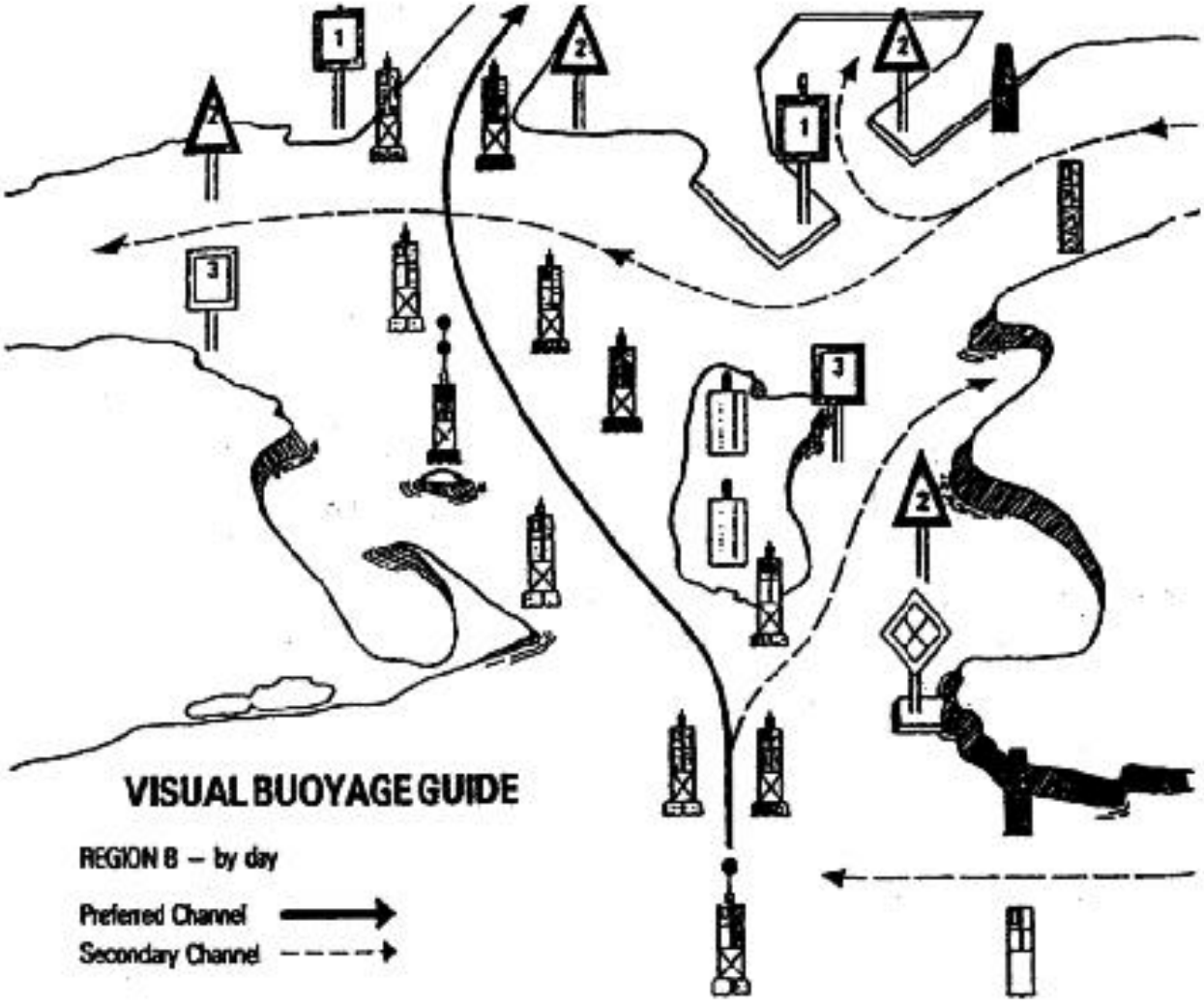
UNITED STATES COAST GUARD

AUXILIARY



NATIONAL

AIDS TO NAVIGATION AND CHART UPDATING STUDY GUIDE

1995

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LIST OF ACRONYMS

ADSO-OP Air	Assistant District Staff Officer, Air Operations
AN	Aids to Navigation
ANSC	Auxiliary National Supply Center
ATON(s)	Aids to Navigation/Federal Aid(s) to Navigation
ATONIS	Aids to Navigation Information System
AUXMIS	Auxiliary Management Information System
AV	Aids Verifier
BC-OEN	National Branch Chief, Operations Education Aids to Navigation
BC-ONC	National Branch Chief, Aids to Navigation Cartographic
C&GS	Charting and Geodetic Services
CU	Chart Updating
DIRAUX	Director of Auxiliary
DMAHTC	Defense Mapping Agency Hydrographic/Topographic Center
DOT	Department of Transportation
DSO-AN	District Staff Officer, Aids to Navigation
DVC-ON	National Division Chief, Aids to Navigation
FSO-AN	Flotilla Staff Officer, Aids to Navigation
FSO-MA	Flotilla Staff Officer, Materials
GPS	Global Positioning System
IALA	International Association of Lighthouse Authorities
LOP(s)	Line(s) of Position
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
oan	Aids to Navigation Division (USCG District)
PATON(s)	Private Aids to Navigation
SAR	Search and Rescue
SO-AN	Division Staff Officer, Aids to Navigation
WAMS	Waterway Analysis Management System

OVERVIEW OF THE STUDY GUIDE

The U.S. Coast Guard has the responsibility for the establishment and maintenance of all Aids to Navigation on the Waterways of the U.S. This is an all inclusive responsibility, and it includes the coastal waters and inland waters of the U.S. This responsibility is effected in conjunction with other Federal Government agencies, State and Local Government elements and Private entities. The U.S. Coast Guard Auxiliary, in its overall supplemental supporting role, provides specifically authorized assistance to the Coast Guard in its Aids to Navigation missions. This Auxiliary support effort is provided through the Aids to Navigation and Chart Updating (ATON/CU) Program.

In order for Auxiliary members to participate in the ATON/CU Program they must have a general knowledge of the responsibilities of the Auxiliary in the conduct of the program. This "Study Guide" presents a tutorial for the Auxiliary member of the, "WHAT, WHERE, WHEN and HOW," questions pertaining to the conduct of ATON/CU Program associated activities. The subject matter of this "Study Guide" is all inclusive. The challenge is for the Auxiliary member to assimilate the information provided, and to put into practice the "lesson material" of each of the fourteen "Study Guide Sections" during the conduct of ATON/CU Program "MISSIONS/PATROLS" and the "REPORTING of FINDINGS."

The development of this "Study Guide" is the work of several Auxiliary members involved in the instruction, management and conduct of the ATON/CU Program. In this regard, due to this combination of contributors, the individual "Study Guide" Sections may be presented in slightly different styles. The editor has attempted to correct this anomaly without variation to the subject matter.

SECTION I - PREPARATION AND TOOLS

INTRODUCTION:

One of the many important steps in scheduling a U.S. Coast Guard Auxiliary Aids to Navigation and/or Chart Updating (ATON/CU) Program patrol or mission is PREPARATION. Several adverse conditions/occurrences could affect the successful performance of an ATON/CU patrol or mission, i. e., crew proficiency (state of crew training and qualification), insufficient or improper equipment, weather conditions, etc. Participating Auxiliary members must be properly trained and equipped to conduct successful ATON/CU patrols and missions.

OBJECTIVE:

1. To acquire a general knowledge of the responsibilities of the Auxiliary in the conduct of ATON/CU PATROLS and MISSIONS.

2. To become familiar with the preparation for an ATON/CU PATROL or MISSION.

3. To become familiar with the use of the tools and equipment required to support ATON/CU operations.

INFORMATION:

Preparation is the first step in conducting an ATON/CU patrol or mission. Accordingly, it is important to know that there are differences between an ATON/CU PATROL and an ATON/CU MISSION. They differ as follows:

- ATON/CU PATROL - Shall be performed aboard a properly equipped and crew-staffed operational facility (Surface or AIR, refer to notes). A surface patrol must be of at least four hours duration, and should be entered in AUXMIS under Type 03 of the ANSC 7030, Activity Report-Mission. An ATON/CU Patrol may be conducted under reimbursable or non-reimbursable orders. Members must be in proper PATROL uniform.

- ATON/CU MISSION - May be performed by one or more participating Auxiliary members. A privately owned vehicle or other conveyance may be used in the conduct of an ATON/CU mission. Mission must be accomplished within a 24-hour period and should be entered in AUXMIS under Mission type 30, 31, 32 or 4l on the ANSC 7030 - Activity Report-Mission. Member(s) must be in proper uniform for public appearance.

NOTE: When an ATON/CU mission is conducted as an OPERATIONAL SUPPORT MISSION aboard a properly equipped and crew-staffed operational facility, reimbursable or non-reimbursable orders may be used.

NOTE: An ATON/CU patrol or mission can be conducted under the "MULTI-MISSION"

concept, e.g., in conjunction with a scheduled Safety Patrol, wherein the activities are so listed on the ANSC 7030 Activity Report-Mission, accordingly.

NOTE: When an ATON/CU patrol is authorized by the call-out authority and conducted in an Air facility, the proper reporting procedures must be established by the respective DIRAUX. This is because all Air Patrol time is reported as AIR OPERATIONS MISSIONS type on the ANSC 7030 Activity Report-Mission.

In preparing for an ATON/CU patrol or mission, consideration is given to the purpose(s) of the activity, the prevailing weather, water conditions, and any additional tasks to be accomplished during the operation. Consideration should be given to such activities as: checking or verifying aids to navigation (refer to Sections II, III, IV, V, XII and XIV), or updating charts (refer to Sections VI, VII, IX, X, XI, XII, XIII and XIV). While traveling to the patrol/mission area for a particular task, a prudent observer should also check each aid that is passed for possible discrepancies and the shoreline for any changes in chartable objects. That type of information is considered in preparing for a patrol or mission and deciding the type of tools or material that will be required.

Consideration of the type of equipment required for a CU patrol would be easy enough for an owner of an operational facility whose primary assignment was ATON/CU support, such as an AN Staff Officer (FSO-AN/SO-AN/DSO/AN). In cases where an AN observer is aboard a facility only for transportation, consideration should be given to the type of equipment, other then the usual vessel items, that will be needed to properly conduct any expected tasks.

The equipment required to support an ATON/CU patrol differs somewhat from that required to support an ATON/CU mission. For an ATON/CU mission involving visits to marine facilities for chart updating activities, a minimum amount of equipment would be required. However, if such on-shore missions include, say, determining the position of an aid to navigation from an on-shore location, then specific equipment needed to complete the task would be required.

The following provides a listing of items required to support ATON/CU patrol/mission contingency requirements:

- EQUIPMENT FOR TAKING OBSERVATIONS:

a.	Binoculars	Size 7 X 50 preferred. Some Binoculars have a built in Bearing Compass and Stadimeter.
b.	Time Piece	Two types preferred - standard type clock or watch, and stopwatch. Good practice to have capability to read the specific time of day and to time intervals.
c.	Hand Bearing Compass	Standard type - scale of not less than two degrees, stable and capable of night use.

- EQUIPMENT FOR TAKING OBSERVATIONS (con't):

d.	Sextant	Observer's most important piece of equipment. Used to determine distance from an object, height of an object, and the angle between objects. Davis Mark 15 provides outstanding accuracy for chart update information.
e.	Calculator	Facilitates calculations.
f.	Light List	Current edition corrected with the latest changes (Notices to Mariners by the Coast Guard via "Broadcast" or published in the USCG District "Local Notice to Mariners" or DMAHTC (Defense Mapping Agency Hydrographic/ Topographic Center) "Weekly Notice to Mariners"). Alternatively, reproduce pages needed during the observation.
g.	Coast Pilot	Current edition corrected with the latest changes (Notices to Mariners). Alternatively, reproduce pages needed during the observation.
h.	Private Aids Information	Private Aids Printout, Private Aids Application (CG-2554), or last report.
i.	Forms	Supply of "Aids To Navigation Report" CG-5474 or Coast Guard District (oan) prepared forms originated from the District's "ATONIS" computer database printouts of aids, and "USCG AUX - NOS Cooperative Chart Updating Program" NOAA 77-5 forms. Consider using reproduced copies of these forms for field use. Also, there are several good work-sheets available or that can be developed for recording and calculating information.

NOTE: Throughout the AN/CU Study Guide the "Aids To Navigation Report" CG-5474 form is referred to as "CG-5474" and the "USCG AUX - NOS Cooperative Chart Updating Program" NOAA 77-5 form is referred to as "NOAA 77-5." Also, as applicable, any reference to the use of the CG-5474 may be supplemented with the respective Districts (oan) "ATONIS" aids database form.

- EQUIPMENT FOR PLOTTING THE OBSERVATIONS TAKEN:

a.	Pencil	Number "2" is the recommended hardness - a device for sharping is required.
b.	Parallel rule	Several types are used for plotting.

- EQUIPMENT FOR PLOTTING THE OBSERVATIONS TAKEN (con't):

c.	Three-Arm Protractor	Mandatory for plotting multi-angles from Sextant or bearing observations. Once the tool is set, lock the bearing using tape, clips or screws.
d.	Dividers	Used primarily as a measuring tool.
e.	Compass	Not a Bearing Compass, but a Compass for drawing circles. Must be large enough for the Chart that will used.
f.	Chart No. 1	Provides list of symbols, abbreviations and terms used on marine charts.
g.	Chart Board	Mandatory when chart work is to be accomplished while making the observations. Consideration given to the size of the Chart.
h.	Chart	Large Scale Chart of the area. (Nautical charts are being converted to the METRIC SYSTEM with the **base unit** expressed in **meters**.)

Some AN Observers have fabricated additional types of instruments for ATON/CU activities use. Examples are: sounding poles for shallow depths, chain or wire drags for confirming sunken items and tools for measuring the degree of leaning aids.

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

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.

- <u>BEACONS (FIXED STRUCTURES - Fixed to Land or the Bottom)</u>

  a. <u>Description</u> - 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) <u>LIGHT</u> - A fixed structure with lighting apparatus (some lights are also on poles fitted with radar reflectors, sound apparatus, radar, radio beacons and daybeacons).

     (2) <u>DAYBEACON</u> - An unlighted fixed structure equipped with dayboards.

(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.

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

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.

LIGHTED AIDS - LIGHT CHARACTERISTICS

Standard Flash Characteristics

STANDARD LIGHT PHASE CHARACTERISTICS

LIGHT PHASE CHARACTERISTIC	CHARACTERISTIC DESCRIPTION	FLASHES PER MINUTE
IQ	10s Six 0.3s fl., separated by 0.7 sec off, followed by 4.7 sec off.	36
C	1.0s .3s fl., 0.7 sec off	60
Mo(A)	8s 0.4s fl., 0.6 sec off 2.0s fl., 5.0 sec off	Inspection should be performed by timing 30 flashes in 2 minutes.
Fl 2.5(.3)	2.5s 0.3s fl., 2.2 sec off	24
Fl 4.0(.4)	4 s 0.4s fl., 3.6 sec off	15
Fl 6.0(.6)	6 s 0.6s fl., 5.4 sec off	10
Fl (2)5	5 s 0.4s fl., 0.6 sec off 0.4s fl., 3.6 sec off	24
Fl (2+1)6	6s (2+1) 0.3s fl., 0.4 sec off 0.3s fl., 1.2 sec off 0.3s fl., 3.5 sec off	30
ISO 6	6 s 3.0s fl., 3.0 sec off	10
OC 4	4 s 3.0s fl., 1.0 sec off	15
F	Continuous Steady Light	Continuous Steady Light

TIMING CHARACTERISTIC

OLD	NEW
	Fl 6(.6)
	Fl 4(.4)
	Fl 2.5(.3)
Ox.Fl.	O
Gp.Fl.5	Fl(2)5
Gp.Fl.6	Fl(2)6
I.Ox.Fl.	IO
Gp.Fl.6(2+1)	Fl(2+1)6
	Mo(A)
E.Int.6	Iso 6
Occ.4	Oc 4
	FIXED

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

SECTION III - PRIVATE AIDS TO NAVIGATION (PATONs)

INTRODUCTION:

Another major responsibility of the Auxiliary ATON/CU Program is the VERIFICATION of the STATUS of PATONs. Again, the total number of PATONs is about the same as the total number of ATONs. As such, it is beyond the capability of the Coast Guard to inspect some 49,000 ATONs and 47,000 PATONs. It therefore falls to the members of the Auxiliary to assist the Coast Guard in the verification of the majority of PATONs.

OBJECTIVE:

1. To acquire a general knowledge of the types and characteristics of PATONs, and the responsibilities of the Auxiliary in the verification of PATONs.

2. To become familiar with the classes of PATONs.

3. To become familiar with the procedures used in the verification of PATONs.

INFORMATION:

PATON is the term that describes all marine aids to navigation established and operated in navigable waters of the U.S. other than those operated by the Federal Government or those operated in State waters as PATONs. PATONs like ATONs are Short Range Aids to Navigation. Examples of the types of PATONs are: markings for private channels such as marinas, residential development or industrial sites, structures and wrecks, e.g., Buoys, Lights, Daybeacons, Ranges, Fog Signals. PATONs have the same shape, color, numbering and light characteristics as ATONs, but do not have to be the same size. PATONs are divided into three classes as follows:

- CLASS I Aids to navigation on marine structures, to include bridges or other works which the owners are legally obligated to establish, maintain and operate as prescribed 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 and Class II, located in waters not ordinarily used by general navigation.

The Auxiliary periodically VERIFIES the status of Class II and Class III PATONs at the discretion of the District Commander (oan). In addition, when requested by the Coast Guard, the Auxiliary "CHECKS" (VERIFIES) Class I PATONs (refer to notes).

To assist the Coast Guard in this important AN operation, it is essential that participating

Auxiliary members have appropriate training and sufficient practice in ATON/CU program activities. The respective Coast Guard Districts have an active PATON VERIFICATION PROGRAM which qualifies Auxiliary members as an **"Aid Verifier" (AV).** The "AV" qualification is entered into the AUXMIS database for each qualified Auxiliary member. Such qualified AVs may receive orders for PATON verification activities. AV qualification is not required for Auxiliary member participation in CU activities, or to report an AN (ATON/PATON) discrepancy.

The level of effort involved in PATON verification is determined by the type and charted position of the aid. The position of a fixed aid (beacon) seldom changes between periodic inspections. However, the position of a floating aid (buoy) could change significantly over time. Such circumstances regarding floating aids demand a more definitive position verification with more frequency than that required for fixed aids.

NOTE: Class I aids are normally INSPECTED by Coast Guard personnel. Notwithstanding, Class I PATONs can be CHECKED (VERIFIED) by AV certified Auxiliary members, when so designated and authorized by the District Commander (oan). Moreover, as with ATONs, as a matter of routine or otherwise activities, Auxiliary members should report any DISCREPANCIES that are observed on PATONs (Class I, Class II and Class III).

NOTE: The AV training programs vary among the Districts depending on the complexity of the PATONs, therein. For example, in certain geographical areas of the country buoys must be removed during winter months and replaced in the spring. Such situations require Auxiliary members to be proficient in the verification of the position of such PATONs.

NOTE: It is important to know that Auxiliary members do not tie to, climb aboard, repair or make adjustments to PATONs. Moreover, Auxiliary members are not authorized to contact or to offer suggestions or corrective action, or other instructions to the owners of PATONs. However. it is the responsibility of Auxiliary members to report the observation of non-standard conditions on PATONs to the representative Coast Guard unit.

The reporting of PATONs that have been "VERIFIED" 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 "VERIFIED" PATONs that are found to be "**watching properly**." Individual CG-5474s are required for reporting PATONs that are found with DISCREPANCIES. (Refer to Section XII.)

Some Coast Guard Districts have adopted a system of individual printouts for each PATON from the District Commander (oan) "ATONIS" database which provides multi-copy printouts. (Refer to Section I.)

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

SECTION IV - DISCREPANCIES

INTRODUCTION:

An important aspect of the Auxiliary ATON/CU Program includes the methods and procedures for informing the proper Government agencies of findings. An Auxiliary member should report DISCREPANCIES observed on ATONs and PATONs, the VERIFICATION of Class I, II and III PATONs and the as directed CHECKING of ATONs in accordance with the established policy of the District.

OBJECTIVES:

1. To acquire a general knowledge of the responsibilities of the Auxiliary on how discrepancies and verifications are reported.

2. To become familiar with the CATEGORIES of ATON DISCREPANCIES.

3. To become familiar on how to recognize a discrepancy on an aid to navigation.

INFORMATION:

A Discrepancy on an aid to navigation is defined as a unit which is defective unit, i.e., an ATON or PATON which is NOT **watching properly**. Discrepancies to ATONs are divided into three categories. The purpose of categorizing ATON discrepancies is to establish the significance of the defective unit and to identify how the observation should be reported. The three discrepancy categories for ATONs are **CRITICAL, URGENT or ROUTINE.** Discrepancies to PATONs are classified in the **ROUTINE** category only.

- The definitions for each category of ATON discrepancies are as follows:

    a. **CRITICAL** - For those discrepancies where failure to report by the most expeditious means may result in loss of life or damage to a vessel.

    b. **URGENT** - For those discrepancies where failure to report will result in NO danger or loss of life or vessel damage, BUT may contribute to grounding or stranding.

    c. **ROUTINE** - For those discrepancies where failure will result in very low likelihood of grounding or stranding, BUT corrective maintenance is necessary.

The HOW?/WHEN?/WHAT? for the reporting of discrepancies is determined by the nature of the discrepancy. The primary transmittal methods that are available for reporting discrepancies are RADIO, TELEPHONE or by U.S. MAIL.

- The following describes the HOW?/WHEN?/WHAT? discrepancies are reported for both

ATONs and PATONs : (All reports by radio or telephone must be followed-up by a written report.)

a. ATONs ONLY

(1) Critical Discrepancies - Report by **Radio** - Immediately

(a) Aid totally covered or shrouded in ice.

(b) Light signal showing improper characteristics or rhythm.

(c) Light signal obscured or extinguished.

(d) Sinking or submerged buoy.

(e) Buoy off station, adrift, missing, capsized or stranded.

(f) Radio beacon off the air or giving improper characteristics. (Note: Characteristics of radiobeacons are in the Department of Transportation/U.S. Cost Guard Light List.)

(g) Vandalism of aids (either in progress or the result of such actions).

(h) Aids damaged by vessel collision.

(i) Collapsed bridge structures, fender systems and obstructions to navigable channels.

(2) Urgent Discrepancies - Report by **Telephone** - ASAP

(a) Daymarks missing or damaged by causes other than vandalism.

(b) Sound signal failure (bell/gong/horn/tapper/whistle/etc.) (Note: Sound signals may be electrically operated or wave actuated.)

(c) Radio beacon timing sequence incorrect. (Note: Timing sequence of radio beacons are in the Light List.)

(d) Light burning dim or showing reduced intensity. (Note: Verify by close examination that the "burning dim" or "reduced intensity" condition is not being caused by smoke or other atmospheric conditions.)

(e) Lights partly or totally obscured by dayboards.

(f) Bridge light outages: inoperative draw, swing, lift or retractable

bridges.

b. ATONs and PATONs

Routine Discrepancies - Report by **Mail** - ASAP

(a) Aid obscured by foliage or other objects that should be removed.

(b) Faded daymarks, whether located on aids in the water or on shore.

(c) De-lamination of dayboards.

(d) Leaning structure. (Leaning more than 15 degrees from the vertical)

(e) Bird nest(s) on aid.

(f) Improper dayboards. (Check against Light List.)

(g) Retro-reflective material peeling, missing or inadequate.

(h) Dayboard missing.

(i) Numbers that are obliterated and not easily read or identified.

(j) Extensive bird fouling on aid.

(k) Peeling paint interfering with ability to see aid.

(l) Extensive deterioration and/or rotting of wood supporting structure.

(m) Missing or severely damaged radar reflectors.

(n) Missing vent valve on lighted buoy.

(o) Discrepancies regarding State and privately owned and maintained aids.

(p) Other bridge or fender system discrepancies. (Refer to Bridge Discrepancies in Section V).

(q) Unauthorized PATON

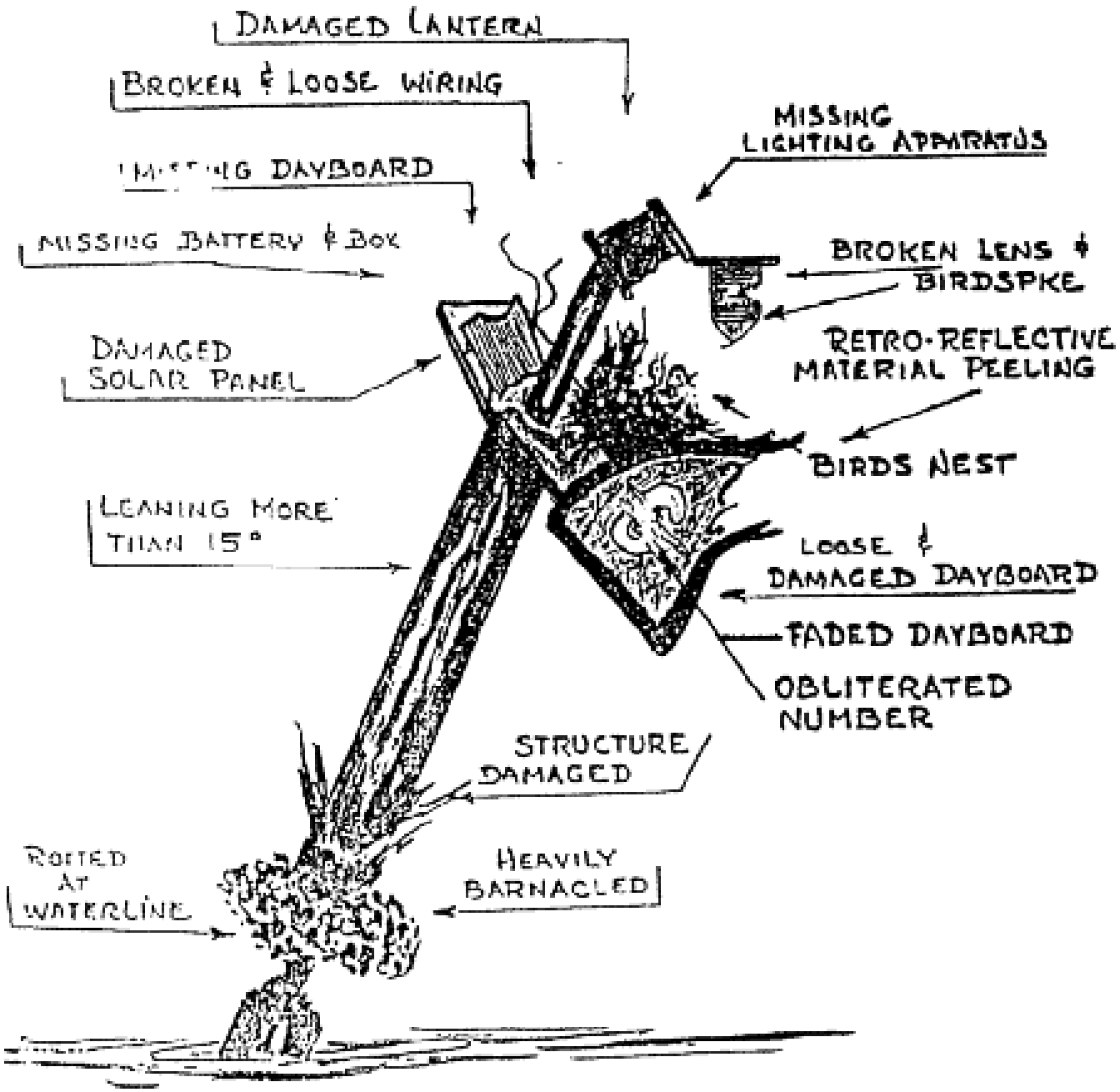
Once a discrepancy on an aid to navigation has been reported via Radio, Telephone or Mail and followed-up with a distributed CG-5474 and/or Notices to Mariners by the Coast Guard

via Broadcast or published in the USCG District Local Notice to Mariners or DMAHTC Weekly Notice to Mariners, no further reporting is necessary. AN Staff Officers transmitting discrepancy reports should assure that they are not duplicated.

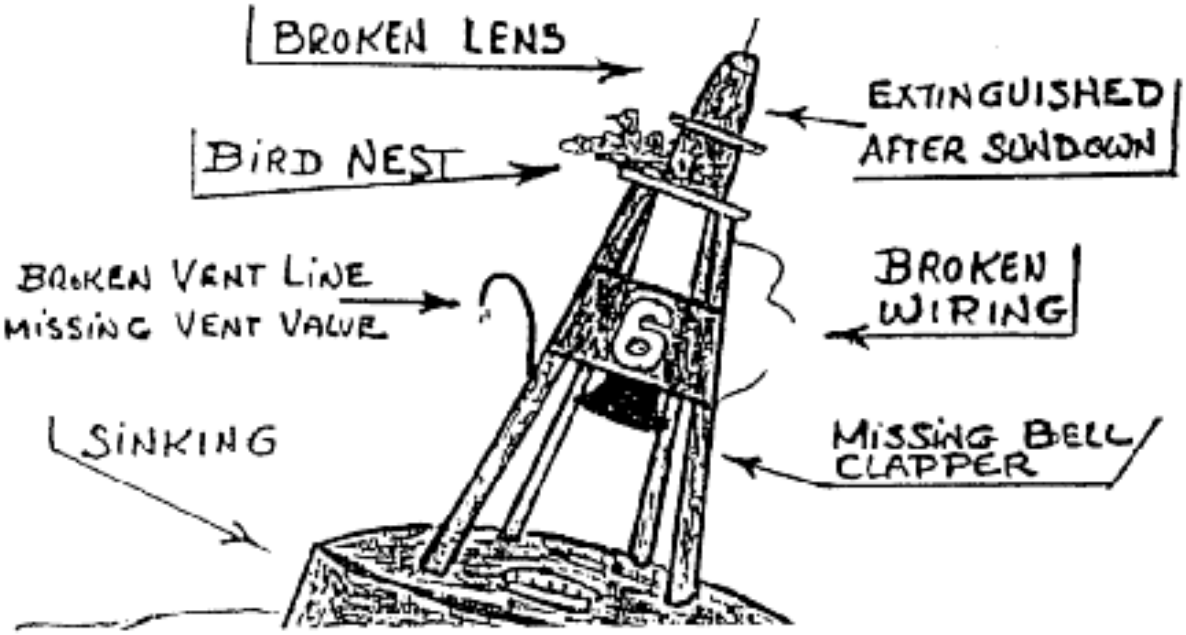
Again, it is important to know that, Coast Guard personnel actually INSPECT ATONs, Auxiliary members only CHECK ATONs when so directed.

Examples of some of the types of ATON/PATON discrepancies and sample copies of reported items via CG-5474s are illustrated in the following:

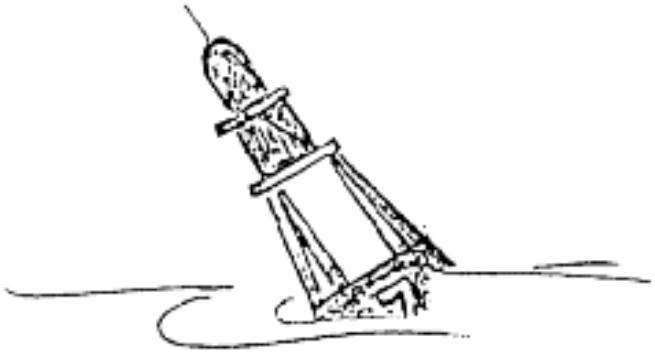
Auxiliary members and their units submitting CG-5474 reports are awarded points, refer to Section XII.



EXAMPLE #1 - DISCREPANCIES



SINKING CONDITION



SUNKEN CONDITION

SUNK

EXAMPLE #2 - DISCREPANCIES

UNAUTHORIZED
ESTABLISHMENTS
SIGNS - Pipes - Poles - STAKES

EXAMPLE #3 – UNAUTHORIZED AIDS

SAMPLE

A TYPICAL ATON (FEDERAL AID) "CHECKING" REPORT INVOLVING MORE THAN ONE AID (ALL IN ONE CHANNEL, "WATCHING PROPERLY")

DEPARTMENT OF TRANSPORTATION
U.S. COAST GUARD
CG-5414(AUX) (10-87)

AIDS TO NAVIGATION REPORT

INDICATE
☑ VERIFICATION
☐ DISCREPANCY

SECTION I OBSERVER'S IDENTIFICATION DATA

MEMBER NUMBER	LAST NAME	FIRST NAME AND INITIAL
07011101123	SPOTTIM	WILLIE

OBSERVER'S MAILING ADDRESS

NUMBER AND STREET	CITY	STATE	ZIP CODE	TELEPHONE NUMBER
P.O. BOX 123	ANYTOWN	TX	12345	923-123-4567

SECTION II COAST GUARD NOTIFICATION

COAST GUARD UNIT NOTIFIED	DATE OBSERVED (MMDDYY)	DATE REPORTED (MMDDYY)	METHOD OF REPORTING
ANT. CORPUS CRISTI, TX	021292	021292	RADIO ___ TELEPHONE ___ MAIL ☑
			TIME REPORTED ___

SECTION III DESCRIPTION OF DISCREPANCY

OWNERSHIP — COAST GUARD ☑ STATE ___ PRIVATE ___

POSITION — AID NAME MARINER VILLAGE CHAN'L LLLP 413 MILE MARKER ___

LATITUDE 00°-06.2' N LONGITUDE 00°-34.2' W. CHART NO. 11411 OTHER ___

TYPE OF AID — BUOY ___ STRUCTURE ☑ LIGHTED ___ SOUND ___ ELECTRONIC ___

STRUCTURES — WOOD ☑ METAL ___ OTHER ___

SOUND SIGNALS — BELL ___ GONG ___ HORN ___ WHISTLE ___

LIGHT COLOR — RED ___ GREEN ___ WHITE ___ YELLOW ___

COMMON DISCREPANCIES (* COMMENTS REQUIRED)

___ VANDALIZED*	___ DAMAGED BY COLLISION	___ RETROREFLECTIVE MATERIAL
___ IMPROPER CHARACTERISTICS	___ OBSCURED	___ PEELING
___ MISSING*	___ DAMAGED	___ MISSING
___ BIRDS NEST	___ FADED	___ INADEQUATE
___ EXCESSIVE BIRD FOULING	___ PEELING PAINT	___ MICE MARKER
___ BATTERY BOX INTACT	___ MISSING VENT VALVE	___ MISSING
___ OBLITERATED NUMBER	___ DAYMARK DELAMINATED	___ DAMAGED
___ EXCESSIVE DETERIORATION	___ ROTTING WOOD STRUCTURES	___ LEANING MORE THAN 15°

LIGHTED AID — LANTERN DAMAGED ___ EXTINGUISHED ___ LIGHT DIM/REDUCED INTENSITY ___
TIMING ERROR ___ OPERATING INTERMITTENTLY ___ OTHER ___

BUOY — SINKING ___ SUBMERGED ___ SIGNAL ___ NUMBER OBSCURED ___ NUMBER OBLITERATED ___
ADRIFT ___ CAPSIZED ___ STRAIGHTENED ___ TAPPER MISSING ___ BELL MISSING ___ GONG MISSING ___
WHISTLE MISSING ___

COMMENTS: *HOW WAS OFF STATION DETERMINATION MADE? (i.e., HORIZONTAL SEXTANT ANGLES, COMPASS BEARINGS, RANGE FINDER, RADAR, LORAN OR SEAMAN'S EYE?)

MARINER VILLAGE CHAN'L DBN 1 (LL 51190) ALL ARE
" " " DBN 2 (LL 51191) WATCHING PROPERLY -
" " " DBN 3 (LL 51192)
" " " DBN 4 (LL 51193) STRUCTURES APPEAR
" " " DBN 5 (LL 51194) SOUND.

REMEMBER - LIGHTED AIDS MUST be CHECKED ALSO AFTER SUNDOWN!

(DO NOT LIST DISCREPANT AIDS ON THIS TYPE REPORT.)

SIGNATURE OF OBSERVER: Willie Spottim, FSO-AN

DATE: FEB. 12, 1992

EXAMPLE – ATON CHECKED REPORT (CG-5474)

SAMPLE

REPORTING A FEDERAL OR PRIVATE AID DISCREPANCY.

ONLY CHECK ONE BOX

DEPARTMENT OF TRANSPORTATION
U.S. COAST GUARD
CG-5474(AUX) (10-87)

AIDS TO NAVIGATION REPORT

INDICATE ☐ VERIFICATION ☑ DISCREPANCY

SECTION I OBSERVER'S IDENTIFICATION DATA

MEMBER NUMBER	LAST NAME	FIRST NAME AND INITIAL
97d1110229	DOAKS	JOSEPH Q.

OBSERVER'S MAILING ADDRESS

NUMBER AND STREET	CITY	STATE	ZIP CODE	TELEPHONE NUMBER
1234 MAIN ST.	LARGO	FL.	12345	813-123-456

COPY TO ANT. SPPORT UNIT

SECTION II COAST GUARD NOTIFICATION

COAST GUARD UNIT NOTIFIED	DATE OBSERVED (MMDDYY)	DATE REPORTED (MMDDYY)	METHOD OF REPORTING
CLEARWATER STA. RELAY TO ANT. ST PETERSBURG, FL.	111092	111092	RADIO ___ TELEPHONE ✓ MAIL ___ TIME REPORTED 1520R

SECTION III DESCRIPTION OF DISCREPANCY

OWNERSHIP: COAST GUARD ✓ STATE ___ PRIVATE ___ OTHER ___

POSITION: AID NAME CAUSEWAY CHAN'L DBN 1 LLNR 21170 MILE MARKER ___
LATITUDE 27° 59.9' N LONGITUDE 82°-48.4' W CHART NO. 11411 (SA) OTHER ___

SHOW THE FULL CHANNEL NAME AND LIGHT LIST NUMBER

TYPE OF AID: BUOY ___ STRUCTURE ✓ LIGHTED ___ SOUND ___ ELECTRONIC ___
STRUCTURES: WOOD ___ METAL ✓ OTHER ___
LIGHT COLOR: RED ___ GREEN ___ WHITE ___ YELLOW ___
SOUND SIGNALS: BELL ___ GONG ___ HORN ___ WHISTLE ___

COMMON DISCREPANCIES (* COMMENTS REQUIRED)

- ___ VANDALIZED*
- ___ IMPROPER CHARACTERISTICS
- ___ MISSING*
- ___ BIRDS NEST
- ___ EXCESSIVE BIRD FOULING
- ___ BATTERY BOX INTACT
- ___ OBLITERATED NUMBER
- ___ EXCESSIVE DETERIORATION
- ✓ DAMAGED BY COLLISION
- ___ OBSCURED
- ___ DAMAGED
- ___ FADED
- ___ PEELING PAINT
- ___ MISSING VENT VALVE
- ___ DAYMARK DELAMINATED
- ___ ROTTING WOOD STRUCTURES
- ___ RETROREFLECTIVE MATERIAL
  - ___ PEELING
  - ___ MISSING
  - ___ INADEQUATE
- ___ MILE MARKER
  - ✓ MISSING DAYBOARD
  - ___ DAMAGED
  - ✓ LEANING MORE THAN 15°

LIGHTED AID: LANTERN DAMAGED ___ EXTINGUISHED ___ LIGHT DIM/REDUCED INTENSITY ___ TIMING ERROR ___ OPERATING CONTINUOUSLY ___ OTHER ___

BUOY: SINKING ___ SUBMERGED ___ OFF STATION ___ NUMBER OBSCURED ___ NUMBER OBLITERATED ___ ADRIFT ___ CAPSIZED ___ STRANDED ___ TAPPER MISSING ___ BELL MISSING ___ GONG MISSING ___ WHISTLE MISSING ___ OTHER ___

TO INCLUDE AS MUCH INFORMATION AS POSSIBLE

COMMENTS: *HOW WAS OFF STATION DETERMINATION MADE? (i.e., HORIZONTAL SEXTANT ANGLES, COMPASS BEARINGS, RANGE FINDER, RADAR, LORAN, OR SEAMAN'S EYE?)

THE METAL STRUCTURE IS BENT AND LEANING APPROX 25°.
DAYBOARD THAT FACES EAST IS MISSING.
DAYBOARD THAT FACES WEST IS UPSIDE-DOWN AND HANGING LOOSE BY A SINGLE BOLT.

SIGNATURE OF OBSERVER: John Q. Doaks, FSO-AN

DATE: Nov. 10, 1992

EXAMPLE – ATON DISCREPANCY REPORT (CG-5474)

SAMPLE

A TYPICAL PATON VERIFICATION REPORT INVOLVING MORE THAN 1-AID. (Most all are in the same channel and all are "Watching Properly).

DEPARTMENT OF TRANSPORTATION U.S. COAST GUARD CG-5474(AUX) (10-87)

AIDS TO NAVIGATION REPORT

INDICATE ☑ VERIFICATION ☐ DISCREPANCY

SECTION I OBSERVER'S IDENTIFICATION DATA

MEMBER NUMBER	LAST NAME	FIRST NAME AND INITIAL
07611012 3	SPOTTIM	WILLIE

OBSERVER'S MAILING ADDRESS

NUMBER AND STREET	CITY	STATE	ZIP CODE	TELEPHONE NUMBER
P.O. Box 123	ANYTOWN	TX	12345	923-123-4567

SECTION II COAST GUARD NOTIFICATION

COAST GUARD UNIT NOTIFIED	DATE OBSERVED (MMDDYY)	DATE REPORTED (NNDDYY)	METHOD OF REPORTING
ANT- CORPUS CRISTI, TX	021292	021292	RADIO ___ TELEPHONE ___ MAIL ☑
			TIME REPORTED ___

(COPY FOR THE ANT SUPPORTING COAST GUARD UNIT)

SECTION III DESCRIPTION OF DISCREPANCY

OWNERSHIP COAST GUARD ___ STATE ___ PRIVATE ☑

POSITION AID NAME MARINER VILLAGE CHANL LL# 413 MILE MARKER ___

LATITUDE 00°-06.2' N LONGITUDE 00°-34.2' W. CHART NO. 11411 OTHER ___

TYPE OF AID BUOY ___ STRUCTURE ☑ LIGHTED ___ SOUND ___ ELECTRONIC ___

STRUCTURES WOOD ☑ METAL ___ OTHER ___

SOUND SIGNALS BELL ___ GONG ___ HORN ___ WHISTLE ___

LIGHT COLOR RED ___ GREEN ___ WHITE ___ YELLOW ___

COMMON DISCREPANCIES (* COMMENTS REQUIRED)

___ VANDALIZED*
___ IMPROPER CHARACTERISTICS
___ MISSING*
___ BIRDS NEST
___ EXCESSIVE BIRD FOULING
___ BATTERY BOX INTACT
___ OBLITERATED NUMBER
___ EXCESSIVE DETERIORATION
___ DAMAGED BY COLLISION
___ OBSCURED
___ DAMAGED
___ FADED
___ PEELING PAINT
___ MISSING VENT VALVE
___ DAYMARK DELAMINATED
___ ROTTING WOOD STRUCTURES
___ RETROREFLECTIVE MATERIAL
___ PEELING
___ MISSING
___ INADEQUATE
___ MILE MARKER
___ MISSING
___ CAMOUFLAGED
___ LETTERING MORE THAN 15°

LIGHTED AID LANTERN DAMAGED ___ EXTINGUISHED ___ LIGHT DIM/REDUCED INTENSITY ___
TIMING ERROR ___ OPERATING CONTINUOUSLY ___ OTHER ___

BUOY SINKING ___ SUBMERGED ___ STATION ___ NUMBER OBSCURED ___ NUMBER OBLITERATED ___
ADRIFT ___ CAPSIZED ___ DAMAGED ___ TAPPER MISSING ___ BELL MISSING ___ GONG MISSING ___
WHISTLE MISSING ___ OTHER ___

COMMENTS: *HOW WAS OF ESTIMATION OR TERMINATION MADE? (i.e., HORIZONTAL SEXTANT ANGLES, COMPASS BEARINGS, RANGE FINDER, RADAR, EORAN, OR JUST MAN'S EYE?)

MARINER VILLAGE CHANL DBN 1 (LL 51190) } ALL ARE
" " " DBN 2 (LL 51191) } WATCHING PROPERLY-
" " " DBN 3 (LL 51192) }
" " " DBN 4 (LL 51193) } STRUCTURES APPEAR
" " " DBN 5 (LL 51194) } SOUND.

REMEMBER- LIGHTED AIDS MUST BE CHECKED ALSO AFTER SUNDOWN!

SIGNATURE OF OBSERVER Willie Spottim, FSO-AN

DATE FEB. 12, 1992

(DO NOT LIST DISCREPANT AIDS ON THIS TYPE REPORT.)

EXAMPLE – PATON VERIFICATION REPORT (CG-5474)

SAMPLE

REPORTING AN UNAUTHORIZED ESTABLISHMENT.

ONLY CHECK ONE BOX

DEPARTMENT OF TRANSPORTATION
U.S. COAST GUARD
CG-5474(AUX) (10-87)

AIDS TO NAVIGATION REPORT

INDICATE: ☐ VERIFICATION ☑ DISCREPANCY

SECTION I OBSERVER'S IDENTIFICATION DATA

MEMBER NUMBER	LAST NAME	FIRST NAME AND INITIAL
Ø7Ø111Ø229	JONES	JOHN P.

OBSERVER'S MAILING ADDRESS

NUMBER AND STREET	CITY	STATE	ZIP CODE	TELEPHONE NUMBER
P.O. BOX 123	ANYTOWN	FL.	34431	813-791-Ø023

SECTION II COAST GUARD NOTIFICATION

COAST GUARD UNIT NOTIFIED	DATE OBSERVED (MMDDYY)	DATE REPORTED (MMDDYY)	METHOD OF REPORTING
ANT. ST. PETERSBURG, FL. (COMMANDANT SUPPORT UNIT)	Ø21292	Ø21292	RADIO ___ TELEPHONE ___ MAIL ✓ TIME REPORTED ___

SECTION III DESCRIPTION OF DISCREPANCY

OWNERSHIP: COAST GUARD ___ STATE ___ PRIVATE ✓ OTHER ___

POSITION — AID NAME: NOT LISTED OR CHARTED — LLNR: NA — MILE MARKER ___

LATITUDE 28°-41'-10" N LONGITUDE 82°-29'-31" W CHART NO. 11411 (56TH ER) ___

TYPE OF AID: BUOY ___ STRUCTURE ✓ LIGHTED ___ SOUND ___ ELECTRONIC ___

STRUCTURES: WOOD ✓ METAL ___ OTHER ___

LIGHT COLOR: RED ___ GREEN ___ WHITE ___ YELLOW ___

SOUND SIGNALS: BELL ___ GONG ___ HORN ___ WHISTLE ___

COMMON DISCREPANCIES (* COMMENTS REQUIRED)

- ___ VANDALIZED*
- ___ IMPROPER CHARACTERISTICS
- ___ MISSING*
- ___ BIRDS NEST
- ___ EXCESSIVE BIRD FOULING
- ___ BATTERY BOX INTACT
- ___ OBLITERATED NUMBER
- ___ EXCESSIVE DETERIORATION
- ___ DAMAGED BY COLLISION
- ___ OBSCURED
- ___ DAMAGED
- ___ FADED
- ___ PEELING PAINT
- ___ MISSING VENT VALVE
- ___ DAYMARK DELAMINATED
- ___ ROTTING WOOD STRUCTURES
- ___ RETROREFLECTIVE MATERIAL
- ___ PEELING
- ✓ MISSING (INCLUDE AS ABOVE INFORMATION AS POSSIBLE)
- ___ INADEQUATE
- ___ MILE MARKER
- ___ MISSING
- ___ DAMAGED
- ___ LEANING MORE THAN 15°

LIGHTED AID: LANTERN DAMAGED ___ EXTINGUISHED ___ LIGHT DIM/REDUCED INTENSITY ___ TIMING ERROR ___ OPERATING CONTINUOUSLY ___ OTHER ___

BUOY: SINKING ___ SUBMERGED ___ OFF STATION ___ NUMBER OBSCURED ___ NUMBER OBLITERATED ___ ADRIFT ___ CAPSIZED ___ STRANDED ___ TAPPER MISSING ___ BELL MISSING ___ GONG MISSING ___ WHISTLE MISSING ___ OTHER ___

COMMENTS: *HOW WAS OFF STATION DETERMINATION MADE? (i.e., HORIZONTAL SEXTANT ANGLES, COMPASS BEARINGS, RANGE FINDER, RADAR, LORAN, OR SEAMAN'S EYE)

AN UNCHARTED/UNLISTED AID HAS BEEN DISCOVERED AT A POSITION 3900 yds - 228° FROM THE BAY CITY WATER TANK, BAY CITY, FL. (LAT/LO CONSISTING OF A 12" pile, WITH A WOODEN ARROW PAINTED RED AND POINTING TO THE EL-ZAPPO MARINA AND SET IN 10 FEET ALWD. POSITION WAS DETERMINED BY (SEXTANT, - COMPASS BEARINGS - SEAMANS EYE, ETC.).

THE OWNER OF THIS AID IS IDENTIFIED AS:

EL-ZAPPO MARINA
123 MAIN ST.
BAY CITY FL. 123456
PH: 813-797-Ø015

OR

ATTEMPTS TO IDENTIFY THE OWNER PROVED UNSUCCESSFUL
ENCL: CHART SECTION OR DRAWING

SIGNATURE OF OBSERVER: John P. Jones

DATE: FEB. 12, 1992

EXAMPLE – PATON DISCREPANCY REPORT (CG-5474)

SECTION V - BRIDGE LIGHTING AND FENDER SYSTEMS

INTRODUCTION:

The Coast Guard relies on mariner notification of discrepancies in BRIDGE LIGHTING AND BRIDGE FENDER AND PROTECTION SYSTEMS as well as other hazardous and non-standard bridge conditions. In this regard, prior to May 1981, the Coast Guard annually inspected navigational lighting, fender and protection systems that were situated over the navigable waters of the United States. Subsequently, it was determined that an adequate high level of compliance could be achieved in response to reports of complaints or violations by professional and private mariners. The Auxiliary plays an important part in Bridge discrepancy notification in conjunction with the ATON/CU Program.

OBJECTIVE:

1. To acquire a general knowledge of the different types of Bridges, and the responsibilities of the Auxiliary in reporting Bridge discrepancies.

2. To become familiar with the requirements for Bridge lighting, fender and protection systems.

3. To become familiar on how to determine discrepancies on Bridges.

INFORMATION:

There are six basic types of Bridges: fixed, double-opening swing, single-opening draw, pontoon, bascule and vertical lift.

In Bridge construction, the Coast Guard District Commander having jurisdiction over the area in which the Bridge is built, prescribes lights and other signals that are to be displayed for the protection of navigation. When construction is completed, permanent lights and other signals approved by the District Commander, must continue to be displayed.

- BRIDGE AND PIER LIGHTING: Periods of operation require that Bridge lights be displayed from sunset to sunrise or at other times when visibility is reduced to less that one mile. Bridge lights are not required for bridges over waters that are not open to navigation. (Vessels transiting such waters do so at their peril with complete liability.) Information describing the minimum lighting requirements for the type Bridges of interest is listed at the end of this Section.

- BRIDGE FENDER AND PROTECTION SYSTEMS: The Bridge fender and protection systems are designed to protect the Bridge from vessels transiting under or in the vicinity of the bridge. The fender system is made up of heavy wooden timbers lashed and/or

bolted together along with lights and other aids that are prescribed by the Coast Guard District Commander.

- Examples of the other aids to navigation associated with Bridges are:

  a. RETRO-REFLECTIVE PANELS on BRIDGE PIERS High intensity red or green retro-reflective panels on bridges or piers.

  b. DAYMARKS and LATERAL LIGHTING - Markings of the margins of navigation channels through Bridges with appropriate marks and lights installed on the superstructure or channel piers.

  c. RADAR REFLECTORS AND RACONS - Radar reflectors and RACONs on bridge structures, stakes or buoys to mark the edges and centerline of the navigation channel.

  d. FOG SIGNALS - On waterways where visibility is frequently reduced due to fog or other causes. One or more fog signals may be installed.

  e. PAINTING OF BRIDGE PIERS - The painting of the sides of Bridge channel piers below the superstructure facing traffic. (May be painted white or yellow when they have become significantly darkened by weather.)

  f. VERTICAL CLEARANCE GAUGES - When necessary for reasons of safety of navigation, clearance gauges may be installed. Clearance gauges must meet the prescribed requirements.

- BRIDGE DISCREPANCIES:

Bridge discrepancies, which could pose a hazard to navigation, include the following:

  a. Clearance gauges, missing, not legible or numbers not readable from 1/2 mile minimum distance.

  b. Unreadable drawbridge regulation signs.

  c. Bridge signals not functioning, e.g., horn, whistle or siren.

  d. Vertical lift bridge not equipped with height indicator.

  e. Cables hanging below bridge structure.

  f. Net or gondola hanging below bridge structure.

g. Scaffolding hanging below bridge structure.

h. Pier protection cells, planks, or coatings missing, steel sheathing protruding, cell damage.

i. Pile or dolphin cluster broken off, leaning into channel, debris protruding from cluster, or top of cluster wrapped with other than wire cable.

j. Ladders, platforms or rails protruding into channel.

- BRIDGE FENDER SYSTEMS DISCREPANCIES:

Discrepancies in Bridge fender systems, which could pose a hazard to navigation, include the following:

a. Bolts, washers, corner plates, steel members, wales (rub rails), etc., protruding beyond the face (vessel side) of the wooden wales, pilings, sheathing or any other part of the system. (EXAMPLE - Right fender downstream side has bolts protruding approximately 3" from face of wales.)

b. Damaged steel plates and wales (rub rails) - used at corners and other places where heavy wear may be encountered.

c. Collection of mass debris wedged in or behind fender systems.

d. Protrusion of dolphins on the fender side.

e. Steel wales (rub rails) not coated with non-sparking material instead of wood.

f. Torn or loose ice protection or pier repair items - loose and subject to present a hazard to navigation. (EXAMPLE - Steel plates around the fourth stone pier from the right bank on the upstream side are loose and are extending into the channel.)

g. Fender system damaged due to fire, collision, natural deterioration and or rotting. (EXAMPLE - Left fender upstream side is partially collapsed due to vessel collision and badly rotted wood members. Right fender on the downstream side has been partially destroyed due to fire.)

- REPORTING DISCREPANCIES: Upon discovering a bridge discrepancy, which includes the Bridge, lights, fender protection, etc., the Auxiliary member should complete a CG-5474 (marked "BRIDGE" at the top) or other respective Coast Guard District developed reporting form and forward to the respective District (oan) via established distribution procedures. Such reports should be in specific detail such that

the District (oan) can provide sufficient information to the owner to complete proper repairs. A sample bridge report is illustrated in the following.

Some districts have adopted an annual bridge lighting and fender system survey program, using an individual printout of each bridge from the District Commander (oan-br) database.

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

SAMPLE – BRIDGE REPORT

DEPARTMENT OF TRANSPORTATION
U.S. COAST GUARD
(CG-5474) (REV.)

AIDS TO NAVIGATION REPORT — BRIDGE

INDICATE: ☐ VERIFICATION ☑ DISCREPANCY

SECTION I OBSERVER'S IDENTIFICATION DATA

MEMBER NUMBER	LAST NAME	FIRST NAME AND INITIAL
07010129	JONES	JOHN P

OBSERVER'S MAILING ADDRESS

NUMBER AND STREET	CITY	STATE	ZIP CODE	TELEPHONE NUMBER
PO Box 123	CLEARWATER	FL.	34683	813-791-0101

SECTION II COAST GUARD NOTIFICATION

COAST GUARD UNIT NOTIFIED	DATE OBSERVED (MMDDYY)	DATE REPORTED (MMDDYY)	METHOD OF REPORTING
CCGD7 (oau-bridges)	021292	021392	RADIO ___ TELEPHONE ___ MAIL ✓ TIME REPORTED ___

SECTION III DESCRIPTION OF DISCREPANCY

OWNERSHIP: COAST GUARD ___ STATE ___ PRIVATE ___ OTHER ___

POSITION: AID NAME DUNEDIN BRIDGE LLNR ___ MILE MARKER 139.0

LATITUDE 28°-03'-06" N LONGITUDE 82°-47'-36" W CHART NO. 11411(SC) OTHER ___

TYPE OF AID: BUOY ___ STRUCTURE ___ LIGHTED ___ SOUND ___ ELECTRONIC ___

STRUCTURE: WOOD ___ METAL ___ OTHER ___

LIGHT COLOR: RED ___ GREEN ___ WHITE ___ YELLOW ___

SOUND SIGNALS: BELL ___ GONG ___ HORN ___ WHISTLE ___

COMMON DISCREPANCIES (* COMMENTS REQUIRED)

- ___ VANDALIZED*
- ___ IMPROPER CHARACTERISTICS
- ___ LIGHTED*
- ___ BIRDS NEST
- ___ EXCESSIVE BIRD FOULING
- ___ BATTERY BOX INTACT
- ___ OBLITERATED NUMBER
- ___ EXCESSIVE DETERIORATION
- ___ DAMAGED BY COLLISION
- ___ OBSCURED
- ___ DAMAGED
- ___ FADED
- ___ PEELING PAINT
- ___ MISSING VENT VALVE
- ___ DAYMARK DELAMINATED
- ___ ROTTING WOOD STRUCTURES
- ___ RETROREFLECTIVE MATERIAL
  - ___ PEELING
  - ___ MISSING
  - ___ INADEQUATE
- ___ MILE MARKER
  - ___ MISSING
  - ___ DAMAGED
  - ___ LEANING MORE THAN 15°

LIGHTED AID: LANTERN DAMAGED ___ EXTINGUISHED ___ LIGHT DIM/REDUCED INTENSITY ___ TIMING ERROR ___ OPERATING CONTINUOUSLY ___ OTHER ___

DAYBEACON: MISSING ___ SUBMERGED ___ OFF STATION ___ NUMBER OBSCURED ___ NUMBER OBLITERATED ___ ADRIFT ___ CAPSIZED ___ STRANDED ___ TAPPER MISSING ___ BELL MISSING ___ GONG MISSING ___ WHISTLE MISSING ___ OTHER ___

COMMENTS (HOW WAS OFF STATION DETERMINATION MADE? E.G., HORIZONTAL SEXTANT ANGLES, COMPASS BEARINGS, RANGE FINDER, RADAR, LORAN, OR SEAMAN'S EYE?)

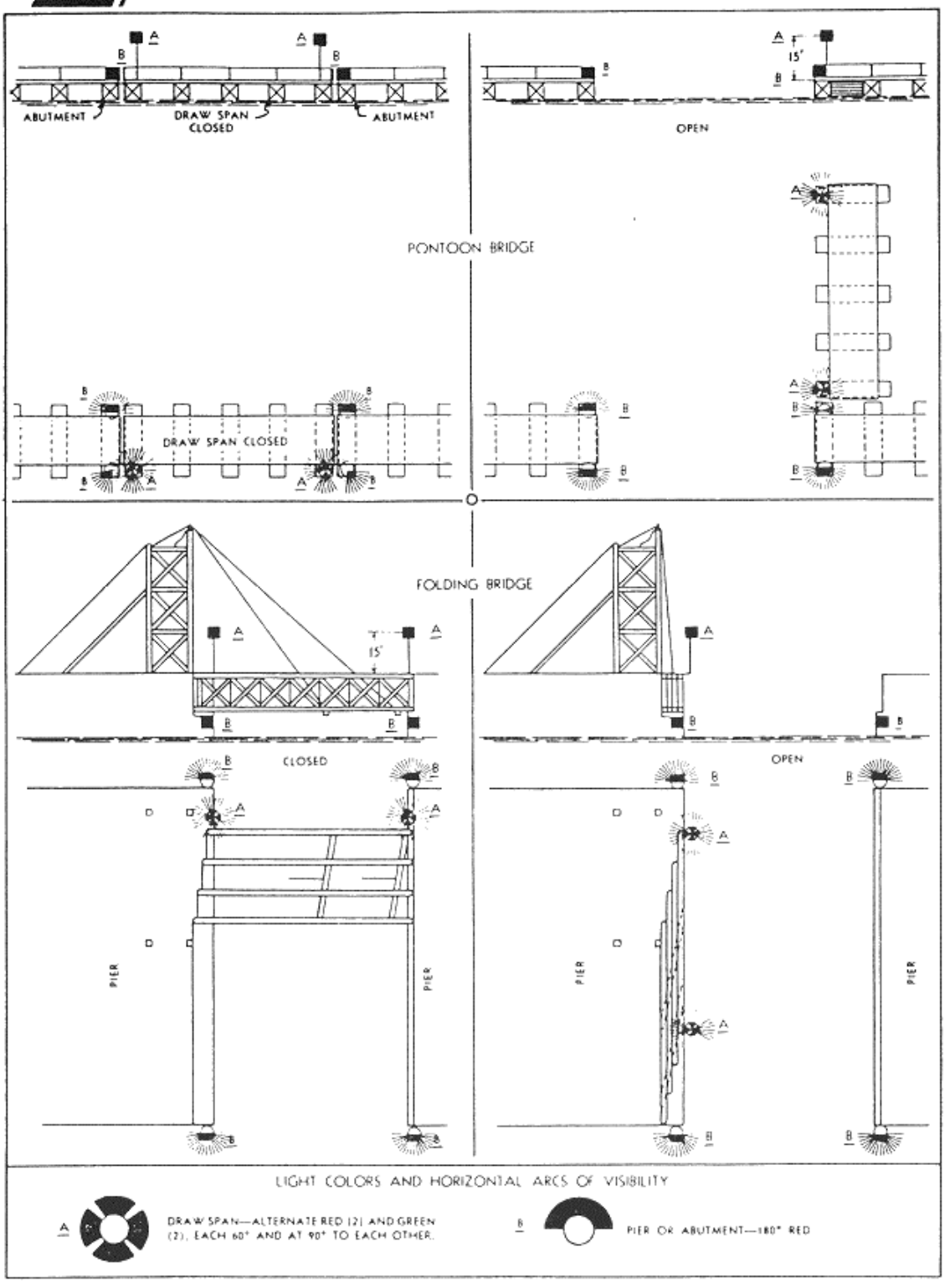
THE FIXED WHITE CLEARANCE GAUGE LIGHT ON THE SOUTHEAST PIER OF THE BASCULE BRIDGE OVER THE ICW AT DUNEDIN FL. IS EXTINGUISHED BEING UNABLE TO READ THE RANGE DURING PERIODS OF DARKNESS

SIGNATURE OF OBSERVER: John P. Jones. DATE: FEB. 12, 1992

COPY 1 - ~~HEADQUARTERS~~

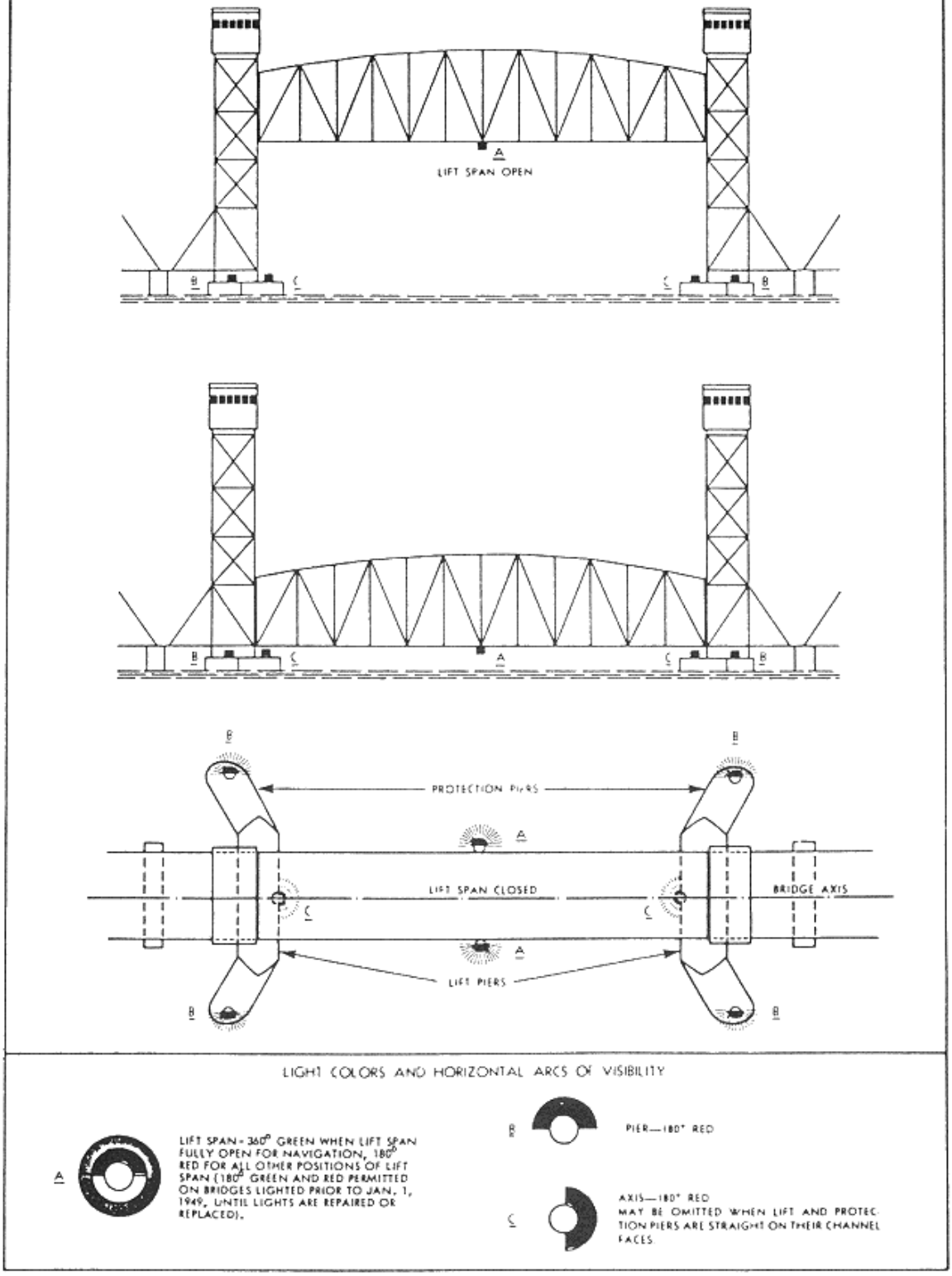
NOTE: DISTRICT FORMS MAY BE USED

EXAMPLE – BRIDGE DISCREPANCY REPORT (CG-5474)

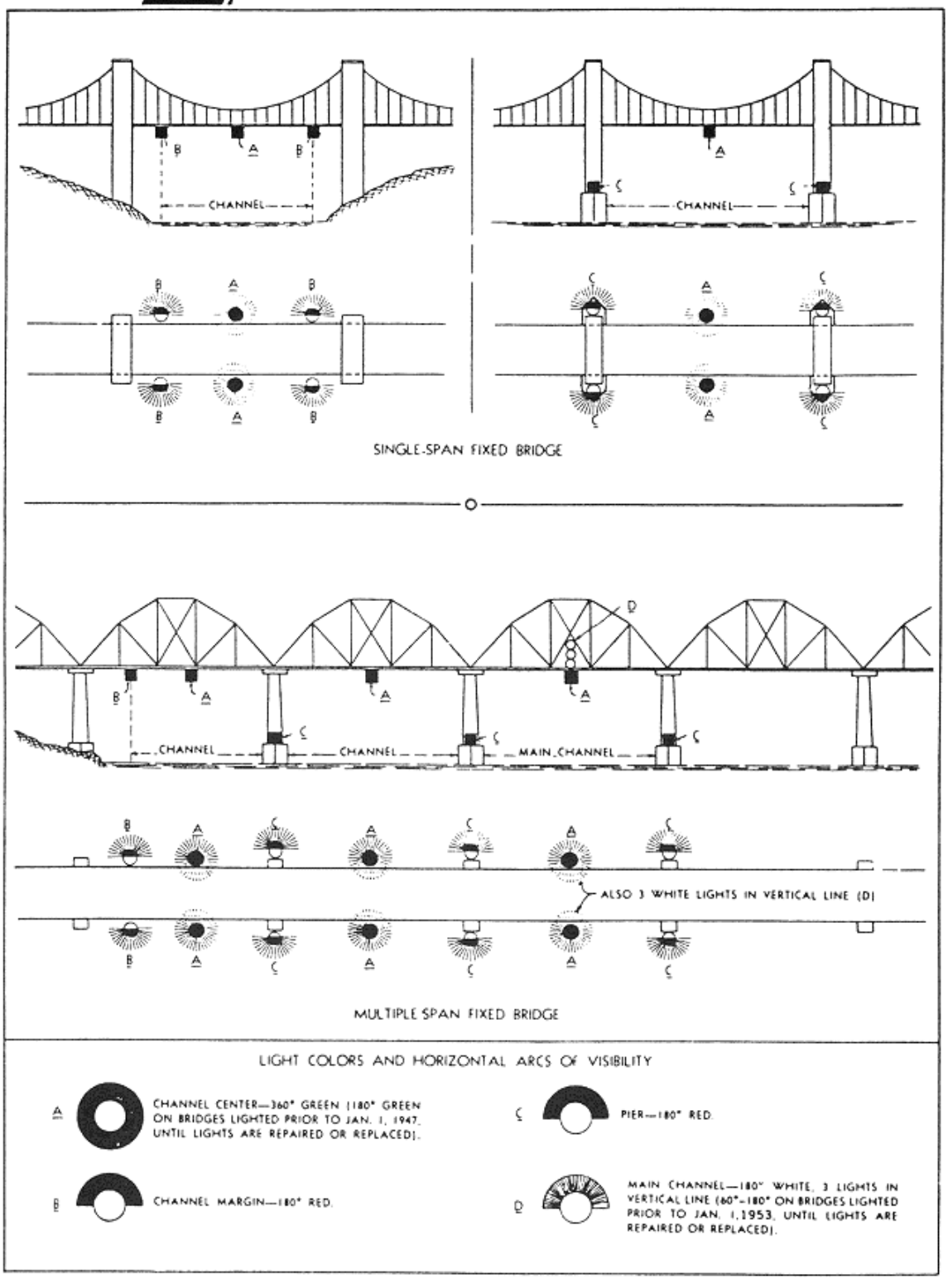


GUIDE TO BRIDGE LIGHTING – SINGLE-OPENING DRAW BRIDGES

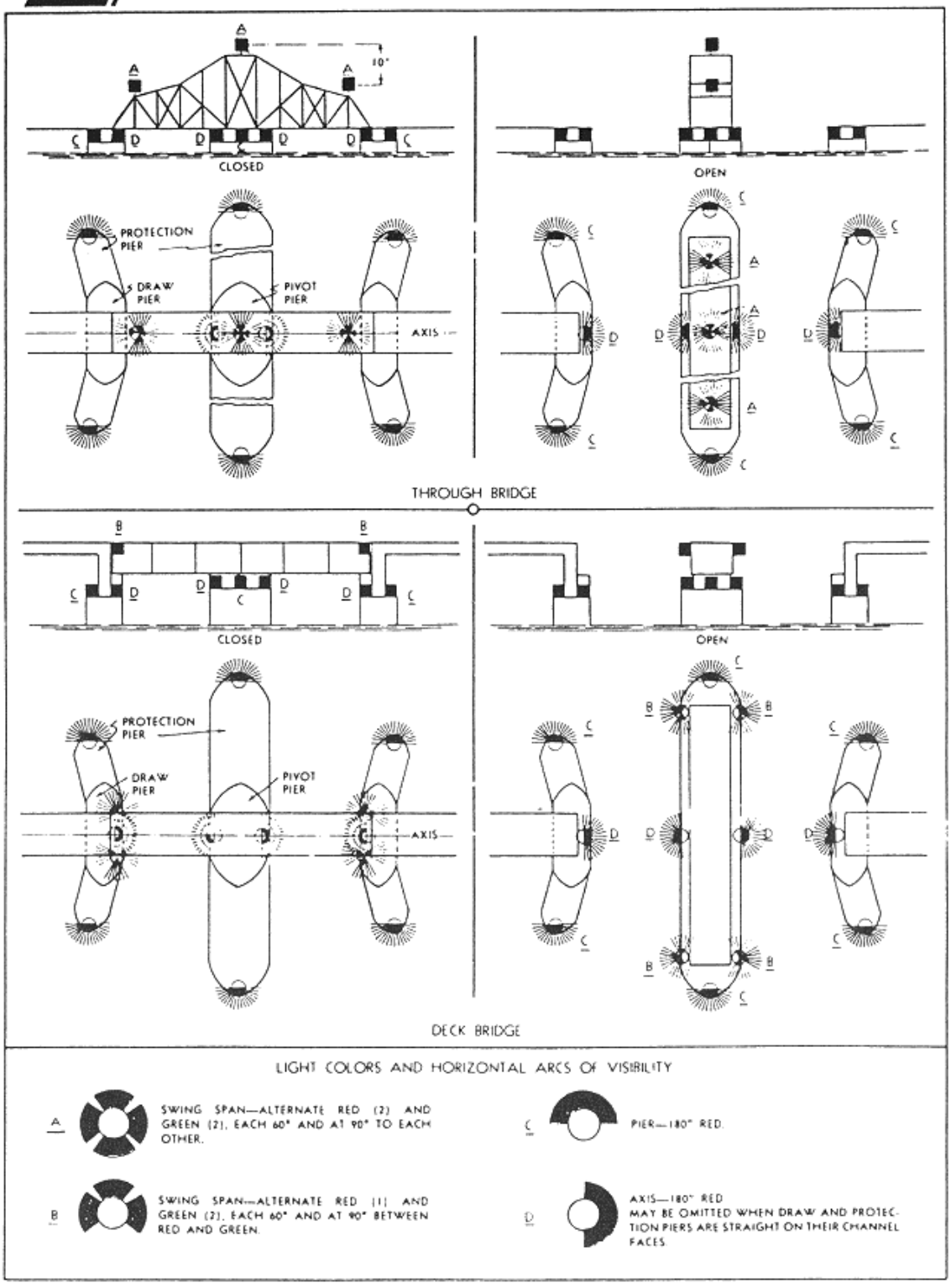
A GUIDE TO BRIDGE LIGHTING
MINIMUM LIGHTING FOR VERTICAL LIFT BRIDGES



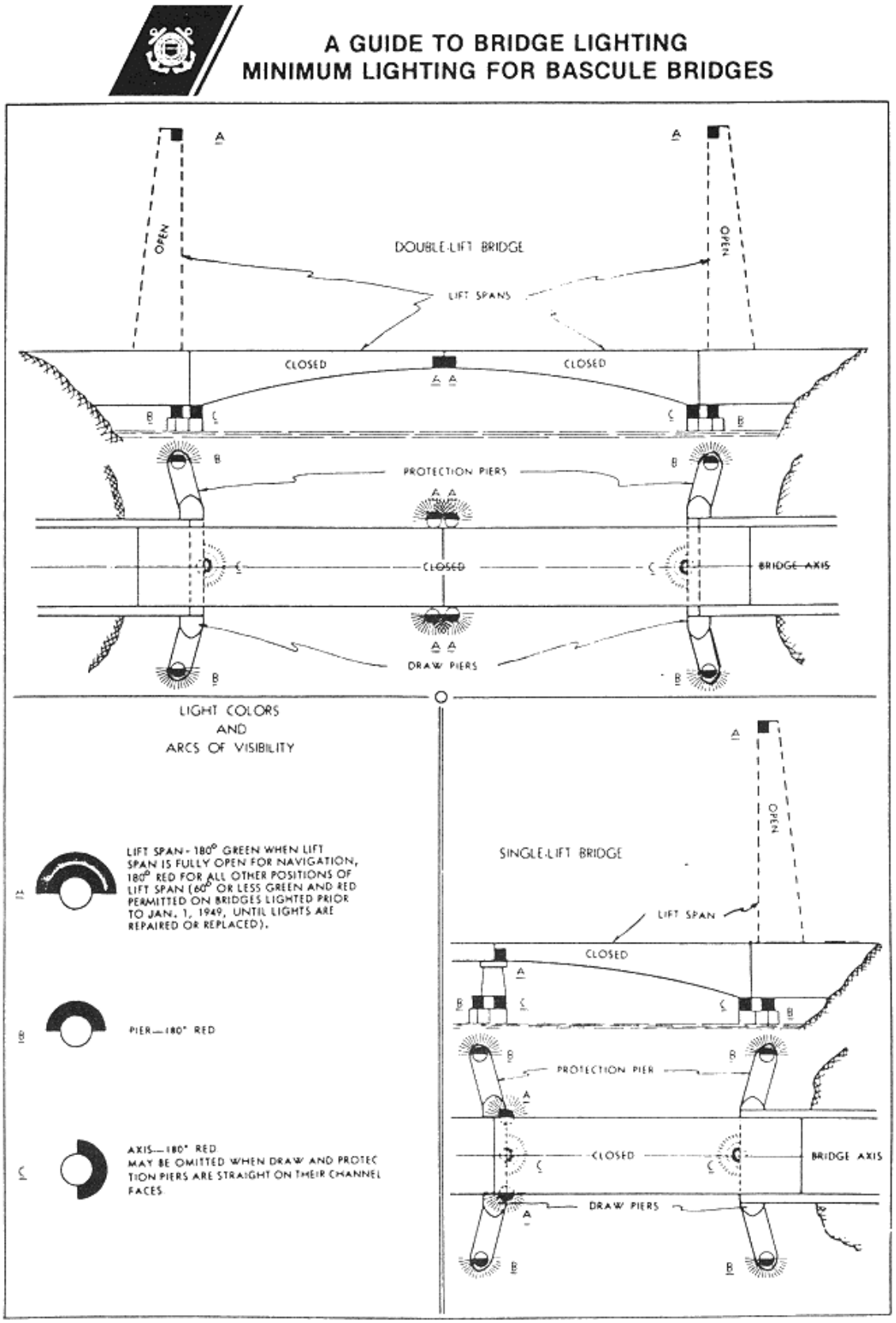
GUIDE TO BRIDGE LIGHTING – VERTICAL-LIFT BRIDGES



GUIDE TO BRIDGE LIGHTING – FIXED BRIDGES



GUIDE TO BRIDGE LIGHTING – DOUBLE-OPENING SWING BRIDGES



GUIDE TO BRIDGE LIGHTING – BASCULE BRIDGES

SECTION VI - SMALL-CRAFT FACILITY UPDATING

INTRODUCTION:

Another important phase of the Auxiliary ATON/CU Program is SMALL-CRAFT FACIUTY UPDATING as part of overall CU activities. The Auxiliary assist the National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS) in the accomplishment of this important mission. This CU activity involves the conducting of periodic visits (usually on an annual basis) to marine facilities for the purpose of updating charts and related publications. These charts and publications contain information necessary for the Small-Craft operator.

OBJECTIVE:

1. To acquire a general knowledge of the responsibilities of the Auxiliary in the conduct of Small-Craft Facility CU PATROLS AND MISSIONS.

2. To become familiar with the procedure for conducting Small-Craft Facility CU PATROLS and/or MISSIONS.

3. To become familiar with the reporting procedures for Small-Craft Facility CU PATROLS and/or MISSIONS.

INFORMATION:

The primary purpose of the participation of the Auxiliary in Small-Craft Facility CU activities is specifically to assist NOS in chart and other NOAA publications updating operations. Under present arrangements with NOS, each Flotilla that agrees to and actively participates in CU activities of the ATON/CU Program is entitled annually to receive four Large Scale Nautical Charts (1:40,000 or larger) for their assigned geographical operating area. The purpose of this chart distribution is the replacement of charts that the Auxiliary (Flotilla) has sectioned/clipped for attachments to NOAA 77-5 reports.

NOS/NOAA charts and other publications are listed in the Nautical Chart Catalogs (refer to Section VII). Among the charts listed in these catalogs are: Conventional Charts, Folio Small-Craft Charts, Small-Craft (Pocket Fold) Charts, Other Small-Craft Charts and Marine Facility Charts. Small Craft-Charts are identified with (SC) after the respective chart number. Small-Craft Charts and Marine Facility Charts are specifically designed to provide detailed information for Small-Craft operators. Additionally, some Large-Scale Conventional Charts list the locations of marine facilities along with the services these facilities provide for the Small-Craft operator (refer to Figure 6-1).

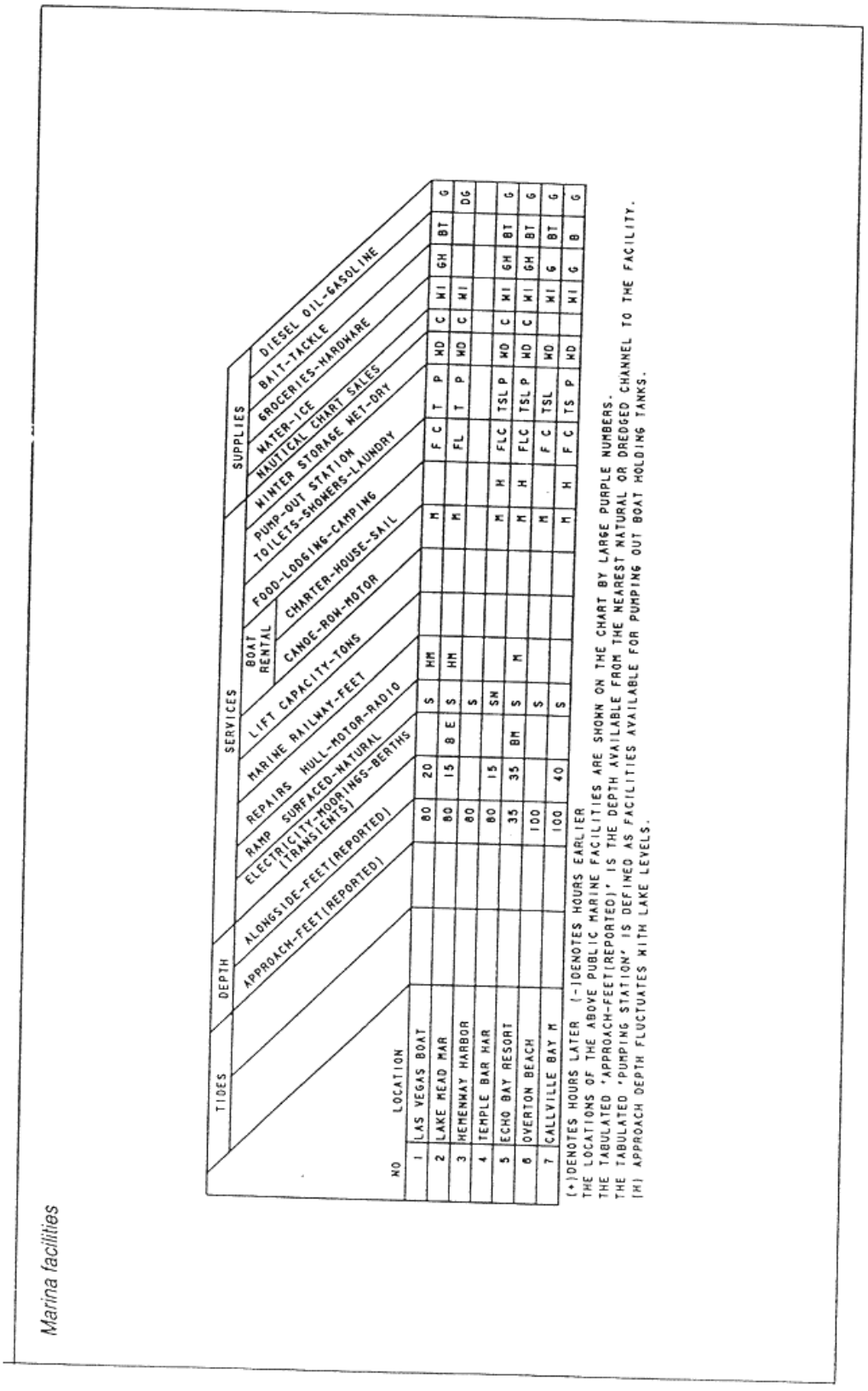


FIGURE 6-1 MARINE FACILITY INFORMATION

Small-Craft Facility CU visits to marine facilities, should be conducted, at a minimum, on an annual basis for the purpose of updating applicable charts. This CU activity can be conducted utilizing an operational facility as an ATON/CU PATROL (Mission type 03 on the ANSC 7030, Activity Report-Mission) or as an Operational Mission (Mission type 41 on the ANSC 7030, Activity Report-Mission) under reimbursable or non-reimbursable orders. Generally, Auxiliary members prefer to conduct Small-Craft Facility CU activities as a Mission, utilizing a privately owned vehicle or other conveyance, rather than with a full crew-staffed operational facility. Moreover, Auxiliary members residing within close proximity of the marine facilities usually volunteer for the MISSIONS. For public appearance considerations, when conducting Small-Craft Facility CU operations, Auxiliary member(s) must be in proper uniform.

- A suggested procedure to initiate the conduct of a Small-Craft Facility CU visit to a marine facility, follows:

  a. Present an introduction of the Auxiliary members participating and their functions relating to the Small-Craft operator/marine facility/Coast Guard/NOS/NOAA support activity.

  b. Focus the visit with the owner/manager of the marine facility.

  c. Provide a clear explanation of the purpose of the visit.

  d. Demonstrate to the owner/manager how the information about the marine facility will be presented to the general boating public, i.e., NOS/NOAA charts and other publication, Notices to Mariners, announcement, etc.

  e. Practice prudence in answering any technical questions regarding ATON/CU subjects not covered within the report form.

  f. Discreetly refer the owner/operator to the nearest Coast Guard unit for any unanswered concerns.

  g. Provide a visit close-out summary to the owner/manager, i.e., an outline of any follow-on actions and an expression of appreciation for the level of cooperation provided.

The NOAA 77-5 form is used in Small-Craft Facility reporting. Each line in the right-hand column of the Form should be answered either "Y" (for yes) or "N" (for no). The comment section of the Form should be used for the inclusion of pertinent information that would assist a Small-Craft operator ("passing through the area").

- Typical information would include the following:

  A description of the general area where the facility is located -

  (1) WHAT - type of facility; operating hours; on-site services; off-site/adjacent services

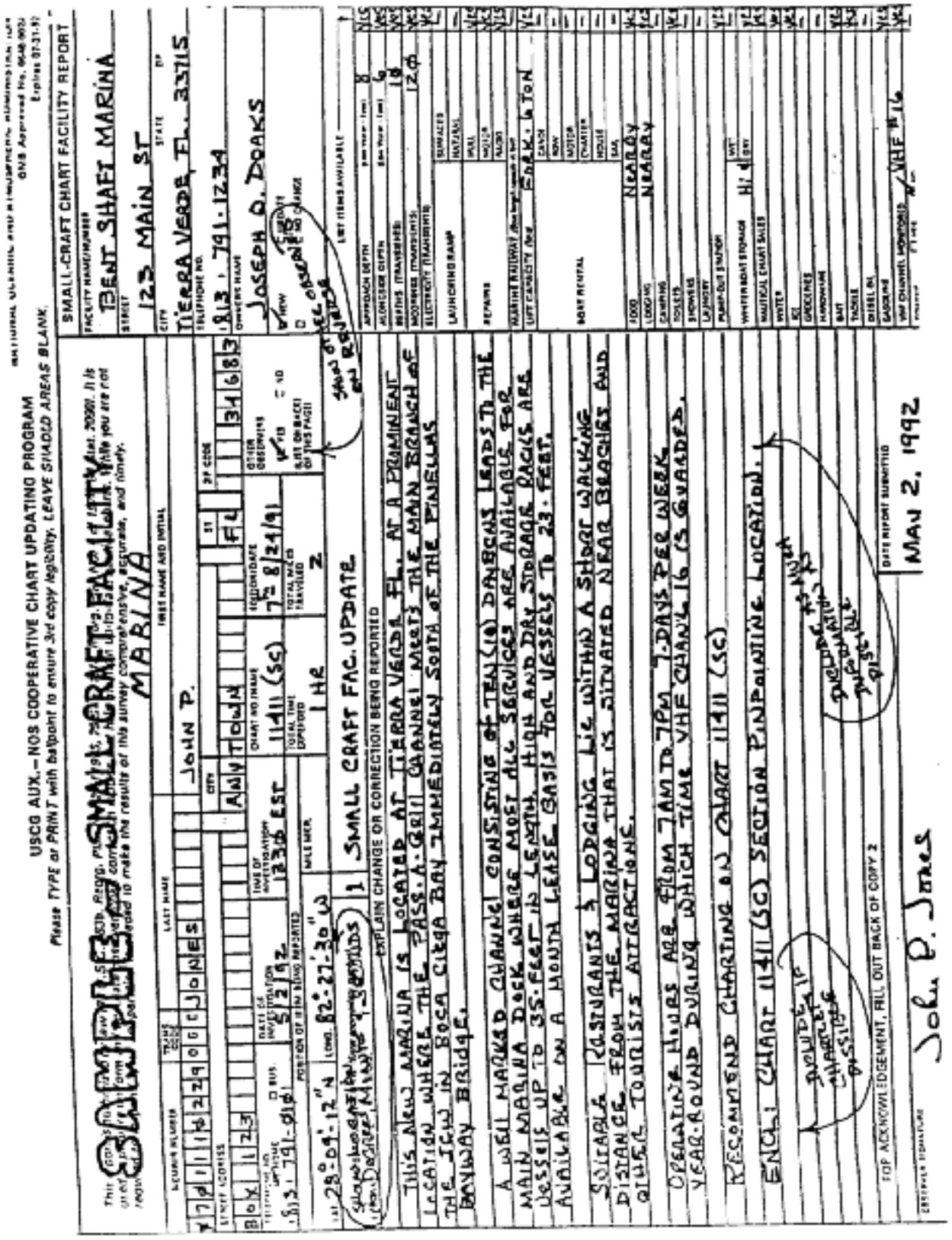
  (2) WHERE - nautical chart location with regard to the waterway; road-map location with regard to on-shore road-routes

  (3) HOW - to get to it on-water navigation; on-shore routing

Include as attachments to the NOAA 77-5 enclosures such as chart sections, drawings, brochures and photographs. Such additional information and presentations will enhance the value of the report to the agency responsible for the chart in any modification that may be considered. Moreover, the more value-added information the report contains, the more credit the Auxiliary member(s)/unit will receive. Legibility is important - consideration should be given to using reproduced copies of the NOAA 77-5 for field use.

Auxiliary members and their units submitting NOAA 77-5 reports are awarded credits, refer to Section XII.

An example of a SAMPLE SMALL CRAFT FACILITY UPDATING REPORT (NOAA 77-5) follows:



EXAMPLE – CHART UPDATE REPORT (NOAA 77-5) – SMALL CRAFT

SECTION VII - NAUTICAL CHARTS and CHART NO. 1

INTRODUCTION:

In conjunction with the ATON/CU Program, it is necessary for Auxiliary members to understand the general composition and purposes of NAUTICAL CHARTS and CHART NO. 1. A nautical chart is a representation, in a significantly reduced form, illustrated on a plane surface in a two-dimensional presentation, of a portion of the earth's surface, primarily water, emphasizing natural and man-made features. Through its ATON/CU Program activities, the Auxiliary plays an important role in providing information that affects corrections or changes to NAUTICAL CHARTS. This Auxiliary provided information assist NOS/NOAA in maintaining the quality and reliability of nautical charts for general navigation usage.

OBJECTIVE:

1. To acquire a general knowledge of NAUTICAL CHARTS, CHART NO. 1, the entitlement and procurement procedures for charts, and the responsibilities of the Auxiliary regarding nautical charts.

2. To become familiar with the various projections and scales employed on nautical charts.

3. To become familiar with the colors, symbols and abbreviations presentations on nautical charts.

INFORMATION:

The primary purpose of a nautical chart is to provide navigation related data to assist mariners in course plotting, danger avoidance and information interchange. Nautical charts are prepared by various Government agencies. They provide the pilot or navigator with a high level of accuracy, as charted, of navigable bodies of water showing depths, aids to navigation, shorelines, physical features and other useful and essential information. However, nautical charts are no more accurate than the competency of the survey upon which they are based. It is important to know that, a nautical chart and the data provided, does not absolve the pilot or navigator of the responsibility of safe passage. A need for periodic updating of nautical charts is required to keep current with physical or data input changes.

Nautical charts exhibit a grid of intersecting lines to aid in the description of a position on the chart. These grid lines are the charted representations of a system of GEOGRAPHIC COORDINATES (lines of vertical and horizontal parallels) which are depicted, representatively as if, on the earth's surface. GEOGRAPHIC COORDINATES are defined by two sets circles on the earth's surface. One set, referred to as MERIDIANS of LONGITUDE, consists of GREAT CIRCLES (a circle on the earth's surface described by a plane passing through the earth's center) each of which pass through the north and south geographic poles (refer to Figure

7-1). The other set, referred to as PARALLELS of LATITUDE, consist of parallel planes cutting through the earth perpendicular to the polar axis. The EQUATOR is the largest of these parallel planes, it is located midway between the poles and thus also passes through the center of the earth, it is the only one of these parallel planes which is a GREAT CIRCLE. The other PARALLELS of LATITUDE form SMALL CIRCLES (refer to Figure 7-2).

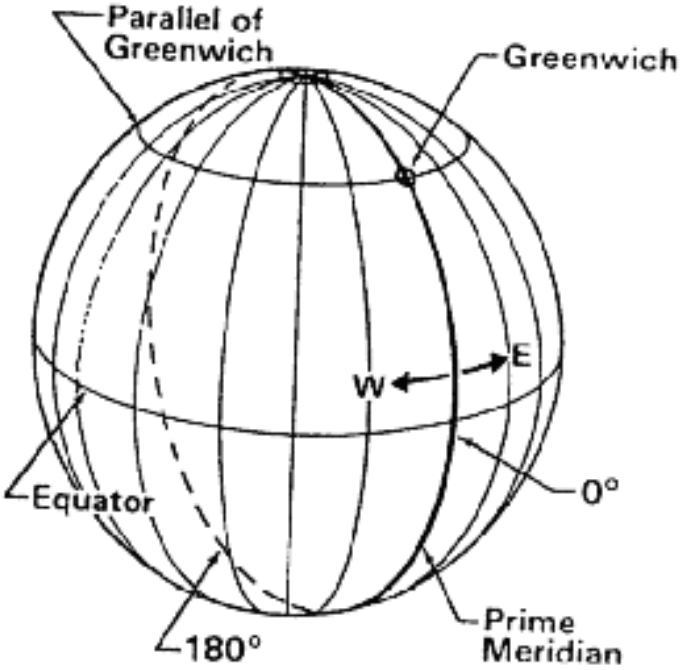


FIGURE 7-1 MERIDIANS OF LONGITUDE

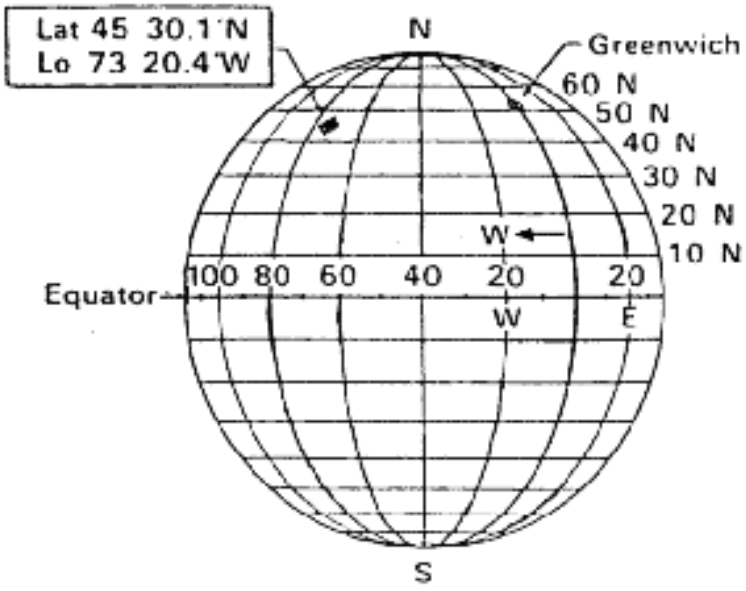


FIGURE 7-2 PARALLELS OF LATITUDE

The earth is essentially a sphere. The surface of a sphere is considered non-developable, i.e., its surface or portions thereof cannot be spread flat without some distortion. Again, a nautical chart is a reduced form/two-dimensional/flat surface representation of a portion of the earth's surface. As such, the construction of a chart depicting a segment of the earth's surface immediately produces problems of accurate representation. Since a certain ratio of distortion is inevitable, various methods for transferring details on a sphere to a flat surface have been developed. An approach, such as a cone or cylinder, which can be unrolled to form a flat surface, is considered to be developable. This method of transfer of details from a sphere onto a plane is called PROJECTION. In all PROJECTIONS, as the segment of the earth's surface illustrated on the chart decreases the ratio of distortion decreases and the accuracy of the PROJECTION increases (viz., as the segment of the earth's surface illustrated on the chart is closer to the point of tangentcy between the sphere and the plane, the ratio of distortion decreases and the accuracy of the PROJECTION increases).

- The optimum characteristics for PROJECTION include:

  a. True shape of physical features. (Considered as, "CONFORMAL PROJECTION.")

  b. Correct angular relationships. (Considered as, "CONFORMAL PROJECTION.")

  c. Equal area, i.e., representation of areas in relative proportions.

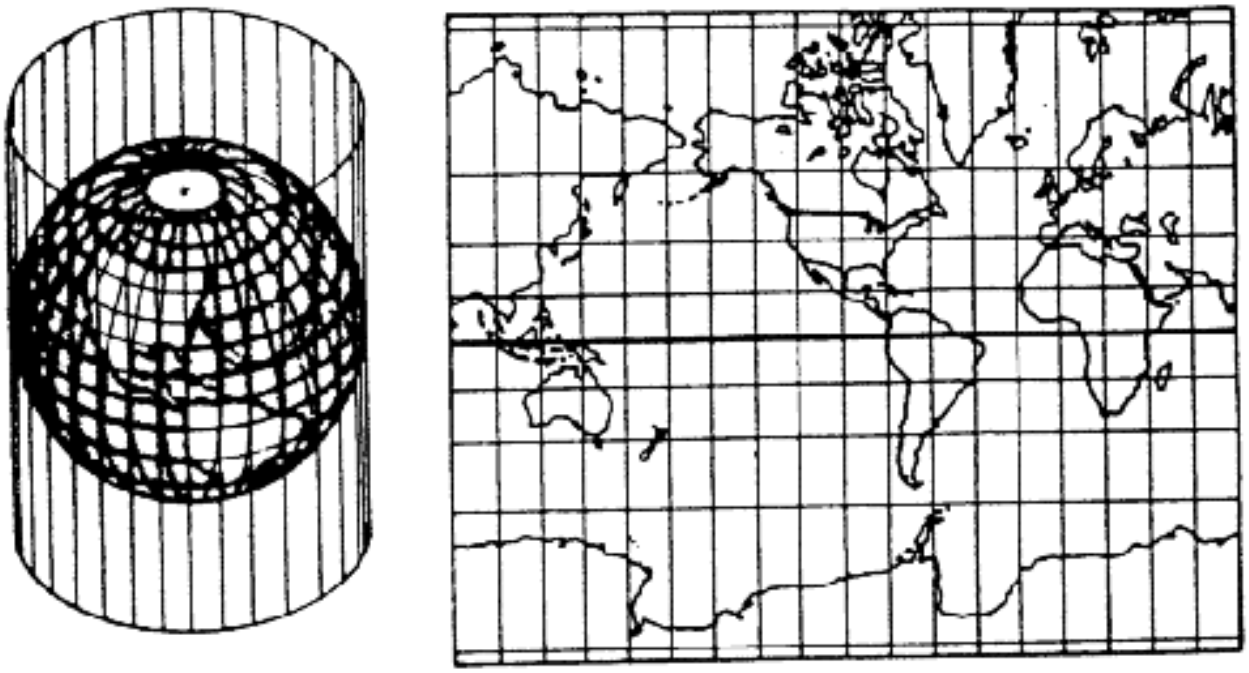
  d. True scale, i.e., permits accurate measurement of distance.

  e. RHUMB LINES presented as straight lines. (A Rhumb Line is a line on the earth's surface that crosses all MERIDIANS at the same angle.)

  f. GREAT CIRCLES represented as straight lines. (A Great Circle is a circle on the earth's surface described by a plane passing through the earth's center.)

NOTE: It is not possible to prepare a chart which includes all of the listed optimum characteristics, e.g., it is not possible to prepare a chart on which both Great Circles and Rhumb Lines are represented by straight lines.

There are many different types of PROJECTIONS. The two which are of primary interest to the mariner are the MERCATOR projection, most commonly used for ocean and coastal navigation, and POLYCONIC projection which is utilized on the Great Lakes and Inland Rivers. The Auxiliary is involved in updating MERCATOR and POLYCONIC projection charts. Refer to Figure 7-3 and Figure 7-4.



- Angles are correctly represented
- Great circle appears curved
- Rhumb line appears as straight line
- Distortion in BOTH directions

FIGURE 7-3 MERCATOR PROJECTION

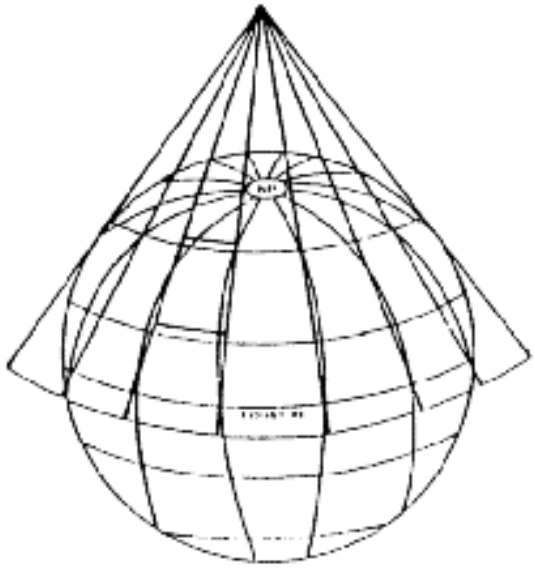


FIGURE 7-4 POLYCONIC PROJECTION

As a nautical chart is a representation in reduced form on a flat surface of an area of navigable water on the surface of the earth, actual distances must be presented relative to the available space on the chart. This distance dimension reduction is termed the SCALE of the chart. The scale of a chart is its so-called "natural scale," an expression of the relationship between a given distance on the chart to the actual distance it represents on the earth's surface. The chart scale may be expressed in the form of a ratio, say 1:80,000, where one unit on the chart represents 80,000 units on the earth's surface. It may also be expressed in the form of a fraction, say 1/80,000, a priori. Charts are published in a wide range of scales.

- For general convenience of reference, the issuing agencies have classified charts into the following series:

  a. **SAILING CHARTS** 1:600,000 scale and smaller

  b. **GENERAL CHARTS** Scales range from 1:150,000 to 1:600,000

  c. **COASTAL CHARTS** Scales range from 1:50,000 to 1:150,000

  d. **HARBOR CHARTS** Scales range from 1:50,000 and larger

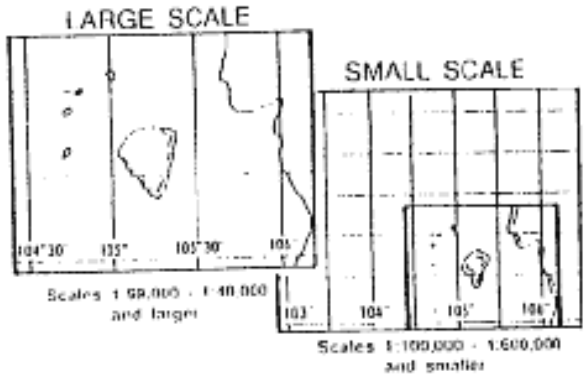
- Charts of the Great Lakes are also grouped into series:

  a. **GENERAL** Showing all of the lakes plus one for each lake

  b. **COAST** Scaled 1:80,000 or 1:120,000

  c. **HARBOR** Having larger scales than NOS charts

When chart scales are expressed in the form of fraction, confusion sometimes results from the use of terms LARGE SCALE (where the denominator of the fraction gets smaller), and SMALL SCALE (where the denominator of the fraction gets larger). For example, 1/80,000 is a smaller fraction than 1/40,000, thus a chart of 1/80,000 scale is termed a SMALL SCALE CHART (refer to Figure 7-5).



Large Scale Charts Cover a Small A
Small Scale Charts Cover a Large Ar

FIGURE 7-5 LARGE SCALE/SMALL SCALE CHARTS

When using MERCATOR projection charts, for distance measuring purposes, one minute of latitude equals one nautical mile, i.e., for distances measured parallel to MERIDIANS of LONGITUDE (north-south grid lines). On charts of a scale smaller than 1:80,000, the latitude scale will be the only means of measuring distance. Auxiliary members should primarily use large scale charts in conducting ATON/CU Program activities.

A general information block is located at a convenient place on charts. In this block are the chart title, description of the area covered, type of projection, scale, unit of depth measurement and datum plane for each sounding. It is important to know that, nautical charts are being converted to the METRIC SYSTEM with the **base unit** expressed in **meters**. Refer to Figure 7-6.

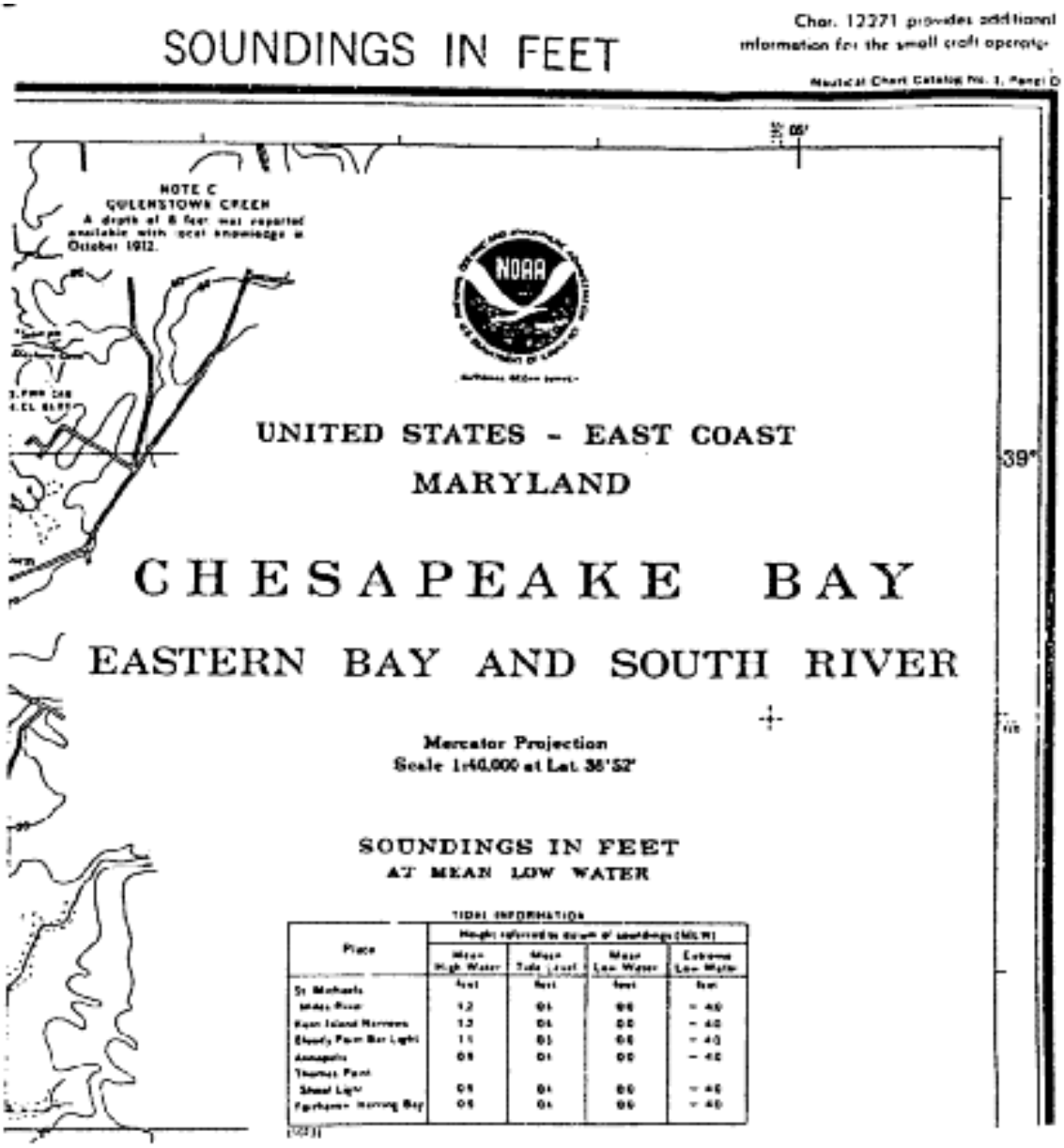


FIGURE 7-6 CHART - GENERAL INFORMATION BLOCK

Other useful and essential information may be found on the chart, such as the meaning of symbols and abbreviations, special notes of caution, units of measurements of heights and the reference plane from which measured, tidal information, anchorage information and physical features data.

The chart edition number and publication date appear at the lower left hand corner. Immediately following this data will be the date of the chart revision (refer to Figure 7-7).

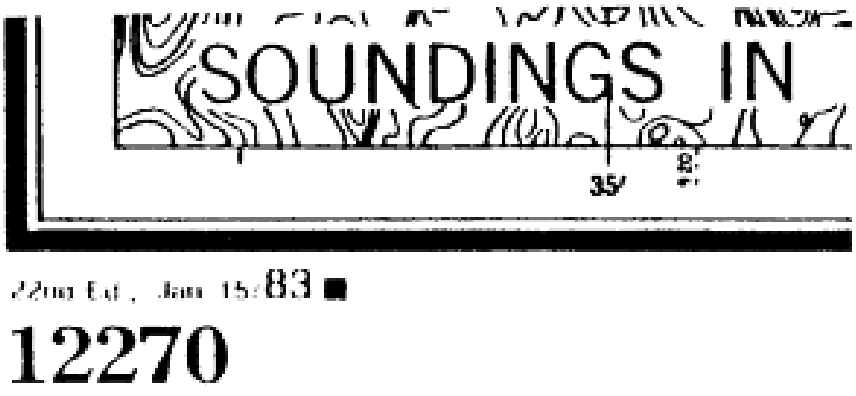


FIGURE 7-7 CHART EDITION NUMBER

New Editions charts are published when major changes in hydrography occur, as indicated by chart updating reports from the Auxiliary and other sources. A New Edition chart is a revision which cancels previous issues. It is important to note that, a Revised Print chart is a revision that does not supersede a current edition. Auxiliary members SHOULD ONLY USE THE LATEST EDITION CHART in support of ATON/CU activities. Moreover, such latest edition charts SHOULD BE CURRENT, i.e., annotated with chart updating input data from various sources not yet incorporated on the latest edition chart.

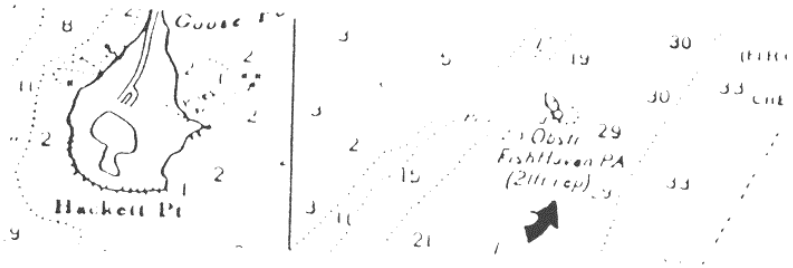
Conventional type nautical charts have the geographical north direction towards the top of the sheet, LATITUDE scale on the side borders and LONGITUDE scale on the top and bottom borders. The PARALLELS of Latitude and MERIDIANS of Longitude are drawn across the chart in fine black lines at intervals of two, five or 10 minutes of Latitude and Longitude as determined by the scale of the particular chart.

NOS charts which have a scale larger than 1:40,000, such as a 1:100,000 harbor chart, have border subdivisions scales in terms of minutes and tenths of minutes of Latitude and Longitude. On smaller scale charts, such as a 1:80,000 chart, the border subdivisions are in minutes and fractions of minutes.

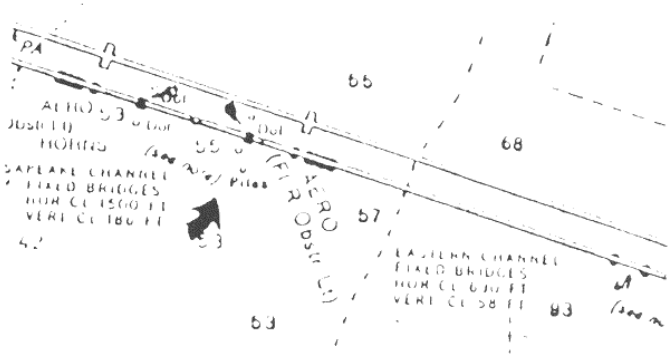
Most chart employ color to emphasize various features and to facilitate chart reading and interpretation. The NOS uses various shades of five colors on their regular charts: land areas are shown in buff or yellowish color; water areas are shown in white except in shallow regions which are shown in blue; submerged areas which at times uncover at some tidal stages are shown in green. Purple is used for many purposes on charts and shows well under red light,

for preservation of night vision. Buoys and other aids are appropriately colored, red. green. red and green. red and white. or yellow, while lighted buoys of any color have a purple disc over a dot or small portion of a symbol to assist in identification. Black is used for most symbols and printed information.

Certain classes of information are printed in one style of lettering and other classes in another style. Vertical lettering is used for features which are dry at high water and are not affected by movement of water, while leaning or slanted letters are used for water, underwater and floating features except depth features (refer to Figure 7-8).



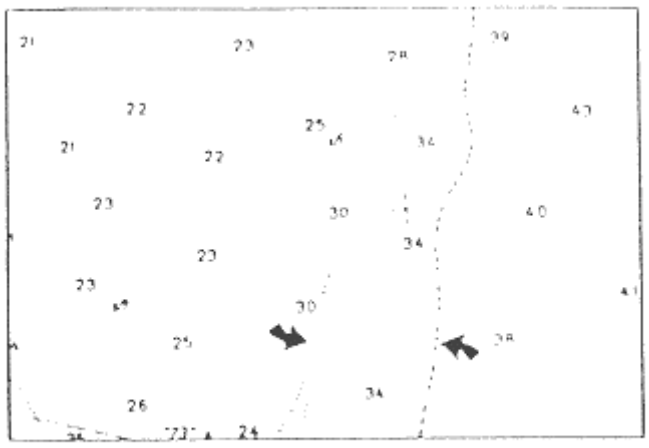
Slanted Letters Indicate That an
Obstruction Is Covered Part of the Time



Straight Letters Indicate That an
Obstruction Is Always Above Water

FIGURE 7-8 CHART – CLASSES OF INFORMATION

For a system of depth information there must be a reference plane or datum, particularly in coastal areas where depths may change hourly as the result of tidal action. Each chart contains a statement of datum from which all depths are measured near to normal low-water levels. Depth information is shown on the chart by a number designation. These numbers indicate the depth at, that indicated position measured in feet (or fathoms) or meters. The tidal datum system for all marine waters of the U.S. and its territories have been implemented to Mean Lower Low Water. Lake and river charts will usually use a datum based on past records of variations in level over many years. Most charts contain contour lines, sometimes called Fathom Curves connecting points of equal depth. Such lines will appear at certain depths as determined by the chart scale and relative range of the depths. Continuous solid lines or various combinations of dots and dashes are used to code the depth along each line (refer to Figure 7-9).



Soundings with Five and Six Fathom Curves

FIGURE 7-9 FATHOM CURVES/RANGE OF DEPTHS

The NOS publishes six Nautical Chart Catalogs. These catalogs are available to the general public and the Auxiliary through regular chart distribution sources. The catalogs indicate areas covered by each chart, the scale used and the price. Catalogs 1 through 4 cover contiguous waters as follows: #1 - Atlantic & Gulf Coasts including Puerto Rico and Virgin Islands; #2 - Pacific Coast, including Hawaii and Pacific Islands, Guam & Samoa; # 3 - Alaska including the Aleutian Islands; and #4 - Great Lakes, including connecting and adjacent waterways. Catalog #5 list Bathymetric and Fishing Maps. Catalog #6 is a Guide to NOAA Nautical Products and Services (refer to Figure 7-10).

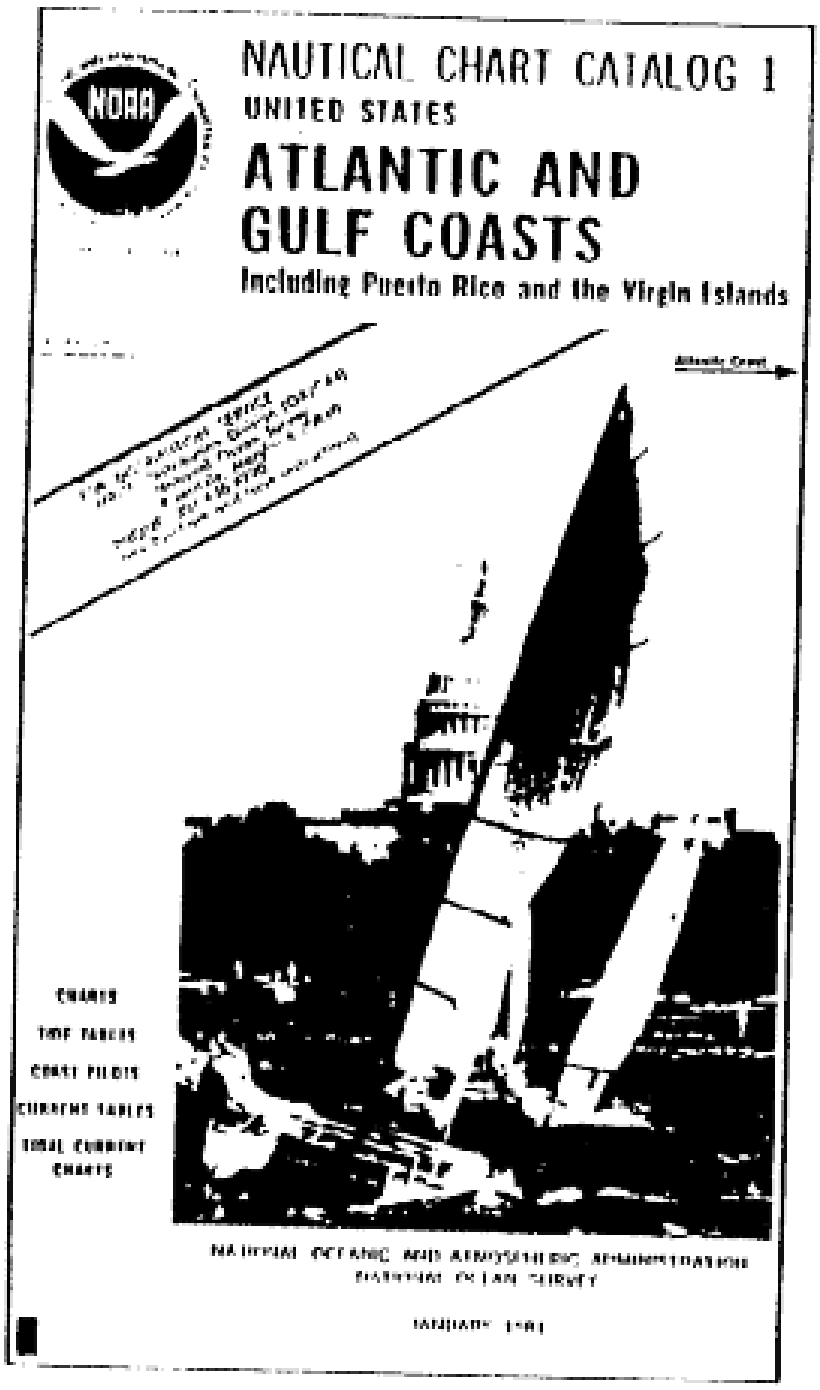


FIGURE 7-10 NAUTICAL CHART CATALOG #1

The vast amount of information to be shown on a chart and the proximity in which many physical features appear necessitates the extensive use of charting symbols and abbreviations. Symbols and abbreviations used on charts have been standardized and published in a small pamphlet designated as Chart No. 1. Chart No. 1 is a joint publication of NOS/NOAA and DMAHTC. Generally, similar information is printed on the reverse of TRAINING CHART-l2lOTr. Auxiliary members participating in the ATON/CU Program should be familiar with the contents of Chart No. 1, particularly with regard to some specific symbols and abbreviations. For example, it is important to know that the symbol for an APPROXIMATE position is a small circle with small lettering, whereas for an ACCURATE position the symbol is a larger circle with a dot in the center with capital letters. When available, accurate positions should always be used in taking bearings or determining position.

Other than purchases by over the counter sales, each Flotilla that agrees to and actively participates in CU activities of the ATON/CU Program is entitled annually to receive four Large Scale Nautical Charts (1:40,000 or larger) for their assigned geographical operating area. The purpose of this chart distribution is the replacement of charts that the Auxiliary (Flotilla) has sectioned/clipped for attachments to NOAA 77-5 reports. The Flotilla requests for charts are forwarded by the FSO-ANs to the SO-AN for consolidation into a single Division request. The SO-ANs forwards the Flotilla/Division consolidated request to the DSO-AN for review and forwarding to the BC-ONC. The period for such chart requests is from January 1 through May 1 or at other times for specific "special" projects. The turn-around time for Flotilla receipt of charts is approximately eight weeks. Refer to Section VI.

SECTION VIII - THE SEXTANT

INTRODUCTION:

The SEXTANT is one of the most economical instrument for an Auxiliary member to use in determining positions of objects both ashore and afloat with a high degree of accuracy. The Three-Arm Protractor is used in conjunction with the SEXTANT in plotting positions on a chart, i.e., laying-out angles on a chart. In their ATON/CU support role, Auxiliary members need to understand the use and application of the SEXTANT and Three-Arm Protractor for determining and plotting position data.

OBJECTIVE:

1. To acquire a general knowledge of the use of the Sextant and the Three-Arm Protractor.

2. To become familiar with the use of the Davis Mark 3 and Davis Mark 15 Sextants to include the major parts and proper care:
   - o How to read the Sextant.
   - o How to determine the Sextant index error and adjust or apply the error.
   - o How to take independent Sextant angles and develop a three-point horizontal FIX and a two-point horizontal FIX.
   - o How to determine heights of an object with the Sextant.

3. To become familiar with the use of the Three-Arm Protractor:
   - o How to transfer Sextant acquired data to applications with a Three-Arm Protractor.
   - o How to lay-out angles on a chart with a Three-Arm Protractor.

INFORMATION:

The Sextant is an instrument for measuring angles. The Sextant is oriented vertically (held vertical) for determining a vertical angle. The Sextant is oriented horizontally (held horizontal) for determining a horizontal angle. There are several models and manufacturers of Sextants. The most economical Sextant available is the Davis Mark 3, which cost in the neighborhood of $30.00 (refer to Figure 8-1). Other higher quality model/manufacturer Sextants sell in the thousand dollar range. For Auxiliary members participating in ATON/CU activities, the Davis Mark 3 Sextant is sufficient for general use. However, the Davis Mark 15 Sextant is a somewhat more sophisticated Sextant, containing a Micrometer Drum and Vernier, and provides a higher degree of precision in reading angles (refer to Figure 8-2). Some Auxiliary members prefer the Davis Mark 15 Sextant. As such, for the purposes of this Study Guide, information on both the Davis Mark 3 and the Davis Mark 15 Sextants will be included.

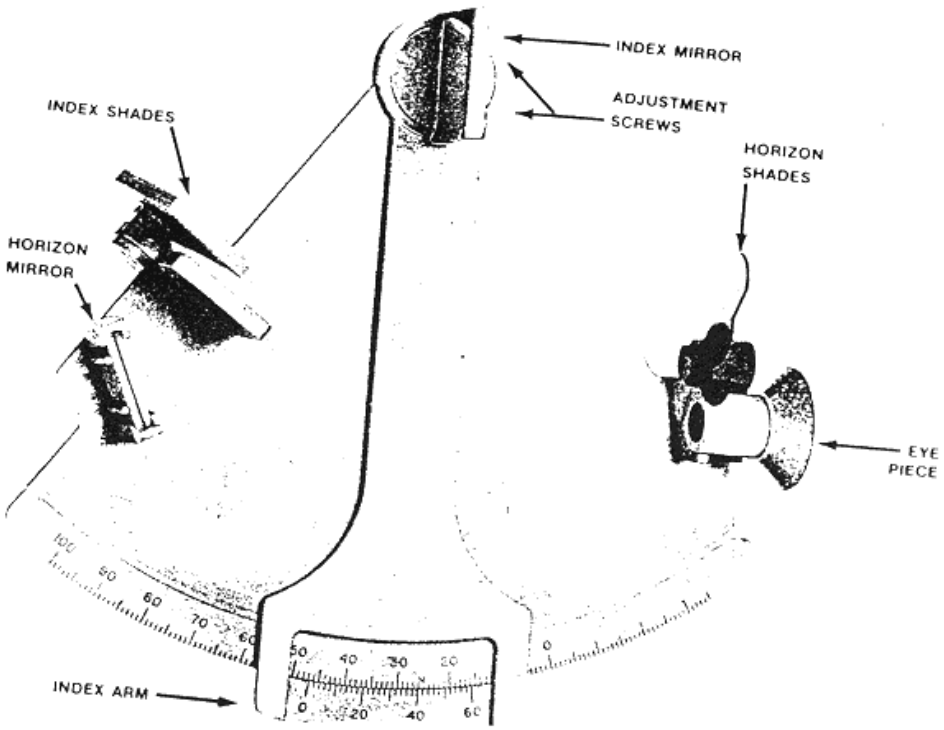


FIGURE 8-1 DAVIS MARK 3 SEXTANT

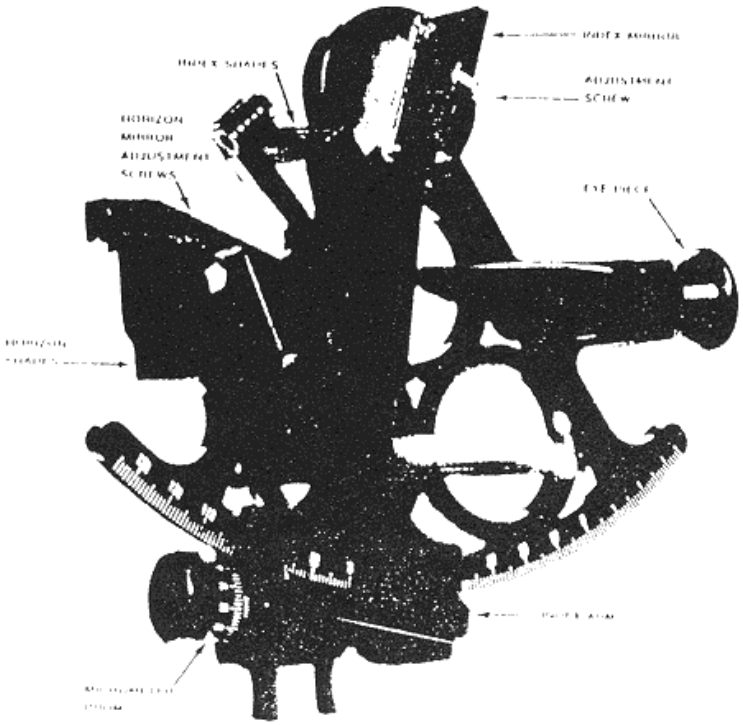


FIGURE 8-2 DAVIS MARK 15 SEXTANT

All Sextants contain two scales. The "ARC" Scale, located on the Frame of the Sextant, reads in degrees, with each mark/division/graduation equal to one degree. The "VERNIER" Scale, located on the Index Arm of the Sextant, reads in minutes, with each mark/division/graduation equal to two minutes. Some Sextants are equipped with a Micrometer Drum to read degrees, minutes and fractions of minutes. In Auxiliary ATON/CU activities only readings in degrees and minutes are required. Thus, the Davis Mark 3 Sextant is adequate.

To "Read" the Davis Mark 3 Sextant, first read the "ARC" Scale at the zero mark to determine degrees, next then look at the lower line or the "VERNIER" Scale to determine the figure that aline with a figure on the arc to the right of zero.

To "Read" the Davis Mark 15 Sextant, first "Read" the "ARC" for degrees and then the Micrometer Drum at the first longest line on the "VERNIER" Scale for minutes (refer to Figure 8-3).

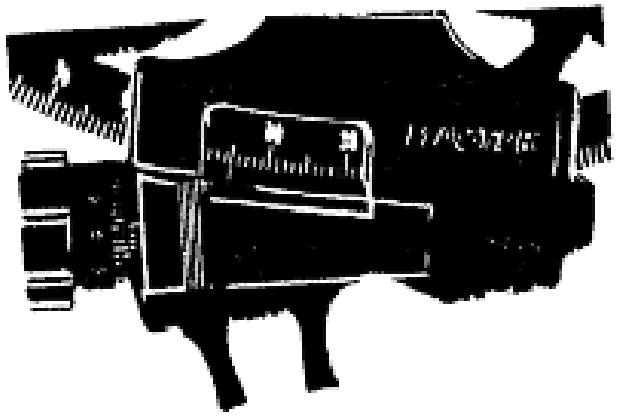


FIGURE 8-3 READING THE SEXTANT (DAVIS MARK 15)

- The following presents important information that should be considered when using a Sextant for the determination of angles:

  a. The Sextant is a very accurate but delicate instrument. Particular care should be taken when using and storing the Sextant.

  b. Determine if the telescope or clear sighting tube will be used for viewing the object. The telescope is very rarely used.

  c. Determine if any filters will be needed for the observation. If not, turn the filters away from the index mirror and horizon glass.

  d. Every effort should be made to hold the Sextant level during observations. This can be accomplished with a spirit level attached to the Sextant or by leveling the frame of the horizon glass to the actual horizon. Errors will occur if the Sextant is not held level.

e. All adjustments to the Sextant should be made before taking an observation. Recheck adjustments whenever the Sextant is moved or mishandled.

The purpose of Sextant adjustment is to insure the two mirrors are perpendicular to the frame and parallel to each other when the "ARC" and "VERNIER" scales read zero.

- The following is a summary of those adjustments:

a. INDEX MIRROR ADJUSTMENT - First, adjust the index mirror so that it is perpendicular to the frame by setting the Sextant to about 50 degrees. Hold the Sextant horizontal and about eight inches horizontally from the eye level and look with one eye into the index mirror. Move the Sextant until you can look past the index mirror and see the actual frame ARC as well as the reflected ARC. The two ARCs should appear as one continuous curve. If they do not, turn the adjustment screw on the back of the index mirror until the two ARCs come into alignment (refer to Figure 8-4).

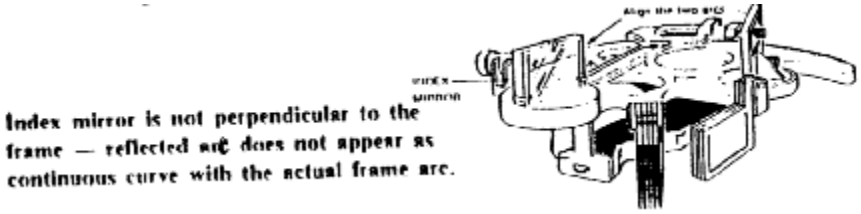


FIGURE 8-4 ADJUSTING THE SEXTANT - INDEX MIRROR (DAVIS MARK 3)

b. HORIZON MIRROR ADJUSTMENT - Next, adjust the horizon mirror for "side error" so that it is perpendicular to the frame. Holding the Sextant in your right hand, raise it to the eye. Look at any horizontal straight edge (horizon, roof of building, etc) and move the index arm back and forth. The real horizon will remain still while the mirror horizon will appear only when the object and the drum scales read close to zero. Line up the mirror horizon and the real horizon so that both appear as a single line. Now, without changing the setting, look through the Sextant at any vertical straight edge (flag pole, vertical edge of a building, etc.) and swing the Sextant back and forth across the vertical line. If the horizon mirror is not perpendicular to the frame, the line will seem to jump to one side as the mirror passes it. To correct this situation, slowly tighten or loosen the screw closest to the frame at the back of the horizon mirror until the vertical line no longer appears to jump (refer to Figure 8-5).

(a) Horizon mirror screw too tight. (b) Horizon mirror screw correctly adjusted. (c) Horizon mirror screw too loose.

FIGURE 8-5 ADJUSTING THE SEXTANT - HORIZON MIRROR

c. INDEX ERROR ADJUSTMENT - The last step is to remove the index error so that the index and horizon mirrors are parallel to each other. Set the Sextant to zero degrees and zero minutes and look at the horizon or a straight horizontal line. With the Sextant at your eye, turn the top screw on the horizon mirror until the actual horizon or straight line and the reflected horizon or straight line now form one straight line (refer to Figure 8-6).

(a) Horizon mirror and index mirror not parallel. (b) Horizon mirror and index mirror parallel.

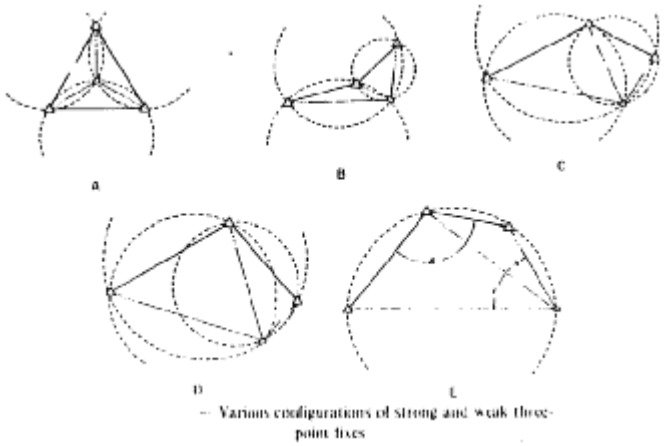
FIGURE 8-6 ADJUSTING THE SEXTANT - INDEX ERROR

To be certain that the Sextant is correctly adjusted, incline the Sextant from side to side and the horizon should remain in a straight line. If it does not, recheck the horizon mirror adjustment (refer to Figure 8-7).

On a correctly adjusted sextant, the real and mirror horizons remain in a single line when the instrument is rocked from side to side.

FIGURE 8-7 CHECKING SEXTANT ADJUSTMENT

Once the Sextant is properly adjusted, it can be used to measure angles and determine the position of objects, i.e., obtain a FIX. A FIX is an accurate position established by the intersection, as simultaneously as possible, of two or more lines of position (LOPs) between objects. The three-point FIX (three LOPs) is the most common method used to determine the position of a charted object. When a three-point FIX is not possible, a two-point FIX is used. The selection of the points or objects will determine the accuracy of the FIX, i.e., a strong FIX. To obtain the strongest three-point FIX, the three LOPs should intersect at angles as close to 60° or 120° as possible. To obtain the strongest two- point FIX, the two LOPs should intersect at an angle as close to 90° as possible. In Figure 8-8, "A" represents the strongest three-point FIX possible, where the observer is at the center of an equilateral triangle (three LOPs with intersecting angles of 60° each); "B" is a strong FIX where the observer is closer to the center object than the right and left objects; "C" is a weak but adequate FIX and should be avoided if stronger FIXES are available; "D" and "E" are unacceptable.



Various configurations of strong and weak three-point fixes

FIGURE 8-8 THREE-POINT FIXES - STRONG/WEAK

- The following are general rules for selecting three objects to form a strong FIX:

    a. Strong FIXES occur when the observer is inside the triangle formed by three objects.

    b. A FIX is strong when three objects lie in a straight line with the center object closest to the observer.

    c. The sum of any two angles should not be less than 60 degrees.

    d. A FIX is strong when two objects that lie a considerable distance apart are aligned and the angle to the third object is not less than 45 degrees.

When planning a FIX, use objects on the chart that are accurately positioned. Charted objects that are accurate are indicated on the chart by a circle with a dot in the center and capital letters. Charted objects that are approximate are indicated on the chart by a small circle and small letters.

To measure an angle between two objects with the Sextant: Hold the Sextant horizontal to the horizon and sight on the object to the left. Move the index arm until the object on the right moves under the left object and the two objects are aligned. (When using a Mark 15 Sextant, squeeze the release lever to move the index arm.) When the two objects are lined in the horizon glass read the "ARC" Scale first (degrees) and then the "VERNIER" Scale (minutes). Record the reading as soon as the observation is completed. Take a second reading to confirm the first reading.

The Three-Arm Protractor is an instrument used to lay-out angles on a chart, i.e., assists in position plotting. The Davis Mark 3 Sextant and the Three-Arm Protractor read very similarly. Once the angles are measured with the Sextant, the next step is to plot the information. The plotting is accomplished by the transfer of the Sextant measured information onto a chart with a specialized piece of equipment, the Three-Arm Protractor. The Three-Arm Protractor has three scales, one on each arm - a 360 degree scale on the "Center Arm," which reads in degrees, with each mark/division/graduation equal to one degree, and a 60 minutes scale on each the "Left Arm" (scale on the left side of the center line) and "Right Arm" (scale on the right side of the center line), which read in minutes, with each mark/division/graduation equal to two minutes.

- As an example, for a three-point FIX (three LOPs), to set an angle of 17° and 56' to the left of the center object:

    a. Move the "Left Arm" left until the center line on the arm is between 17° and 18° on the 360 degree "Center Arm" scale.

    b. Next fine tune the reading so that 56' on the "Left Arm" scale is perfectly aligned

with a mark on the 360 degree "Center Arm" scale (refer to Figure 8-9).

c. Lock the arms of the Three-Arm Protractor in-place, accordingly, once the reading(s) is/are set.

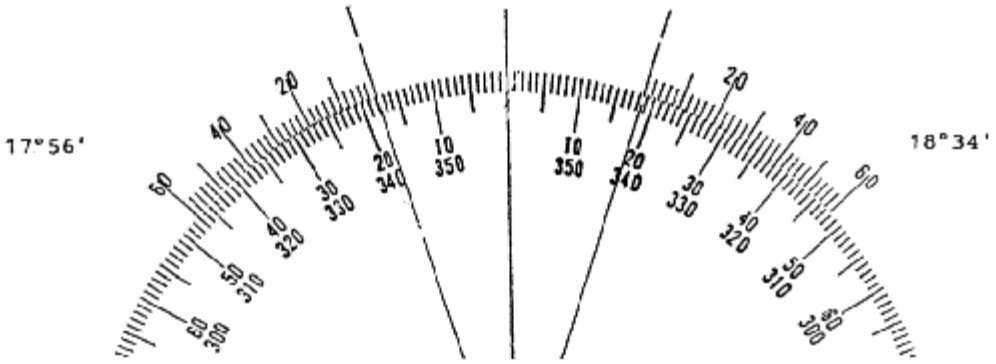


FIGURE 8-9 THREE-ARM PROTRACTOR SCALES

Now, when the two observed angles are set on the Three-Arm Protractor the position can be plotted on a chart. Thus, the angle measured between the center object and the left object is set using the "Left Arm" of the protractor, and the angle measured between the center object and the right object is set using the "Right Arm" of the protractor. In this operation, keep the "Center Arm" center line on the center object and maneuver the protractor until the "Left Arm" and "Right Arm" center lines are on their respective sighted objects. When alignment is achieved, the center pivot hole in the protractor indicates the position from which the Sextant angles were taken and should be so marked on the chart (refer to Figure 8-10).

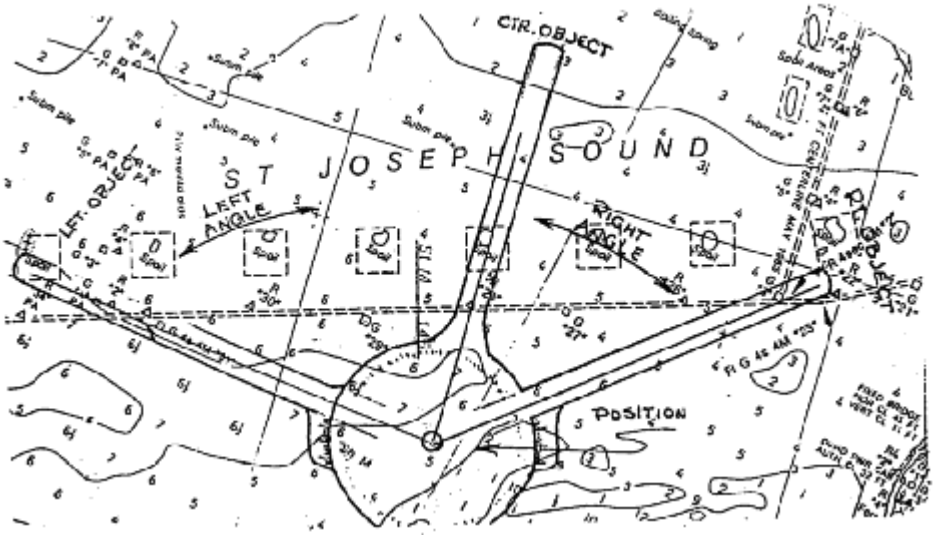


FIGURE 8-10 THREE-ARM PROTRACTOR - PLOTTING A THREE-POINT FIX

NOTE: The Three-Arm protractor should not be exposed to direct sunlight or heat as it is constructed of plastic and subject to warping.

When conditions dictate using a two-point FIX, where only two objects are available to establish a position, a bearing to one of the objects must be established. Once such a bearing is determined, the Sextant is used to measure the angle between the two objects and the FIX is established. In this connection, it is important to know that an LOP obtained from a bearing taken by magnetic compass must be corrected for variation and deviation to a TRUE bearing, before plotting on a chart. If a hand bearing compass is used to take the bearing, the observation should be taken from a deviation free location and corrected to a TRUE bearing (refer to Figure Figure 8-11).

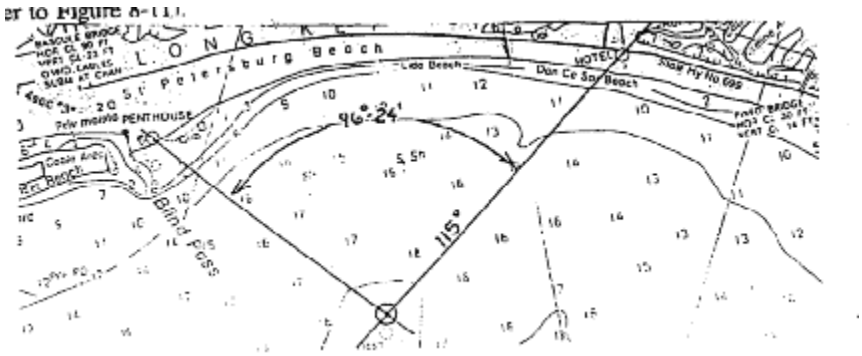


FIGURE 8-11 A TWO-POINT FIX

Understanding the techniques used to establish a position, the next step is to determine the position of an object from a charted position. In the three charted object case, three separate charted locations are used with an angle being established at each location between the object that is to be positioned and each of the charted objects. The charted objects will serve as a point of reference as angles are taken to the object to be positioned. The observer will hold the first position while the angle is measured from the charted object to the object to be positioned. The observer will then lay-out the angle using the known position and the known object as one side and the other side of the angle being an LOP from the known position through the object to be positioned. The same procedure will be repeated from the second position and third position. The chart location of the object to be positioned is at the intersection of the resulting three LOPs.

During such charting operations, the Auxiliary observer should make note of any un-charted objects, such as type of structure, color, lighting, etc. This type of information, along with Sextant measured angles, chart sections, drawings and photographs should be included as part of a NOAA 77-5 chart updating report.

For purposes of general navigation, i.e., position determination, safe passage, etc., it is necessary to know the height of an object such as tower, bridge, or building. In this regard, the height of an object is expressed in feet or meters. The Sextant is used to determine the height(s) of objects. This is accomplished by measuring vertical angles. To measure a vertical angle, hold the Sextant vertical and measure the angle from the top of the subject object/structure to the water's edge. For this operation, the Sextant index error must be checked, as such vertical angles are extremely small. Now, in conjunction with the available charted data, i.e., the charted position of the observation point and the charted position of the object/structure, the distance from the observation point to the object/structure is determined, the vertical angle of the object/structure is measured and its height determined.

- The formula to determine the height of an object is:

VerticaL Angle (in MINUTES) X Distance (in NAUTICAL MILES)/0.565 = Height of Object (in FEET)

Also, it is important to know, when the height of the object and the vertical angle are known, the distance from the observer to the object can be determined. Also, it is important to know that, the height of the object is determined in relationship to its height above the water. Refer to the following examples and illustrations:

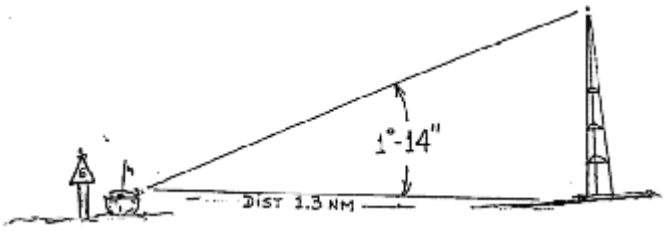
EXAMPLE #1

TO DETERMINE THE HEIGHT OF AN OBJECT FROM A KNOWN DISTANCE

a. Determine the distance to the object - expressed in NAUTICAL MILES - say for example 1.3nm

b. Measure the vertical angle of the object - expressed in MINUTES - say for example 74 minutes (one degree and 14 minutes)

c. From the formula - multiply the vertical angle (MINUTES) by the distance (NAUTICAL MILES) and divide their product by the factor 0.565 - as the example: 74 X 1.3/0.565 = 170 (feet)



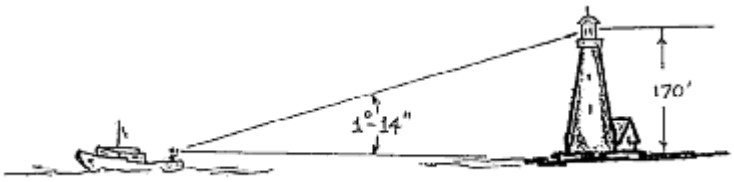
EXAMPLE #1 - DETERMINING HEIGHT OF AN OBJECT

TO DETERMINE THE DISTANCE FROM AN OBJECT OF A KNOWN HEIGHT

a. Given the height of the object as known - say 170 feet

b. Prom the formula we can say: 0.565 X Height of Object (in FEET) divided by the Vertical Angle (in MINUTES) = Distance (in NAUTICAL MILES)

c. As the example: 0.565 X 170/74 = l.3nm



EXAMPLE #2 - DETERMING DISTANCE FROM AN OBJECT

NOTE: Nautical charts are being converted to the METRIC SYSTEM with the **base unit** expressed in **meters**. The appropriate metric conversion factors apply, viz., feet-to-meters multiple by 0.30480, meters-to-feet multiple by 3.28083. Therefore, 170 FEET = 51.8160 METERS. As such, for the metric conversion of the above formula, i.e., FEET-to-METERS, change the factor **0.565** to **1.8566**, the resulting height computation will be expressed in METERS. [For Example #1 - 74 X 1.3/1.8566 = 51.8151 (meters) and for Example #2 - 1.8566 X 51.8151/74 = 1.3nm.]

SECTION IX - NAUTICAL CHART UPDATING

INTRODUCTION:

NOS and the Coast Guard rely on mariner notification of any modifications that may be required to keep nautical charts and other related publications current. In 1962 NOS, the Coast Guard and the Auxiliary entered into an agreement for mutual cooperation, wherein the Auxiliary through its ATON/CU Program agreed to report data useful for NAUTICAL CHART UPDATING. Today, in respect to that agreement, NAUTICAL CHART UPDATING has become an important responsibility in the Auxiliary ATON/CU Program efforts.

OBJECTIVE:

1. To acquire a general knowledge of the responsibilities of the Auxiliary in NAUTICAL CHART UPDATING activities.

2. To become familiar with the characteristics of the NAUTICAL CHART UPDATING information to be reported.

3. To become familiar with the method of reporting NAUTICAL CHART UPDATING information on the NOAA 77-5 form with attachments.

INFORMATION:

To maintain the efficiency and effectiveness of the navigation information provide on nautical charts and other related publications, the proponent agencies need input data on observed non-standard conditions. Accordingly, any and all changes, deletions, additions and discrepancies between information published on nautical charts or in nautical publications and that observed on location, should be reported. In this regard, the Auxiliary member on location observer should assume that any finding is a first instance discovery, of a non-standard condition, and should report such a finding as a chart update on the NOAA 77-5 form. The Auxiliary member should understand that there is no retribution for independent redundant reporting. Moreover, for those cases when more that one independent report is submitted, such data may better confirm the prevailing situation for modifications. In this connection it is important to know that, items checked and found to be published correctly should not be reported unless requested by appropriate authority.

Chart updating reports should be as concise, definitive, and complete as possible using a NOAA 77-5 form. Of particular concern are those features on the water, such as buoys, which must be observed close aboard and are the most difficult for charting agencies to verify. Features on land or in the water fixed to the bottom, such as beacons, can be verified more expeditiously from distant observation. Observers should always use the current edition of the largest scale charts available. Such charts should be kept current through application of data

contained in Notices to Mariners. Refer to the Example Chart Update Reports on NOAA 77-5 Forms at the end of this Section.

Auxiliary members and their units submitting NOAA 77-5 reports are awarded credits, refer to Section XII.

Observations at the location of geographical areas where magnetic disturbances affect compass readings and/or electronic disturbances affect electronic equipment readings should be reported in chart updating. Include the extent of area affected, the amount of deflection observed, water and weather conditions. Also note if any similar disturbances were observed during previous surveillance of the area.

Prominent objects/features are charted on nautical charts as distinctive landmarks for ready points-of-reference. Such prominent objects include tall/large/distinctive structures, i.e., smokestacks, spires, towers, flagpoles, lights, buildings, and natural formations of rocks, cliffs, trees, hills, etc., at significant locations. More recently, with the increased use of cellular telephones, many new micro towers have been established which are ideal landmarks in view of their height and lights. These micro towers can be observed during reduced visibility and at night. In an environment of massive new construction and reconstruction, new landmarks emerge and old landmarks are modified, demolished or obscured. As appropriate, such occurrences should be reported as chart updating information.

Positions of landmarks can normally be determined with Sextant measured angles or compass bearings or both taken from known positions. Heights of landmarks can be determined with Sextant measured vertical angles and computations (refer to Section VIII).

Newly dredged waterway channels and the re-dredging/modification of existing channels, as approved, by local authorities, private firms, and individuals, should be indicated on nautical charts. Some waterway channels may be of a purely local nature, but if shown on the chart, would benefit mariners in general. Such new, re-dredged or modified channels should be reported with particular attention to: the width and depth of the channel, date and hour such measurements were taken, position of channel markers (if any), and (if possible) who performed the dredging and for whom it was done. For those situations, when an area in which a dredging operation was recently completed, has not been charted, the particulars should be reported. Included in such a chart updating report should be a copy of the after-dredging survey.

Of all chart updating input, accurate data pertaining to submerged objects, i.e., object type, characteristics, position and depth, are the most critical and difficult to obtain, define, and report.

REPORTABLE NAUTICAL CHART UPDATING ITEMS

AERONAUTICAL LIGHTS, AERONAUTICAL RADIO BEACONS	NEW OR REMOVED
AIDS TO NAVIGATION	CONFIRM CHARTED LOC~ON
AIRPORTS AND LANDING STRIPS	NEW OR DISCONTINUED
ANCHORAGES	NORMAL AND EMERGENCY
BRIDGES	NEW, REMOVED, UNDER CONSTRUCTION, OR IN RUINS
CABLES	OVER OR UNDER NAVIGABLE WATERS
CHANNELS	NEW OR MODIFIED – INDICATE CENTERLINE, CONTROLLING DEPTH, WIDTH, MARKINGS
COAST GUARD STATION	NEW, DISCONTINUED OR CHANGE IN FACILITY
CRIBS AND WATER INTAKES	VISIBLE OR SUBMERGED, SIZE, TYPE OF CONSTRUCTION AND DEPTH IF SUBMERGED
DAMS	TYPE, POSITION, LIGHTS, OTHER PERTINENT DATA
DIKES AND LEVEES	TYPE, HEIGHT AND EXTENT
DOLPHINS OR OTHER PILINGS	VISIBLE OR SUBMERGED
DRY DOCKS	NEW OR DISCONTINUED
DUCK BLINDS	TEMPORARY OR PERMANENT STRUCTURES
DUMPING GROUNDS AND SPOIL AREAS	EXTENT
FERRIES	TYPE, DOCK FACILITIES, UNDERWATER OR OVERHEAD CABLES
FISH HAVENS	OBSTRUCTION (ARTIFICIAL FISH HAVEN)

REPORTABLE NAUTICAL CHART UPDATING ITEMS (con't)

FISH STAKES	VISIBLE, SUBMERGED (OUTSIDE OF CHARTED TRAP AREA)
FISH TRAP AREA	SHOW LIMITS OF AREA COVERED
GEOGRAPHIC NAMES	CORRECT INCORRECT OR MISSPELLED NAMES - SUBMIT OMITTED LOCAL NAME
GROINS	TYPE, VISIBLE, SUBMERGED, OR RUINS
JETTIES AND BREAKWATERS	TYPE, VISIBLE, SUBMERGED, OR RUINS
LANDMARKS	NEW, REMOVED, DESTROYED, OR SUBMERGED - RECOMMEND NEW ONES THAT CAN BE SEEN FROM SEAWARD
LOG BOOMS	EXTENT AND LOCATION, NAVIGATIONAL HAZARD
MARINAS AND FACILITIES	REPORT NEW, CLOSED, CHANGES
MARINE CONSTRUCTION	BULKHEADS, WHARVES, DOCKS, PIERS, ETC.
MARINE RAILWAYS	NEW OR DISCONTINUED, VESSEL LENGTH, TONNAGE
NEW CHART REQUIREMENTS	RECOMMEND NEW OR ADDITIONAL COVERAGE
OBSTRUCTIONS	TYPE, VISIBLE, SUBMERGED, PERMANENT OR TEMPORARY
PIERS AND DOCKS	NEW, DISCONTINUED, EXTENDED, RUINS, VISIBLE OR SUBMERGED
PILES	VISIBLE OR SUBMERGED, SINGLE OR MULTIPLE - SHOW LOCATION
PIPELINES	OVERHEAD OR SUBMERGED, CLEARANCES, MATERIAL CONTAINED
PLATFORMS (ALL TYPES)	TYPE, MARKINGS, LIGHTS, AND HAZARDS

REPORTABLE NAUTICAL CHART UPDATING ITEMS (con't)

RADIO BROADCASTING TOWERS	NEW, DISCONTINUED, CALL LETTERS, HEIGHTS AND LIGHTS
RAMPS	TYPE, SURFACE, LENGTH, PUBLIC OR PRIVATE
ROCKS	VISIBLE OR SUBMERGED, AT TIDE, LAKE OR RIVER STAGES - GIVE WATER DEPTH, SIGNIFICANT CHANGES OF TWO FEET OR MORE IN CHARTED DEPTHS
RUINS	NOT COVERED IN OTHER CATEGORIES
SEWER OUTLETS	SIZE AND TYPE OF CONSTRUCTION
SHOALS	VISIBLE OR SUBMERGED, AT TIDE, LAKE OR RIVER STAGES - GIVE WATER DEPTH
SNAGS	TYPE, VISIBLE OR SUBMERGED
STACKS AND CHIMNEYS	MARKINGS, HEIGHT, LIGHTS, CONSTRUCTION
WRECKS	VISIBLE OR SUBMERGED AT TIDE, LAKE OR RIVER STAGES WRECKS ABOVE HIGH WATER MARK SHOULD NOT BE REPORTED UNLESS USEFUL AS A LANDMARK

The chart scale is important in determining whether reported items are chartable. In this connection, it is noted that, to determine if an object is of chartable size "THE OBJECT SHOULD NOT BE LESS THAN 0.03. INCHES (RELATIVE) WHEN ILLUSTRATED ON THE CHART." Using a Pier as an example of a object to be charted; then, for the Pier to be chartable it must be equal to or greater than 0.03 inches relative to the scale of the chart. It is also important to note that, nautical charts are being converted to the METRIC SYSTEM with the **base unit** expressed in **meters**, not in feet. Accordingly, the following examples and graph can be used with the appropriate metric conversion factors, viz., feet-to-meters multiple by 0.30480, meters-to-feet multiple by 3.28083; also, inches-to-meters multiply by 0.02540, meters to inches multiple by 39.36992. As an illustration, let:

Base Unit in FEET	Pier length in feet multiplied by 12 (representing inches per foot) and divided by the Chart Scale

- Base Unit in METERS Pier length in meters multiplied by 39.36992 (representing inches per meter) and divided by the Chart Scale

    - **EXAMPLE #1A** Pier length 90 feet, Chart Scale 1:40,000 (one inch on the chart representing 40,000 inches on the earth's surface) 90 X 12/40,000 = **0.027 inches** (Pier is not chartable as it is less than the specified lower limit of **0.03 inches**)

    - **EXAMPLE #1B** Pier length 27.43200 meters, Chart Scale 1:40,000 27.43200 X 39.36992/40,000 = **0.027 inches** (Pier is not chartable as it is less than the specified lower limit **of 0.03 inches**)

    - **EXAMPLE #2A** Pier length 125 feet, Chart Scale 1:30,000 125 X 12/30,000 = **0.05 inches** (Pier is chartable as it is greater than the specified lower limit of **0.03 inches**)

    - **EXAMPLE #2B** Pier length 38.10000 meters, Chart Scale 1:30,000 38.10000 X 39.36992/30,000 = **0.05 inches** (Pier is chartable as it is greater than the specified lower limit of **0.03 inches**)

The following graph is provided for quick reference in determining pier lengths. The "Length of Pier in Feet" (ordinate/y-axis) presentation can be converted to meters, as say:

10 feet = 3.0480 meters, 130 feet = 39.62400 meters, etc.

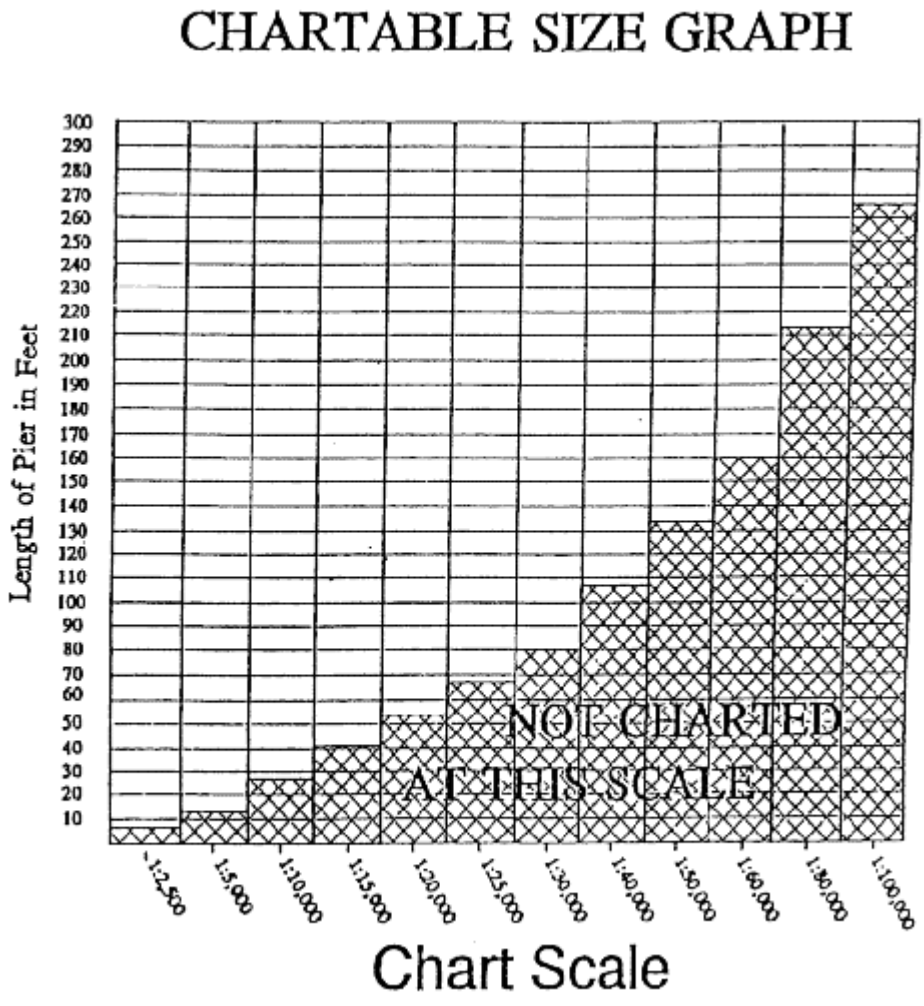
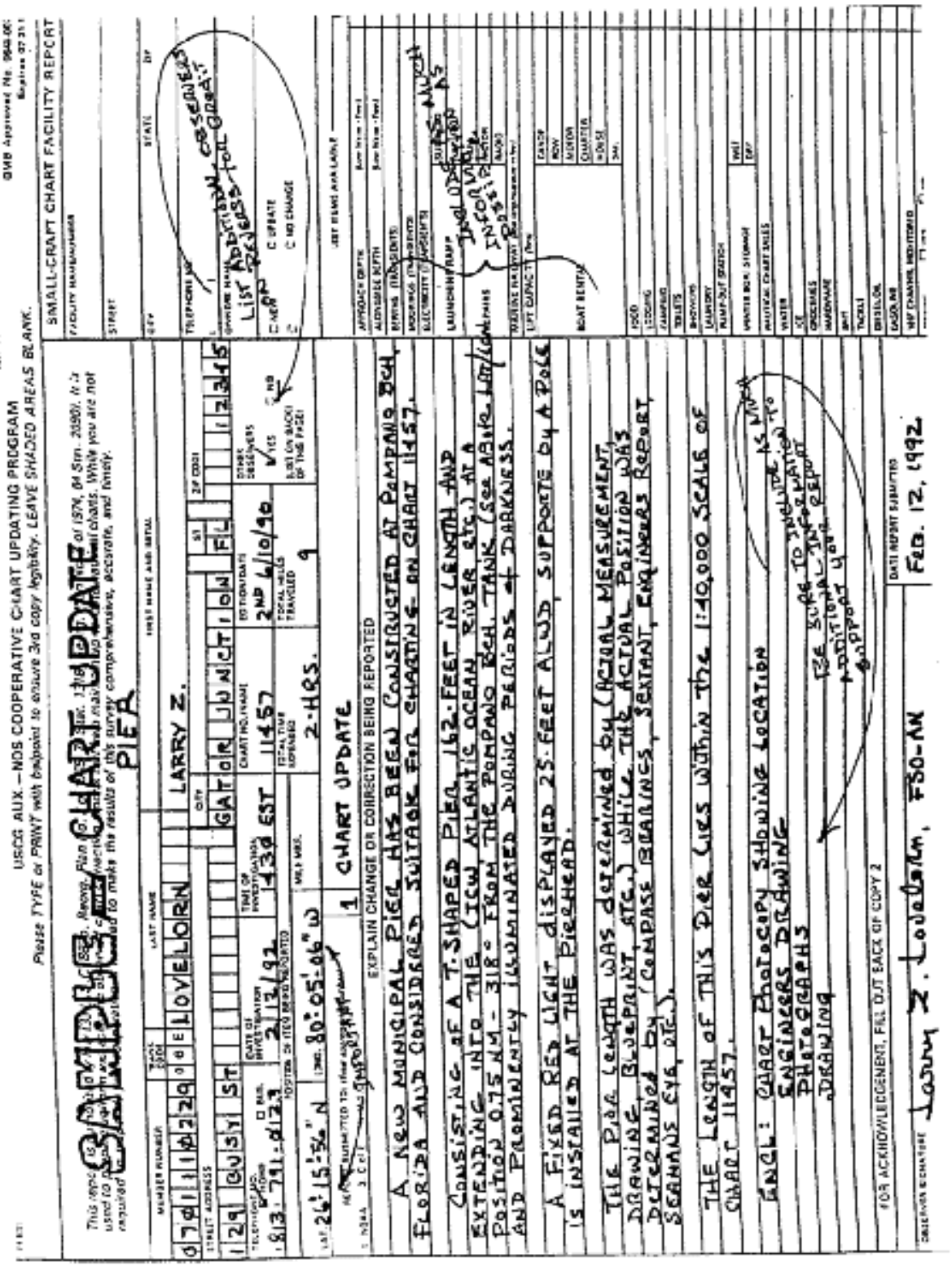
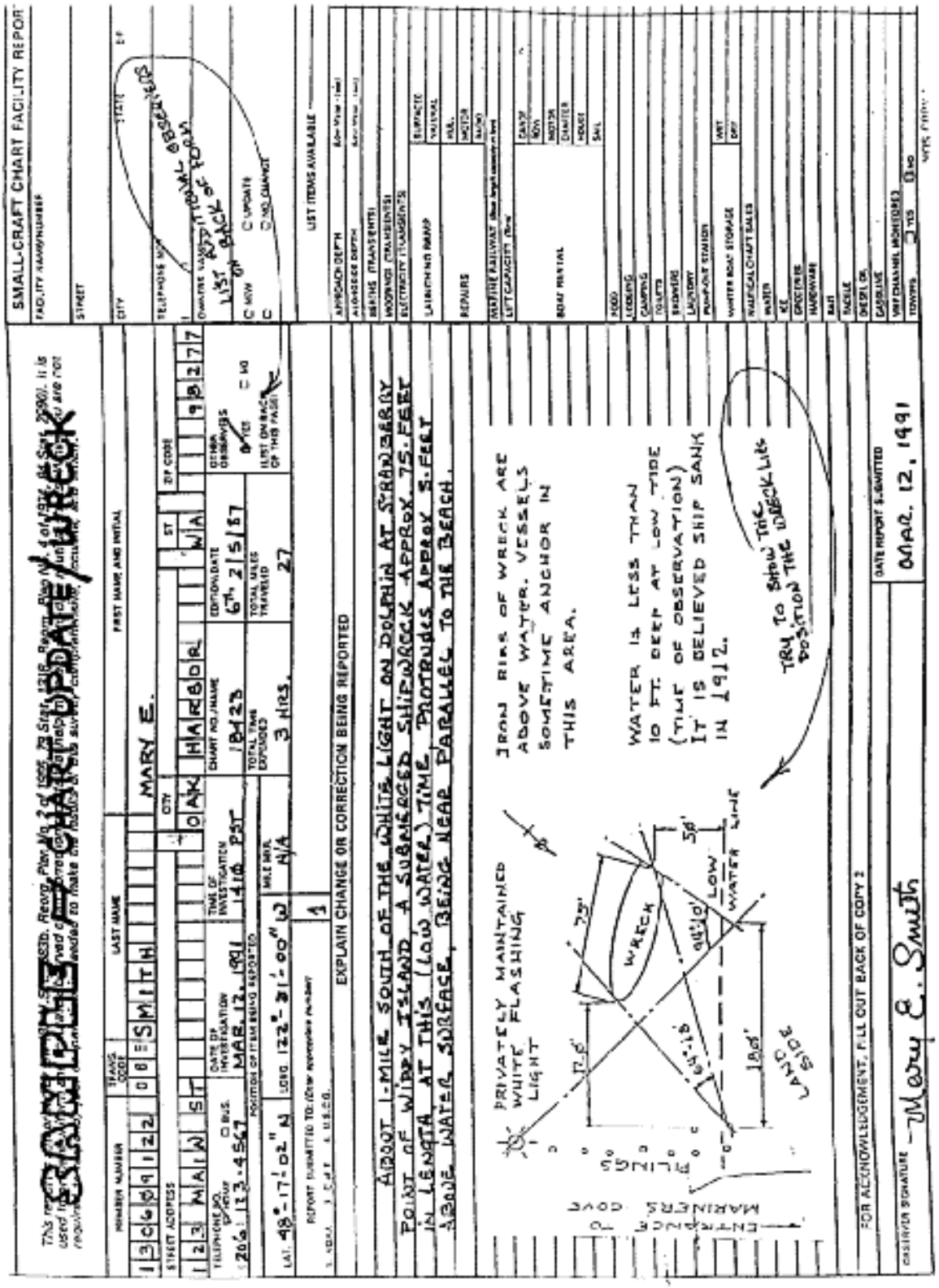


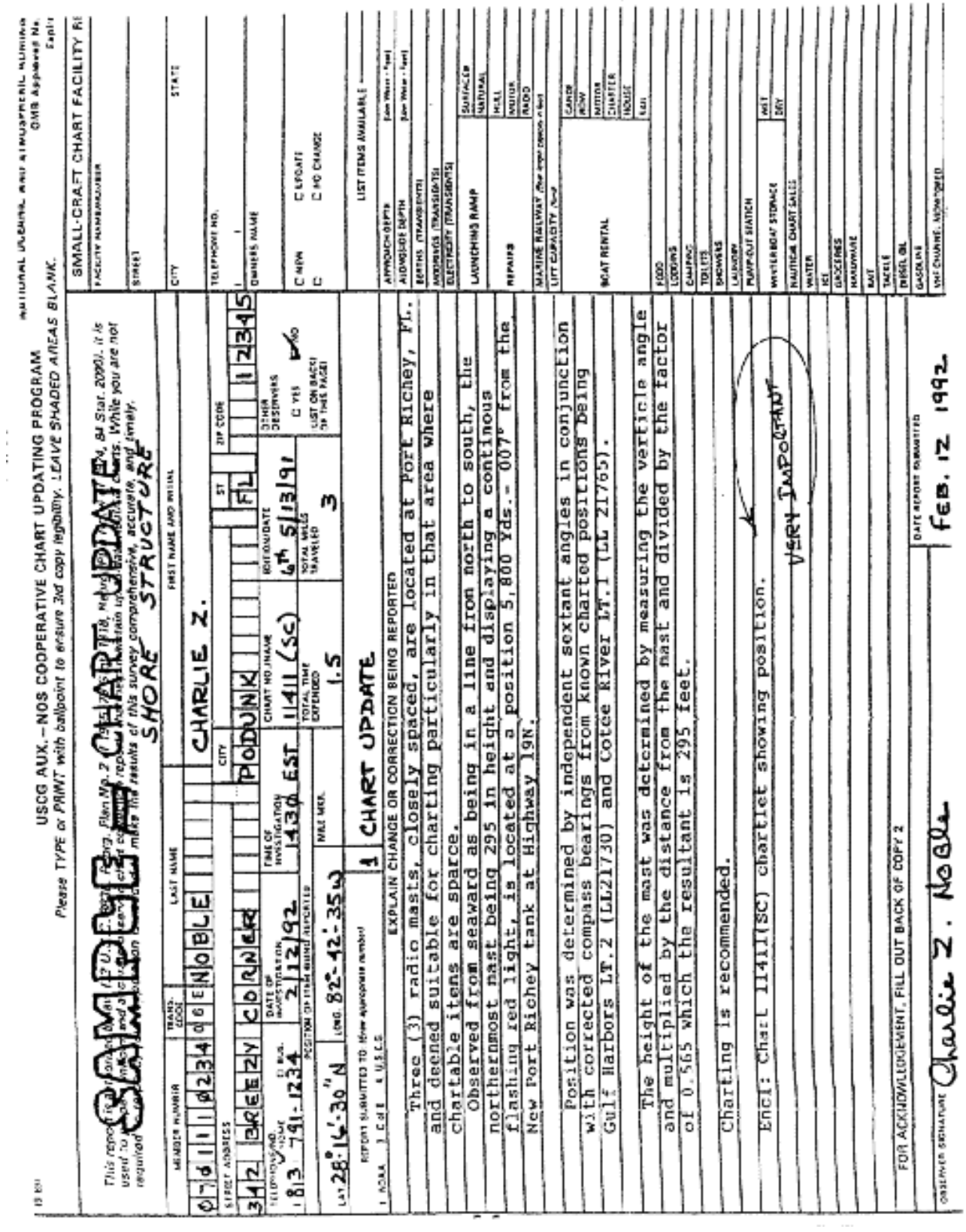
FIGURE 9-1 CHART SCALE RATIO GRAPH



EXAMPLE – CHART UPDATE REPORT (NOAA 77-5) - PIER



EXAMPLE – CHART UPDATE REPORT (NOAA 77-5) - WRECKS



EXAMPLE – CHART UPDATE REPORT (NOAA 77-5) – SHORE STRUCTURE

SECTION X - AERONAUTICAL CHART UPDATING

INTRODUCTION:

The NOS-Charting and Geodetic Services (C&GS), Aeronautical Chart Division rely on user notification of any modifications that may be required to keep AERONAUTICAL CHARTS and other related publications current. In 1978 the Auxiliary entered into a program of AERONAUTICAL CHART UPDATING in cooperation with NOS-C&GS, Aeronautical Chart Division. In consideration of the training and experience of Auxiliary members in NAUTICAL CHART UPDATING activities as part of the ATON/CU Program, the incorporation of the AERONAUTICAL CHART UPDATING program was relatively uncomplicated. Today, AERONAUTICAL CHART UPDATING has become an important responsibility in the Auxiliary ATON/CU Program efforts. Refer to Section IX.

OBJECTIVE:

1. To acquire a general knowledge of the responsibilities of the Auxiliary in AERONAUTICAL CHART UPDATING activities.

2. To become familiar with the characteristics of the AERONAUTICAL CHART UPDATING information to be reported.
   - o The procedures for requisitioning aeronautical charts.
   - o The different types of reportable items.

3. To become familiar with the method of reporting AERONAUTICAL CHART UPDATING information on the NOAA 77-5 form with attachments.

INFORMATION:

Auxiliary aviators may find many opportunities to file reports regarding AERONAUTICAL CHARTS during flights, whether on personal or Auxiliary business. There are numerous types of aeronautical charts, however, of particular interest in ATON/CU Program activities are those used in piloting which depend upon recognizable features on the surface of the earth for positioning. Auxiliary aviators should routinely note any non-standard conditions related to the charts they normally use, i.e., landmarks (natural and man-made features) that are easily recognizable from the air that may have changed or are new to the area covered by the chart. Accordingly, such findings for AERONAUTICAL CHART UPDATING should be reported in the same manner as NAUTICAL CHART UPDATING reports, using NOAA 77-5 forms (refer to Section IX).

In order to conduct AERONAUTICAL CHART UPDATING activities, it is recommended that a copy of NOS-C&GS publication "Aeronautical Chart Users Guide" be obtained through regular chart supply sources. The "Aeronautical Chart Users Guide" provides

a complete listing of aeronautical symbols for identifying chart features and for training.

Unlike nautical charts, aeronautical charts are not numbered, they are primarily characterized by SECTIONAL and TERMINAL areas.

Aeronautical charts are requisitioned in the same manner as nautical charts. For Flotillas which have assigned operational aircraft, aeronautical charts are furnished by NOS specifically for updating purposes and only for the areas normally covered by the Flotilla aircraft. As is the procedure for nautical charts, the Flotilla requests for aeronautical charts are forwarded by the FSO-ANs to the SO-AN for consolidation into a single Division request. The SO-ANs forwards the Flotilla/Division consolidated request to the DSO-AN for review and forwarding to the BC-ONC. The period for such chart requests is from January 1 through May 1 or at other times for specific "special" projects. The turn-around time for Flotilla receipt of charts is approximately eight weeks. Refer to Section VI and Section VII. In certain Coast Guard Districts, requests for aeronautical charts must be approved by the ADSO-Air OP.

There are two types of observations that are made, either AERIAL or AERONAUTICAL as defined below:

a. **AERIAL** - Observation of navigable water from an aircraft for the purpose of comparing actual surface conditions with nautical charts and related publications.

b. **AERONAUTICAL** - Air or surface observation of actual surface (water and land) conditions and comparison with aeronautical charts and related publications. These charts are primarily SECTIONAL and TERMINAL area charts.

REPORTABLE AERONAUTICAL CHART UPDATING ITEMS

UNCHARTED OR IMPROPERLY CHARTED OBSTRUCTIONS	More than 200-feet above ground such as towers, stacks, cooling towers, and bridges. Less than 200-feet above ground, report only those obstructions or features which are a hazard to flight or in approach paths.
INCORRECT OR UNCHARTED AIRPORT/FACILITY DATA	Surface lighting, navigation, facility information (frequency, name identifier, etc.), pilot briefing services phone number), special operations (parachute jumping areas and glider operations).

REPORTABLE AERONAUTICAL CHART UPDATING ITEMS (con't)

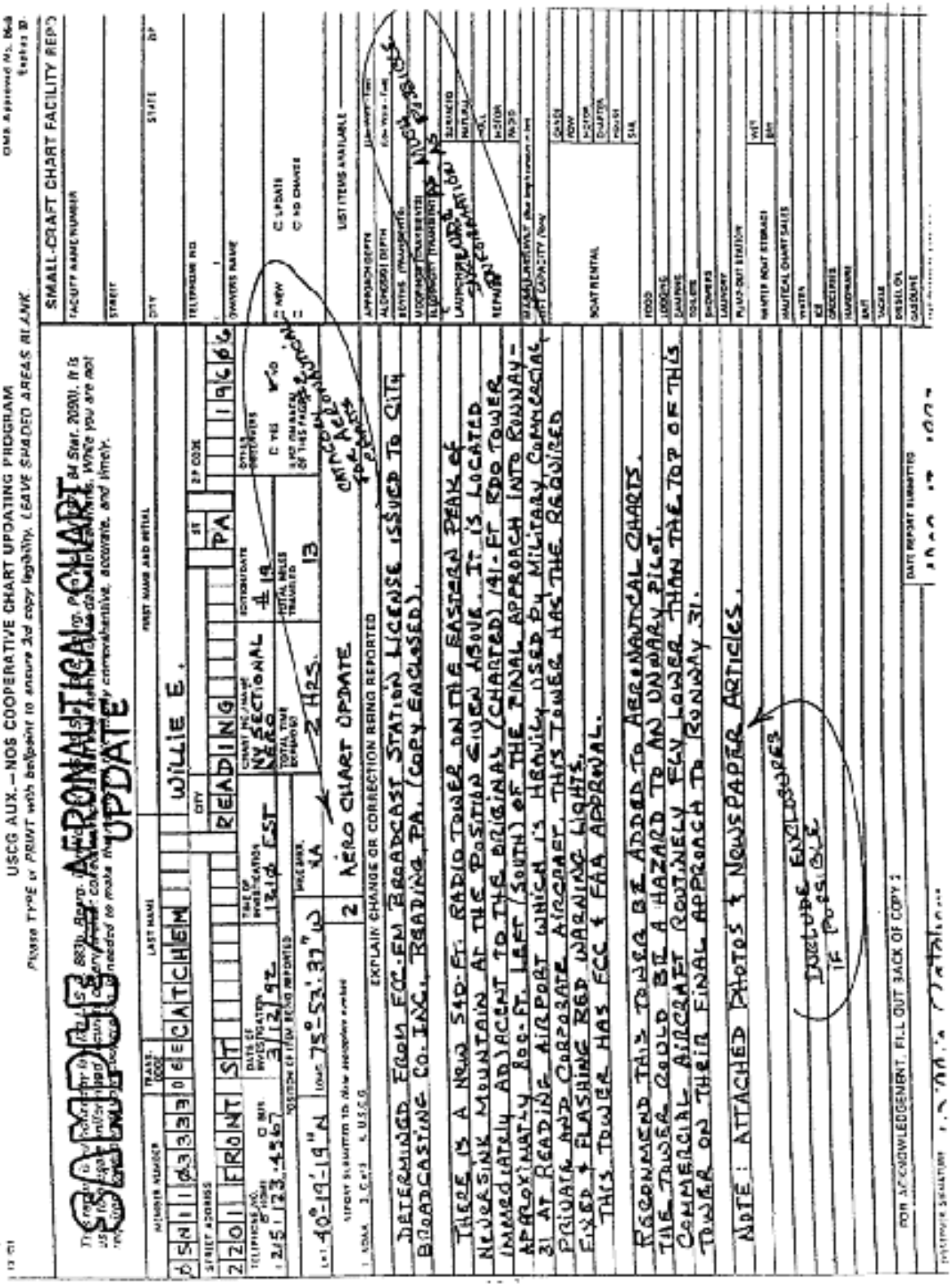
INCORRECT/UNCHARTED LANDMARKS	Such as linear features (major highways, railroads, pipelines), major power transmission lines, mines and quarries, hydrography (major lakes, rivers and dams), outdoor theaters, race tracks, lookout towers, microwave towers, and tank farms.
MARINE RADIO BEACONS	Incorrect or uncharted (include frequency data and characteristics).
INCORRECT OR OMITTED GEOGRAPHIC NAMES	
STRONG MAGNETIC DISTURBANCES	
CHANGES TO SHORELINE PROFILE OR DETAIL	

The purpose of an Auxiliary flight chart updating mission is to conduct aircraft flights over areas charted by NOS, in order to examine, verify and evaluate topographic and aeronautical data. Auxiliary aircraft flight crew duties include indicating corrections and/or changes to charts, recommending addition or deletion of data, and resolving questions raised by the chart compiler that cannot be settled by office review. The chart compiler questions will be furnished through the Auxiliary National Division Chief, Aids to Navigation (DVC-ON) to the DSO-AN upon request. Auxiliary flight checking is usually performed at altitudes of **2,000** to **5,000** feet above the terrain and only during periods of good visibility. The Auxiliary observer must always consider the usefulness of the chart features as seen by a pilot flying at a much lower altitude under minimum visibility. Flights may be conducted at lower altitudes, however the flight commander must observe Federal Aviation regulations while conducting these activities.

The "Meander Traverse System" method of flight checking, i.e., where flights are made along cultural and topographic features such as highways, railroads, drainage, etc., is best used in areas where there is sufficient detail which enables the observer to fix the relative position of the aircraft at all times. The observer should verify all information shown on the published chart. Only corrections, additions, deletions, and/or discrepancies are reported. Special attention should be given to such features as water tanks, railroad round houses and other landmarks which may have been dismantled or destroyed. It is very important that landmarks which are shown on the chart be deleted if they do not exist on the ground or are not prominent enough to have any real value as a landmark. The observer should add new landmarks which aid in positive identification of a certain geographic location.

Reporting procedures for discrepancies, additions and/or deletions to aeronautical charts are the same as for nautical charts. Submit reports on a NOAA 77-5 form with a cutout from the SECTIONAL/TERMINAL chart (preferably a photocopy of the chart section) through the DSO-AN. Mark the top portion of the NOAA 77-5 form, "AERONAUTICAL CHART UPDATE" and indicate in the CHART NO./NAME block of the form the SECTIONAL/ TERMINAL chart name, instead of the chart number as for a nautical chart update.

Auxiliary members and their units submitting NOAA 77-5 reports are awarded credits, refer to Section XII.



EXAMPLE – CHART UPDATE REPORT (NOAA 77-5) - AERONAUTICAL

SECTION XI - COAST PILOT UPDATING

INTRODUCTION:

The United States Coast Pilot published by the NOS-C&GS, is a series of volumes that supplement the navigational data shown on nautical charts. Sources for updating the Coast Pilot include field inspections conducted by NOAA, Notices to Mariners, Governmental agencies, mariners and the Auxiliary. Accordingly, COAST PILOT UPDATING has become an important responsibility in the Auxiliary ATON/CU Program efforts.

OBJECTIVE:

1. To acquire a general knowledge of the responsibilities of the Auxiliary in COAST PILOT UPDATING activities.

2. To become familiar with the characteristics of the COAST PILOT UPDATING information to be reported.
   - o The content of the COAST PILOT.
   - o The different types of reportable items.

3. To become familiar with the method of reporting COAST PILOT UPDATING information on the NOAA 77-5 form with attachments.

INFORMATION:

The Coast Pilot contains information required by the navigator which cannot be graphically illustrated conveniently on standard nautical charts and is not readily available otherwise. The Coast Pilot consists of data pertaining to channel descriptions, anchorages, bridge and cable clearances, currents, tide and water levels, prominent features, pilotage, towage, weather, ice conditions, wharf descriptions, dangers, routes, traffic separations schemes, small-craft facilities, and Federal regulations applicable to navigation.

The Coast Pilot Manual is a NOS-C&GS publication working guide to facilitate the use of the Coast Pilot. It is available to assist in updating the various editions of the Coast Pilot, as may be required.

There are nine volumes of the Coast Pilot, five for the Atlantic Coast, one for the Great Lakes and three for the Pacific Coast. The nine volume series consists of, Coast Pilot:

No.1 Atlantic Coast: Eastport to Cape Cod

No.2 Atlantic Coast: Cape Cod to Sandy Hook

No.3 Atlantic Coast: Sandy Hook to Cape Henry

No.4 Atlantic Coast: Cape Henry to Key West

No.5 Atlantic Coast: Gulf of Mexico, Puerto Rico, and Virgin Islands

No.6 Great Lakes: Lakes Ontario, Erie, Huron, Michigan, Superior, and St. Lawrence River

No.7 Pacific Coast: California, Oregon, Washington and Hawaii

No.8 Pacific Coast, Alaska: Dixon Entrance to Cape Spencer

No.9 Pacific and Arctic Coasts, Alaska: Cape Spencer to Beaufort Sea

New editions of Coast Pilots are published biennially. Writing requirements for updating the Coast Pilot may be found within each edition.

REPORTABLE COAST PILOT UPDATING ITEMS

Aids to Navigation	Anchorages
Areas (to be avoided)	Bars
Basins	Bearing
Breakwaters and Jetties	Bridges
Cables	Channels
Charts	Chart Datum
Chart Symbols and Abbreviations	Clearances
Coast Guard Stations	Colregs
Communications	Construction
Courses and Directions	Currents
Dangers	Datums
Depths	Dumping

REPORTABLE COAST PILOT UPDATING ITEMS (con't)

Ferry Service	Fish Havens
Geographic Names	Harbor Regs
Heights	Ice
Immigration	Landing Places
Language Equivalents	Locks
Magnetic Disturbances	Measured Courses
Measurements	Navigation Regulations
Numerals	Oil Pollution
Parks	Pilotage
Port Discussion	Prominent Features
Quarantine	Racons
Radio beacons	Ranges
Shipping Safety Fairways	Small Craft Facilities
Submarine Features	Supplies
Tides	Time
Vessel Traffic	Weather
Wharves	Wrecks

The NOAA 77-5 form is used for reporting Coast Pilot updating items. Reports should be accurate, brief and presented in standard terminology. Topical entries should be boldfaced. The present Coast Pilot edition can serve as a guide in style and terminology. Corrections should be neatly printed or typed doubled spaced, and referenced by page, line and column of the current edition of the Coast Pilot. It is important to indicate to which edition of the Coast Pilot the corrections are referenced.

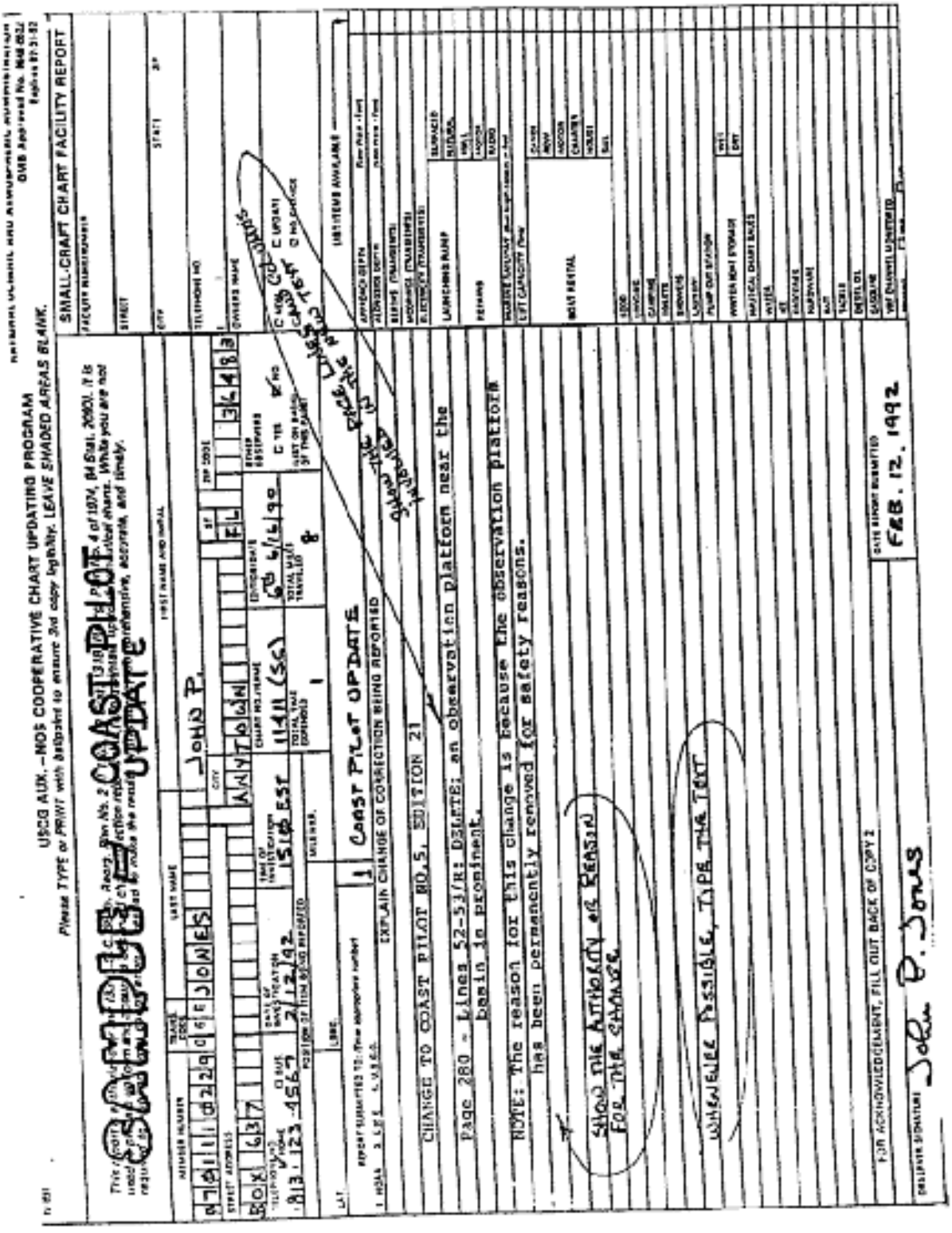
EXAMPLE: To revise lines 12 and 13 on the right hand column of page 103, use the following format:

"Page 103 - Paragraph 123 - Lines 12-13/R; read

When a change is made to an existing line, the entire line must be rewritten, repeating any part of the line that is to remain unchanged and adding the new information. The source of authority of each correction must be entered in parentheses on the line below the correction.

Auxiliary members and their units submitting NOAA 77-5 reports are awarded credits, refer to Section XII.

A sample of a typical Coast Pilot update is shown on the following:



EXAMPLE – CHART UPDATE REPORT (NOAA 77-5) – COAST PILOT

SECTION XII - ATON-CU REPORTS AND PUBLICATIONS

INTRODUCTION:

A primary responsibility of the Auxiliary in the conduct of the ATON/CU Program, is the REPORTING OF FINDINGS. As in most of the other activities in which the Auxiliary participates, there are certain reports that are required for informational and statistical purposes. As such, Auxiliary members who are involved in ATON/CU Program activities must be familiar with the WHAT, WHEN, WHERE and HOW of REPORTING FINDINGS. It should be noted that, the Mission Hour Report is not included in this Section. Upon the completion of the expansion of AUXMIS, a new related Mission Hour Report will be used to input ATON/CU activity.

OBJECTIVE:

1. To acquire a general knowledge of the types, characteristics and purposes of the required forms for reporting ATON/CU PROGRAM FINDINGS, and other associated ATON/CU forms.

2. To become familiar with the procedures used in the completion of ATON/CU REPORTS.

3. To become familiar with the distribution of ATON/CU REPORTS.

INFORMATION:

There are two principal forms for reporting the resulting findings from ATON/CU Program activities. These two forms are the CG-5474, "Aids To Navigation Report" [or, as applicable, the District (oan) "ATONIS" aids database form] for reporting aids to navigation associated data, and the NOAA 77-5, "USCG AUX - NOS Cooperative Chart Updating Program" for reporting chart and related publication updating associated data.

The CG 5474 form [or the District (oan) "ATONIS" aids database form] provides information to the respective Coast Guard District (oan) with regard to "DISCREPANCIES" on ATONs and PATONs, "CHECKED" ATONs, and the "VERIFICATION" of PATONs. The information submitted on a CG-5474 discrepancy/verification report should be concise, definitive and accurate, as it provides an audit trail for corrective actions. This is of primary importance when a discrepancy is being reported for an aid which is "**not watching properly**." Moreover, such documentation may assist in the event any litigation occurs where a "CHECKED"/"VERIFIED" aid is involved. Once a discrepancy on an aid to navigation has been reported via Radio, Telephone or Mail and followed-up with a distributed CG-5474 and/Notices to Mariners by the Coast Guard via Broadcast or published in the USCG District Local Notice to Mariners or DMAHTC Weekly Notice to Mariners, no further reporting is

necessary. Refer to Sections II, III, IV, V and XIV.

The NOAA 77-5 form provides information to NOS for the possible modification of charts and other nautical/aeronautical publications. The information submitted as part of a NOAA 77-5 updating report should be concise, definitive and accurate, as it may involve permanent changes to a particular chart or publication. It is important to note that, erroneous data submitted on a NOAA 77-5 and subsequently published in nautical/aeronautical documents could result in catastrophic occurrences. An important element in submitting the NOAA 77-5 is to include the method used in determining the item that is being reported, and, as appropriate, chart sections, drawings, and photographs (all with LAT/LON designations). This type of data contributes towards the possibility of the update being accepted as a change to a publication, and may result in additional reporting credits for the Auxiliary member and unit. Independently developed and submitted updating reports, by different Auxiliary members, concerning the same item are permissible. Such independent redundant reporting provides additional input to NOS for a determination of the validity of the update. Refer to Sections VI, IX, X and XI.

All acceptable NOAA 77-5 reports received from Auxiliary members are awarded credit units which are reported in AUXMIS on a monthly basis and counted towards National awards in the following manner:

PERSON..... With the greatest number of CU items submitted (NOAA 77-5)

PERSON..... With the greatest number of reporting credits (NOAA 77-5)

FLOTILLA ..... With the most members submitting NOAA 77-5 reports

DISTRICT ..... With the most members submitting NOAA 77-5 reports

DISTRICT ..... With the greatest number of reporting credits (NOAA 77-5)

All CG-5474 and NOAA 77-5 reports must be submitted to the respective addressees via the AN Staff Officer chain, i.e., FSO-AN, SO-AN, DSO-AN. Reports that are illegible, duplicates of other reports or those that are NOT submitted through the DSO-AN, will not receive credits toward awards. Both CG-5474 (Stock No.7054) and NOAA 77-5 (Stock No. 7037) forms may be requisitioned by the FSO-MA from regular material sources at ANSC.

Until AUXMIS is expanded, the DSO-ANs will be required to maintain a District manual tally of AN activity - awarding one point for each ATON or PATON discrepancy reported, each PATON verification reported, and specific USCG requested "CHECKED" ATONs reported. At the end of the reporting year, November 30, each DSO-AN will advise the DVC-ON of the their District's "highest" reporting individual, Flotilla and Division. From this tally data, the DVC-ON will prepare awards for each category for each District and forward to the District Commodore for presentation. Additionally, the DVC-ON will submit the "top" award for each category for presentation at the National Conference.

Other publications normally referred to in ATON/CU Program activities along with the

obtaining source follow:

ATON/CU MANUAL (NOS/CGS)	Requisitioned by FSO-MA from ANSC.
CHART No.1	Procure locally from chart distributors.
NAUTICAL CHARTS	Requested by each Flotilla that agrees to submit ATON/CU reports. Submit requests for only large scale (1:40,000 or larger) via FSO-AN, SO-AN, DSO-AN to BC-ONC. Order period: January 1 to May 1 (approximately eight week turn-around time)
AERONAUTICAL CHARTS	For Flotillas which have assigned operational aircraft - same requisition procedure as for nautical charts.
COAST PILOT	For Flotillas that agree to update the Coast Pilot. FSO-AN, SO-AN or DSO-AN, reproduce the applicable pages.
COAST PILOT MANUAL	Issued on request by DVC-ON as available.
LIGHT LISTS	Limited supply provided to DSO-AN by DVC-ON. FSO-AN, SO-AN or DSO-AN, reproduce the applicable pages.
TIDE TABLES	Not an issue item.

The following forms are also available from DVC-ON through the DSO-AN (subject to change or cancellation).

DVC-ON	101-77	Transmittal Notice of Reports
DVC-ON	101-84	ATON Shirt Pocket Guide
DVC-ON	102-77	ATON/CU Report for AN Staff Officers
DVC-ON	103-77	Monthly Activity Report
DVC-ON	107-77	ATON Check-Off List

NOTE: Computerized local versions are authorized containing the same format and information.

SECTION XIII- CHART UPDATING MISSION/PATROL PLANNING

INTRODUCTION:

An Auxiliary ATON/CU Program CHART UPDATE MISSION or PATROL, including "multi-mission", has a specific purpose and a desired outcome For example, a scheduled safety patrol may involve hours of inactivity without a SAR case, while a CHART UPDATE MISSION or PATROL will have a specific task, i.e., charting of a new object or survey of a new marina. It is for this reason that extensive proactive planning should be accomplished before a CHART UPDATE MISSION or PATROL begins.

OBJECTIVES:

1. To acquire a general knowledge of the responsibilities of the Auxiliary in CHART UPDATE MISSION/PATROL planning.

2. To become familiar with how to select items for a CHART UPDATE MISSION or PATROL.

3. To become familiar with proactive planning of a CHART UPDATE MISSION or PATROL.

INFORMATION:

The planning of any activity begins with the establishment of the objective. For an UPDATE MISSION or PATROL, this planning consists of activities such as the identification of a new structure, verification of the position of a listed structure, survey of a marine facility, etc. In this connection, it is important to note that a "Surface" CHART UPDATE PATROL is done underway and is reported under type 03 on the ANSC 7030, Activity Report-Mission (for AUXMIS); an "Air" CHART UPDATE PATROL is reported as AIR OPERATIONS MISSIONS type on the ANSC 7030 Activity Report-Mission; and a CHART UPDATE MISSION is done ashore and is reported under Mission type 41 on the ANSC 7030, Activity Report-Mission. Also, all chart update patrols must be a minimum of four hours in duration.

For planning purposes, the following time factors can be use to determine how much activity should be scheduled:

a. Location of a structure such as a building, tank, or aid that is new or for verification - 1.5 hours, not including positioning and de-positioning time.

b. Marina/facility survey - 1 to 2 hours, not including position and de-positioning time

NOTE: Underway positioning and de-positioning time is counted as "HOURS ON MISSION" for a Mission type 03 "Surface" CHART UPDATE PATROL or AIR OPERATIONS MISSIONS type "Air" CHART UPDATE PATROL.

Proactive planning is essential for the accomplishment of an effective and efficient chart update mission or patrol. (Otherwise, to start a chart update mission or patrol without extensive preplanning would be like going to the grocery store without a shopping list, sufficient money, checkbook or credit cards to pay for any items that might be purchased.) As such, before a chart update mission or patrol is started, a review of the mission/patrol area must be conducted to determine what structures, aids or facilities will be surveyed. This area review should be an ongoing process that is accomplished by the participating Auxiliary members during safety patrols or recreational outings with the information passed to the FSO-AN. The FSO-AN can then evaluate the data and assign specific objectives to be accomplished during the chart update mission or patrol. The evaluated information is then utilized in the conduct of the chart update mission or patrol.

The criteria for the selection of an item for a chart update by the FSO-AN are subject dependent. As such, pertinent questions are:

a. Is it a permanent item?

b. Will the item be used for navigation?

c. Is the item a hazard to navigation

d. Can the item or its location be easily identified by a mariner?

If the answer to any one of the above questions is yes, and the vital information concerning the item is not shown on the current chart of the area or in related publications (Coast Pilot, etc.), then the item should be surveyed and the information reported to NOS on a NOAA 77-5.

When the specific objects/features have been determined and the mission or patrol assigned, the next step is for the crew to determine how the chart update objectives/tasks will be accomplished. This analysis is done before the mission or patrol begins, utilizing the current chart that shows the greatest detail. This is where the crew determines what angles wilt be taken to determine the position of the subject objects/features. It is important, when planning what angles are to be taken, to review the criteria for a strong fix (refer to Section VIII). Pertinent chart update mission or patrol preplanning questions are:

a. What tools and instruments will be required?

b. What will the weather conditions be during the time of the planned mission or patrol, i.e., wind, precipitation, visibility, etc.?

c. What objects will be used for the sightings?

d. Will the charted items used for the sightings need to be checked for accuracy or can their location be assumed correct?

e. What procedures will be used to verify the results (sightings from another location, check angles, photographs, LORAN, GPS, etc.)?

f. Where is the best position to take angles or bearings?

g. For Surface operations:

(1) What is the maximum wave action that will allow acceptable results?

(2) What is the maximum leeway or current that allow acceptable results?

SECTION XIV - INLAND AIDS TO NAVIGATION

INTRODUCTION:

Included in the responsibility of the Auxiliary ATON/CU Program is familiarization with INLAND AIDS TO NAVIGATION. This ATON/CU Program element is conducted similarly to the ATON/CU Program elements as indicated in the respective preceding Sections. It is an all inclusive program responsibility, consisting of reporting discrepancies on ATONs, "CHECKING" ATONs as directed, the verification/discrepancy reporting on PATONs, and chart updating for INLAND WATERWAYS. The Auxiliary assist the Coast Guard and the U.S. Army Corps of Engineers in the accomplishment of this important mission. In order to perform the tasks associated with this mission, participating Auxiliary members must be familiar with the physical characteristics and functioning of INLAND AIDS TO NAVIGATION (shape, color(s), identification, size, lights, attachments, etc.).

OBJECTIVE:

1. To acquire a general knowledge of the characteristics and functioning of INLAND AIDS TO NAVIGATION, and the responsibilities of the Auxiliary in the reporting the status of INLAND AIDS TO NAVIGATION.

2. To become familiar with the variations to the U.S. Aids to Navigation System.

3. To become familiar with the Intercoastal Waterway (ICW), the Western Rivers System and the Uniform State Waterway Marking System (USWMS).

INFORMATION:

As previously stated in Section II and otherwise, "To assist in navigation, the waterways of the U.S. are marked by the U.S. Aids to Navigation System." Now, the exception is, the INLAND WATERWAYS of the U.S. are marked by INLAND AIDS TO NAVIGATION in variation to the U.S. Aids to Navigation System. INLAND AIDS TO NAVIGATION consists of aids located on or adjacent to the INLAND WATERWAYS of the U.S. These INLAND AIDS TO NAVIGATION are characterized by the category of the INLAND WATERWAY for which they are associated with, i.e., the "Intercoastal Waterway" (ICW), the "Western Rivers System" or the "Uniform State Waterway Marking System" (USWMS). The Aids to navigation of the ICW and Western Rivers System are similar in characteristics and functioning as those of the U.S. Aids to Navigation System. with variation. The aids to navigation of the USWMS are significantly different than those of the U.S. Aids to Navigation System. These variations/ differences are:

- **INTERCOASTAL WATERWAY (ICW)**

a. The ICW consists of a combination of natural and man-made/man-enhanced waterways, traversing parallel to the Atlantic and Gulf coasts of the U.S. from Manasquan Inlet, New Jersey to the Texas/Mexican border.

b. **The direction of buoyage in the ICW is generally southerly along the Atlantic coast and Westerly along the Gulf coast, unless otherwise indicated**. (RED MARKERS ON RIGHT when heading South or West.)

c. All ICW aids to navigation have a YELLOW marking to distinguish them from aids marking other waterways. Otherwise, ICW aids have the same characteristics and functioning as those of the U.S. Aids to Navigation System. The characteristics and functions of the ICW YELLOW marked aids are:

(1) Yellow Triangle - indicates aids should kept to the starboard/right-hand of the passing vessel.

(2) Yellow Square - indicates aids should kept to the port/left-hand of the passing vessel.

(3) Yellow Horizontal Band - has no lateral significance, indicates aids which mark the ICW.

d. When the ICW route is congruous with a major waterway, e.g., from Cape May (Light), New Jersey to Norfolk, Virginia - the Delaware Bay/Chesapeake and Delaware (C&D) Canal/Chesapeake Bay inside route, or Delaware/Maryland/ Virginia coasts outside route, the buoyage system will be that of that waterway without the special ICW YELLOW marks.

- **WESTERN RIVERS SYSTEM**

a. The Western Rivers System consists of the Mississippi, Ohio, Missouri, Illinois, Tennessee, Cumberland, Arkansas and White Rivers and their tributaries, and certain other rivers that flow towards the Gulf of Mexico. More than 14,000 aids to navigation mark these waterways.

b. **The conventional direction of buoyage is considered upstream or towards the head of navigation.**

c. Aids to navigation are placed to mark "SAFE WATER" and follow the depth curve, i.e., subject to frequent relocation due to changes in river paths and/or conditions As such, aids are **not position with respect to latitude/longitude.**

d. Floating aids to navigation, due to small size and type of sinker, and the characteristics of the river, may be placed using the "kick and splash" method.

e. Seasonal changes, i.e., ice conditions, flooding, etc., dictate constant requirements to place and remove aids to navigation. This situation requires more frequent verification of such aids.

f. Characteristics and functioning of aids to navigation similar to the U.S Aids to Navigation System are:

(1) Special Marks ("Yellow").

(2) Information and Regulatory Markers.

(3) Range Daymarks.

(4) Daymarks having no lateral significance.

g. Distinct characteristics and functioning of aids to navigation in variation to the U.S Aids to Navigation System are:

(1) Aids are **not number for lateral significance**. Due to the constant relocation of aids to mark "SAFE WATER, " it is not practical to number an aid for lateral position each time it is placed.

(2) **"Mile Boards"** (12 inch by 36 inch horizontally mounted board**) are marked with numbers indicating mileage** from a fixed point - normally from the mouth of a river or the headwater of a stream.

(3) **No "Red and White"** (Safe Water) aids used.

(4) **Isolated Danger** marks are not used.

(5) **"Green"** aids indicate **port-side or right-descending bank** - lights may be **green** or **white** and show a single-flash characteristics.

(6) **"Red"** aids indicate **starboard-side or left-descending bank** - lights may be **red** or **white** and show a group-flash characteristics.

(7) **Diamond shaped "Green" or "Red" "Crossing Dayboard"** aids indicate where the river channel crosses from one bank to the other - channel change.

(8) **Rectangle shaped "Green" or triangle shaped "Red" "Passing**

Dayboard" aids indicate passing lanes.

h. Other data pertaining to the Western Rivers System:

(1) Distances, usually in statue miles, are displayed on 12 inch by 36 inch horizontal Mile Boards attached to fixed aids to navigation (beacons - daymarks and lights). Otherwise, these Mile Boards are attached to landmarks, i.e., bridges, islands, overhead power-lines, etc. On all Western Rivers except the Ohio River, Mile Boards mark the distance beginning at the mouth of the river. On the Ohio River, Mile Boards mark the distance beginning at the headwater.

(2) Position is determined from reference to mile markers, landmarks, and/ or fixed aids to navigation. In this connection, it is important to know that, floating aids to navigation (buoys) are not used for position determination.

(3) Dead reckoning can be accomplished similarly as in coastal piloting, using the time-distance-speed calculations. Cognizance should be given to the particular over-the-bottom-speed characteristics of the waterway, i.e.,wind, current, debris, visibility, etc.

- **UNIFORM STATE WATERWAYS MARKING SYSTEM (USWMS)**

a. The USWMS supplements the existing Federal aid to navigation marking system on INLAND WATERWAYS. It includes lakes and other inland waterways that are not depicted on nautical charts.

b. **The conventional direction of buoyage is considered upstream or towards the head of navigation.**

c. Distinct characteristics and functioning of aids in variation to the U.S Aids to Navigation System are:

(1) Lateral system aids (buoys):

(a) **"Black Can"** (being converted to Green) - odd numbered, may show Green reflector or light - marks port-side looking upstream.

(b) **"Red Can"** - even numbered, may show Red reflector or light - marks starboard-side looking upstream.

(2) Other significance aids (buoys) - may shown White reflector or light:

(a) **"Black-horizontal top-band White Can"** (being converted to Green) - may be numbered (odd) - represents an obstruction - pass to north or east of buoy.

(b) **"Red-horizontal top-band White Can"** - may be numbered (even) - represents an obstruction - pass to south or west of buoy.

(c) **"Red-vertical stripped White Can"** - indicates an obstruction between the buoy and the nearest shore.

(3) Mooring Buoy - **"Blue-horizontal mid-band White Can"** - may show a slow flashing white light.

(4) Regulatory Markers - **"Orange"** marking on **"White"** background with **"Black"** lettering - may be lettered, may show a white light.

- CHARTING:

a. The Western Rivers are charted by the Corps of Engineers. Some of these Western Rivers area charts may be revised and published annually, other may be revised less frequently.

b. Other navigable INLAND WATERWAYS are charted, as the case may be, by NOS.

c. Some INLAND WATERWAYS are not charted.

d. River charts, are simple easy to use "line-drawn maps" that, illustrate the principal geographic features of the waterway and prominent man-made objects, and aids to navigation and channel or sailing lines. Unlike coastal charts, only landmarks/objects/structures in the immediate proximity of the waterway banks are shown on the chart. River charts do not necessarily indicate the geographical names for areas along the bank. As such, a general Road-Map of the area would serve as a useful supplement, providing names of local areas, road routes, etc. Also, topographical type maps provide essential terrain detail along the waterway.

NOTE: POLYCONIC projection is used for INLAND WATERWAY charts (refer to Section VII).

- **ATON/CU PROGRAM - REPORTING OF ACTIVITIES:**

1. ICW: No change from reporting for U.S. Aids to Navigation System - CG-5474 and NOAA 77-5 forms.

2. WESTERN RIVERS SYSTEM: As specified by the respective Coast Guard District - CG-5474 and NOAA 77-5 forms, and/or specific reporting formats.

3. USWMS: As specified by the respective Coast Guard District - CG-5474 and NOAA 77-5 forms, and/or specific reporting formats.

Auxiliary members and their units are awarded points for submitting CG-5474 or specific District AN form reports for ATON/PATON activities, and are awarded credits for submitting NOAA 77-5 reports for CU activities, refer to Section XII.