

SECTION II - FEDERAL SHORT RANGE AIDS TO NAVIGATION (ATONs)

INTRODUCTION:

One of the primary responsibilities of the Auxiliary ATON/CU Program is the REPORTING of DISCREPANCIES on FEDERAL SHORT RANGE Aids to Navigation (ATONs). The Auxiliary assist the U.S. Coast Guard in the accomplishment of this important mission. In order to accomplish this task, participating Auxiliary members must be familiar with the physical characteristics and functioning of ATONs (shape, color(s), numbers, letters, size, lights, sound devices, etc.).

OBJECTIVE:

1. To acquire a general knowledge of SHORT and LONG RANGE Aids to Navigation, and the responsibilities of the Auxiliary in reporting discrepancies on Federal SHORT RANGE Aids to Navigation (ATONs).
2. To become familiar with the types of beacons and buoys of SHORT RANGE Aids to Navigation.
3. To become familiar with the types and characteristics of lights that are on SHORT RANGE Aids to Navigation.

INFORMATION:

To assist in navigation, the waterways of the U.S. are marked by the U.S. Aids to Navigation System. The U.S. Aids to Navigation System consists of Buoys and Beacons and conforms to the International Association of Lighthouse Authorities (IALA). However, it is important to know that, there are variations to the U.S. Aids to Navigation System (refer to Section XIV).

NOTE: The IALA Maritime Buoyage System "**Region B**" is employed on all U.S. waterways, i.e., buoyage "Red-to-Starboard" ("RED-RIGHT-RETURNING").

The various types of Aids to Navigation have been categorized as either LONG RANGE or SHORT RANGE. LONG RANGE Aids to Navigation consists of GPS, Loran-C, SATNAV, OMEGA or other distant sources that transmit signals or characteristic identifiers suitable for position determining. Normally, Auxiliary members are not involved in activities associated with LONG RANGE Aids to Navigation. SHORT RANGE Aids to Navigation consists of BUOYS, BEACONS and RACON.

BUOYS are floating aids to navigation moored to the bottom of the waterway with sinkers. BEACONS are fixed aids to navigation permanently attached to the bottom of the waterway or ashore. BUOYS consists of various types floating lighted or unlighted aids to navigation, i.e., Port-Side Marks, Starboard-Side Marks, Preferred Channel Marks, Safe Water

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Marks, Isolated Danger Marks and Special Marks. BEACONS consists of various types of fixed aids to navigation, i.e., all of the type floating aid Marks as Lights or Dayboards, Ranges as Lights or Dayboards, Information and Regulatory Marks as Lights or Dayboards, and some Lighthouses and Radio Beacons. Such aids to navigation are primarily the ones the Auxiliary is involved with.

An approximate total of 49,000 SHORT RANGE Aids to Navigation are Federally owned. The Coast Guard establishes the location, and installs, operates and maintains this classification of aids to navigation. Another approximate 47,000 SHORT RANGE Aids to Navigation are Privately owned. Under Coast Guard authority, the owner (State, Private or Other concerns) establishes the location, and installs, operates and maintains this classification of aids to navigation. As such, we will first consider Federal SHORT RANGE Aids to Navigation, ATONs. It is important to note that, ONLY Coast Guard personnel are authorized to inspect ATONs, since such inspection involves entering upon, opening, cleaning, repairing or other type maintenance to assure proper operation. Notwithstanding, in some special situations, **Auxiliary** units may be **requested** by the representative Coast Guard unit to periodically "**CHECK**" the status of selected **ATONs**. Moreover, as a matter of routine activities or otherwise, Auxiliary members should report any **DISCREPANCIES** that are observed on ATONs.

The reporting of ATONs that have been "CHECKED" and/or found with **DISCREPANCIES** is accomplished via the CG-5474 form. The **VERIFICATION/DISCREPANCY** block in the upper right hand corner of the form is marked accordingly. The specific procedures for filling out the CG-5474 and its distribution may vary among the Coast Guard Districts. A single CG-5474 will suffice for reporting "CHECKED" ATONs that are found to be "**watching properly.**" Individual CG-5474s are required for reporting ATONs that are found with **DISCREPANCIES**. (Refer to Section XII.)

The respective States are authorized to operate Aids to Navigation in State waters which are deemed navigable by the Commandant, U.S. Coast Guard. Under the authorization of the Commandant, the respective State Government is required to establish regulations relative to those waters. The Auxiliary normally is not involved with Aids to Navigation located in State waters unless specifically requested. The National Staff Officer for Aids to Navigation (DVC-ON) should be advised through the parallel staff before acting on such requests.

- BEACONS (FIXED STRUCTURES - Fixed to Land or the Bottom)
 - a. Description - Beacons (fixed structures) are permanently constructed either ashore or at a position extending to various heights above the surface of the water. Such structures are lighthouses, lights, ranges or daybeacons defined as follows:
 - (1) LIGHT - A fixed structure with lighting apparatus (some lights are also on poles fitted with radar reflectors, sound apparatus, radar, radio beacons and daybeacons).
 - (2) DAYBEACON - An unlighted fixed structure equipped with dayboards.

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- (3) RANGE - Two lights (or other marks), front and rear, associated to form a range indicating a channel centerline.
- b. Beacons (fixed structures) are usually supported by a:
 - (1) DOLPHIN - A number of piles lashed together in a circular pattern.
 - (2) PILE - A simple wooden or metal pole.
 - (3) SKELETON TOWER - A structure of vertical, horizontal and diagonal members with bracing usually of steel.
- BUOYS (Floating Aids)
 - a. Description - Buoys are floating aids, either lighted or unlighted. Some buoys support similar components as supported by some beacons.
 - b. Efficiency - Buoys are subject to breaking moorings or otherwise becoming off-station. The reliability of buoys maintaining a particular charted position is therefore questionable and should not be considered as the only source in position determination.
 - c. Size - The size of a buoy is dependent upon the waters it is intended to watch. Accordingly, a buoy positioned to watch in sheltered waters would not require the size and components as would a buoy positioned to watch in waters exposed to severe sea or weather elements. The size of an Unlighted Buoy (ULB) is determined in Classes: 1st, 2nd, 3rd, etc., with the 1st class being the largest. Lighted Buoys (LBs) are classified by the diameter of the buoy body and overall height, e.g., a 6 X 20 LB would have a body diameter of six feet and would stand 20 feet in height.
 - d. Construction - Most buoys are of steel construction. However, some buoys are fabricated of aluminum, plastic and/or Styrofoam. Steel buoys are given a serial number which denotes the size, type and year it was built.
 - e. Moorings - Moorings for buoys usually consists of a bridle, mooring chain and anchor (sinker) that are compatible to the depths and elements they will watch.

The lighting apparatus for beacons and buoys is determined with regard to the intended function of the aid to navigation. Light fixtures consist of lanterns of various shapes and sizes plus the following components:

- a. A lampholder or lampchanger,
- b. A flasher - when a specific characteristic other than fixed light is desired.

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- c. A power source - commercial power, generator or batteries. (Lighted Aids to Navigation powered by batteries usually contain solar panels and controls which allow the batteries to recover during periods of daylight.)

NOTE: For training purposes, where possible, members should have an opportunity to observe the operation of a 155mm lantern, flasher and lampchanger with daylight control. With this demonstration, where available, the members can test their skill in examining light characteristics with a stopwatch. This is an important task in "CHECKING" ATONs or "VERIFYING" Private Aids to Navigation (PATONs). Refer to page 2-6, "Lighted Aids - Light Characteristics," which illustrates timing phases and characteristics including the number of expected flashes if the light characteristic is correct.

NOTE: While the conditions or status of any ATON/PATON is usually conducted during daylight hours, the member is reminded that light intensity, dark or colored sectors and characteristics of illuminated aids must be determined during periods of darkness (see following page 2-6, for Lighted Aids light characteristics). A simple method in checking colored or dark sectors of an ATON/PATON would be to determine the Lines-of-Position (LOPs) of each extremity of the sector and simply set course to cross the range while taking bearings to determine the beginning and ending edge of the sector. Care should be taken in applying variation and deviation if magnetic bearing instruments are used. Also, since most light sectors denote danger areas, care should be taken in setting courses within the sector range, particularly in unfamiliar waters.

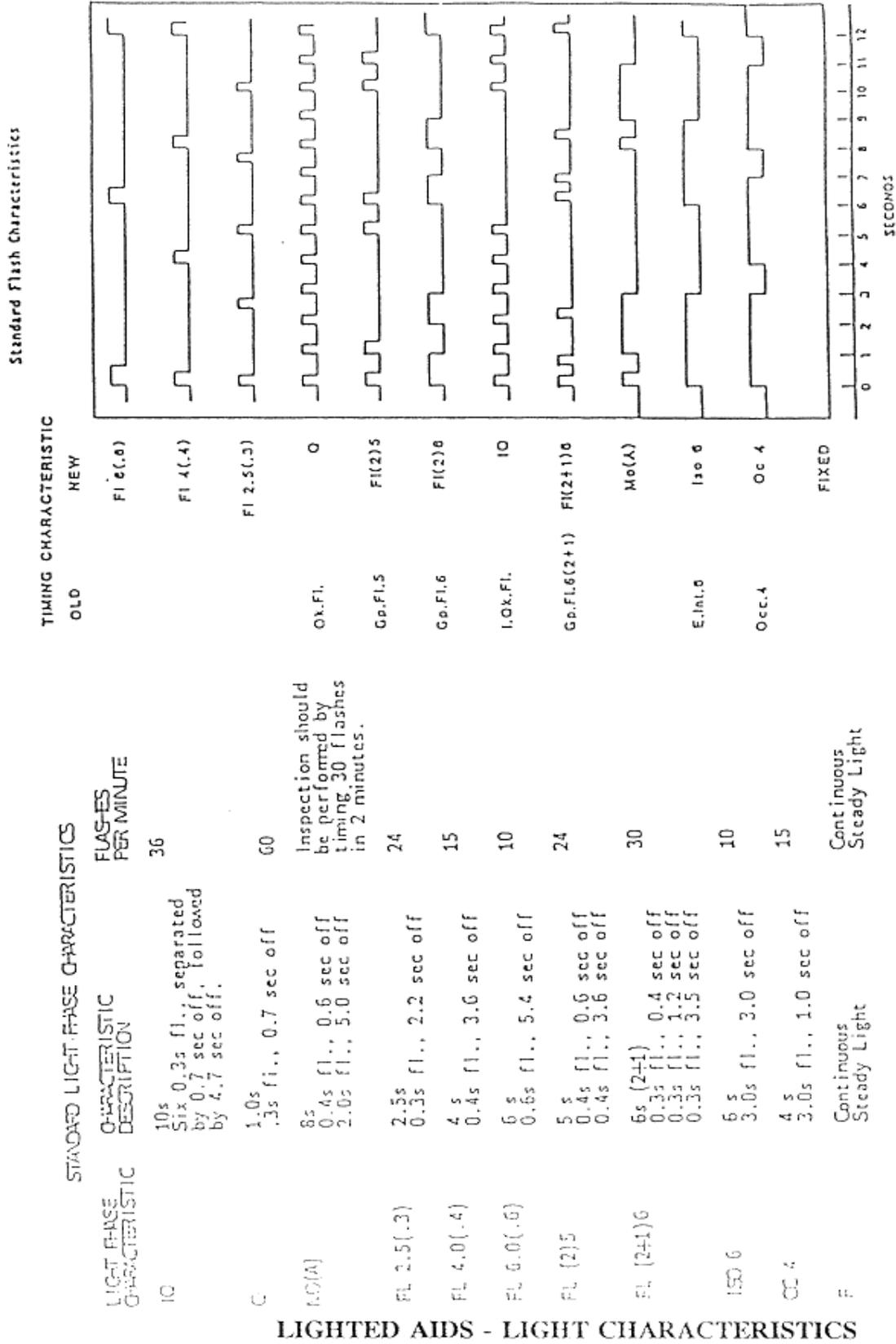
- The following is a listing of "things to remember" in "CHECKING" ATONs or "VERIFYING" PATONs:
 - a. FIXED AIDS - Upon approach, it can be determine if a fixed aid is obscured by buildings or foliage. Moreover, it can be determined if the aid is tilted or leaning by sighting its vertical position against the horizon or shoreline. Most fixed aids are located either ashore, in shallows or shoaling areas and should not be approached close aboard. The condition of fixed aids can be determined by binoculars, or other instruments from safe distances.
 - b. STRUCTURES - Upon approach, it can be determined if a structure is sound, in-place and in serviceable condition, i.e., bent, leaning, at or below the surface of the water, deteriorated, heavily barnacled; or displays unauthorized signs or other misrepresentative fixtures.
 - c. LANTERNS - Upon approach, it can be determined if a lantern is in serviceable condition, i.e., lens cracked, broken, covered with excessive bird droppings or faded or improper color; or any broken or exposed wiring.
 - d. DAYBECONS/DAYBOARDS - Upon approach, it can be determined if a dayboard is sound, in-place and in serviceable condition, i.e., proper size, shape, color(s), number, letter; fitted with retro-reflective material; or evidence of illegibility or peeling or broken slats. (Descriptions of all types of dayboards can

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be found in the front section of the Light List).

- e. BUOYS - Upon approach, it can be determined if a buoy is close-on its charted station or watch circle, and in serviceable condition, i.e., riding low in the water or leaning; body, cage or radar reflector damaged; proper size, shape, color(s), number, letter; proper and functioning sound device (bell/gong/horn/tapper/whistle/etc.), light (characteristics); intact vent line and valve.
- f. LIGHTED AIDS - The position and condition of lighted aids should be determined during daylight hours. However, the actual confirmation of the light intensity, characteristics, colored or dark sectors of lighted aids must be performed during periods of darkness. It is important to note that, the light intensity of floating aids is not constant, due to changes in the focal plane caused by wave action. A stopwatch is required to determine the light characteristics of lighted aids. (A guide for checking light characteristics is enclosed at the end of this Section.)
- g. UNAUTHORIZED ESTABLISHMENTS - Miscellaneous signs, pipes, poles, buoys and other objects, established without prior authorization to advertise or mark specific areas, may be found in navigable waters. The suspected establishment of an unauthorized aid should be reported on a CG-5474 for Coast Guard District (oan) disposition. It is important to include as much information as possible in the report, i.e., a description, approximate position, water depth, etc., of the establishment, and as available, the name, address and phone number of the responsible person or parties.

Auxiliary members and their units submitting CG-5474 reports are awarded points, refer to Section XII.



REMEMBER LIGHT SECTORS, INTENSITY and CHARACTERISTICS MUST BE CHECKED DURING PERIODS OF DARKNESS.