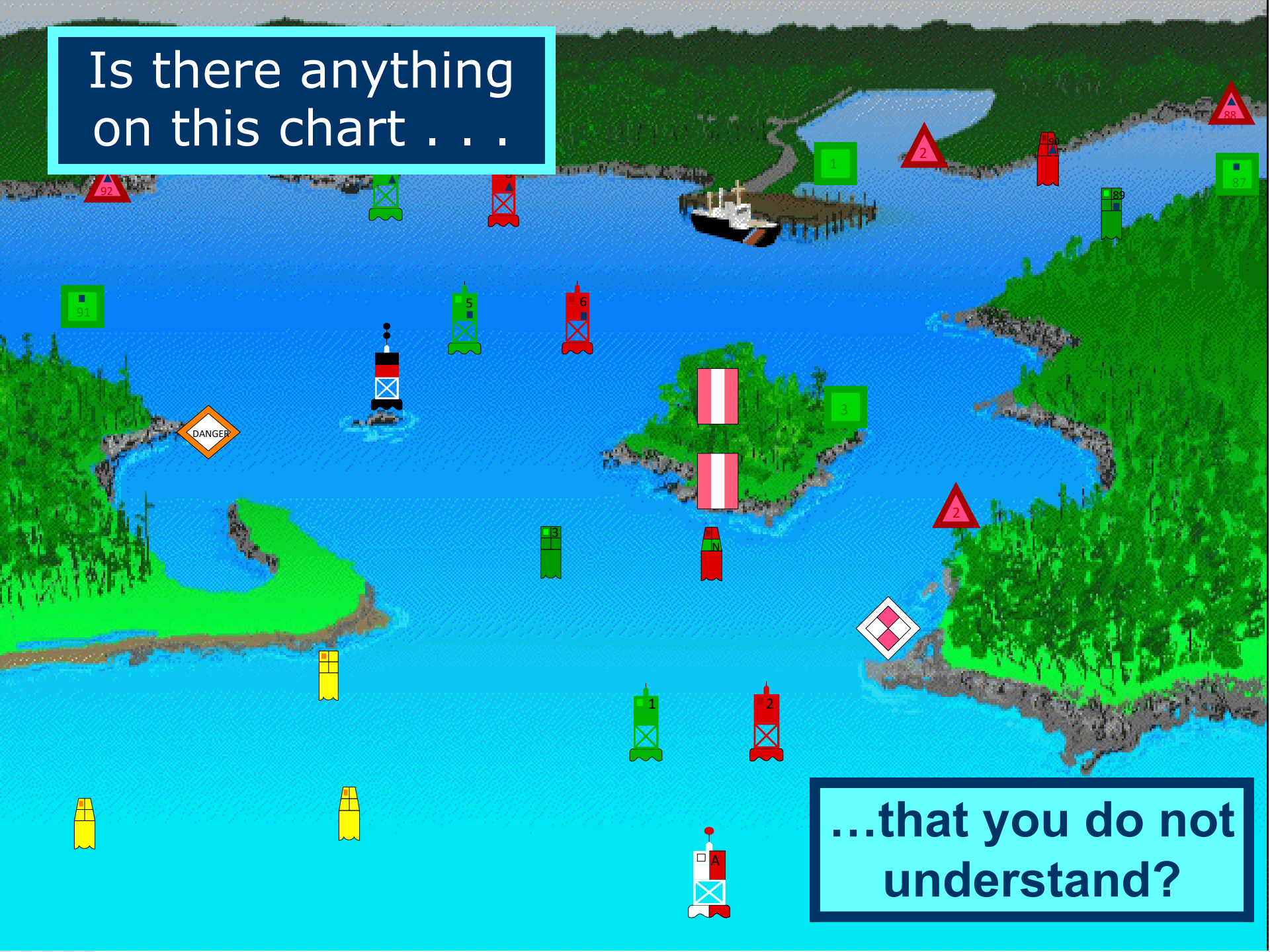
Symbol data in quotes indicates that the characters appears on the aid.

Symbol data in italics indicates that the aid is floating.

Vertical symbol data indicates that the aid is fixed.

**te that the
on your chart
matches the aid that you
observe and the entry for the
aid in the Light List.**

Is there anything
on this chart . . .



...that you do not
understand?

AtoN - Reference Materials

Local Notice to Mariners – LNM - [online](#)

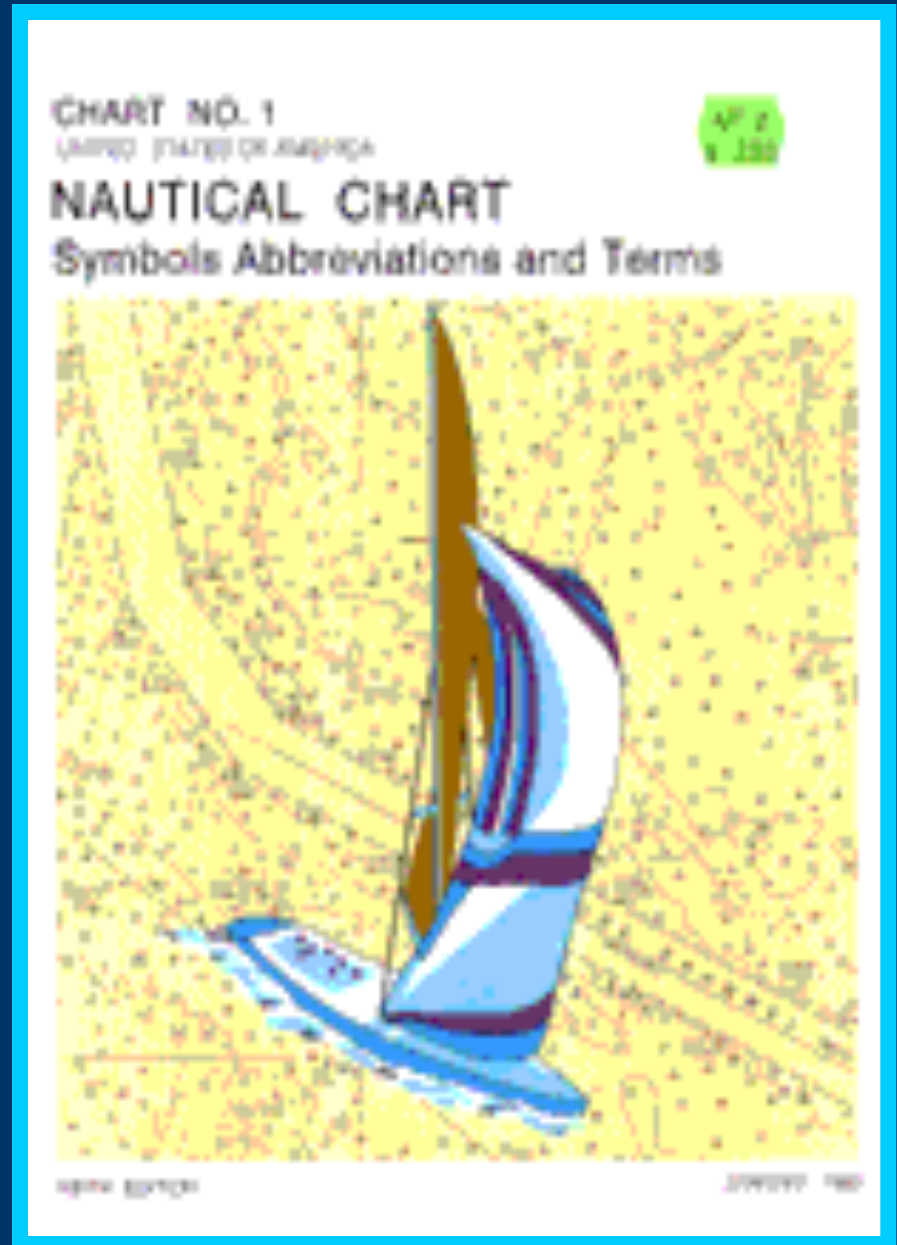
Chart No. 1: Nautical Chart Symbols, Abbreviations, and Terms - [online](#)

Light List 1– ME to New Jersey - [online](#)

Coast Pilot 1 – ME to Cape Cod - [online](#)

Chart No. 1

- Purpose is to help you identify AtoNs.
- Standard conventions for all charts
 - Listed in Chart No. 1
 - On Line



Supports the Local Notice to Mariners

U.S. Department
of Transportation
**United States
Coast Guard**



LOCAL NOTICE TO MARINERS COASTAL WATERS FROM EASTPORT, MAINE TO SHREWSBURY, NEW JERSEY WEEKLY SUPPLEMENT

INTERNET ADDRESS

<http://www.navcen.uscg.gov>

Weekly supplemental editions contain new information only available following the monthly edition. NOTE: Chart corrections and Light List changes appear only once each. A complete listing of current discrepancies and temporary changes appear in the monthly issue, LNM 4092. Subscription to this weekly publication is free. If you have questions about the LNM or wish to be on the mailing list, contact:

COMMANDER, FIRST COAST GUARD DISTRICT (0601)

408 Atlantic Avenue, Boston, Massachusetts 02116-3350
Telephone (Day): 1-800-848-3942 To order LNM: Ext. 8351 or 8222
24 Hour FAX: (617) 223-8073
Coast Guard's Customer Infoline (8:00 a.m. - 4:00 p.m.): 1-800-368-5647
Hearing impaired: (TDD) 1-800-685-0816

All bearings are in degrees TRUE - All times are in Local Time unless otherwise noted.

NOTE: A vertical line in the RIGHT MARGIN of sections I, V, VI, VII indicates new information.

BROADCAST NOTICE TO MARINERS

The following Broadcast Notice to Mariners (BNMs) have been issued since last week:

First District	CGI-0461	to	0470
Group Boston	BOS-0092	to	0093
Group Long Island Sound	LIS-0167	to	0168
Group Monches	MOR-0044	to	0044
Group New York	NEW-0186	to	0193
Group Portland	POR-0077	to	0077
Group Southwest Harbor	SWH-0042	to	0042
Group Weeks Hole	WHG-0130	to	0130

Light List Reference: ATLANTIC COAST, VOLUME I, COMDT PUBL P16502.1, 2002 Edition

SPECIAL NOTICES This section contains information of special concern to the Mariner.

NONE THIS WEEK

DISCREPANCIES This section lists all discrepancies to Aids to Navigation reported and corrected since the last published list. A discrepancy is a change in the status of an aid to navigation that differs from what is published and/or charted.

DISCREPANCIES (since last week)

LNMR	Name of Aid	Status	Chart Affected	BNM Ref.	LNM Ref.
2350	Weaver Ledge Buoy 1	OFF STA	13318	SWH-0042-02	4402
10820	President Roads Anchorage Lighted By B	BUOYDMGD	13272	BOS-0093-02	4402
12580	Danbury Par Light	FS INOP	13253	BOS-0092-02	4402
19715	Southeast Pass Buoy 1	OFF STA	13217	WEL-0131-02	4402
19795	Watch Hill Light	FS INOP	13214	CGI-0463-02	4402
22855	Scotch Cap Light 11	LT EXT	13213	LIS-0167-02	4402
35135	Sandy Hook Ch R Fl Lt (East and Main)	DBN DMCH	12401	NEW-0193-02	4402

The Local Notice to Mariner is generated using the ATONIS Database

- Chart Corrections
- Discrepancies
- Light List Changes
- **On line.**

Intracoastal Waterway

- Begins in New Jersey.
- Goes south to the Florida Keys.
- Then north along the west coast of Florida.
- Then west along the Gulf of Mexico to Brownsville, Texas.


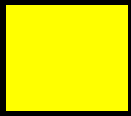

Intracoastal Waterway Marks

When aids in a channel are also used to identify an ICW channel.

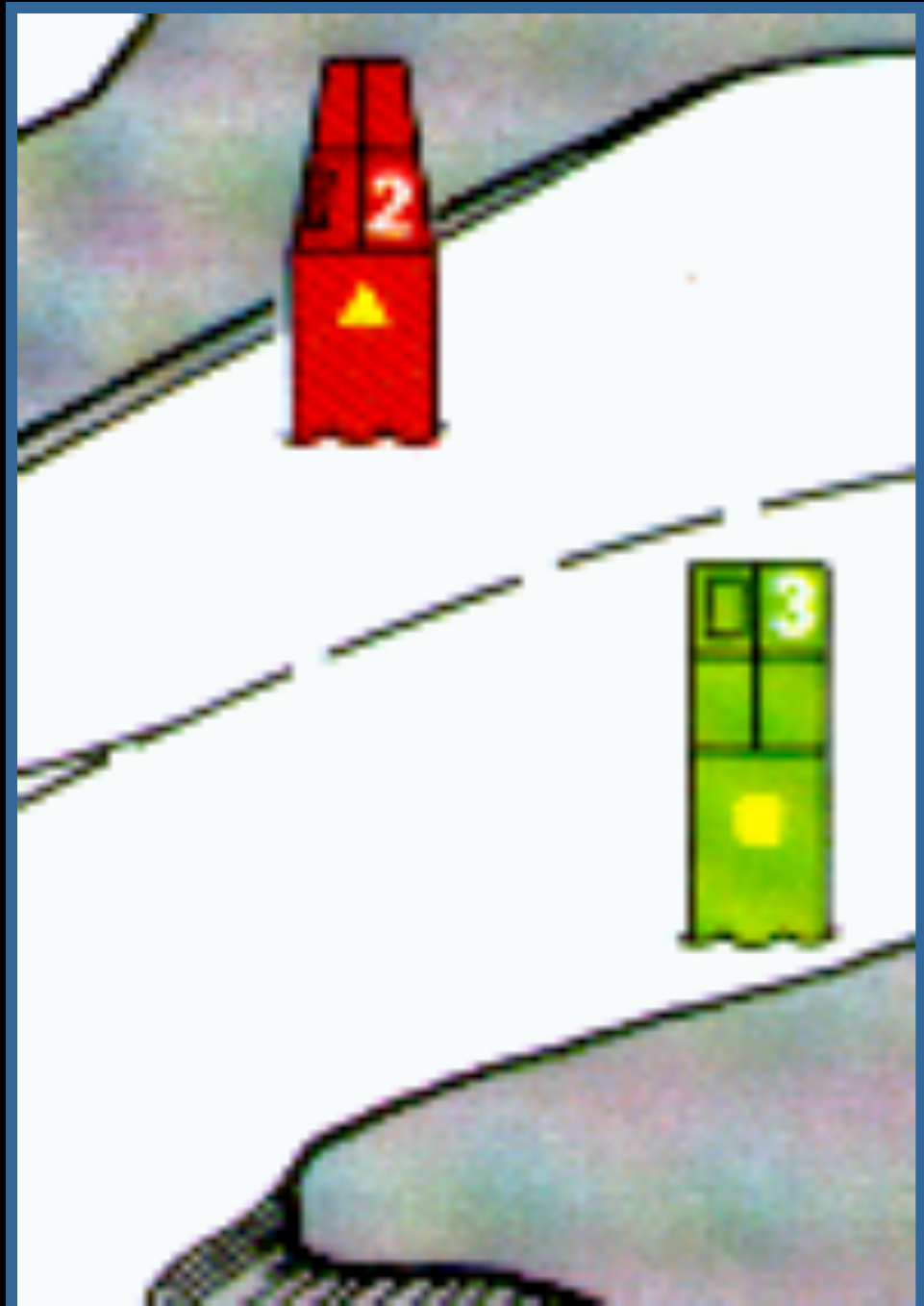
The normal “Red right returning from the sea” rule applies to both.

- **Yellow triangles, squares** and **bands** are used to identify ICW marks.

Intracoastal Waterway Marks

- The material used is **retroreflective**.
- **Yellow triangles** are usually displayed on **red** lateral marks used on the ICW.

- **Yellow squares** usually are usually displayed on **green** lateral marks used on the ICW.

- **Yellow bands** are displayed on non-lateral marks used on the ICW.


Aids marking the Intracoastal Waterway

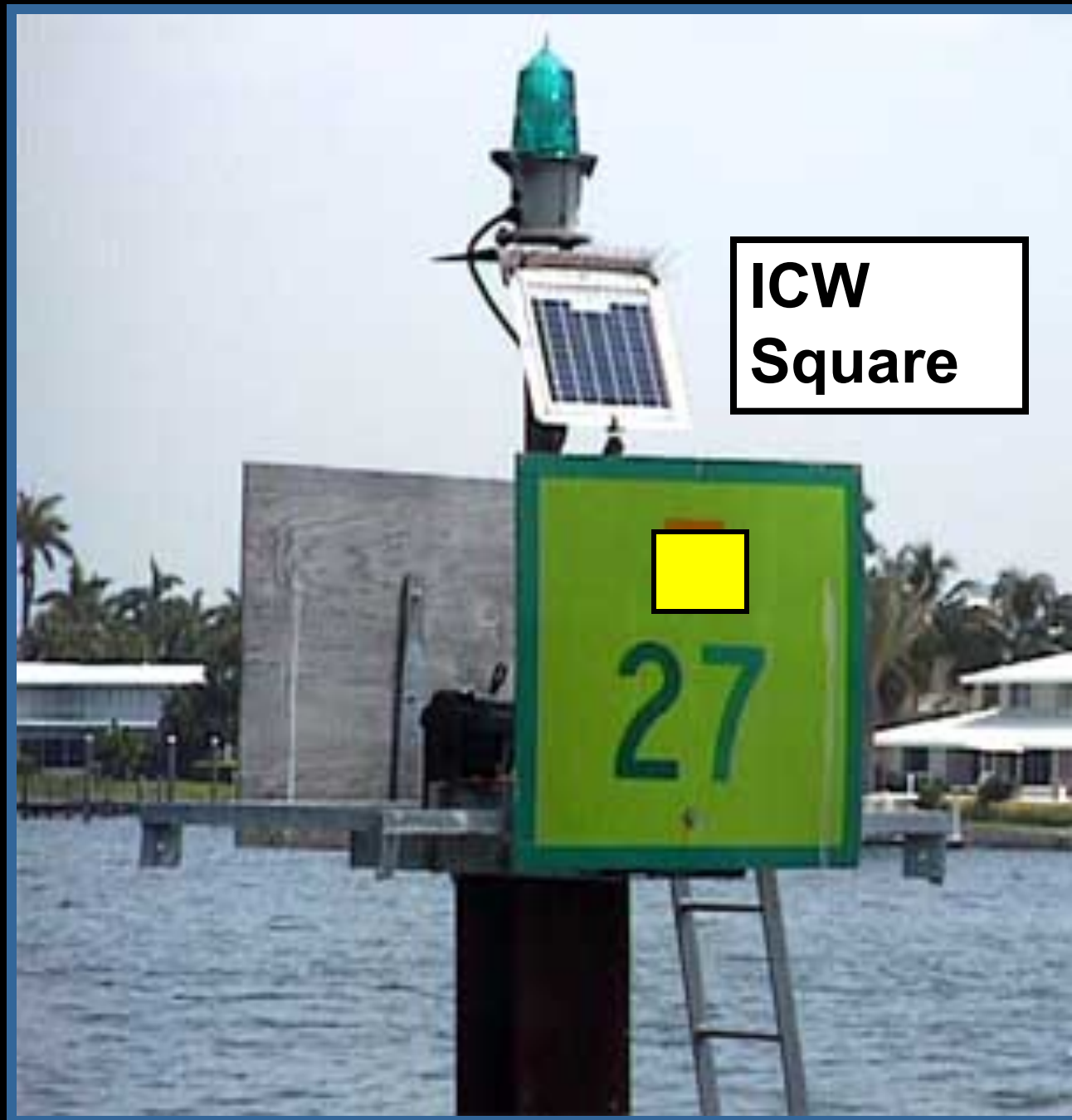


**Red
Daymark
/Small
Light
with ICW
Mark**



**ICW
Triangle**

**Green
Daymark/
Small
Light with
ICW Mark**



**ICW
Square**

Dual Purpose Marks

When aids in a channel are also used to identify an ICW channel.

The “Red right returning from the sea” rule applies to the regular aids.

The role for the regular aids is reversed and marked for ICW transit - - called “dual purpose.”

Dual Purpose Marks

- Are found on port and starboard marks in the ICW.
- Sometimes a **yellow triangle** appears on a **can** or square daymark or a **yellow square** appears on a **nun** or triangle daymark. The mark has dual purpose.
- To transit the ICW, follow the **yellow marks**.
- When following the local waterway, use the IALA-B lateral system marks.

Electronic Aids To Navigation

Loran-C

Obsolete

Not usable for positioning in the ATON program.

GPS - Global Positioning Systems

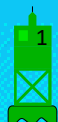
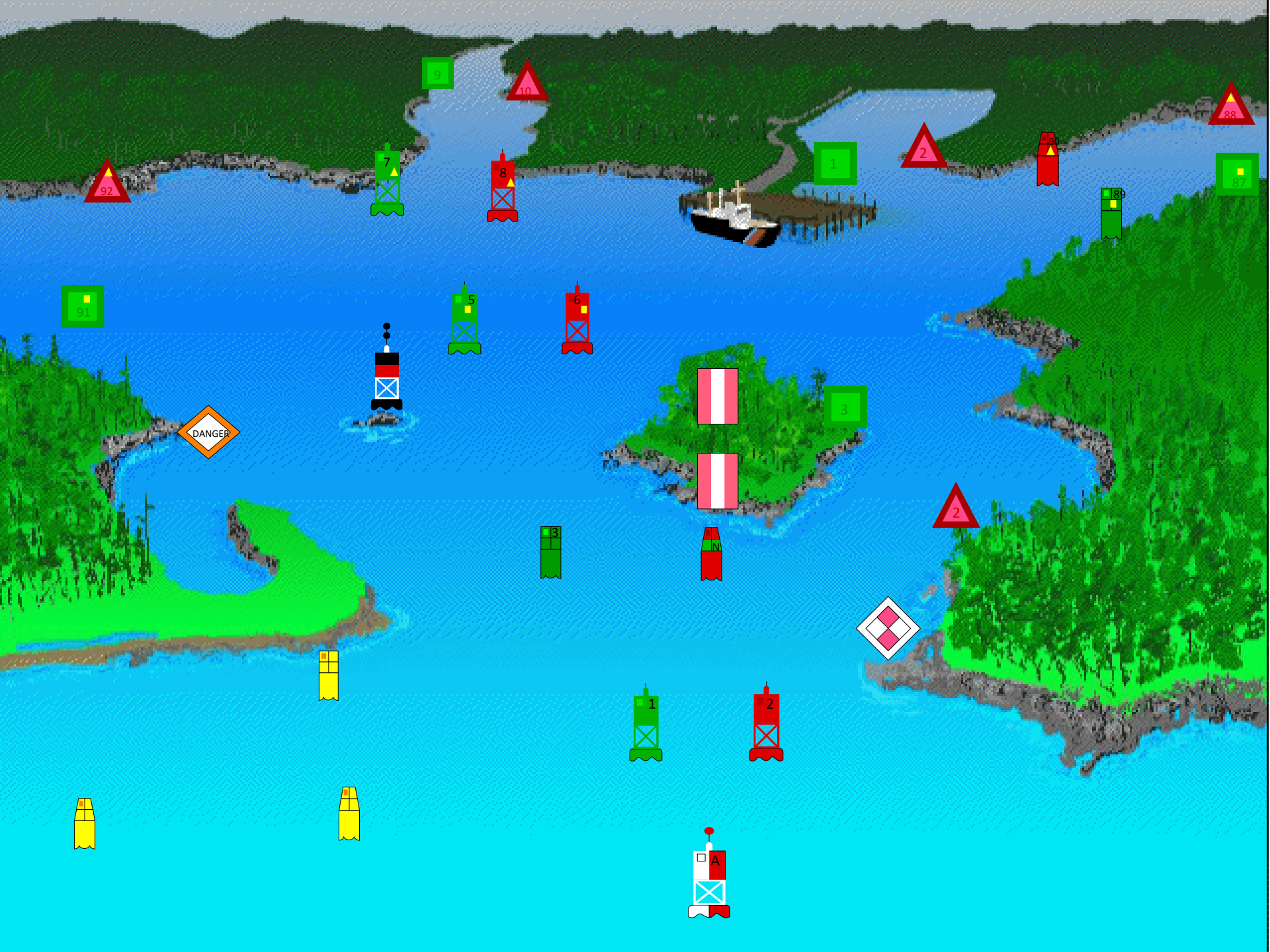
- Differential GPS – used by Coast Guard.
- WAAS - Wide Area Augmentation Systems
- These are the preferred positioning systems.

Electronic Nautical Charts.

Integrated to GPS, RADAR, and Depth Sounder.

Must be supplemented with a NOAA paper chart.

REVIEW



THE

END