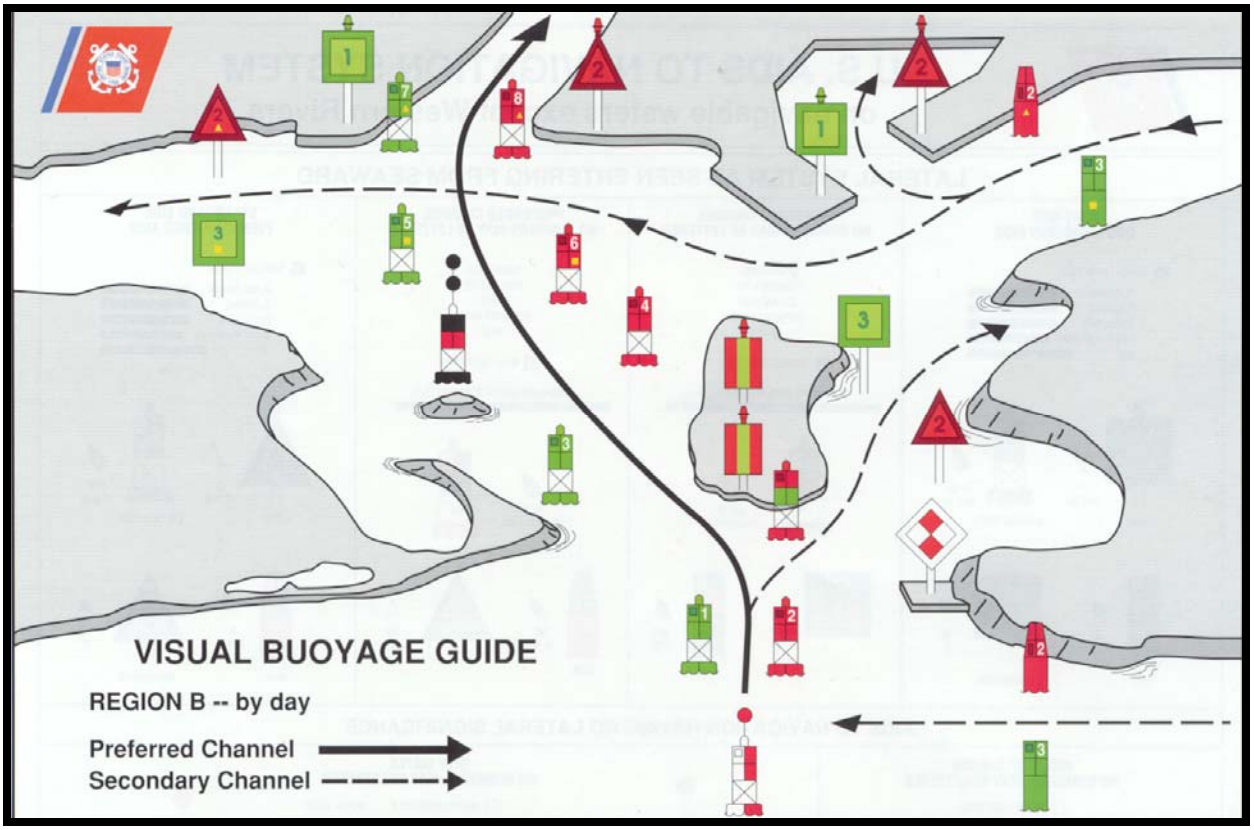
United States Coast Guard Auxiliary

Private Aids to Navigation

Study Guide



"We verify the ATONs and PATONs, check the Bridges, and update the Charts and Small Craft Facilities along the waterways of the United States"

March, 2008

This document is a work in process and has not been approved for use by the members of the Auxiliary.

Table of Contents

Figures

PART 66--PRIVATE AIDS TO NAVIGATION

This is great background material to help you understand the rules and regulations associated with the Private Aid to Navigation program. Read it carefully.

66.01-1 Basic Provisions for PATONs

Unless otherwise noted, no person, public body or instrumentality not under the control of the Commandant, exclusive of the Armed Forces, shall establish and maintain, discontinue, change or transfer ownership of any aid to maritime navigation, without first obtaining permission to do so from the Commandant of the Coast Guard.

For purposes of clarification, the term "private aids to navigation" includes all marine aids to navigation operated in the navigable waters of the United States other than those operated by the Federal Government or those operated in State waters as private aids to navigation.

Coast Guard authorization of a private aid to navigation does not authorize any invasion of private rights, nor grant exclusive privileges, nor does it obviate the necessity of complying with any other Federal, State or local laws or regulations.

With the exception of radar beacons (RACONS) and shore based radar stations, operation of electronic aids of navigation as private aids will not be authorized.

66.01-3 PATON authority is delegated to the District Commander.

The Commandant of the Coast Guard delegates to the District Commanders within the confines of their respective districts the authority to grant permission to establish and maintain, discontinue, change or transfer ownership of private aids to maritime navigation and to administer the requirements of this program.

The decisions of the District Commander may be appealed within 30 days from the date of the decision. The decision of the Commandant in any case is final.

66.01-5 PATON Application Procedure

Application to establish and maintain, discontinue, change or transfer ownership to a private aid to navigation shall be made to the Commander of the Coast Guard District in which the private aid is or will be located. Application form (CG-2554) will be provided upon request. The applicant shall complete all parts of the form applicable to the aid to navigation concerned, and shall forward the application in triplicate to the District Commander.

The following information is required:

(a) The proposed position of the aid to navigation by two or more horizontal angle, or bearings and distance from charted landmarks. A section of chart or sketch showing the proposed location of the aid to navigation shall be included.
(b) The name and address of the person at whose expense the aid will be maintained.
(c) The name and address of the person who will maintain the aid to navigation.
(d) The time and dates which it is proposed to operate the aid.
(e) The necessity for the aid.
(f) For lights: The color, characteristic, height above water, and description of illuminating apparatus.
(g) For fog signals: Type (whistle, horn, bell, etc.) and characteristic.
(h) For buoys or daybeacons: Shape, color, number, or letterm depth of water in which located or height above water.
(i) For RACONS: Manufacturer and model number of RACON, height above water of desired installation, and requested coding characteristic. Equipment must have FCC authorization.

66.01-10 Lights Characteristics of Private Aids

The light characteristics of a private aid to navigation shall conform to the United States Aid to Navigation System, except that only tungsten-incandescent light shall be approved for electric lights.

66.01-15 Processing of Applications by the Coast Guard

The District Commander receiving the PATON application shall review it for completeness and will assign the aid one of the following classifications:

Class 1 – Aid to navigation on marine structures or other works which the owner(s) are legally obligated to establish, maintain and operate by the Coast Guard.

Class II – Aids to navigation, exclusive of Class I, located in waters used by general navigation.

Class III – Aids to Navigation exclusive of Class I, located in waters not ordinarily used by general navigation.

Upon approval by the District Commander, a signed copy of the application will be returned to the applicant. Approval for the operation of radar beacons (RACONS) will be affective for an initial two year period, then subject to annual review without submission required of the owner,

66.01-20 Inspection of Private Aids

All classes of private aids to navigation shall be maintained in proper operating condition. They are subject to inspection by the Coast Guard at any time and without prior notice.

66.01-25 Discontinuance and removal of Private Aids.

No person, public body or instrumentality shall change, move or discontinue any authorized private aid to navigation required by statute or regulation without first obtaining permission to do so from the District Commander.

Any authorized private aid to navigation not required by statute or regulation (Classes II and III) may be discontinued and removed by the owner after 30 days' notice to the District Commander to whom the original request for authorization for establishment of the aid was submitted.

Private aids to navigation which have been authorized by the District Commander shall be discontinued and removed without expense to the United States by the person, public body or instrumentality establishing or maintaining such aids when so directed by the District Commander.

66.01-30 Corps of Engineers approval required for fixed aids.

Before any private aid to navigation consisting of a fixed structure is placed in the navigable waters of the United States, authorization to erect such structure shall first be obtained from the District Engineer, U.S. Army Corps of Engineers in whose district the aid will be located.

The application to establish any private aid to navigation consisting of a fixed structure shall show evidence that the required permit has been issued by the Corps of Engineers.

66.01-40 Exemptions.

Nothing in the preceding sections shall be construed to interfere with, or nullify the requirements of existing laws and regulations pertaining to the marking of structures, vessels and other obstructions sunken in waters subject to the jurisdiction of the United States, the marking of artificial islands and structures which are erected on or over the seabed and subsoil of the Outer Continental Shelf, or the lighting of bridges over navigable waters of the United States.

66.01-45 Penalties for establishment without a CG Permit.

Any person, public body or instrumentality, excluding the armed forces, who shall establish, erect or maintain any aid to maritime navigation without first obtaining authority to do so from the Coast Guard, or who shall violate the regulations relative thereto issued in this part, is subject to the provisions of 14 U.S.C. 83.

66.01-50 Protection afforded to owners of private aids to navigation.

Private aids to navigation lawfully maintained under these regulations are entitled to the same protection against interference or obstruction as is afforded by law to Coast Guard aids to navigation. If interference or obstruction occurs, a prompt report containing all the evidence available should be made to the Commander of the Coast Guard District in which the aids are located.

66.01-55 Transfer of PATON ownership.

When any private aid to navigation authorized by the District Commander, or the essential real estate or facility with which the aid is associated,

is sold or transferred, both parties to the transaction shall submit application to the Commander of the Coast Guard District in which the aid is located requesting authority to transfer responsibility for maintenance of the aid.

The party relinquishing responsibility for maintenance of the private aid to navigation shall indicate on the application form (CG-2554) both the discontinuance and the change of ownership of the aid sold or transferred.

The party accepting responsibility for maintenance of the private aid to navigation shall indicate on the application form (CG-2554) both the establishment and the change of ownership of the aid sold or transferred.

In the event the new owner of the essential real estate or facility with which the aid is associated refuses to accept responsibility for maintenance of the aid, the former owner shall be required to remove the aid without expense to the United States. This requirement shall not apply in the case of any authorized private aid to navigation required by statute or regulation (Class I) which shall be maintained by the new owner until the conditions which made the aid necessary have been eliminated.

State Aids to Navigation

66.05-1 Purpose.

The purpose of the regulations in this subpart is to prescribe the conditions under which state governments may regulate aids to navigation owned by state or local governments, or private parties. Aids to navigation must be in accordance with the United States Aids to Navigation System.

66.05-5 Definitions.

The term State waters for private aids to navigation means those navigable waters of the United States which the Commandant, upon request of a State Administrator, has designated as waters within which a State government may regulate the establishment, operation, and maintenance of marine aids to navigation, including regulatory markers. The Commandant will entertain requests to make such designations with respect to navigable waters of the United States not marked by the Federal government. These designations when approved will be set forth in separate sections by States in this subpart and will briefly describe or identify waters so designated.

The term **Uniform State Waterway Marking System** (USWMS) means the system of private aids to navigation which may be operated in State waters.

The term **State Administrator** means the official of a State having power under the law of the State to regulate, establish, operate or maintain maritime aids to navigation on waters over which the State has jurisdiction.

The term **State aids to navigation** means all private marine aids to navigation operated in State waters for private aids to navigation, whether owned by a State, political subdivisions thereof or by individuals, corporations, or organizations.

The term **regulate State maritime aids to navigation** means to control the establishment, disestablishment, operation and maintenance of State aids to navigation.

66.05-10 State waters for private aids to navigation; designations; revisions, and revocations.

A State Administrator who desires to regulate State maritime aids to navigation in the navigable waters of the United States not marked by the Federal Government, shall request the Commandant to designate the specific bodies of water involved as State waters for private aids to navigation.

The request shall be forwarded to the District Commander in whose district the bodies of water are located. The request shall give the name and description of the waterway; the extent of use being made of the waterway for marine navigation, in general terms; an appropriate chart or sketch of the area; and a general outline of the nature and extent of the State aids to navigation which the Administrator plans to establish in the waterway.

The District Commander shall review the request and consult with the State Administrator concerning the terms of an initial agreement to be entered into under specific provisions. When they have arrived at terms of an agreement satisfactory to both, the District Commander shall forward the request to the Commandant with his recommendations and the terms of

agreement mutually settled upon. If they cannot reach such agreement, the District Commander shall forward the request with his recommendations and a statement of the points agreed upon and the points remaining at issue.
Upon receipt of the request, the Commandant will determine whether or not approval of the request is in the public interest and will inform the State Administrator and the District Commander of the Coast Guard's decision. If the request is approved, the designation by the Commandant of the waters in question as State waters for private aids to navigation will be also defined and described in this subpart.

The Commandant may, upon his own initiative or upon request, revoke or revise any designations of State waters for private aids to navigation previously made by him. Written notice shall be given the State Administrator of the action contemplated by the Commandant. The State Administrator will be afforded a period of not less than 30 days from the date of the notice in which to inform the Commandant of the State's views in the matter before final action is completed to revoke or revise such designation.

66.05-20 - Coast Guard-State agreements.

The District Commander in whose District a waterway is located may enter into agreements with State Administrators permitting a State to regulate aids to navigation, including regulatory markers, in State waters for private aids to navigation, as, in the opinion of the District Commander, the State is able to do in a manner to improve the safety of navigation. When a waterway is located within the area of jurisdiction of more than one Coast Guard District, the District Commander in whose District the State capital is located shall execute the agreement in behalf of the Coast Guard. All such agreements shall reserve to the District Commander the right to inspect the State aids to navigation without prior notice to the State. They shall stipulate that State aids to navigation will conform to the Uniform State Waterway marking System or to the U.S. Aids to Navigation System and that the State Administrator will modify or remove State aids to navigation without expense to the United States when so directed by the District Commander, subject to the right of appeal on the part of the State Administrator to the Commandant.

A Coast Guard-State agreement shall become effective when both parties have signed the agreements. In lieu of the procedure prescribed in Sec. 66.01-5, the agreement shall constitute blanket approval by the Commandant, of the State aids to navigation, including regulatory markers, established or to be established in State waters for private aids to navigation designated or to be designated by the Commandant.

In addition to the matters set forth in the first paragraph of this section, Coast Guard-State agreements shall cover the following points, together with such other matters as the parties find it desirable to include:

(1) A description, in sufficient detail for publication in Notices to Mariners, of all aids to navigations under State jurisdiction in navigable waters of the United States in existence prior to the effective date of the agreement which have not been previously approved under procedures of Sec. 66.01-5.

(2) Procedures for use by the State administrator to notify the District Commander of changes made in State aids to navigation, as required by Sec. 66.05-25.

(3) If prior to December 21, 2003, specification of the marking system to be used, whether the U.S. Aids to Navigation System or the Uniform State Waterway Marking System.

(4) Specification of standards as to minimum size and shape of markers, the use of identifying letters, the use of reflectors or retroreflective materials, and any other similar standards so as to enable Coast Guard inspectors to determine compliance with Statewide standards.

66.05-25 Change and modification of State aids to navigation.

Wherever a State Administrator shall determine the need for change in State aids to navigation, he shall inform the District Commander of the nature and extent of the changes as soon as possible, preferably not less than 30 days in advance of making the changes.

66.05-30 Notice to Mariners.

The District Commander may publish information concerning State aids to navigation, including regulatory markers, in the Coast Guard

Local Notices to Mariners as he deems necessary in the interest of public safety.

Notices to Mariners which concern the establishment, disestablishment, or change of State aids to navigation, including regulatory markers, may be published whenever the aids to navigation concerned are covered by navigational charts or maps issued by the National Ocean Service or the U.S. Army Corps of Engineers.

66.05-35 Private aids to navigation other than State owned.

No person, public body or other instrumentality not under control of the Commandant or the State Administrator, exclusive of the Armed Forces of the United States, shall establish, erect or maintain in State waters for private aids to navigation any aid to navigation without first obtaining permission to do so from the State Administrator. Discontinuance of any State aids to navigation may be effected by order of the State Administrator.

66.05-40 Corps of Engineers' approval.

In each instance where a regulatory marker is to be established in navigable waters of the United States which have been designated by the Commandant as State waters for private aids to navigation, the State Administrator is responsible for obtaining prior permission from the District Engineer, U.S. Army Corps of Engineers concerned, authorizing the State to regulate the water area involved, or a statement that there is no objection to the proposed regulation of the water area. A copy of the Corps of Engineers permit or letter of authority shall be provided by the Administrator to the District Commander upon request.

Similarly, where an aid to navigation is to be placed on a fixed structure or a mooring buoy is to be established in State waters for private aids to navigation, the State Administrator shall assure that prior permission or a statement of no objection to the structures or mooring buoys proposed is obtained from the District Engineer concerned. A copy of the permit or letter is not required by the District Commander.

66.05-100 Designation of navigable waters as State waters for private aids to navigation.

In accordance with the procedures contained in Sec. 66.05-10(d), the following navigable waters listed by the State in which they are located, are designated as State waters for private aids to navigation:

(a) Arizona. The portion of Lake Havasu within the State, except that portion within Havasu Lake National Wildlife Refuge.

(b) Louisiana. The portion of Toledo Bend Reservoir within the State.

(c) Missouri. Teach water within the State except the:

(1) Mississippi River; and

(2) Missouri River.

(d) Montana. The portion of Missouri River between the U.S. Highway 287 bridge near Townsend and Great Falls including the following impoundments:

(1) Black Eagle Dam Reservoir.

(2) Canyon Ferry Reservoir.

(3) Hauser Lake.

(4) Holter Lake.

(5) Rainbow Dam Reservoir.

(e) North Carolina. Each navigable water within the State not marked with Coast Guard aids to navigation on June 1, 1973.

(f) Pennsylvania. The portion of Youghiogheny River Reservoir within the State.

(f-1) South Carolina.

(1) The portion of Lake Wylie within the State;

(2) Lake Marion;

(3) Lake Moultrie; and (4) Lake Murray.

(g) Texas. The portion of Toledo Bend Reservoir within the State.

(h) Virginia.

(1) Claytor Lake, on the New River in Pulaski County.

(2) Leesville Lake, on the Roanoke River below Smith Mountain Dam.

(3) The portions of the following reservoirs within the State:

(i) Gaston.

(ii) Holston.

(iii) John H. Kerr.

(iv) Philpott.

(i) Wisconsin. Navigable waters within the State not marked with Coast Guard aids to navigation as of May 1, 1996.

Uniform State Waterway Marking System

Sec. 66.10-1 General.

Until December 31, 2003, the Uniform State Waterway Marking System's (USWMS) aids to navigation provisions for marking channels and obstructions may be used in those navigable waters of the U.S. that have been designated as state waters for private aids to navigation and in those internal waters that are non-navigable waters of the U.S. All other provisions for the use of regulatory markers and other aids to navigation shall be in accordance with United States Aid to Navigation System.

The USATONS may be used in all U.S. waters under state jurisdiction, including non-navigable state waters.

66.10-15 Aids to navigation.

USWMS aids to navigation may have lateral or cardinal meaning.

On a well defined channel including a river or other relatively narrow natural or improved waterway, an aid to navigation shall normally be a solid colored buoy. A buoy which marks the left side of the channel viewed looking upstream or toward the head of navigation shall be colored all black. A buoy which marks the right side of the channel viewed looking upstream or toward the head of a navigation shall be colored all red. On a well defined channel, solid colored buoys shall be established in pairs, one on each side of the navigable channel which they mark, and opposite each other to inform the user that the channel lies between the buoys and that he should pass between the buoys.

On an irregularly defined channel, solid colored buoys may be used singly in staggered fashion on alternate sides of the channel provided they are spaced at sufficiently close intervals to inform the user that the channel lies between the buoys and that he should pass between the buoys.

Where there is no well-defined channel or when a body of water is obstructed by objects whose nature or location is such that the obstruction can be approached by a vessel from more than one direction, supplemental aids to navigation having cardinal meaning (i.e., pertaining to the cardinal points of the compass, north, east, south, and west) may be used. The use of an aid to navigation having cardinal meaning is discretionary provided that the use of such a marker is limited to wholly State owned waters and the State waters for private aids to navigation as defined and described in this part

Aids to navigation conforming to the cardinal system shall consist of three distinctly colored buoys.

(1) A white buoy with a red top may be used to indicate to a vessel operator that he must pass to the south or west of the buoy.

(2) A white buoy with a black top may be used to indicate to a vessel operator that he must pass to the north or east of the buoy.

(3) In addition, a buoy showing alternate vertical red and white stripes may be used to indicate to a vessel operator that an obstruction to navigation extends from the nearest shore to the buoy and that he must not pass between the buoy and shore. The number of white and red stripes is discretionary, provided that the white stripes are twice the width of the red stripes.

66.10-35 Navigation lights.

A red light shall only be used on a solid colored red buoy. A green light shall only be used on a solid colored black or a solid colored green buoy. White lights shall be used for all other buoys. When a light is used on a cardinal system buoy or a vertically striped white and red buoy, it shall always be quick flashing.

Introduction

One of the primary responsibilities of the Auxiliary Private Aid to Navigation Program is the reporting of discrepancies observed on Private Aids to Navigation (P**ATON**s). The Auxiliary works with the U.S. Coast Guard to accomplish this important mission in a partnership that is focused on assisting the Coast Guard in backwater and remote areas where the most of the private aids are normally deployed.

This "Private Aid to Navigation (**ATON**) Study Guide" explains the guidelines for checking private aids and for reporting observations of any discrepancies to the local C.G. Units.

Verification vs Checking an Aid

Checking is the process of reviewing an aid to navigation for potential discrepancies. Every Auxiliarist, while underway on an OPFAC, is encouraged to check every aid to navigation (both Federal and Private) that they pass and report only observed discrepancies to the Coast Guard.

Verification of a private aid is reserved for a qualified AV—Aid Verifier who performs a verification at the request of the Coast Guard. A verification report is always submitted to the Coast Guard, even when the aid is found "watching properly."

AUXDATA Credit for AN Activity

Auxiliarists are able to take credit in AUXDATA for all of their Private Aid to Navigation activities, whether an aid is observed with a discrepancy or is just found watching properly. The guiding principal here is that it takes a lot of an Auxiliarist's time and effort to search out a discrepant private aid and, therefore, they should receive credit for this mission activity.

ANNUAL ATON Awards

Annual Aid to Navigation awards are based on the **AN** Mission Activity data (**30**-ATON, **31**-PATON, and **32**-Bridges) as lead person that are reported and recorded in AUXDATA as of December 31 each year.

Objectives of this Study Guide

- To acquire a generalized knowledge of the specifications for a private aid to navigation.
- To develop a familiarity with all of the potential discrepancies that may be found on a private aid to navigation (**PATON**).
- To become familiar with the Auxiliary guidelines for verifying a private aid to navigation (**PATON**) properly, including the guidelines for taking and reporting fixes and depths.
- To provide members with an understanding of the quality standards necessary for operating any electronic equipment used for taking measurements for the PATON program.
- To gain an appreciation for the importance of reporting all PATON activity to AUXDATA for time and mission credits.

Tools needed for checking Private Aids (PATONs):

The following tools are needed for checking an PATON properly. Usually, this equipment is found aboard an operational facility (**OPFAC**). However, many Auxiliarists, who participate in the AN/CU Programs, often carry a personal ***Navigation Kit*** that contains their personal navigation equipment. For a successful PATON checking experience, insure that you have the right navigational tools, that they are operating accurately, and that they are available when needed. By including this equipment as part of your pre-underway equipment check, you are helping to guarantee a successful patrol. Pre-calibrate each electronic navigational instrument to insure that it is operating accurately before you get underway. Make it a standard practice to record the test results on a pre-underway checklist. A special "AN Patrol Pre-Underway Checklist" is provided in this study guide. You may need the data on this checklist later as part of your PATON report(s). Links to Aid to Navigation publications and catalogs can be found on the **First Northern Aid to Navigation Web Site.**

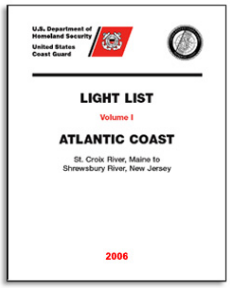
Binoculars - Size 7 x 50 are preferred. Binoculars are used to view aids or objects that maybe located in area where it is unsafe to operate an operational facility (**OPFAC**) to order to get a close up view of potential discrepancies. Many small, inexpensive and powerful binoculars or monoculars are commercially available and will make a perfect addition to your personal Navigation Kit.

Time Piece - A stopwatch is a useful tool for timing the period of an aid's light. Any good wristwatch also satisfies this operational need. Your GPS set can provide very accurate date and time information. Report the time when taking fixes and depths alongside aids. Set up a GPS screen to show time, Lat/Lon, and EPE (Estimated Position Error). The screen set up in Figure 1 below is a very handy reference tool for collecting data when locating objects on-scene.

Figure 1 – Three-line GPS Screen

Latitude	Longitude
42–36-23.50 N	**070-23-30.01 W**
12.4 ft	**EPE**
Time:	**14:45**

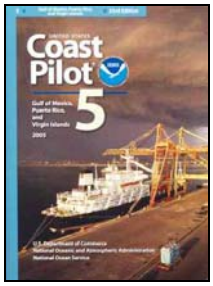
GPS - A GPS set with **DGPS** (Differential GPS) or **WAAS** (Wide Area Augmentation System) can provide location (LAT/LON) data accurate to within 8 to 10 feet. WAAS usually comes as a standard feature on new GPS sets. Ten feet is inside the limits of the width of the ordinary OPFAC. If you use one of the fine hand-held GPS models that are currently available, be sure to buy a power cable that plugs into your vessel's 12v power. Also, add spare batteries for your GPS to your navigation kit. Consider purchasing a hand-held GPS mounting bracket and attaching your hand-held GPS to a plotting board or large clipboard. The clipboard can hold your GPS set while underway and keep your reference documents from blowing away. Good organizational practices speed up the on-scene observations and recording time.



The **Light List** contains a listing of most of the aids to navigation in your AOR. Note that some private aids may not be listed in the Light List. Light List Volume 1 – Atlantic Coast covers the First Northern geographic area. Links to the Light List are available on the First Northern Aid to Navigation Web Site. Print out only those pages that relate to the area where you operate your boat.

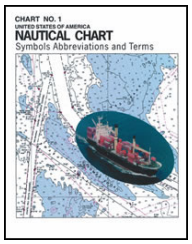
Check all on-scene observations for each aid to navigation against its entry in the Light List. Also, validate your observation of the aid and the entry in the Light List to the symbols and abbreviations used to identify the aid on the NOAA chart. Any mismatch is a reportable discrepancy. Charted errors provide an additional Chart Updating report to NOAA. Note that the assigned position of a charted aid is changed by NOAA from reports made to the Coast Guard and published in the Light List and not from Chart Updating reports submitted to NOAA by an Auxiliarist.

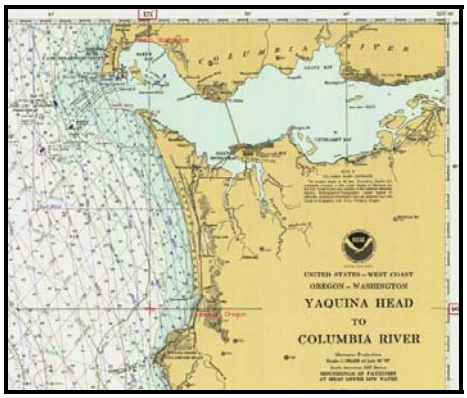
LNM – Local Notice to Mariners - Keep your flotilla charts and other nautical publications updated to the latest Notice to Mariners. The LNM is available on a weekly basis and is published on the Coast Guard's Navigation Center web site. Prudent mariners update their nautical chart(s), Light List and Coast Pilot before every ATON patrol. Links to your LNM are available on the National Navigation Systems Division Web Site.



Coast Pilots contain information that is not easily included on the nautical chart. Links to this publication are available on line on the Navigation Systems Division Web Site. Print out only those pages that pertain to your area of operation (AOR) and keep them in your personal Navigation Kit. It is always a good practice to review the Coast Pilot data while you are performing PATON activity or when you are planning a patrol. Submissions of Chart Update and Small Craft Facility reports to NOAA update are used to update Coast Pilots. Reference the "CU02-Chart Updating Study Guide" for specific guidelines for preparing and reporting Coast Pilot corrections. This guide is available on the CU Page of the First Northern Aid to Navigation Web Site.

Chart No. 1 contains every abbreviation and symbol used on a nautical chart and should be part of the navigation kit of every serious navigator. While this publication is also available on-line, it is better to purchase a hard copy. Every authorized marine chart dealer should stock a copy or you can purchase a copy from the major on-line book dealers. Reference special links page of the First Northern Aid to Navigation Web Site for a link to this publication.





NOAA Nautical Chart - Every OPFAC should always use the latest and largest scale NOAA nautical chart that is updated to the latest Local Notice to Mariners (LNM).

Internet links to NOAA Nautical Charts and Local Notice to Mariners (LNM) corrections for every NOAA nautical chart is available on the National Navigation Systems Division Web Site. Keep copies of the largest scale NOAA Nautical Charts in your personal navigation kit.

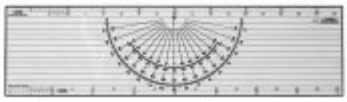
While coxswains and vessel owners are responsible for maintaining up-to-date nautical charts on their OPFACs, FSO Staff officers should offer their chart correcting skills and services to the OPFAC owners in the flotilla and division as a regular part of their job.

Members who submit acceptable chart update reports to NOAA may order and receive a free replacement chart. Reference the "CU02-Chart Updating Study Guide" for specific guidelines for ordering these NOAA charts. The Flotilla's Chart Updating activity should be managed by the FSO-AN.

The **"PATON-04 7054 PATON Discrepancy Report"** is available on the PATON Web Page of the First Northern Aid to Navigation Web Site. Print out some blank forms for use while on patrol for reporting discrepancies. Keep adequate copies of this form in your navigation kit along with a copy of the form's instructions.

Pencil - An automatic pencil using 0.5 HB lead with an eraser is ideal. It is always sharp. Include extra pencils, leads and erasers in your personal navigation kit. If you decide to use regular wooden pencils, add a small pencil sharpener to your kit.

Plotter – A paraglide plotter is a practical plotting instrument to use on a small boat. Be sure your plotter has wheels to roll it easily on a chart without losing the course angle. Prudent mariners always plot their intended courses on their nautical chart before they get underway. Modern mariners take the extra step to establish waypoints and routes in their GPS, and schedule their aid verifications and checks along the route. This practice not only speeds up the ATON patrol but also saves much time and fuel. It also provides a great opportunity to teach navigation to the crew between planned PATON activity events. This practice also provides a safety factor for your return trip in the event of deteriorating weather. There are many different plotters available.



Digital Camera – A digital camera is a great tool for communicating discrepancies to the Coast Guard and other agencies. Purchase a computer cable with your camera to be able to download your pictures to your PC so that they can be e-mailed to the appropriate C.G. Unit or Agency. One picture of a discrepancy is often worth a thousand words. This phrase may sound trite but it is true. Clear photos of a discrepancy greatly increase the credibility of your discrepancy reports with the Coast Guard.

Record the number that is assigned to the picture by the camera on your "**PATON-04 7054 PATON Discrepancy Report**" form as you take the photos. This practice eliminates any confusion later about what has been photographed when you are finalizing your report for the Coast Guard.

Special Developments

Some Auxiliarists have fabricated many unique tools and instruments. Some examples are sounding poles for shallow depths, chain and wire drags, tools for measuring the angle of leaning aids, and plotting boards fitted with mounting devices for hand held GPS sets. Also, there are EXCEL systems developed that calculates the distance an aid is off station using location (Lat/Lon) and almanac data available on your GPS. Check out the "**CU07 - Vertical and Horizontal Error Calculator Master**" on the Chart Updating web page on the First Northern Aid to Navigation Web Site. The use of GPS sets with chart plotters and computerized charts facilitate the checking of whether the aid is on station.

Hand Held Calculator with solar panel.

Calculators

There are many calculations needed when checking and preparing Federal Aid discrepancy reports. Add a good calculator to your Navigation Kit. The ideal unit would have a solar panel and a battery system for nighttime use. You may have to get two units. Do not forget to add spare batteries to your navigation kit.

References:

USCG Aids to Navigation Manual – Administration COMDTINST M16500.7A

Light List – COMDTPUB P16502.1

The Coast Pilot

Chart No. 1

LNM - Local Notice to Mariners

NOAA Nautical Charts

CDB - Conventional Direction of Buoyage

In U.S. waters, the IALA-B system of lateral marks, with few exceptions, is arranged in geographic order known as the "conventional direction of buoyage". The memory aid "**3R rule"** of "Red, Right, Returning from the sea" applies. This means "keep the red markers to the right hand side of the vessel" when returning from seaward and when transiting from north to south along the Atlantic Coast, from south to north and east to west along the Gulf Coast, from south to north and east to west along the Pacific Coast, and from east to west in the Great Lakes except for Lake Michigan which is north to south.

Figure 2 – **CDB - Conventional Direction of Buoyage Graphic**

The IALA-B System of Aids to Navigation

The U.S. Aids to Navigation System is predominantly a lateral system which is consistent with Region B requirements of the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA-B) Maritime Buoyage System. Exceptions exist for the U.S. possessions west of the International Date Line and those south of 10 degrees north latitude, which follow the IALA-A Aid to Navigation System. **Private aids that do not conform to these specifications should be reported as discrepant.**

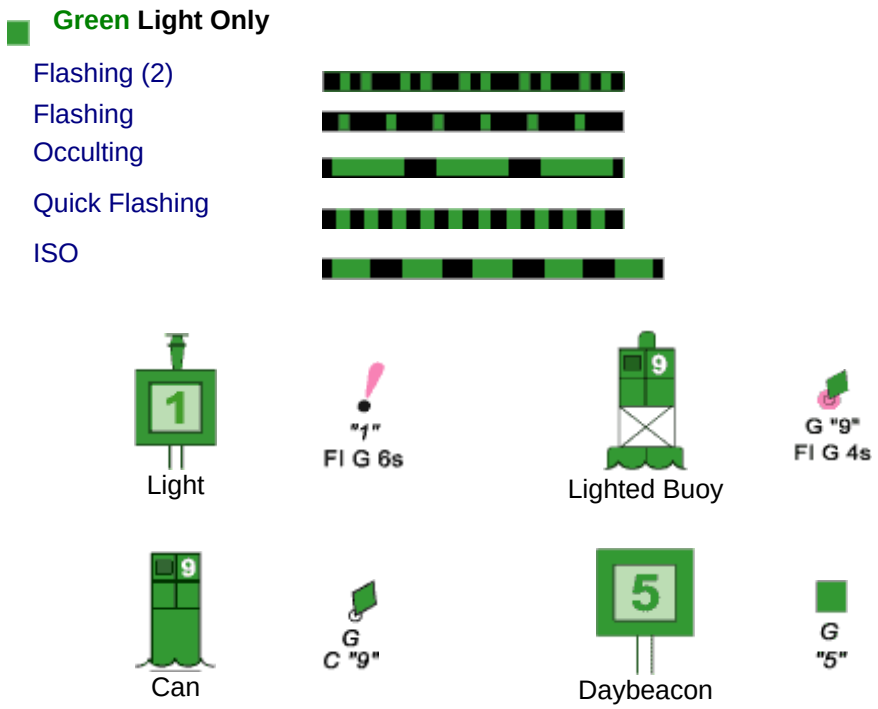
THE LATERAL SYSTEM AS SEEN WHEN ENTERING FROM SEAWARD

Lateral marks define the port and starboard sides of a route. Their most frequent use is to mark the sides of channels. However, they may be used individually to mark obstructions located outside of clearly defined channels. Lateral marks normally have three criteria that assist the mariner in their quick identification – **shape, color**, and **numbering**. Lighted lateral aids use the same light color as the aid color. Lighted aids are often made up from a buoy body and the structure on which the light is mounted. While this voids the shape criterion, the light color becomes the third criteria during the nighttime and periods of reduced visibility. Lateral aids are numbered from seaward toward the land, from the mouth of rivers upstream, and clockwise around islands.

Lateral marks include side marks and preferred channel marks. Side marks are not always placed directly on a channel edge and may be positioned outside the channel as indicated on charts and nautical publications.

Port side marks indicate the left side of channels when proceeding in the Conventional Directions of Buoyage. They normally show as a square or can in shape, are **green** in color, and have odd numbering. Beacons have green square daymarks while buoys are green cans or pillar buoys**. Green** lights of various rhythms are used on port side marks. **Private aids used to mark fairways and channels should comply with these specifications.**

Figure 3 - **Port Side Odd Numbered Aids**



Note that the numbers on daymarks are the color of the aid while the numbers on buoys are white.

Preferred Channel Aids

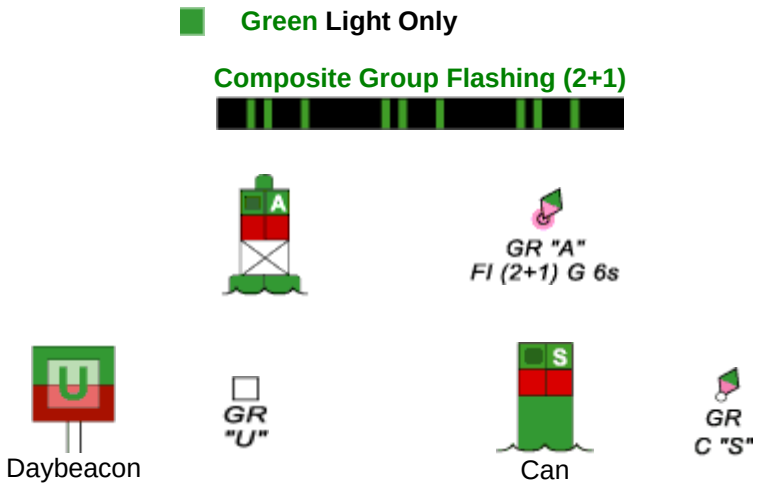
Figure 4 – **Preferred Channel Aids**

Private aids used to mark junctions and bifurcations should comply with these specifications.

Preferred Channel to Starboard - have no numbers but may be lettered.

Use as Port Side aids in the Primary Channel; used as Starboard Side aids in the Secondary Channel.

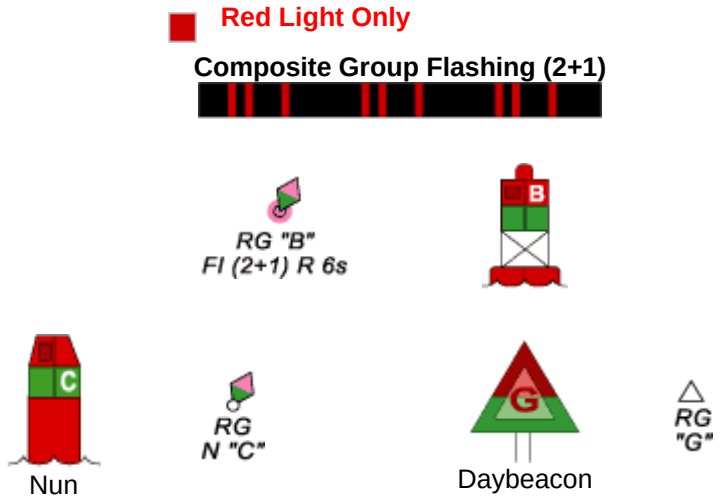
The topmost bands are colored **green.**



Preferred Channel to Port - have no numbers but may be lettered.

Use as a Starboard Side aids in the primary channel, used as a Port Side aids in the Secondary Channel.

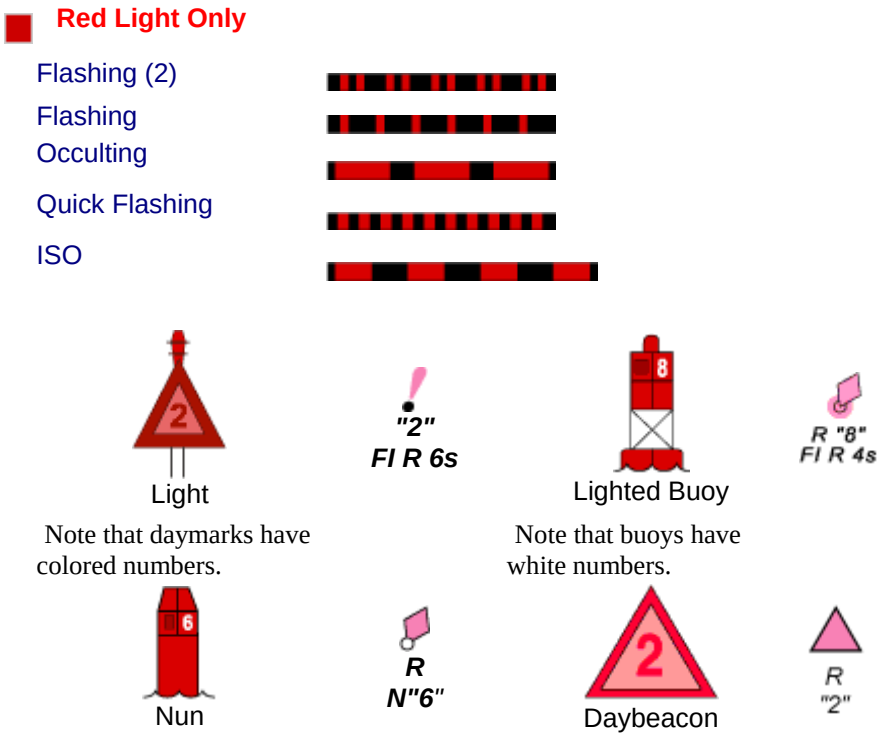
The topmost bands are colored red.



Starboard Side Marks indicate the right side of channels when proceeding in the conventional directions of buoyage. They normally show as a conical or nun shape, are red in color, and have

even numbering. Beacons have triangular red daymarks while buoys are red nuns or pillar buoys. Red lights of various rhythms are used on starboard side marks. **Private aids used to mark fairways and channels should comply with these specifications.**

Figure 5 – **Starboard Side Even Numbered Aids**



Note that the numbers on daymarks are the color of the aid while the numbers on buoys are white.

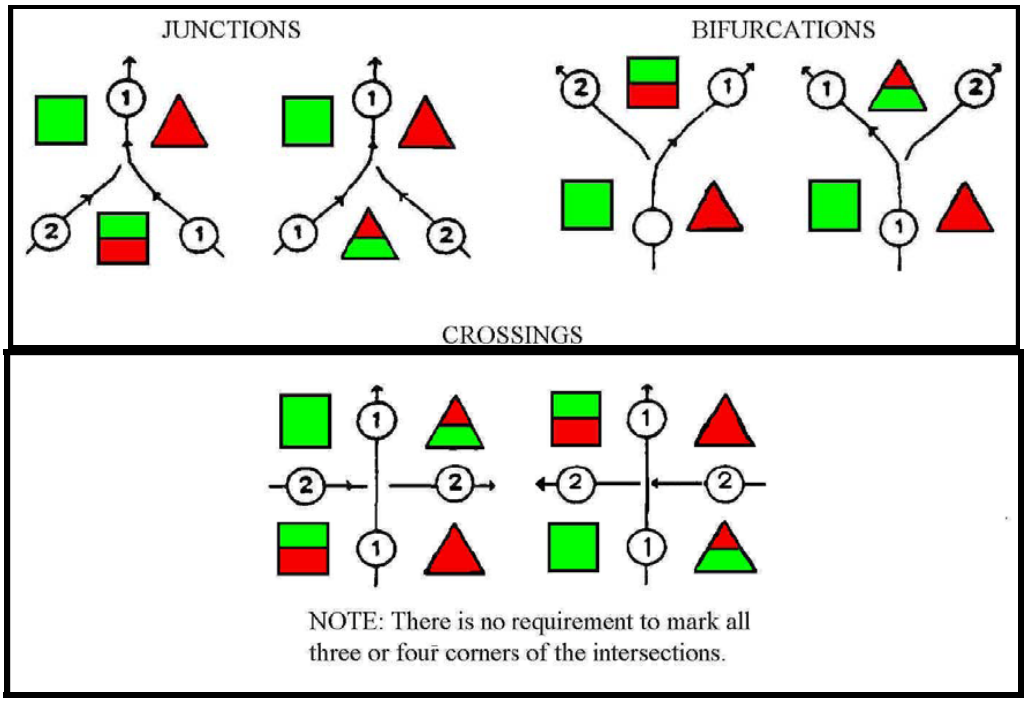
Junction – **The point where a channel divides when proceeding to seaward**. The point where a tributary departs or splits from the main channel

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

Crossing – **The point where a main and secondary channel cross each other.**

Note the placement of the preferred channel buoys in the three examples below. The main channels are labeled as 1. The secondary channels are labeled as 2.

Figure 6 – **Junctions and Bifurcation Patterns**



Strictly defined, a **Beacon** is any fixed aid to navigation. For our purposes, however, we take beacons to mean all minor lights of relatively low candlepower and daybeacons. Fixed aids provide immobile, stable signals. Floating aids do not. Beacons, therefore, are superior to floating aids in the signal quality they provide to the mariner. Beacons may be set back from the channel edge to protect them from damage. The utility of a beacon decreases as its distance from the channel edge increases. When beacons must be set back, the distance from the channel edge should remain constant within a waterway.

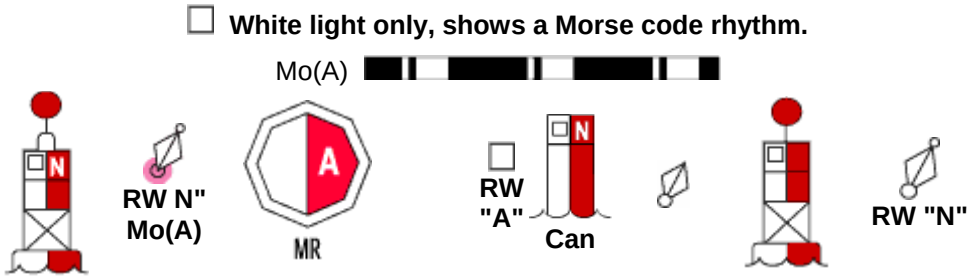
Buoyant beacons appear to be fixed, but in actuality are moored to the bottom by a sinker. They remain afloat through use of a buoyant collar attached below the waterline. Buoyant beacons are deployed only in unusual situations where their high cost is offset by the requirement for a reduced watch circle. An **articulated light** is a vertical pipe structure supported by a submerged buoyancy chamber and attached by a universal coupling to a weighted sinker on the seafloor. The light, allowed to move about by the universal coupling, is not as precise as a fixed aid. However, it has a much smaller watch circle than a conventional buoy, because the buoyancy chamber tends to force the pipe back to a vertical position when it heels over under the effects of wind, wave, or current. Primarily, articulated lights are designed to mark narrow channels with greater precision is needed rather than that obtained using conventional buoys.

Buoys are unmanned, floating aids to navigation moored to the seabed. They may be lighted or unlighted.

AIDS TO NAVIGATION HAVING NO LATERAL SIGNIFICANCE

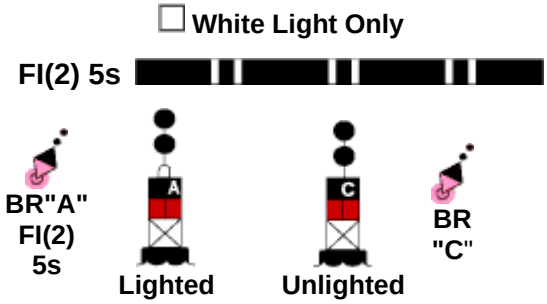
Safe Water Marks indicate that there are navigable water all around the mark. They usually mark fairways, midchannels, and offshore approach points. Safe water marks have red and white vertical stripes, are spherical in shape and are never numbered. When a Safe Water mark is lighted or fitted with a sound signal, its displays a red spherical topmark. Lighted Safe Water marks show a white light with a Morse Code "**A**" rhythm.

Figure 7 - **Safe Water Marks**
Have no numbers but may be lettered.



Isolated Danger marks are erected on, moored over, or placed immediately adjacent to an isolated danger that may be passed on all sides by mariners. They are black with one or more broad horizontal red bands and are fitted with a top mark of two black spheres, one above the other. When lighted, the aid displays a white light, group flashing (two) with a period of five seconds. **These aids should not be approached closely without special caution.**

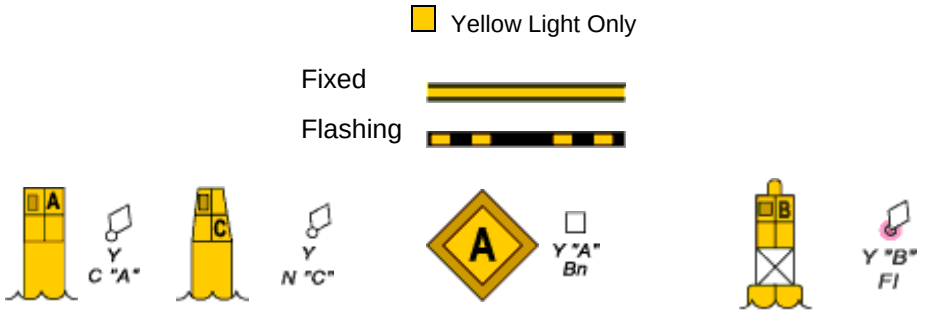
Figure 8 - **Isolated Danger Marks**
Have no numbers but may be lettered.



Special Marks are not primarily intended to assist safe navigation, but more to indicate a special area or a feature referenced on charts or in another nautical publication. They

may be used, for example, to mark anchorages, cable or pipeline areas, traffic separation schemes, military exercise zones, ocean data acquisitions systems, etc. Special marks are colored a solid yellow and, when lighted, show yellow lights with a slow-flashing rhythm preferred. Special marks may not show a quick-flashing rhythm. **Many special marks are often private aids.**

Figure 9 - **Special Marks** — May Be Lettered.



Information and Regulatory Marks are used to alert the mariner about various conditions or regulatory matters. These marks have orange geometric shapes against a white background. When lighted, these marks show a white light with any rhythm not reserved for other types of aids. The meanings of the orange shapes are:

A vertical **open-faced diamond shape** signifies **danger**. These buoys are often termed, "Danger Buoys." The nature of the danger is often indicated inside the diamond shape, such as, Dam, Rock, Shoal, etc.

A vertical **diamond shape with a cross centered within the diamond** indicates that vessels are **excluded** from the marked area. These buoys are often called, "Exclusion Buoys." The explanation for the exclusion may be placed outside the crossed diamond shape, such as, Exclusion Area, Dam, Rapids, Falls, etc.

A **circular shape** indicates that certain **operating restrictions** or **controls** are in effect within the marked area. These buoys have various names, such as, No Wake Buoy, Speed Buoy, Regulatory Buoy, Swim Buoy, etc. The type of control is shown within the circle. Other restrictions may be placed outside the circle.

A **rectangular shape** is used for displaying information such as **directions, locations, distances,** etc.

Many Class 3 private aids are regulatory marks. Figure 10 below depicts examples of Information and Regulatory Marks.

Figure 10 - **Information and Regulatory Marks**

When lighted, may display any light rhythm except quick flashing and flashing (2)

NW ☐ White Light Only

Information and Regulatory Marks are used to alert vessel operators to various warnings or regulatory matters. Examples:

Boat Exclusion Area

Explanation may be placed outside the crossed diamond shape.

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

Used to display directions, distances, locations, etc.

This buoy may be used to display regulatory markers.

May show white light and may be lettered.

Mooring Buoys are white with a blue horizontal band. This distinctive color scheme facilitates identification and helps the mariner distinguish these buoys from regular aids to navigation. When lighted, mooring buoys display a white light with any rhythm not reserved for aids to navigation. Federal mooring buoys and those privately-owner mooring buoys that are permitted as Private Aids to Navigation, and are charted or included in the Light List, shall be listed in I-ATONIS. Ball-shaped mooring buoys are more common.

Mooring Buoys

May show white light or white reflector.

Major Lights are lights of moderate to high candlepower and reliability that are exhibited from a fixed structure. They do not fall under the IALA agreement. While their signal characteristics are largely discretionary, they will be marked to provide maximum information while avoiding conflicts with nearby aids displaying IALA markings. The coloration of a light is often unique in order to avoid confusion with any nearby lights. The color of the structure should allow the light tower to clearly stand out from its background.

A major light may or may not have colored sectors with higher intensities. Major lights have an availability standard of 90% and fall into two broad categories:

Many lighthouses that have been converted to private ownership have been designated as Class I Private Aids to Navigation

Coastal or **seacoast lights** assist vessels during coastal navigation or when making a landfall. Their operational range should, based on local visibility conditions, supply needed navigation data 90% of the time for the transition of the mariner into waters marked by the short range system.

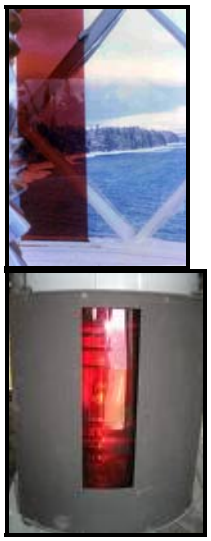
Inland major lights are found in bays, sounds, and coastal approaches. They can serve a variety of functions including use as a leading light, a range light, an obstruction mark, a sector light, or simply a reference mark from which to obtain a needed visual bearing or radar range. They should have sufficient intensity so they are visible over their usable range 90% of the nights of the year when local visibility conditions are considered.

Discrepancies on major lights.

- **Aid is extinguished**. Many private major lights are unmanned and therefore should be checked each time they are passed
- **Aid has been vandalized**. Most major lights are located in remote areas and, since they are unmanned, are susceptible to vandalism.
- **Also, check the discrepancies related to lanterns**.

Sector Lights

Directional or **Sector Lights** are devices that generate two or more defined regions by displaying different light color characteristics. In practice, directional lights have three sectors, usually have red and green sectors separated by a white sector. They are used to give an indication of a vessel's position with respect to the center of a waterway. Because there is only one light source, the mariner has no indication of how fast a vessel is moving across a given sector nor how far into a sector has a vessel moved. Directional lights should be avoided when an aid is needed to initiate a turn and the turn must be started an appropriate distance before the intersection of the channel centerlines.



Sector lights are commonly used to provide mariners with a warning that they are in an area where navigation may be impaired by a shoal, rock, etc. The mariner will have to use other aids or navigational tools to determine position relative to the danger. In practice, sector lights commonly have two sectors (usually red and white). When you can view the red lights, you are operating in danger.

Fog Detector

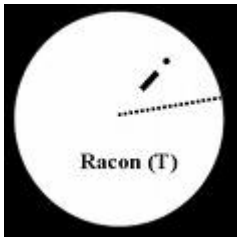
Fog Detectors are very convenient devices for controlling sound signal operation. They are particularly useful where a live watch could be reduced or a radio link to a remote station could be eliminated. Fog signals are usually calibrated to energize the sound signal when the visibility drops below 3 miles.

Discrepancy on a fog detector.

- The fog detector is inoperative.

Note on Fog Signals: Some fog signals are being updated to become "radio activated." During times of reduced visibility, mariners are requested to tune their VHF-FM radio to a predetermined channel. The mariner can then activate the fog signal for a specified time period (minutes) by keying their VHF radio's microphone, consecutively, a prescribed number of times, while on a specified VHF radio channel. Do not report such signals as "inoperative." Do not activate these fog signals as a test during periods of clear visibility.

A **RACON** is a radar transponder, which produces a coded response, or radar paint, when triggered by a surface search radar signal. They are normally operated in the frequency ranges of the X-band and S-band marine radars. RACONs provide radar enhancement, help improve aid identification, and help during the transition from ocean to inland navigation. This is accomplished by the placement of a **RACON:**



- On a prominent point of land that allows the mariner to make a positive identification of the point for a landfall.
- On an aid to distinguish the aid from other aids and vessels where many echoes appear on the radar screen.
- Temporarily, on an aid that marks a new danger.

RACONs are coded with Morse-code letters that begin with a dash and contain no more than four elements. The code usually reflects letters that are consistent with the name of the location. The letter "**D**" is reserved for RACONs marking new, uncharted dangers.

RACON

Discrepancies on a RACON:

- **The aid's RACON is off the air.**
- **The aid's RACON is emitting improper characteristics per the Light List.**

RACONs on Bridges - RACONs are often used to mark the center of the navigable channel on bridges that service large vessels. Often, these aids are Private Aids to Navigation. Three separate discrepancy reports are required. Make discrepancy reports as a PATON discrepancy report, as a Bridge Check Report, and as a special report to the Sector.

A **Sound Signal** (fog signal) is a device that transmits sound, intended to provide information to mariners during periods of restricted visibility. The term also applies to the sound emitted by the device. Due to the inability of the human ear to accurately judge the direction of a sound source, these signals are limited to only one general use—the signal serves to warn mariners of the proximity of an obstruction.

Sound Fog Signals

Although sound signals are valuable, mariners should not implicitly rely on them when navigating. Instead, they should be considered supplements to radar and radio-navigation aids during reduced visibility navigation.

Wave actuated signals are used where environmental conditions permit. When two or more channels are located in the same general area, such as near a junction or bifurcation, a different signal type is used for each waterway to assist in identification. Historically, mid-channels, fairways, and approaches have been marked with whistles. They can also be marked with an electronic horn.

The Coast Guard is discouraging the use of sound signals in lateral situations such as placing gongs to port and bells to starboard and is discouraging mariners from relying implicitly on sound signals.

Discrepancies on a sound signal:

- **The sound signal, either a bell, a gong, a horn, or a whistle, is inoperative.** Sound signals may be electrically operated or wave actuated.
- **The tappers on a gong or a bell are missing.**
- **The sounding device is missing.**
- **The fog horn is inoperative**

Other ranges, sector lights, and crossing marks do not fall under the IALA agreement. While their signal characteristics are largely discretionary, these aids should be marked to provide maximum information to the mariner while avoiding conflicts with nearby aids displaying IALA markings.

Marking of Co-axial Waterways

Occasionally, it is necessary, in a wider waterway, to mark a deep draft channel along with wider boundaries for a shallow draft channel. In this situation, the aids in the deep draft channel are named and numbered first. The name will include a noun indicating a feature of that route (channel, traffic lane, cut, or canal). The aids that mark the broader expanse of water are numbered next. They would not reference the noun used for the deep draft channel. Also, it may not be numbered in pure numerical sequence with the deep draft channel. Alpha-numerics are often used for the shallow draft channel aids. However, on a wide river, the shallow draft channel could be numbered totally independent from the deep draft channel.

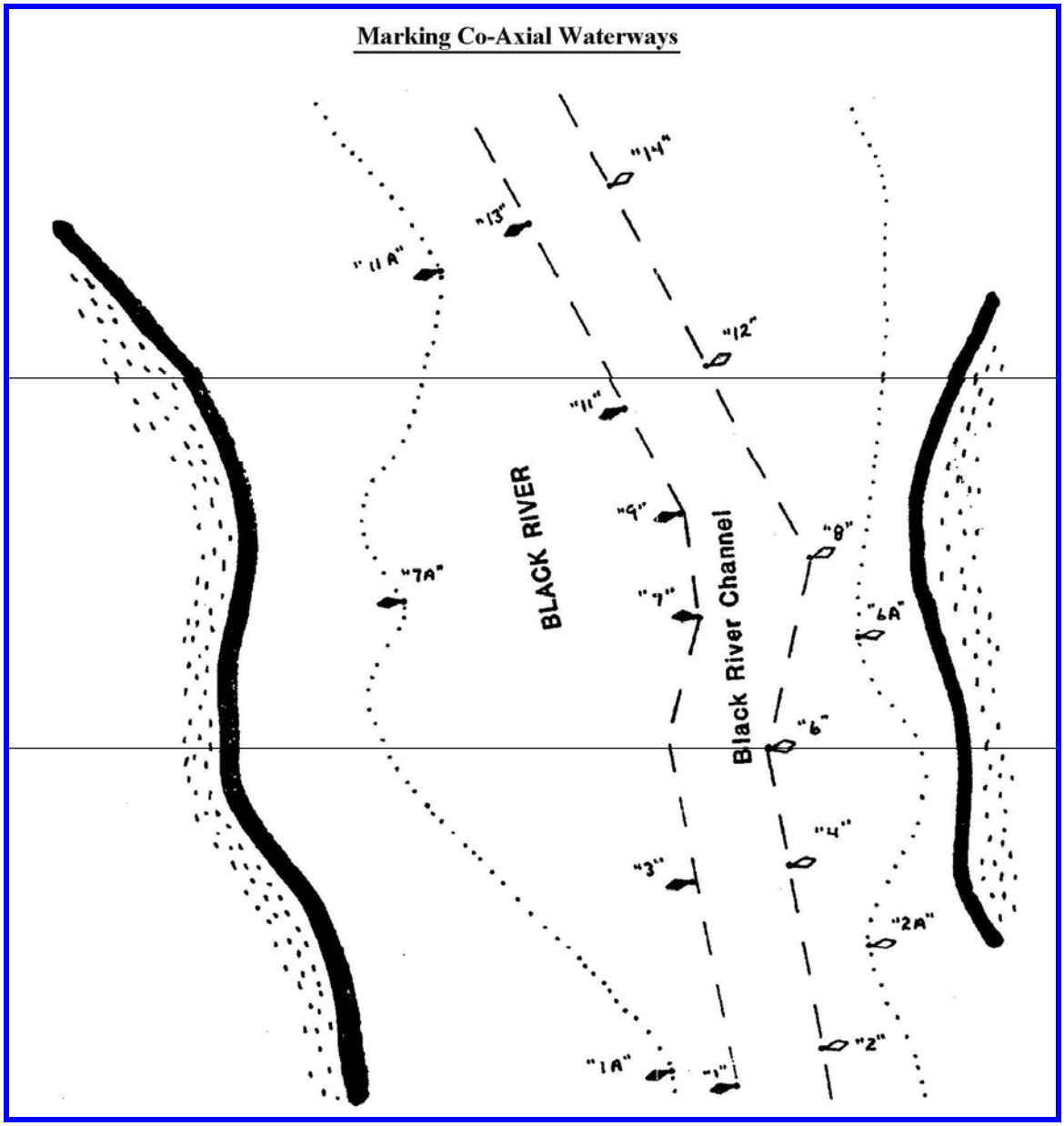
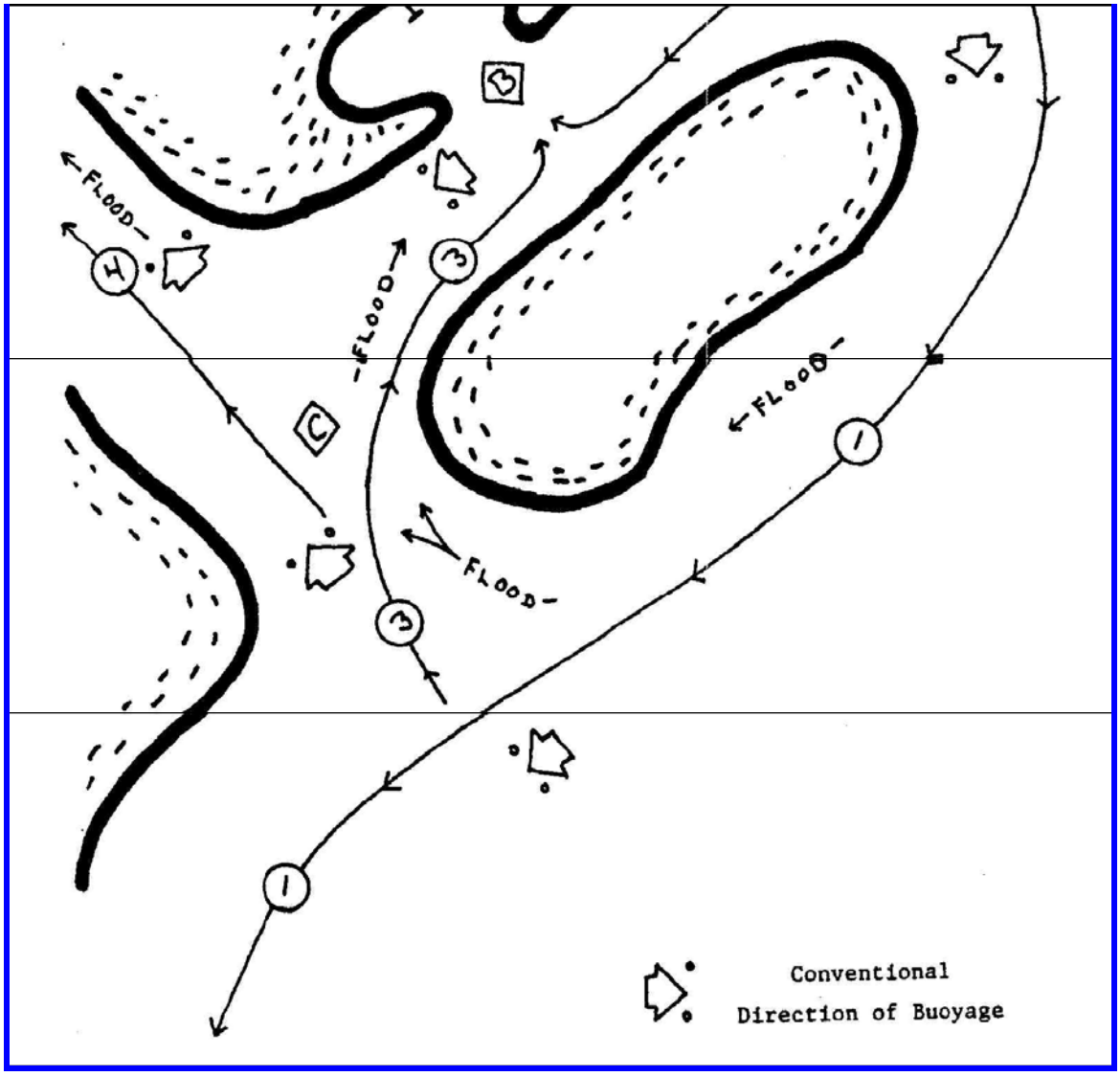


Figure 11 – **Co-axial Waterway**

Variations on the Conventional Direction of Buoyage

At times, strict adherence to the use of flood to determine the conventional direction of buoyage can cause confusion and result in an inconsistent marking scheme. This situation is more likely to occur near islands or river mouths. In the figure below, an apparent confusing situation exists between points "B" and "C," which was eliminated by deviating from the rules and changing the direction of buoyage to go from point "B" to point "C.

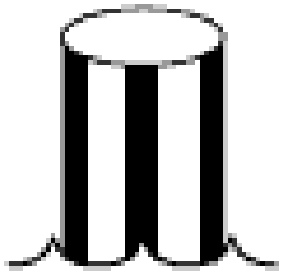
Figure 12 – **Variations on the direction of Conventional Buoyage**



The Uniform State Waterway Marking System (USWMS)

Inland Waters Obstruction Mark. On inland waters, designated by the Commandant as State waters in accordance with **33 CFR66.05-5 (33CFR66.05-100),** provides the specific listing of navigable waters designated as State waters) and on non-navigable internal waters of a State which have no defined head of navigation, a buoy showing alternate vertical black and white stripes may be used to indicate to a vessel operator that an obstruction to navigation extends from the nearest shore to the buoy. The black and white buoy's meaning is "**do not pass between the buoy and the shore**". The number of white and black stripes is discretionary, provided that the white stripes are twice the width of the black stripes. Reference the National Navigation Systems Division Web Site for links to these CFRs.

Inland (State) Waters Obstruction Mark
May show a white reflector or a quick flashing white light.



Cardinal Marks. These marks indicate, in the cardinal points of the compass, the direction of good water from the aid. They are not used in the U.S. Marking System but may be encountered in Canadian waters. .

Figure 13 - **Cardinal System Marks** may show a white reflector or a white light.

Red striped white buoy

Do not pass between buoy and nearest shore.

Black topped white buoy

Think that the black top represents a northeast storm. Pass to north or east of this buoy

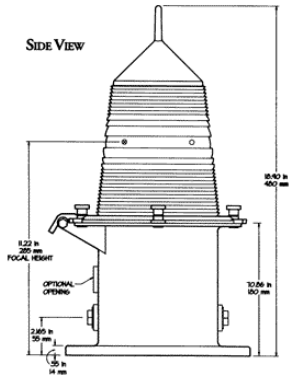
Red topped white buoy

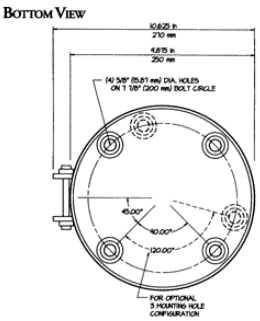
Think that the red top represents heat and the hottest area is in the southwest. Pass to south or west of this buoy

Lanterns, Navigational

Figure 14 - **The Elements of a Navigational Lanterns**

6 Place Lamp changer





155 MM Lanterns

Solar LED Lanterns are self-contained units that eliminate the mechanical problems of previous lanterns such as the lamp changer. Each unit comes equipped with a battery, solar panels, and an LED light. They provide a high level of reliability while expanding the servicing cycle of the aid. Different sizes are available depending on the size of the solar panel required to maintain the light on the aid. While the light color is unalterable, the units provide options for different light characteristics and rhythms. The lights are available with different color lights, and solar panel power production. Solar LED lanterns are currently being deployed throughout the country.

Smaller size LED lanterns are available for use on private aids.

Figure 15 – **Solar LED Lanterns**

Light Characteristics

An aid's light characteristic consists of its color and rhythm. Authorized colors are red, green, white, and yellow. A light's characteristic is determined by the aid's function. The quick rhythm is the most conspicuous and is used on important lateral aids, such as aids in turns, marking shoals, and marking wrecks. Authorized rhythms are:

Fixed (F) – shows a continuous, unblinking light. Not authorized for lateral aids.

Flashing (Fl) – the duration of light is clearly shorter than the duration of darkness. Frequency not greater than 30 flashes per minute.

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

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

Interrupted Quick Flashing (IQ) – is similar to quick flashing but has a brief, extended darkness period.

Group Flashing (Gp Fl (x+x)) – Combination of two patterns in one period, i.e. 2 flashes followed by three flashes would appear as **Gp Fl (2 + 3).** The darkness in between the groups is clearly longer than the darkness between flashes.

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

Slow Flashing – less than 30 flashes per minute. The adjective 'slow" is usually omitted.

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

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

Alternating (AL) – an alternating light changes color. It is used as a special purpose light for situations requiring significant caution.

Morse (Mo) – groups flashes (long and short) to form Morse code characters. Example: Morse code "**U**" shows two short flashes followed by one prolonged flash then a period of darkness.

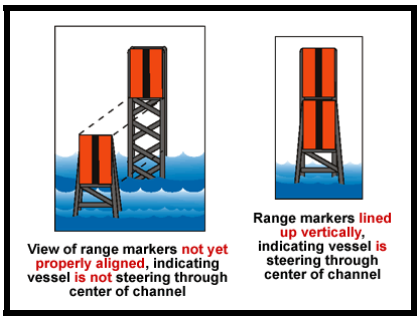
Discrepancies on lights:

- **The light signal is showing improper characteristics or rhythm.** Must be observed during periods of darkness.
- **The light signal is obscured**. Explain the circumstances in the comment section on your report.
- **The light signal is extinguished**. Must be observed during periods of darkness.
- **The lantern is damaged.** This is always a good photo opportunity.
- **The light is burning dim or showing reduced intensity**. Verify by close examination that the "burning dim" or "reduced intensity" condition is not caused by smoke, by some other atmospheric conditions, or by the viewing angle.
- **The aid's light is partially obscured by dayboards.**
- **The battery box is missing or damaged**. Note that many lighted aids are being equipped with Solar LED Lanterns which do not need a battery box. The LED lights are self-contained fixtures—LED light, battery and solar panel.
- **The vent valve on a lighted buoy is missing**. Aids with Solar LED Light fixtures do not need vent valves. When the aid has an old type hull, even though fitted with a LED lantern fixture, always checks the vent valve for integrity.
- **The vent tube(s) on a lighted buoy is broken**. Aids with Solar LED Light fixtures do not need vent valves. When the aid has an old type hull, even though fitted with a LED lantern fixture, always checks the vent tubes for integrity.
- **Bird nests are obscuring the light.**
- **The solar panel is damaged or is not oriented correctly (toward the South)**. Usually does not apply to Solar LED fixtures. However, do check for damage or vandalism.

RANGES are an aligned pairs of beacons placed to define a line down the center of a navigable channel. They are usually, but need not be, lighted. Criteria for range site selection are:

- Use of existing structures such as lights, or daybeacons whenever possible.
- Shoal areas where shallow water depths will decrease structure construction costs are utilized.
- Access to available commercial power is preferred.

Figure 16 - RANGES



The Front Range (**FR**) panel or light is usually lower than the rear range (**RR**) panel or light. Each range provides a mariner with a given lateral sensitivity at a given distance from the near end of the channel. Lateral sensitivity is expressed as Cross-Track Factor and lends a more physical feel to the performance of the range.

- The cross-track factor is a measure of effectiveness for finding and maintaining track on the range axis. A cross-track factor of 25% means that a mariner may be as far as 25% of the distance from the channel centerline to the edge of the channel before determining the vessel is off the centerline.
- Distances of less than two miles are usually marked with dayboards and using standard omni-directional lanterns for nighttime operation.
- Distances of over four miles are commonly marked with daytime lights provided there is an operational requirement to mark the entire channel.
- Distances between 2 and 4 miles are marked as operationally required or as economical as possible.

Discrepancies on ranges:

- **Range is not marking the center of the navigable channel**. See the CU02-Chart Updating Study Guide for instructions for the proper reporting of this discrepancy to the Coast Guard and NOAA.
- **Range Panels have faded**. Since fading is such a subjective opinion, use the criterion, "Can the range panel colors be interpreted as the wrong color, such as, red for orange or yellow, green for yellow, etc. Then, report the panel as faded. Photos are good backup evidence for this type of discrepancy.
- **Range panels are missing**. Note that many ranges that are lighted 24/7 may not have range panels. Recent efficiency improvements in optics combined with solar power has allowed the Coast Guard to expand the use of daytime lighted ranges even when commercial power is not available.
- **Range panels are obstructed by brush or new construction**. Good photo opportunity.
- **Range supporting structure is deteriorated, rotting, or eroding**. Good photo opportunity
- **Range lights are extinguished.**

Extra Pre-underway electronic equipment checks are necessary before AN Patrols

ATON patrols require a more precise use of navigational equipment. Unfortunately, you may find that some of the equipment found on an OPFAC does not meet the accuracy and quality standards needed for taking on scene fixes and depths for the Aid to Navigation program. Do not embarrass yourself by submitting low quality data or by not being able to make proper measurements due to equipment breakdowns or failure. Always be prepared. The two major problematic items are GPS sets and echo sounders.

A handheld **GPS** that is equipped with WAAS is a great adjunct to a navigation kit. Verify that the GPS is operating accurately during the pre-underway check by verifying its read outs against the OPFAC's GPS or against a known charted position. Always indicate how your GPS was calibrated on your pre-underway checklist. Mount the hand-held GPS to a large clipboard to keep it available throughout the patrol. Purchase a power cord for your handheld GPS that can plug into the OPFAC's cigarette receptacle to save your GPS batteries. Keep the power cord in your personal Navigation Kit along with spare batteries.

As part of the OPFAC's pre-underway check, verify that the vessel's GPS is set up correctly. A Suggested Pre-Underway Check List for AN Patrols" lists special items that are tailored for the AN member. Here are a few key items can have a serious effect on the accuracy of your reports.

- **Horizontal Datum** – Does it match the NOAA nautical chart that you will be using? If not, correct the horizontal datum in the GPS set to match the nautical chart. New GPS sets usually come preset to WGS84 and most NOAA charts have WGS84 datum references.
- **Vertical Datum** – (Depth) Does the unit of measure on the echo sounder match the depth showing in the General Information Block on the nautical chart that you will be using? When they do not match, correct the depth unit of measure on your echo sounder before you get underway.
- **Nautical miles vs. statute miles** – New GPS sets usually come set to statute miles. Ensure that the GPS set you use is reading out in nautical miles.
- **GPS headings and bearings** – Check whether the read out on the GPS set and the compass match--True or Magnetic. Be sure that you understand how your electronic equipment is reading before you use it.
- **Check that the compass is operating correctly** – Validate that the OPFAC's compass is operating accurately. If your boat is moored to a finger float, check the reading that should be constant. Otherwise, use a known range. Electronic compasses are equipped with deviation error compensation features and procedures for correcting for variation error.
- **Patrol's planned route is loaded into the GPS?**
- **Pre-calibrate the echo sounder**. This can be accomplished with a lead line or a sounding pole**.**
- **Check that the OPFACs nautical chart is current** and updated to the latest LNM. To be safe, carry the latest nautical charts in your navigation kit.

Figure 17

AN11 - Pre-Underway Checklist for ATON/CU Patrols

Boat Name		Length	OPFAC Number	State Reg. Number	
Item	**Process**	**Status**	**Item**	**Process**	**Status**
Engine	Fuel - Indicate amt of fuel in tank.		**Boat Gear**	Are there sufficient Anchors (2 required)?	
	Oil - Checked reservoir			What is length of the Anchor Rode?	**ft**
	Is there spare oil on board?			Are the heaving lines available on deck?	
	Is the Tool kit readably available?			Are there mooring lines?	
	Is the Backfire Flame arrestor mounted?			Are there sufficient Fenders?	
	Belts – good condition? – spare belt?			Is there a Horn?	
	Batteries – charged and covered.?			Is there a Bell?	
	Fuel shut offs – where located?			Is a Boot Hook available on deck?	
	Transmission fluid – checked?			Radio is operating?	
	Engine Coolant – checked?			Working channel:	**CH**
	Fire Extinguisher System operational?			Alternative channel:	**CH**
	Pollution Placard mounted?			Are the mooring cleats backed?	
	Ventilation?			Are the towing cleats backed?	
	Bilge Blower – checked?			Is there an alternative means of bailing?	
	Bilge pumps – Fore and Aft?			Is a MSD installed?	
Nav Gear	Are the NOAA Charts of AOR on board?			Is there a Swim Platform or	
	Is the Navigation Kit on board?			Is there a Boarding Ladder?	
	Are the Binoculars on board?			Is there a spotlight on board?	
	Was the compass pre-calibrated?			Are there flash lights on board?	
	Read out is (True or Magnetic)?			Is there a Capacity Plate?	
	Is a Deviation Table available?			Is there a Certificate of compliance?	
	Is a RPM Table available on board?			Is there a galley trash disposal card?	
	Is there a Timepiece on board?			Knife (min. 3" inches)	
	How was Echo Sounder pre-calibrated?			Are navigation lights operating properly?	
	Correction for transducer location:			Is the anchor light operating properly?	
	Does the Vert. Datum match the chart?			Are there spare bulbs on board?	
	Is the Light List on board?				
	Is the Coast Pilot on board?			Electrical System condition?	
	Is the Tide Tables on board?			Are there spare fuses on board.?	
	Is the Nav Rules on board?			Is the National Ensign installed?	
	Forms, pencils, and paper on board?			Are there Fire extinguishers plus 2?	
GPS	How was the GPS calibrated?			Is there a First Aid Kit on board?	
	Is the Hor. Datum the same as chart?			Are Blankets (2) available?	
	Does GPS Distance = Nautical Miles?			Are PFDs (wearable) plus 2 available?	
	Heading (True or Magnetic)?			Are PFDs (throwable) available on deck?	
	Vertical Datum (Feet, Fathoms)?			Are VDS available on deck?	
SAR	Is there a Portable Pump on board?			Is Auxiliary Ensign on board?	
	Is Towing Harness on board?		**SAR**	Are SAR Accident Reports on board?	
	Is Towing Line faked out on deck.			Are Patrol Orders on board?	
	Are Bridles available on deck?			7030 - Activity Report Mission on board?	
	Are Spring Lines available on deck?			Are extra Fenders available on deck?	
	Are Sign Boards installed?			Are Wire Cutters available on deck?	
	Is Kicker Hook available on deck?			Is SAR Plotting Guide on board?	

Make copies of the checklist and keep them available in your navigation kit. Fill out this checklist before every ATON/CU patrol. You will need data from this checklist when preparing a discrepancy or verification report.

Guidelines for Checking a Private Aid.

It is always a good practice to advise the local C.G. Unit or agency in charge of the Federal Aids in your area when you will be conducting an **ATON** Patrol. Follow your District policy for making this contact. There may be some specific items that need to be checked. Here are a series of suggestions for the proper checking of a private aid. Use the **AN10-ATON/PATON Observation Worksheet** as a reference guide to potential discrepancies and as a document for recording your on-scene observations and equipment checks. This worksheet is available on the ATON Web Page of the First Northern Aid to Navigation Web Site.

CAUTION - Auxiliarists are advised to always stay in the navigable channel while checking the location and depth alongside a floating private aid, and to exercise extra caution when approaching any fixed aids, being alert for riprap, shoaling or other protection materials often located at the base of these aids.

Step One – Confirm the following conditions about each Private Aid that you check. Report any inconsistency as a PATON discrepancy.

a. **Check your observations of the aid against the aid's characteristics in the Light List and the LNM-Local Notice to Mariners updates.** From the Light List, you should be able to discern the aid type, the aid color, the aid's number or letters, the latitude and longitude, deployment schedule, whether it is a Federal or Private aid, electronic equipment, sounding devices, fog signals, signal characteristics, light, light color, light characteristics, RACON, light height, etc. **Note: Some private aids may not be listed in the Light List. AV qualified members, if they have LOGON authority, may review the aids specifications on the On-line PATON System.**

b. **Check your on-scene observations about the aid against the symbols and chart abbreviations on the nautical chart?** Verify that the charted symbol color and the light characteristic abbreviations are correct? Confirm that the charted symbols and abbreviations match those listed in the Light List for the aid. Report any charted abbreviations, symbol, and color discrepancies to NOAA as a chart updating corrections. Use Chart No. 1 as a reference guide. **Note: Some private aids may not be charted, such as, non-lateral private aids and lateral aids on small remote channels .**

c. **Check that your observation of the aid's characteristics—shape, color, light, and numbering or lettering—comply with the IALA-B Aid to Navigation System standards.**

Step Two – Check the location (LAT/LON) of the private aid. See the Guideline for taking and reporting a fix (Location) to the Coast Guard below.

Terminology update – The Coast Guard "***positions***" aids, the Auxiliary "***locates***" aids using fixes. There are major technological differences between these two procedures, and it is important that we do not confuse anyone as to the technological capabilities of the Auxiliary.

Auxiliary Restriction - All floating aids are connected to the seabed with a harness and an anchor. The Auxiliary is never allowed to pull an aid to short stay in order to determine its exact position, so an aid may be observed anywhere within it watch circle. Since the aid's harness length is unknown, the aid's watch circle can only be estimated. The location of the aid within the watch circle is affected by the direction and force of the wind and the set of the current. Therefore, the only valid judgment that an Auxiliarist can make is a comparison between the aid's assigned position and the fix taken by the member alongside the aid. Auxiliarists must realize that a change of tide or a shift in the wind changes the location of the aid while the assigned position of the aid, as identified by it's anchor position, remains the same.

While underway, keep aware of whether the GPS is reading in 3D mode. Be prepared to record the EPE or HDOP, and the date and time for every LAT/LON fix that you take. Think quality!

Private Aids as "off station" –Be sure of your estimates and calculations before you submit an off-station report. Include the calculation details (as described in the guidelines below) with your report so that the C.G. Unit or agency can make a proper assessment of your report. Also indicate the type of GPS used to determine the fix, the name and model number of the GPS, and the method used to prove the accuracy of your GPS set at the time that the fix was taken, either the EPE or HDOP. Your accuracy and professionalism increases your credibility in the eyes of the Coast Guard. The location of lateral aids are more important that regulation buoys. **Never put your OPFAC is jeopardy while attempting to obtain a fix on the location of a private aid.**

The owner of the private aid is responsible for the location of their aid. The only valid location for a private aid is the latitude and longitude shown on the PATONs permit. The local CG ANT will advise the owner of this discrepancy. In order to change the latitude and longitude of a private aid, the owner must submit a corrected 2554 report to the District DPW office.

Step Three – Take the depth alongside the aid while in the navigation channel. See the Guideline for taking and reporting a depth, explained below.

Step Four – Scan the private aid for discrepancies. Reference the Private Aid Discrepancy section below for the reportable details. Record your observations on an "**AN11 – ATON/PATON Observation Worksheet"** or a **"7054 PATON Discrepancy Report"** that you download from the new **On-line PATON System.**

Step Five - Double check your recorded observations for completeness and accuracy before you leave the scene. It is best to prepare your discrepancy report while still on scene at the aid. This practice helps avoid missing required data and saves time by not having to return to the scene in order to collect the missing data. Using the "**AN10 – ATON/PATON Observation Worksheet**" or a **7054 PATON Discrepancy Report** from the new **On-line PATON System** as a reference guide will minimize this problem and produce a complete report.

Guidelines for taking and reporting a Fix (Location):

Fixes taken for floating and fixed lateral aids need to be highly accurate. These guidelines support this objective. Use an "**AN10 – ATON/PATON Observation Worksheet"** or a **7054 PATON Report** from the new On-line PATON System as a reference guide for recording on-scene observations and equipment checks. The worksheet is available on the ATON Web Page of the First Northern Aid to Navigation Web Site.

1. **During the Pre-underway Check of the GPS on the OPFAC**:
   - Verify that the **DGPS** or **WAAS** feature is activated in the GPS set.
   - Confirm that the horizontal datum loaded in the GPS set matches the horizontal datum printed on the nautical chart that you will use during the patrol.
   - Check that the distance unit of measurement on the GPS is set to **NM** - nautical miles.
   - Be sure that the unit of measure for bearing or heading in the GPS set matches the unit of measure read out capability of the compass on the OPFAC. When the compass reads magnetic, you will need a copy of the vessel's Deviation Table.
   - Set the Latitude / Longitude in the GPS to degrees, minutes, and seconds. This is the standard LAT/LON format for the Coast Guard. It also reflects the LAT/LON used in the Light List.
2. **Explain how the fix alongside the aid was determined and calculated.**
   - A GPS set using **WAAS,** or a **DGPS** set, is the recommended tool for taking a fix. Hand held GPS sets with WAAS can produce LAT/LON (Fixes) within 8 to 12 feet of the actual position of the aid on the earth's surface. That is inside the head of a pinhole on the chart.
   - Horizontal sextant angles and bearings using a hand-held compass are not considered sufficiently accurate for use in the Auxiliary ATON program for taking a fix.
3. **Take the Fix when close aboard lateral aids while remaining in the navigable channel.**
   - Fixes should be taken after the vessel stops alongside the aid. Recording fixes while an OPFAC in motion introduces excess error to the GPS and can produce inaccurate reports.
   - Record your LAT/LON observations on the "**AN11 – ATON Observation Worksheet**" or a **7054 PATON Report** from the new **On-line PATON System**
4. **Record quality control support for the fix, such as EPE and HDOP readings. Also show date and time**. This practice significantly improves the quality of your reports.
   - Reference the make and model of the GPS equipment that you used to determine the fix.
   - Record your observations on an **AN10 – ATON/PATON Observation Worksheet** or a **7054 PATON Discrepancy Report** from the new **On-line PATON System**.

Guideline for taking and reporting a Depth reading:

Random reporting of depth readings from echo sounders produces useless data. Besides the need to control the quality of the instrument, from a practical use, depths must relate to charted depths or depths recorded in the aid specification record. Otherwise, depths reported in areas affected by the tide are always vacillating. This difference becomes more significant in areas within the higher latitudes where tidal ranges vary 10 to 12 feet. Record your on-scene observations and equipment checks on an "AN10 – ATON Observation Worksheet" or a 7054 PATON Report from the new On-line PATON System as a reference guide for recording on-scene observations and equipment checks.

Step One - **During the pre-underway check of echo sounder on the OPFAC, check that the vertical datum shown in the "General Information Block" on the NOAA chart. reflects the depth datum on your echo sounder.**

a. If your echo sounder is integrated to your GPS set, verify that the depth datum's unit of measure on the chart, on the echo sounder, and the GPS are matching.

b. Use a lead line or a sounding pole. Make note of the distance from the waterline to the position of the transducer so you can correct depth readings.

c. Carry a lead line in your navigation kit as backup so, if the vessel's depth sounder fails, you can continue to record accurate depths during the patrol.

Step Two - **Indicate the equipment used for taking the depth alongside the aid.** List the equipment that you use—echo sounder, lead line, chain or dragline, or sounding pole on an AN10 – ATON/PATON Observation Worksheet. When an echo sounder is used, show the manufacturer's name and model number on your report.

Step Three - **When an echo sounder is used, show the distance from the transducer to the water line.**

Step Four - **Always show the time when a depth is taken.**

Step Five - **If you operate in a tidal zone area, show the height of tide for the time when the depth is taken.**

The "Height of Tide" can be obtained from the almanac screen on a GPS or on-line from **http://tidesonline.nos.noaa.gov**.

Step Six - **Calculate the observed depth reading to the charted datum.**

The formula for an echo sounder is: ((**Observed Depth** plus **Distance from transducer to the water line**) minus the **Height of Tide** = **Estimated Depth at Datum**)). The formula for a sounding pole or a lead line is: (**Observed Depth** minus the **Height of Tide**)

Step Seven - **Compare the "Corrected depth at datum" to the charted depth.**

Large depth discrepancies can be an indication that an aid may not be on station. In this case, you will need to take multiple readings to prove your case.

If you are not following these guidelines, you may not be doing a complete and accurate job of checking a Private Aid.

Suggested boat crew assignments for an ATON Patrol:

An ATON Patrol provides a good opportunity to delegate various aid checking assignments among your boat crew and to expose the crew to different navigational experiences. Make your patrol a team effort. You will be able to teach members new navigation techniques, keep your crew members involved with the patrol, cause time to pass quickly, and have a lot more fun while underway.

- ✓ **Recorder** – writes down the data as it is called out by other crewmembers and prepares the final "PATON03 - ATON Discrepancy Report" to record discrepancies.
- ✓ **Document Checker** – references copies of the Light List and Coast Pilot to verify that the observations of the aid match printed data for the aid.
- ✓ **Instrument Reader(s)** – Reads the echo sounder and/or the GPS when the OPFAC is close aboard the private aid. Use the GPS' almanac screen to determine the Height of Tide. Compare the observed depth at the charted datum to the charted depth for the aid. Also, provide the fix data (LAT/LON) and the quality readings of either an EPE or HDOP.
- ✓ **Navigator** – Reviews the data on the nautical chart against the observations taken on scene at the aid. Verifies that the charted abbreviations for the aid match the data published in the Light List.
- ✓ **Observer –** Checks whether the private aid conforms to the IALA-B Aid to Navigation System standards. This crewmember can also be assigned the duty of photographing discrepancies on the aid. Always advise the Recorder of the photo number assigned by the camera in order to avoid confusion later when the CG report is being prepared. It is better to provide a digital photo of a discrepancy or an odd configuration of a private aid rather than just trying to explain your observation. Photos are direct evidence for the Coast Guard and often initiates quicker corrective action by the owner.

Private Aid Discrepancies

A discrepancy to an aid to navigation is defined as a defect on the unit, which, therefore, is not watching properly. Always reference the latest LNM to check whether the discrepancy on the aid has been reported previously. Discrepancies to private aids normally considered "Routine" and are simply reported using the On-line PATON System.

PATON Discrepancies - Critical

The numbers for these critical discrepancies correspond to the discrepancy numbers shown on the PATON04 – 7054 Aid to Navigation Discrepancy Report and on the AN10 – ATON/PATON Observation Worksheet.

1. The aid is totally covered or shrouded in ice.

2. The light signal is showing improper characteristics or rhythm. Normally determined at night.

3. The light is obscured. Explain the circumstances in the comment section of your report.

4. The light is extinguished. Normally determined at night. There is a lantern on the aid but it is not operating.

5. The lantern is damaged. This is a great opportunity to provide a photo to add credibility to your discrepancy report.

6. The buoy is sinking. Double check before reporting. Return to the scene after an elapse of time to check whether the buoy is actually sinking or is just an aid that floats low in the water.

7. The buoy has submerged. The assumption is that you can still see the aid and, possibly, it has become a hazard to navigation. If it was not visible, it would be reported as missing.

8. The buoy has capsized. This is a great photo opportunity.

9. The aid is off station. Be sure you are right before making this report. Lateral PATONs are more important than regulatory buoys. Be observant that lateral aids are marking the best water. Comment on your findings in the Comments section.

10. The aid is missing. Enter the LAT/LON of the buoy as a waypoint on your GPS and use the "GO TO" command on your GPS to try to locate the aid. Be sure to stay in the navigable channel during this procedure. Check your LNM to insure that the PATON has not been discontinued.

11. The buoy is adrift. In this situation, you can see the buoy. Radio or call for instructions from your OPFAC. You may be instructed to take it under tow or tie it off to another private aid or local dock.

12. The buoy is stranded. This is an important photo opportunity.

13. The aid's RACON is off the air--not responding to stimulus. You need a RADAR set to make this determination.

14. The aid's RACON is emitting improper characteristics per the Light List. You need a RADAR set to make this determination, need a radio direction finder (RDF) and must be able to read Morse code to make this determination.

15. The aid's radio beacon is not operating.

16. The aid's radio beacon has a timing error.

17. The aid was vandalized (either in progress or the result of such action). If the vandalism is in process, do not approach the vandals. Notify the Coast Guard and request instructions. This is a good photo opportunity.

18. An object is obstructing the aid's light. This could be a dayboard or a bird's nest. Explain in the Comments section. This is a good photo opportunity.

19. The aid's structure has collapsed. This is an excellent photo opportunity.

PATON Discrepancies - URGENT

1. The light is burning dim or showing reduced intensity. Verify by close examination that the "burning dim" or "reduced intensity" condition is not being caused by smoke, other atmospheric conditions, or viewing angle.

2. The aid's light is partially obscured by dayboards. This is a good photo opportunity.

3. Dayboards are missing. Explain on the Comments section. This is a good photo opportunity.

4. Dayboard(s) is damaged. Explain in the Comments section. This is a good photo opportunity.

5. The sound signal, either a bell, a gong, a horn, or a whistle, is inoperative. Sound signals may be electrically operated or wave actuated. Manual signals can be actuated by generating a wave near the aid with the OPFAC and listening. Some sound signals may be remotely activated or triggered by a Fog Detector.

6. The battery box is missing. Note that many lighted aids are being equipped with Solar LED lanterns which do not need a battery box. The LED lights are self contained—LED light, battery and solar panel.

7. The battery box is damaged. This is a good photo opportunity for communicating the problem.

8. The fog signal is inoperative. Be sure to check that the fog signal is not "VHF-FM radio actuated" before reporting it is as not working properly.

PATON Discrepancies - ROUTINE

1. The aid is obscured by foliage or other objects that needs to be removed. This could be classified as CRITICAL if the aid is completely obscured.

2. Dayboard(s) is faded so that the color of the aid is compromised. The aid could be located in the water or onshore. Fading is a very subjective call. This is a good photo opportunity to show the problem.

3. There is extensive bird fowling on the aid so that the color of the aid is compromised**.** This is a good photo opportunity.

4. Aid is damaged by collision. Explain the extent of the damage as part of your report. Submit photos and the registration numbers or name of the boat, if known. This is a good photo opportunity.

5. Paint deterioration is interfering with ability to identify the lateral color of aid. This could involve peeling paint, fading, retro-material deterioration or missing, or rusting of the buoy. Normal annual maintenance usually corrects these problems. Report when lateral significance is compromised. This is a good photo opportunity.

6. Dayboard(s) is delaminating. This is a good photo opportunity. Explain in Comments.

7. The numbers on the aid are obliterated and not easily read or identifiable. When all the numbers on the aid are missing, this becomes the CRITICAL discrepancy – "The aid is showing improper characteristics." This is a good photo opportunity. Explain in Comments.

8. Wood supporting structure(s) have extensive deterioration and/or is rotting. This is a good photo opportunity.

9. The aid's structure is leaning - more than 15 degrees from the vertical. This is a good photo opportunity.

10. The vent valve on a lighted buoy is missing. Not applicable to new LED lanterns. Explain in Comments.

11. The vent line on a lighted buoy is broken. Not applicable to new LED lanterns. Explain in Comments.

12. **RADAR reflector is missing or severely damaged**. Explain in Comments. This is a good photo opportunity.

13. **The tapper(s) on a sound signal is missing**. Explain in Comments.

Important Points to Remember

- When you discover a discrepancy on an aid to navigation and it is not listed in the LNM, assume you are the ***first*** to discover it and report the discrepancy to the Coast Guard.
- AN Staff Officers when forwarding Aid to Navigation discrepancy reports that have been previously communicated directly to the C.G. Unit or agency should assure that they are not duplicated by completing the "***Coast Guard Notification***" section on their report.
- **Every Auxiliary member should be checking for and reporting discrepancies to the Coast Guard observed on every Aid to Navigation that they pass whenever they are underway on an Auxiliary facility.** Keep extra copies of the "AN10 – ATON/PATON Observation Worksheet" on board your OPFAC for this purpose.
- While private aids found watching properly are normally not reported to the Coast Guard, credit for this activity should always be reported to AUXDATA on an "ANSC 7030 Activity Report – Mission – Individual" report. Include both private aids found "watching properly" as well as private aids observed with discrepancies.
- Checking a private aid for a discrepancy cannot be properly accomplished with a so-called drive-by cursory look. At a minimum, in order to examine an aid properly, the time on scene is estimated to take 5 minutes. Besides observing that the aid complies with IALA-B characteristics, a proper Federal Aid check involves determining the aid's assigned position against the observed LAT/LON (Fix); measuring the depth, correcting it to vertical datum with height of tide data and comparing it to charted depth; reviewing the Light List and checking the abbreviations and symbols on the nautical against the observations of the aid; checking that the light is displaying the correct characteristics; verifying the light's color; checking for lantern and solar panel damage; observing the condition of the paint condition on the aid; checking structures for rot, viewing the battery, vent tubes and valves for damage, etc.

  In effect, all the information presented in this study guide comes into play during the checking and the verification process. This means that the number of aids to navigation that a member could check each hour is limited to about eight aids allowing for time of travel between the aids. The total will be less when a bridge is encountered and checked, or when a chart update is discovered. This time estimate includes the time to prepare the reports. Reporting and observing productivity increases when the team checking approach is used and as the boat crew is trained. Allotting the total aids checked during the patrol among the crewmembers on the OPFAC will also cut down the per capita report counts.

  Based on these new guidelines, it will become obvious to everyone when a member uses the old drive-by approach for this task, and reports large quantities of verifications within a short time interval. The new guidelines in this study guide should insure that the Coast Guard receives high quality PATON discrepancy check reports and required verification reports. Increases the overall credibility of the Auxiliary is expected while encouraging members to participate in the ATON program.

Reporting ATON Patrols and AN Activity to AUXDATA

Three separate reports may be required. Do not confuse their use or purpose.

1. **PATON Discrepancies** are reported to the local C.G.Unit on an "**PATON04 – 7054 PATON Discrepancy Report**" or a **7054 USCGAUX AV PATON Report** generated on the Web-Based PATON System.
   - This report alerts the Coast Guard about the problem on the aid.
   - When no discrepancies are observed on the PATON (i.e., aid is watching properly), it is not necessary to make a report to the C.G. Unit or agency unless it is the annual required verification report or the CG ANT specifically request it.
   - **Note:** Your 7054 report alerts the Coast Guard but does not interface with the AUXDATA system. If you only prepare this 7054 report, you do get any credit for underway hours in the Boat Crew program and do not receive any credit for your AN Mission activity in AUXDATA. There has to be both 7054 and a 7030 report submitted.
2. **ATON Patrols hours** are reported to AUXDATA on an "7030 Activity Report – Mission – **Boat,**" manually prepared or submitted via POMS, through the IS Staff Officer.
   - An "**ANSC 7030 Activity Report – Mission – Boat**" report is submitted by the coxswain or owner of the OPFAC to IS.
     - Use **Mission Code 03 – ATON Patrol**, On multi-mission patrols, be sure that the time spend performing PATON activity is split out and reported on the ANSC 7030 report as a separate mission.
     - This ANSC 7030 report accounts for your hours underway for the Boat Crew and ATON program in AUXDATA.
     - When the AN Patrol is performed by private vehicle or on foot, this report is not required.
   - **Note**: The "ANSC 7030 Activity Report – Mission – Boat" form that is submitted through POMS or as a standalone report to the IS Staff Officer initiates credit for your underway hours in the Boat Crew program, but does do not provide any credit for your Individual AN Mission activity in AUXDATA. **Also, this report does not interface with the local C.G. Unit or agency**. There has to be both a 7030 and a 7054 report submitted.
3. **Your individual AN mission activity** is reported to AUXDATA on an "ANSC 7030 Activity Report – Mission – Unit/Individual," through the IS Staff Officer.
   - Report all your AN activity, including the aids observed as "watching properly" and those observed and reported as "discrepant."
   - **Note**: The "ANSC 7030 Activity Report – Mission – **Individual**" report that is submitted to AUXDATA through the IS Staff Officer accounts for your individual AN activity in AUXDATA but does not provide you credit for underway hours in the Boat Crew Program, nor does it report discrepancies to the local C.G. Unit or agency. There has to be both a 7030 and 7054 report submitted.
   - Only one member may submit an "ANSC 7030 Activity Report Mission – Individual" report for each aid verified. Only one member should be listed on the 7030 report. Credit for activity at a single aid cannot be split among many members. The only option available for distributing credit is to allocate credit among the crew members on the patrol. However, the total ATONs, PATONs, and Bridges checked on the patrol should equal the total ATONs, PATONs, and Bridges reported to AUXDATA. **Multiple crewmembers cannot take AN activity credit for the same aid.**

Submitting a 7030 or 7054 report without the other two takes care of only one-third of the reporting job and leaves two important aspects of the ATON job undone.

- The **7054 Report** alerts the CG ANT to the discrepancy or reports the verification of the PATON.
- The **7030 (Boat) Report** handles your underway time to AUXDATA. This is essential for maintaining your Boat Crew Program status.
- The **7030 (Individual) Reports** handles your AN Mission activity to AUXDATA.

All Auxiliary Aid to Navigation hourly statistics in support of the Coast Guard are retrieved from AUXDATA. In order to provide evidence of the support hours that the Auxiliary provides to the Coast Guard, reporting AN patrol time to AUXDATA is extremely important. Hours reported while underway on an authorized patrol are credited toward your annual underway hours requirements for the Boat Crew program. But, only AN Mission activity is used to calculate the statistics for annual AN awards, not hours.

In summary, to successfully report AN patrol hours and AN Mission activity, you must understand the difference between:

1. **AN Patrols**,
2. **Individual Aid to Navigation Missions,** and
3. **Individual AN Activity Reports**.

They are distinguished as follows:

1. AN Patrols:

- Are only performed aboard a properly equipped and crewed operational facility under orders. Reference the Operations Policy Manual for proper procedures.
- Should be of at least four hours duration. Time is not the primary issue. More important is the AN activity that is accomplished during the Patrol.
- Are recorded in AUXDATA by the coxswain or owner of the OPFAC as a **Type 03 patrol** using an "ANSC 7030, Activity Report-Mission – **Boat**" report that can be generated through POMS. Much AN activity is also conducted as part of multi-mission patrols under other patrol type codes.

2. Individual Aid to Navigation Missions

- AN mission activity is reported on an "7030 Activity Report – Mission – Individual", as follows:

  Mission **30** – Federal Aid Activity
  Mission **31** – Private Aid Activity.
  Mission **32** – Bridge Activity.

3. Individual AN Activity Reporting

- Is a method for reporting the totals of your particular AN activity on an "7030 Activity Report – Mission – **Individual** form." Only one member should be listed on this report.
- Should never be confused with reporting underway patrol hours on an "7030 – Activity Report – Mission – **Boat**," form generated manually or reported via POMS by the Coxswain.
- Arranges and reports observed totals of your particular AN activity as either discrepant and as watching properly.
- Includes all AN activity performed by a particular Auxiliary member aboard a boat on any type of patrol, or individually while in a privately owned vehicle, boat, on foot, or other conveyance.
- In order to get credit in AUXDATA, each member must submit their own individual "7030 Activity Report – Mission – **Individual**" report to their IS Staff Officer reflecting the total

number of ATONs, PATONs, and/or Bridges that were observed as "watching properly" and/or as "discrepant."

- When AN activity is performed while acting as an authorized coxswain or crewmember on an authorized operational patrol, limit the time reported on the "7030 Activity Report – Mission – **Individual**" submissions to 15 minutes and report time outside of the time-window that was used to report for the patrol.
- Remember, there can be no splitting of AN activity credit for checking an aid. Only one member can report one aid to AUXDATA at a time. The member who submits the 7030 report gets the AUXDATA credit for the activity. While there may be other crew members aboard the boat, multiple members can not take individual AN activity credit for the same aid.

Recognition of the Navigation Systems Division and the Aids to Navigation / Chart Updating program by the Coast Guard and the Auxiliary depends on annual and periodic reports of the support activity that is performed by Auxiliarists in support of the Coast Guard. The success and funding of the Aids to Navigation Program relies on your AUXDATA input data. When you fail to report ATON patrol and activity missions, you are actually hurting the Aid to Navigation program.

INDEX

LIST OF ACRONYMS and TERMS

ADRIFT – Afloat and unattached in any way to the shore or seabed.

ADSO - Assistant District Staff Officer.

AID TO NAVIGATION – any device external to a vessel intended to assist navigators in determining their position or safe course, or to warn them of dangers or obstructions to navigation

AN - Aids to Navigation – used when referencing all of the programs in the program or the department.

ANT – Aid to Navigation Team.

ANSC - Auxiliary National Supply Center.

ASSIGNED POSITION – the latitude and longitude position of record for an aid to navigation.

ATON - Aid to Navigation – reference is directed specifically for a Federal aid to navigation.

AUXDATA – Auxiliary Data System.

AV - Aids Verifier.

AVC - Aids Verifier Candidate.

AVQ - Aids Verifier Qualifier.

BAP – Bridge Administration Program

BC-MNC - National Branch Chief, Aids to Navigation. Cartographic.

BC-MNP - National Branch Chief, Aids to Navigation-Private & Federal.

BC-MNB - National Branch Chief, Aids to Navigation, Bridge Administration.

BIFURCATION – The point where a channel divides when proceeding from seaward. The place where two tributaries meet.

BM - Boatswain Mate. The number suffix indicates the class of Petty Officer. BMs are the Coast Guards operational personnel for vessels.

BROADCAST NOTICE TO MARINERS – A radio broadcast designed to provide important marine information.

C&GS - Charting and Geodetic Services.

CDB – Conventional Direction of Buoyage

CFR - Code of Federal Regulations.

COMMISSIONED – The action of placing a previously discontinued aid to navigation back on station.

CU - Chart Updating Program.

DGPS - Differential Global Positioning System.

DIRAUX - Director of Auxiliary.

DISCONTINUE – To remove from operation (Permanently or Temporarily) a previously authorized aid to navigation.

DISCREPANCY – Failure of an aid to navigation to maintain its position or function as proscribed in the Light List.

DMAHTC - Defense Mapping Agency Hydrographic/Topographic Center.

DOP - Dilution of Position.

DSO- District Staff Officer.

DVC-MN - National Division Chief, Navigation Systems Division.

EPE - Estimated Position Error – GPS.

ESTABLISH – To place an aid to navigation for the first time.

EXPOSED LOCATION – An offshore area which is not sheltered by adjacent land and , therefore, may be exposed to extreme weather and sea condition.

EXTINGUISHED – A lighted aid to navigation which fails to show a light characteristic.

FOG DETECTOR – An electronic device used to automatically determine conditions of visibility which warrant the activation of a sound signal or additional light signals.

FSO - Flotilla Staff Officer.

GPS - Global Positioning System.

IALA - International Association of Lighthouse Authorities.

I-ATONIS - Integrated Aids to Navigation Information System.

INOPERATIVE – Sound signal or electronic aid to navigation that is out of service due to a malfunction.

JUNCTION – The point where a channel divides when proceeding seaward or the place where a tributary departs from a main channel.

KNOTS (KTS) - Nautical Miles Per Hour.

LNM - 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 the district.

LOP - Line of Position.

LUMINOUS RANGE – The distance at which a light is visible based on the visibility of an area.

MARK – An artificial or natural object of easily recognizable shape and color, situated in such a position that it may be identified on a chart. AN aid to navigation.

MPH - Statute Miles Per Hour.

NOAA - National Oceanic and Atmospheric Administration

NOMINAL RANGE - .The Nominal Range is the luminous range of a light when the meteorological visibility is 10 nautical miles, and a threshold of luminance of 0.67 sea-mile candela is used.

NOS - National Ocean Service.

OFF STATION – A floating aid to navigation not on its assigned position.

OINC - Officer in charge.

OPCON – Operating Facility Number assigned to a CG Command.

OPERATIONAL RANGE – The distance at which a light is required to be seen to meet the user requirements.

OPFAC – Operation Operational Facility

OTO - Assistant Director of Auxiliary, Operations and Training Officer.

PATON - Private Aid to Navigation.

PROTECTED LOCATION – Inshore areas that are not exposed to extremes of weather and sea condition.

QM - Quarter Master. The number suffix indicates the class of Petty Officer. QMs are the Coast Guard's navigation and signaling personnel.

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 different type and/or characteristics.

RESET – A floating aid to navigation previously off station, adrift, or missing, returned to its assigned position (station).

SAR - Search and Rescue.

SCF – Small Craft Facility.

SEMI-EXPOSED LOCATION – Offshore or inshore areas that may be sheltered by adjacent land and are exposed to lesser extremes of weather and sea conditions.

SO- Division Staff Officer.

SOUND SIGNAL – A device which transmits sound intended to provide information to mariners during periods of restricted visibility and foul weather.

USC - United States Code.

WAAS - Wide Area Augmentation System.

WAMS - Waterway Analysis Management System.

WATCHING PROPERLY – An aid to navigation on its assigned position exhibiting the advertised characteristics in all respects.

WATERWAY – A water area providing a means of transportation from one place to another, principally a water area providing a regular route for water traffic, such as a bay, channel, passage, river, or the regularly traveled parts of the open sea.

WITHDRAWN – The discontinuance of a floating aid to navigation during severe ice conditions or for the winter season.

XPO - Executive Petty Officer.

XTE - Cross Track Error.

LAT/LON Conversion Table

[Decimal minutes to seconds]

The Coast Guard required that all Latitude and Longitude expressions include Degrees, Minutes, and Seconds. Use this table to make your conversions. A simpler method is to adjust your GPS to read out in Degrees, Minutes, and Seconds. This is a quick and simple operation. Check your GPS Operating Manual for the proper procedure.

Decimal Minutes	Seconds	Decimal Minutes	Seconds	Decimal Minutes	Seconds
.017	**01**	.350	**21**	.683	**41**
.033	**02**	.367	**22**	.700	**42**
.050	**03**	.383	**23**	.717	**43**
.067	**04**	.400	**24**	.733	**44**
.083	**05**	.417	**25**	.750	**45**
.100	**06**	.433	**26**	.767	**46**
.117	**07**	.450	**27**	.783	**47**
.133	**08**	.467	**28**	.800	**48**
.150	**09**	.483	**29**	.817	**49**
.167	**10**	.500	**30**	.833	**50**
.183	**11**	.517	**31**	.850	**51**
.200	**12**	.533	**32**	.867	**52**
.217	**13**	.550	**33**	.883	**53**
.233	**14**	.567	**34**	.900	**54**
.250	**15**	.583	**35**	.917	**55**
.267	**16**	.600	**36**	.933	**56**
.283	**17**	.617	**37**	.950	**57**
.300	**18**	.633	**38**	.967	**58**
.317	**19**	.650	**39**	.983	**59**
.333	**20**	.667	**40**	1.000	**60**