AIDS VERIFIER

PROFESSIONAL QUALIFICATION
STANDARD
Housekeeping Announcements

• Restroom facilities
• Breaks
• Exits
• Mute Cell Phones
• Ask questions but avoid side-bar discussions
• I will email you these slides
Introductions

• Name
• Division/Flotilla/AOR
• Primary Position
• Background
• Experience with ATON/Navigation/Quals
• What do you want to get out if this course
United States Coast Guard Auxiliary
Fifth District Northern Region

Divisions & Flotillas
Eastern Area: Divisions 7, 8, 16 & 18
Central Area: Divisions 1, 4, 12 & 17
Western Area: Divisions 15, 19, 20 & 21
AV Qualifications

- Complete the PQS
- Complete initial RMS-TCT
- Attend annual RMS-TCT
- Attend annual operations workshop
- Attend any mandatory District AV workshops
- Do NOT have to be coxswain or boat crew
- Do NOT have to have completed ACN
This Course

• This is a 101 course
  – Introduction
  – Assumes you know nothing
  – Gives you enough info to decide if interested in continuing
  – Gives you enough knowledge to get the dockside PQS signed off
Objective

• Qualify Auxiliarists as ATON Verifiers (AV).
  – Support and augment the Coast Guard’s navigation systems (NS) program.
  – Verify position and characteristics of private aids-to-navigation (PATON), after qualifying
  – Note that we do NOT verify Federal ATON
  – May assist and support aids-to-navigation (ATON) units in servicing Federal aids after receiving proper Coast Guard training.
Objective

– AUX may also help the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Army Corps of Engineers (USACOE)
  • by updating nautical and aeronautical charts and publications,
  • by supporting and augmenting bridge surveys,
  • by investigating incidents and
  • by providing information regarding waterways safety and navigation situations pertaining to the bridge program, and providing direct assistance and support to bridge program personnel.
Aids Verifier

Primary Objectives for AVs is to become familiar with the following:

• The PQS for Aids-verifier.
  • All references pertinent to verifying an aid
• Use of the new EXCEL forms; “7054" for checking buoys and fixed atons / patons, and “7055” for bridges, duties after patrol, and where to send forms.
• Use of the 7030 form for patrol credit and verifying credit for "AV". Categories 03 for Patrols, 31,32, 33 for ATONs, PATONs and Bridges, respectively & 41 for other Agency support.
What is Verified

• Watching Properly: The observed structure matches the chart or the light list description
  – Position
  – Color
  – Shape
  – Characteristic

• Discrepant: The observed structure does not match the chart or the light list description
Aids Verifier

Auxiliary Aid to Navigation (ATON) Verifier Performance Qualification Standard

MAJOR TASKS To Be COMPLETED

• Task No   Major Tasks
• 1.0   Charts and Nautical Publications
• 2.0   US Aids to Navigation System
• 3.0   Private Aids to Navigation (PATON)
• 4.0   Aids to Navigation Discrepancies
• 5.0   Private Aids to Navigation (PATON) Documentation Application Form CG2554; IATONIS
• 6.0   Bridges
• 7.0   Private Aids to Navigation (PATON) Certification and Currency Maintenance

Revision Date: 14 July 2011
Task 1.0 Charts and Nautical Publications

• Objectives
  – Chart 1
  – Coastal Pilot, Vol 3
  – Light List, Vol II
  – LNM
  – Charts 12304 12311, 12312, 12313, 12314 describe Delaware Bay to Trenton (Note: NOAA Booklets Available on-Line and cover the coast and local areas)
  – Tide tables/Tide Predictions –
    http://tidesandcurrents.noaa.gov/ or “Tides and Currents”
Chart No. 1

- Purpose is to help you translate a nautical chart.

- Standard conventions for all charts
  - Listed in Chart No. 1
  - On Line
Chart No. 1

General

Topography
   Above the surface

Hydrography
   Below the surface

Aids/Services
   Help to the mariner
Chart Features

- Chart No. 1 – Section & Title
- Hydrographic source(s)
- Chart title
- Projection & scale
- Notes
- Cautionary notes
- Inset
- Source data diagram
- Chart number in national series
<table>
<thead>
<tr>
<th>Cultural Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ruins, Ruined Landmark</td>
</tr>
<tr>
<td>Motorway</td>
</tr>
<tr>
<td>Road (hard surfaced)</td>
</tr>
<tr>
<td>Track, Path (unsurfaced)</td>
</tr>
<tr>
<td>Railway, with station</td>
</tr>
<tr>
<td>Cutting</td>
</tr>
</tbody>
</table>
D – Cultural Features

- Fixed Bridge
- Opening Bridge
- Swing Bridge
- Lifting Bridge
- Draw Bridge
- Transporter Bridge
- Power Transmission Line
E - Landmarks

- **Tank**
  - CAPITOL DOME
  - WORLD TRADE CENTER

- **Spire**
  - SPIRE

- **Cupola**
  - CUPOLA

- **Tower**
  - TOWER

- **Standpipe Water Tower**
  - STANDPIPE
  - WTR TR

- **Specific Landmark**
  - CHIMNEY
  - TV TR
  - R TR
  - RADAR MAST
  - DOME (RADAR)
  - TANK
  - SILO

- **Other Landmarks**
  - Chimney
  - TV or Radio Tower
  - Radar Mast
  - Radome
  - Tank
  - Silo
  - Grain Elevator
H – Tides, Currents

**Tidal Levels and charted Data**

- **MHHW**: Charted clearance, vertical
- **MHW**: Planes of reference are not exactly as shown below, for all charts. They are usually defined in notes under chart titles.
- **MSL**: Charted height
- **MLW**: Land survey datum
- **MLLW** (CD): Charted NW (coast) line
- **Height of tide**: Charted LW (drying) line
- **Observed depth**: Drying height
- **Sea surface at any time**: Depth Datum
- **Charted depths**: Tidal Range
- **Clearance Datum**: Tide gauge
I - Depths

Depth Soundings at true position [vertical numbers]

Soundings which are unreliable or taken from smaller-scale chart [sloping numbers]

SOUNDINGS

Least depth in Narrow channel [number in parentheses]

No bottom at depth shown

Drying heights above chart datum (green) [number is underlined]
K - Rocks

Charting conventions for bare rocks, rocks that cover and uncover (drying rocks), rocks awash at the level of the low-water datum, and rocks below the level of the low-water datum.
K - Obstructions

Obstruction depth unknown

Obstruction least depth known (sounding)

Obstruction least depth known (swept)

Stumps, Piles all or part time submerged

Submerged Piles etc. – exact position

Fishing stakes

Fish Traps, Weirs, tunnys

Fish Traps, etc, area

Fish haven or artificial reef

… minimum depth

Shellfish cultivation

Obstruction

Fish haven (actual shape)

Obstruction (fish haven)

Obstruction (Auth min 42ft)

Fishing stakes

Stumps

Deadhead

Submerged piles

Stakes, Perches

Shellfish cultivation

Obstructions

Fish haven

Obstruction

Obstruction

Obstruction

Obstruction
M – Tracks, Routes

Direction of Flow
- recommended

Separation Line

Direction of Flow
- mandatory

Maritime Limit

Restricted Area

Roundabout
Q – Buoys & Beacons

- Green & black [unlighted]
- Single colors [unlighted]
- Multiple colors [horizontal bands]
- Multiple colors [vertical stripes]
- Lighted marks [on standard charts]
Horizontal Datum

- Base line or plane from which measurements are made.
- World wide Geodetic Survey
- Calculated tides
- Datum for water depth is important.
  - East coast has two tides very similar.
  - West coast has two tides of uneven depth.
  - Standard is mean lower low water (MLLW).
  - Former standard was mean low water (MLW).
Charts

• NOAA
• Available from marine stores or on line
• Full size or booklet
• Paper charts are going away
Charts

- Longitude
- Latitude
- Nautical mile scale
- Depth curves
- Title block
- Vertical datum
- Compass rose
- Symbols for ATON
- Lighted vs. unlighted
- Nominal range of lights
- Private Aids
- Wreck
- Range
Charts
Latitude and Longitude
Nautical Mile Scale
Depth Curves
Title Block

UNITED STATES - EAST COAST
MASSACHUSETTS
SALEM AND LYNN HARBORS

Mercator Projection
Scale 1:25,000 at Lat. 42° 29'
North American Datum of 1983
(World Geodetic System 1984)
SOUNDINGS IN FEET
AT MEAN LOWER LOW WATER

Additional information can be obtained at nautical/charts.noaa.gov.
Compass Rose
Aids, Lighted, Nominal Range, Wrecks, Ranges
Charts
Summary

• Charts are your resource for key information
  • Navigable waterways
  • Ports
  • Channels
  • Hazards
  • Depths
  • Bottom conditions
  • Direction and Distance
  • Landmarks for reference
  • Navigation Aids
  • Restrictions & regulations
  • Information
The Four R’s for Charts

RECENT

RIGHT SCALE

READILY AVAILABLE

REVIEWED BEFORE SAILING
Light List

• Every aid in the AOR
• Available on line
• Divided into geographic areas
• Print out the section that covers your AOR
<table>
<thead>
<tr>
<th>MC</th>
<th>Light Name</th>
<th>Latitude</th>
<th>Longitude</th>
<th>Range</th>
<th>Color</th>
<th>Symbol</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>261</td>
<td>Cape Henlopen</td>
<td>38° 10' 0&quot;</td>
<td>75° 15' 0&quot;</td>
<td></td>
<td>Green</td>
<td>1</td>
<td>Reduced by 1/10 mile.</td>
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<td></td>
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<td></td>
<td></td>
<td>Fusion Point, 2 miles SSW of Cape Henlopen, 27° 9' 30&quot; W.</td>
</tr>
<tr>
<td>262</td>
<td>Delaware Break</td>
<td>38° 16' 0&quot;</td>
<td>75° 13' 0&quot;</td>
<td>3.5</td>
<td>Green</td>
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LIGHT LIST

- Column (1): Light List number.
- Column (2): Name of the aid to navigation.
- Column (3): Geographic position of the aid to navigation in latitude and longitude.
- Column (4): Light characteristic for lighted aid to navigation.
- Column (5): Height above water
- Column (6): Nominal range of lighted aids
- Column (7): The structural characteristic of the aid
- Column (8): Aid remarks, sound signal characteristic including the VHF-FM channel if remotely activated, RACON, light sector arc of visibility, radar reflector, emergency lights, seasonal remarks, and Private AtoN identification.
Coast Pilot

• NOAA
• Available on line
• Everything you need to know about a port that the chart does not tell you
Much of the content cannot be shown graphically on the charts and is not readily available elsewhere.

- Environmental factors of weather, climate, ice conditions, tides, water levels and currents
- Prominent coastal features and landmarks
- Specific information on vertical clearances
- Wharf descriptions
- Small-craft facilities
- Hazards
- Dredged channels and depths
- Navigation services and regulations
- Pilotage, towing, anchorages
- Routes and traffic separation schemes
- Environmental protection and other Federal laws.
NOTICE

Incomplete and otherwise inaccurate reproductions of *United States Coast Pilot* are being sold on the commercial market.

NOAA has recently become aware that incomplete and otherwise inaccurate reproductions of the *U.S. Coast Pilot* are being offered for sale to consumers. Consumers need to be aware that such reproductions may not meet U.S. Coast Guard carriage requirements.
Local Notice to Mariners

Published by each Coast Guard District.
Available on line
Disseminate information important to navigation.
Include updates to ATONs.
Indicate temporary changes:
– Dredging, marine construction, whale migration, bridge construction, buoys, special activities, etc.
LNM

• Special Notices
• Discrepancies
  – Federal Aids
  – Federal Aids Corrected
  – Private Aids
  – Private Aids Corrected
• Temporary Changes
• Chart Corrections
• Advanced Notices
• Light List Corrections
• Shoaling
• Bridge Information
• Dredging and Construction
• Marine Events
Task 2.0  US Aids to Navigation (ATON) System

• Objectives
  – IALA regions for the United States
  – Identify the characteristics including color, shape, number or letters, and light colors of navigation aids:
  – State the characteristics of lights (flashing, occulting, etc):
  – Demonstrate the ability to use a stopwatch for timing a lighted aid.
IALA Regions A and B
Definition of a Buoy

- Any unmanned, floating aid to navigation that is moored to the seabed.
- May be lighted or unlighted.
- The seabed is owned by the ARMY Corps of Engineers (USACE) and is licensed to the Coast Guard who deploy ATONs and authorize private parties to deploy PATONs.
Unlighted Nun Buoy

Conical shape

Red Retro

White Number

6
Unlighted Can Buoy

Can Shape

Green
Retro

White
Number
Lighted Green Buoy
Lighted Red Buoy
Definition of a Beacon

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

• The pilings the beacon is mounted on is a dolphin

• Lighted beacons are called **Lights**.
  – Minor
  – Major

• Unlighted beacons are called **Daybeacons**
Definition of a Daymark

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

  – The shape may be a square, triangle, rectangle, diamond or octagon
  – The color may be green, red, white, yellow orange, multi-colored
Green and Red Daymarks

Green

Red

45

38
Daybeacon
Daymark Mounted on a Dolphin
Red Minor Light
Lighted Daybeacon
Green Minor Light
U.S. AIDS TO NAVIGATION SYSTEM on navigable waters except Western Rivers

LATERAL SYSTEM AS SEEN ENTERING FROM SEAWARD

PORT SIDE ODD NUMBERED AIDS
- Green Light Only
- Flashing (2)
- Flashing
- Occulting
- Quick Flashing
- ISO

1
LIGHT
F1 0.6s
9
LIGHTED BUOY
G 0 6s
0 6s

5
CAN
C 6s
DABBEACON
0 "8"

PREFERRED CHANNEL NO NUMBERS - MAY BE LETTERED
- Preferred Channel to Starboard
- Topmost Band
- Green

A
COMPOSITE GROUP FLASHING (2+1)
G 0 6s
OR "A"
F1 (2+1) 0 6s

B
COMPOSITE GROUP FLASHING (2+1)
G 0 6s
OR "A"
F1 (2+1) R 6s

C
COMPOSITE GROUP FLASHING (2+1)
G 0 6s
OR "A"
F1 (2+1) R 6s

DABBEACON
0 "8"

PREFERRED CHANNEL TO PORT
- Topmost Band
- Red

2
LIGHT
F1 R 6s
2
LIGHTED BUOY
G 6s
R "8"

3
CAN
C 6s
DABBEACON
R "8"

STARBOARD SIDE EVEN NUMBERED AIDS
- Red Light Only
- Flashing (2)
- Flashing
- Occulting
- Quick Flashing
- ISO

2
LIGHT
F1 R 6s
2
LIGHTED BUOY
G 6s
R "8"

3
CAN
C 6s
DABBEACON
R "8"
JUNCTION
Two channels join to form one channel. Preferred channel buoy is placed upstream.

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

CROSSING
One channel crosses another channel. No requirement to mark all four corners.
Junctions and Bifurcation Patterns

NOTE: There is no requirement to mark all three or four corners of the intersections.
If there was a post in the middle of the desert someone would hit it....... (did you notice the name of the boat?)
Safe Water Marks

- Indicates navigable water all around the mark
Lighted Safe Water Mark
Isolated Danger Mark

- Marks isolated dangers or obstructions that can be passed on all sides
Special Purpose Aids

- Not intended to assist safe navigation but to indicate special areas marked on charts (anchorages, traffic separation schemes, data gathering, etc)
Regulatory and Information Marks

Alert the mariner to such things as submerged pipes, no wake zones, etc.
These are non-lateral aids.
The accuracy of the location of these aids is usually not a major issue.
The location of these aids in the navigable channel is considered a reportable discrepancy.
These aids are normally “Private.”
Restricted Operations - Minimum Wake
Restricted Operations - Manatee Zone

Bridge Discrepancy Report
DANGER
Restricted Operations - No Wake

Check the structure and piles!
Restricted Operations - No Wake
Exclusion Area - No Anchoring
**Wreck Marks**

**Purpose:** To alert the mariner to wrecks.

**Description:**

- **Aid Color:** Appropriate to side of channel.
- **Aid Shape:** Appropriate to side of channel.

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

- **Aid Light:** Same as buoy color.

- **Light Characteristic:** Quick Flashing
  (unless aid is a preferred channel aid)
Some markers will have no lateral significance. They are not designed to indicate the channel but rather, to help you determine where you are.
Definition of a Range

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

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

**Description:**

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

**Aid Shape:** Rectangle with tall side up.

**Aid Light - Green, Red, White or Yellow.**

**Front range light** is lower of the two.

**Rear range light** is higher and further from the mariner.

**KGW = Range, Green, with a White Stripe.**
Range Marks

FR – Front Range Mark

RR - Rear Range Mark
Intracoastal Waterway Marking System

- Runs from **Manasquan, NJ** to **Brownsville, TX**
- Differs only from U.S. marking system in that ICW aids show distinctive identifying symbols
- Conventional Direction of Buoyage is the same as the **East and Gulf Coasts**
Intracoastal Waterway Marking System

- Identifying Marks
  - Starboard Marks: Yellow triangle
  - Port Marks: Yellow square
Intracoastal Waterway Marking System

- Non-lateral Mark: 2” yellow strip along bottom
Light Structures

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

Minor Lights
Not named
Same symbol
Fixed position
Boston Light
Inside the Boston Light tower.
Understanding Light Patterns

Learn how to time a light.
1. Time multiple light cycles.
2. Divide the time by the number of cycles.
**Light Patterns**

- **Fixed** (F) – continuous, unblinking light

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

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

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

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

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

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

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

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

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

**Long Flashing** (LFL) – One long flash in a period with lighted period of at least 2 seconds.
Review the symbols and abbreviations on your NOAA chart for every aid that you see.

Check that the charted symbols and abbreviations match your on-scene observations of the aid.

Report any discrepancies to the Coast Guard and as a chart update to NOAA.
Chart Symbols

**CAN** - Green Diamond with small watch circle

**NUN** – Red diamond with small watch circle.

Watch circle overprinted with magenta when lighted.

Italics used for buoys and other floating aids.
Symbols - Daymarks and Minor Lights

**Red Daymark**
Red triangle

**Green Daymark**
Green square.

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

- What are the ICW identifiers?
  - Starboard Mark:
  - Port Mark:
  - Non-Lateral: