The
Aids to Navigation Bulletin

National Aids to Navigation School **Fall 2004**

National Aids to Navigation School
U.S. Coast Guard Training Center, Yorktown, Virginia

AtoN systems of the United States and its territories are established, operated, and maintained by the Coast Guard to assist mariners in locating their position and to warn of nearby dangers and obstructions. This is done for the benefit of commercial vessels, recreational boaters, and to support the operations of the Armed Forces. Title 14 of the US Code makes this a responsibility of the Coast Guard.

The Bulletin is published to support the individuals and units involved in providing a reliable AtoN system for the mariner. The Bulletin seeks to meet the following objectives:

- To provide a means of circulating job skill information among AtoN technicians,
- To increase the professionalism and knowledge of all AtoN personnel,
- To act as a channel for information flow amidst the AtoN servicing units, District Office staffs, Headquarters staffs, and units, and
- To publish articles and photographs about people, units, or events which may be of general interest to the AtoN community.

To satisfy these objectives, it is necessary for all who read the Bulletin to take an active part in determining its contents. If you have found a "better way" or performed a unique evolution, share it with other people in the AtoN field. Submissions are welcome in any form. Articles and photographs may be submitted electronically to the editor via e-mail at abuffington@tcyorktown.uscg.mil or mailed to:

Editor, The AtoN Bulletin
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Yorktown, VA 23690-5000

Electronic submissions are preferred. Please keep photographs in original electronic form, and send them as separate files; do not imbed or copy them into word documents.

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Volume 32, Number 1

On the Cover:
USCGC HOLLYHOCK (WLB 214) approaching her first mooring at homeport in Port Huron, MI *photo by Maryanne Bellaire*

Distribution

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Other:

Various International Governments, Domestic Manufacturers and Private Citizens affiliated with the Aids to Navigation Mission.

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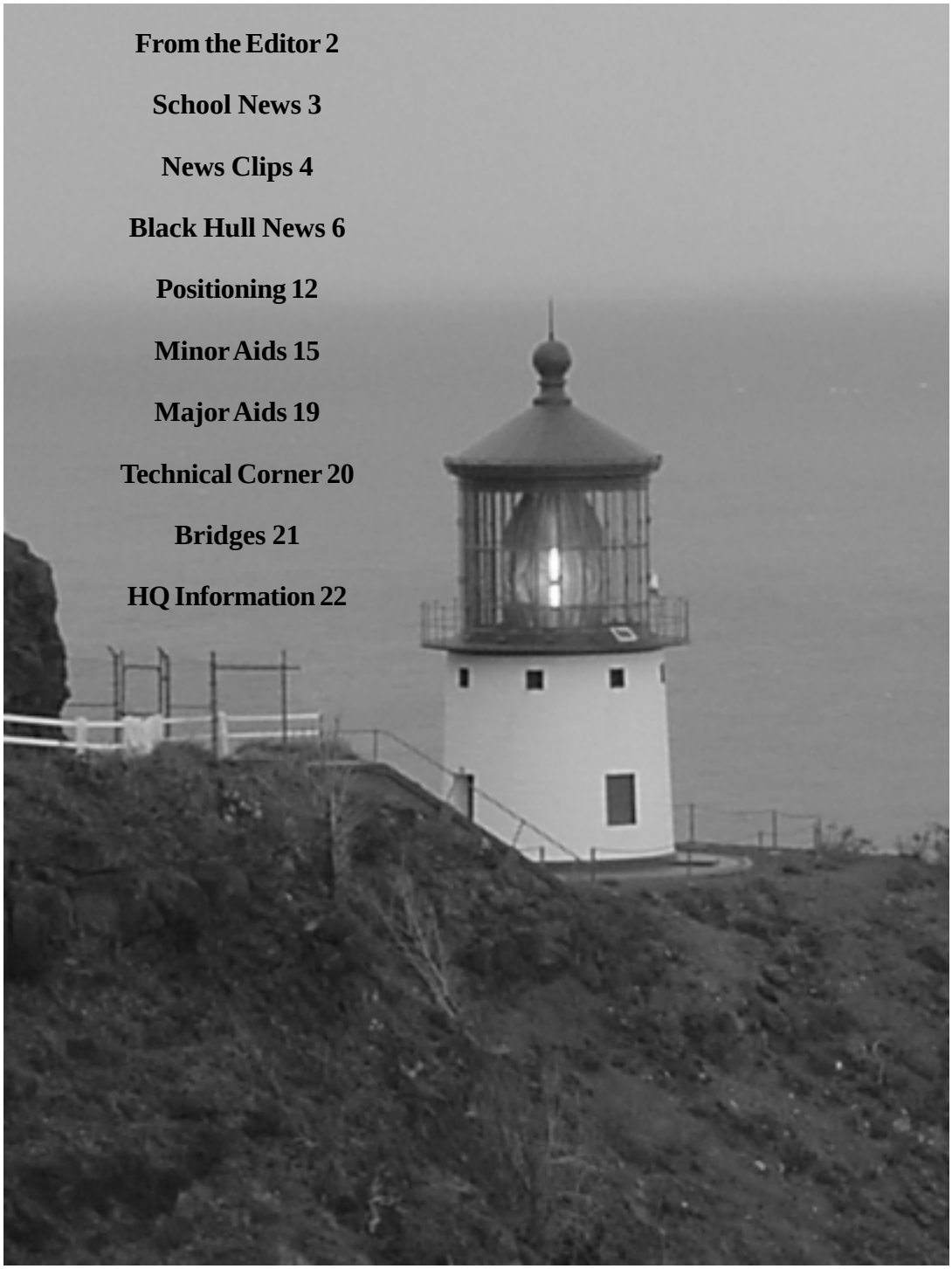


Makapuu Light
Oahu, Hawaii

From the Editor:

LT Jim Bellaire

LTjg Adam Buffington

BM1 Brian Myers

ET1 Jeff Martin

YN2 Carrie Premo

I just reported to NATON in mid-July from KUKUI and took over as the editor for the Bulletin. Everything's going pretty well so far; I don't have any discrepant aids, and I haven't run my cubicle aground, yet. I look forward to meeting many of you as you pass through any of our schools.

We recently had to say goodbye to a few of our friends from NATON. BMC Tony Carnegie left for D11 (oan) in Alameda, CA, BMC Tony Thigpen went to MSST 91108 in St. Mary's, GA, YN1 Jennifer Ronchetti is now at Group Key West, and ET1 Paul Diggins retired after serving for 20 years. We'll miss you all and we wish you the best of luck in the future.

We also welcomed some new members that reported to the School. Our new School Chief, LT Jim Bellaire reported from USCGC HOLLYHOCK, BM1 Brian Myers came to us from ANT South Portland, ET1 Jeff Martin joined us from BARBARA MABRITY, and YN2 Carrie Premo came from Group Miami.

Thank you very much to everyone who submitted articles for this issue, I hope to hear more from you in the future. I also look forward to hearing from everyone else about the good and bad of what's going on out there over the next couple of years. The Bulletin can be a great resource for sharing information among the AtoN community, but I'm not the one who will make it great. That has to come from all of you because without contributions from the field there is no Bulletin. Just a short article and a few pictures is all it takes. When forwarding pictures electronically, please include the original image file instead of imbedding them in a text document. Be sure to keep us in the back of your mind the next time something comes up that could benefit the rest of the community.

Finally, congratulations to EMC Mike Brown on his recent promotion to Chief Petty Officer!!

LTjg Adam Buffington, Editor

Electronic Training Requests

by BMCM Mark Schweiger, NATON School

After a long and careful consideration period, we are moving forward (hopefully) to the computer age. Effective for all FY 05 classes, we will be using Electronic Training Requests (ETR).

A request is only good for one class, and then it is deleted from the system. Unit training officers *must ensure* members meet prerequisites; ETR's for non-qualified members waste everyone's time and clog up the system. Comments on the ETR will be very important to explain why you need a member trained (e.g. no one qualified at unit). Units must put the district and unit in the comment block first. Here is an example:

Comments: D17, ANT Sitka. Member needs this course to meet MTL requirements. Only one other member at unit AtoN tech qualified. Will send Halibut in trade for training.

Districts will still be in the loop via a spreadsheet the School will send for input. So with that said, if a unit has a dire need for training, they need to communicate that to their District Training Teams so Districts can establish their priorities. We want to cut orders for classes eight weeks in advance, so get those requests on file now!

BDTT on the Web

by BM1 C. Wayne Williams, NATON School

The Buoy Deck Training Team (BDTT) recently completed a web page that we feel will be beneficial to the AtoN community. The web page includes information about the Training Team's missions and provides a point of contact for the customer. It contains a list of the most common discrepancies found in the field while conducting training on WLBs and WLMs. The web site also offers a *recommended* Rigging Log and a sample AtoN safety brief in word document format, which can be printed and put into service. Any cutter awaiting training from the BDTT can download an assessment form, pre-arrival checklist, suggested outfit list, and a four-day training syllabus under the "Ship Visits" heading. There are links to sources of supply and general information concerning rigging gear, wire rope, fall protection, and marine hardware under the "Resources" link. The "Pictures" link includes an assortment of photos of proud cutters and crews from around fleet taken during Training Team visits. We encourage crews to send us pictures of special evolutions, damaged gear, or any unique situations. We can use those photographs for training aids and/or post them on our web page. Information on the Buoy Deck Supervisor (ANC-BDS) course is also available. Your suggestions and comments for additional information to be posted on the web site are welcome.

The link for the BDTT page can be found on the School's web page at http://www.uscg.mil/tcyorktown/ops/naton/index.shtm.

KUKUI Transports Howitzers to Oahu for Annual Army 4th of July Spectacular

by ENS Ian Brosnan, USCGC KUKUI (WLB 203)

Each year, the US Army Garrison and 25th Infantry Division puts on a 4th of July Spectacular on Oahu. A highlight of the show has always been a howitzer salute. However, all but one of the Army's howitzers in Hawaii were deployed in support of operations in Afghanistan and Iraq. The remaining howitzer is displayed on Oahu.

The National Guard's 1-487th Field Artillery volunteered to make the salute, but had no way of transporting their howitzers from a training facility on the Big Island. Fortunately, KUKUI had a trip planned to service AtoN on the Big Island in mid-June and transported six howitzers on her return transit to Oahu. The howitzers were returned to the Big Island on a barge provided by the National Guard after the event.

SORS in the Cold

by LTjg Sarah Salazar, USCGC MAPLE (WLB 207)

On January 7, 2004, MAPLE, which is homeported in Sitka, AK, got underway for a short day trip into Sitka Sound to deploy the ship's Shipboard Oil Recover System (SORS). The SORS equipment, very similar to the older Vessel of Opportunity Skimming System (VOSS), was created after the EXXON Valdeez oil spill in 1989. The SORS uses a combination of hydraulic lines, mechanical leverage, and a vacuum pump to skim oil off the surface of the water and then pumps the material into a storage sponson tied off to the opposite side of the ship's hull. Unlike the VOSS method, which uses external motors, the SORS method is relatively quiet because it utilizes installed hydraulic equipment and mechanical motors. The SORS equipment is held in storage areas located under the buoy deck. It took a total of seven hours, after being unloaded from the storage areas, to unpack and set up on the deck of MAPLE. The temperatures reached 28° with an inch of snow on the deck, but the equipment was safely deployed for the first time during an Alaskan winter. A great job goes out to the crew of the MAPLE, the Pacific Area Strike Team, and the District 17 Rapid Response Team, which was onboard to help with the required annual deployment and provide SORS equipment training.

Helo Ops With a WLB

by LTjg Sarah Salazar, USCGC MAPLE (WLB 207)

Early Monday morning on February 2, 2004, MAPLE and AIRSTA Sitka rendezvoused in Sitka Sound just as the sun rose over the surrounding mountains to practice a vertical replenishment operation. The HH-60 Jayhawk, piloted by LT Shawn Tripp, transported two 500 pound cargo bins containing emergency oil pollution response equipment to the Cutter's buoy deck. Another HH-60 Jayhawk hovered off station, approximately a 1000 yards away, as a safety observer. The training, coordinated by MAPLE's Commanding Officer, LCDR Michael Gatlin, and AIRSTA Sitka's Commanding Officer, CDR David Durham, went off without a hitch, allowing both commands to feel comfortable with the evolution in a real life, emergency situation. This type of training is especially important for areas such as Southeast Alaska where port calls, roads, and emergency services are not available in most of the region.

The Juniper Class Buoy Tender:
Operational Design and Performance

by LCDR D. Scott Bauby, USCGC SPAR (WLB 206)

This essay summarizes design and performance aspects of Juniper Class Buoy Tenders. It is written to future Captains, Engineers, and Operational Commanders responsible for the operation and maintenance of these Tenders. This essay is also written to Professional Mariners interested in their Coast Guard.

The Cutterman's challenge since 1790 . . . Know your ship. Lead your crew. Execute your mission.

To know a ship is to study, observe, and understand a ship. Our new Tenders represent a leap in technology and efficiency. Electronic charts are just the beginning. Remote machinery operation, auto-pilot track following, and dynamic position holding capabilities are modern tools of the Professional Mariner.

Prudently applying modern Technology and timeless Seamanship, with fewer Shipmates, is the modern mariner's challenge – the modern art and science of seamanship. I am a student of maritime art and science. This is my understanding of our Juniper Class Tenders.

The Tender

Our *Juniper Class Tenders* are stout 3-fathom ships with diesel propulsion reaching 17 knots and hydraulic deck machinery servicing 20 tons. A single controllable pitch propeller, with bow and stern thrusters, is a peculiar but efficient propulsion design. A broad beam and ample tonnage make her buoy deck spacious and stable. Winch and stopper innovations offer marked improvements in deck safety and efficiency. A stout aluminum workboat and a quick rigid hull skiff are reliable diesel-powered tools for servicing shore aids and transporting boarding teams. Three computer systems linked by fiber optic cable, offer precise monitoring and control of machinery, navigation, and maneuvering. A generous fuel capacity, reverse-osmosis water makers, and an extensive salt water ballasting system make these Tenders stable and durable through a wide range of fuel states and loading conditions. The optimized crew complement and limited cold food storage are determining variables for estimating operational endurance. Sewage and grey water tank capacities drive near coastal operational planning.

Keel and Curves

The *hull* curves are formed by transverse modular construction designed to flex significantly under hogging and sagging forces. You can see the weld spacing and feel the designed flexing in a seaway. Transverse frames are

appendage exposed directly to shoaling when trimmed by the stern and squatting from shallow water effects. Two 15-foot chines called "accelerating fins" or "flow fins," extend beneath the transom running aft and directing water flow toward the propeller.

Propulsion and Thrust

The single *propeller* is controllable pitch, measures 10 feet in diameter, and counts four blades turning in a right-hand rotation. The blades spread broadly from the hub, creating a virtual bronze disc when viewed from ahead or astern. Neutral thrust is achieved with 14% positive pitch. This constant turning single propeller design produces a significant and constant walking effect. The broad blades also shield water flow from the rudder at neutral pitch – an important shiphandling variable when mooring, station keeping, and maneuvering in extremis. The propeller rotates only 6 inches above the keel and 2 feet beneath the waterline. A bulbous stern extension and rope guard tube encapsulate the propeller shaft all the way to the hub. The absence of a keel extension leaves the propeller, like the rudder, exposed directly to shoaling.

The *bow and stern thrusters* are direct-current electric-powered propellers mounted within 4-foot diameter athwartship tunnels. The bow tunnel crosses the base of the stem, 3 feet above the keel. The stern tunnel crosses beneath the propulsion shaft just forward of the propeller and 1 foot above the keel. Mechanical clutches reverse thruster blade rotation, within 1-3 seconds, to deliver rapid answers to port and starboard thrust commands. Thruster propellers are oriented to port in the stern tunnel and to starboard in the bow tunnel. This design applies most efficient thrust in reciprocal directions to the propulsion propeller's walking effect and far from the pivot point. In addition, the stern and bow thrusters are governed to 550hp and 450hp respectively. This power distribution is designed to assist the Conning Officer or Dynamic Positioning System (DPS) computer in maneuvering disproportionate bow and stern masses around the pivot point.

Hook and Tackle

The hydraulic *Buoy Deck Crane* working load limited (WLL) to 20 tons, is the Tender's strong arm and reason for existence. The forecastle mounted telescoping crane reaches 35 feet outboard of the buoy ports and just forward of the bow. Dual hydraulic winches provide operators with an auxiliary hook (5 ton WLL) and a main two-purchase block assembly hook (20 ton WLL). The main block assembly weighs 750 pounds, demands two-rigger attention, and presents a constant safety concern during even slight pitching and rolling. A constant tensioning mechanism in the main winch is designed to reduce dynamic loading forces encountered in buoy servicing evolutions. In practice, Buoy Deck Supervisors opt for positive vertical control and rarely apply constant tensioning.

The hydraulic *Chain Inhaul Winch and Roller Chain Stopper*s serve like a salt water fishing reel for buoy chain. Roller fairleads and stoppers guide and secure chain at the buoy deck sills. Operators lower the rollers to secure chain in the stopper and raise the rollers to haul and set chain. The winch drum rotates vertically to retrieve and feed chain, while a level wind arm and rolling fairlead guide the chain lay. The drum can hold up to 5 shots of 1.5-inch chain. The winch, level arm, and roller stopper hydraulics are rated to 16,500 pounds

(WLL). This capability to haul, store, and set buoy chain mechanically is a quantum leap in deck safety and efficiency. The winch and roller stoppers also offer exceptional precision and control during complex dragging and recovery evolutions. These Tenders can deploy a grapnel, maneuver across the position of a sunken buoy, and use the inhaul winch to achieve a controlled drag, while holding station into current and wind.

The *anchors and chain* are moderately proportioned tools. The 4000-pound stockless anchors have eight shots of 1.25-inch stud link chain. The ground tackle is adequate for routine anchorages. However, the broad and tall superstructure becomes a taut square sail in strong winds – a variable holding at anchor and maneuvering underway. At anchor, these Tenders horse significantly through moderate winds and excessively across 40 knot or greater winds. The relatively lightweight 1.25-inch chain needs mud and silt to hold these 2000-ton Tenders from dragging their anchors. By comparison, our 1800-ton *Bear Class* cutters use the same anchors, but enjoy an additional 600 pounds of holding power in each shot of 1.5-inch chain. The moderate ground tackle does serve as an exceptional tool for dredging. A standard dredging scope, 25-35% ahead pitch, and even slight rudder angles deliver controlled maneuvering in shallow water – sound mariner's insurance for calculated maneuvering risks and unplanned thruster casualties.

Plumbing

The *Main and Auxiliary Salt Water System (MSW and ASW)* is the circulatory system, providing cooling water to machinery systems. Port and starboard sea chests located at frame 80, beneath the turn of the bilge, take water to a central sea bay reservoir. Main Propulsion Engine (MPE) and Ship Service Diesel Generator (SSDG) gear driven pumps draw sea bay water for engine, stern tube, and reduction gear cooling. Two electrical pumps draw sea bay water to cool auxiliary machinery and supply the reverse osmosis watermakers. Two fire pumps draw sea bay water and cross-connect to both systems for emergency cooling water.

The Tender's righting arm is strengthened by a *Salt Water Ballast System*. One peak tank, two forward wing tanks, and four centerline tanks provide desired trim and stability through all fuel state and deck load conditions. Fire pump pressure fills and empties tanks through a machinery space manifold. In line orifices and eductors limit flow rates to 40-100 gpm. A Tender's varied loads and shoal water operations make this system vital to routine stability and emergency weight transfer.

The *Fuel Oil System* uses eight storage tanks and one overflow tank to hold 70,000 gallons of fuel. A centerline tank at frame 30 holds 20,000 gallons. The remaining tanks hold less than 8,000 gallons. None of the tanks are baffled. However, the well-distributed fuel load and 150 gpm fuel pumps maximize options for routine stability and rapid emergency weight transfer.

The *Sewage and Grey Water Systems* have limited capacity relative to mission and crew needs. The 1700 gallon sewage and 2800 gallon grey water holding tanks reach capacity within three days, during normal operations. When operating in near coastal waters, these Tenders need to run seaward or return pier side every third day – a surprising design constraint for a Coast Guard Cutter.

Electrons

The *Main Propulsion Control and Monitoring System (MPCMS)* computer is located in main control and connected to every ship system. A software program operates through two redundant data processing motherboards to monitor and control valves, alarms, gauges, switches, and machinery from a central computer workstation. The Main Machinery Room (MMR) watch stander can operate valves, switches, and machinery from a keyboard. The computer records system temperatures, pressures, voltages, and commands continuously at desired intervals.

The *Electronic Chart Precise Integrated Navigation System (ECPINS)* serves as an Assistant Navigator delivering a fused navigation and shipping picture. Two ECPINS computer systems independently process and display charted position, trackline, depth, shipping, dead reckoning, and sensor data on color monitors. Two DGPS receivers process satellite and differential beacon signals from two antennas. Two fathometers and two X-band RADAR systems deliver sensor input to ECPINS. Contacts acquired by the Automated RADAR Plotting Aid (ARPA) system are displayed with corresponding vectors and designations. Wind, temperature, humidity, and barometric pressure are converted to digital input for the system. The ECPINS software requires the operator to enter a number of variable settings. Draft, dead-reckoning intervals, chart shift points, and alarm parameters are only a glimpse of over 60 manual settings for this system. ECPINS will listen and follow digital orders precisely, but it will not understand the subtle intent of a Captain's orders. Navigation Standards and Standing Orders need to be quantified into manual settings tailored to various evolutions. Otherwise this Assistant Navigator becomes an annoying alarm and a misleading display.

The *Dynamic Positioning System (DPS)* is a tireless and reliable Conning Officer. This autopilot and station-keeping system processes chart, position, Doppler log, heading, and anemometer data. It then commands various rudder, propulsion, and thruster combinations to maneuver automatically. The *autopilot* capability operates in MPCMS transit mode (17-knot max speed and no thrusters). It uses rudder and propulsion commands to maintain a desired course and speed; and even execute turns along a plotted trackline. The *dynamic positioning* capability operates in MPCMS maneuvering mode (12-knot max speed and thrusters). It uses thrusters and propulsion to hold a desired heading and/or position; and even follows a desired trackline at up to 2 knots. DPS holds the Tender's position within a 10-yard radius against 30-knot winds and 8-foot seas, both approaching within 30° of centerline. DPS is designed to hold position in 3 knots of fair or head current running within 6° of centerline. DPS uses a position averaging and dead reckoning computer model to continually tighten the radius of motion around a selected position. The system prefers to measure and maneuver against a constant force, just off centerline, rather than dead ahead or astern. The autopilot track following feature and the dynamic position holding capability are exciting new tools for Tender crews.

tems. This 8-fiber cable runs aft from frame 57 on the centerline, carrying digitized information and commands throughout the ship. Several network interface units and trunk-coupling units serve as electronic junctions used by technicians to monitor, isolate, and service the network. This electrical, mechanical, and electronic convergence is a tangible definition of "network centric" and "system of systems" rhetoric. SAFENET and these linked computer systems also represent a significant fiscal, technical, and policy leap for the Coast Guard.

Shallows and Narrows

Narrow channels and shallow waters are terms of judgment. Many Captains apply rules of thumb to ship's draft and tactical diameter in order to determine operating parameters – navigation standards and standing orders. A traditional naval toast, "May we always have one fathom beneath our keels," repeats a timeless adage of seamanship. Naval engineers quantify this adage and remind us of the predictable effects on a vessel's trim and steerage when operating in depths 1.5 times a ship's draft. Thus, art and science judge our Tenders to be three-fathom ships. A narrow channel for these Tenders is also an approximation of art and science. Old *Balsam Class* tracklines, new navigational precision, and dual thruster maneuverability sway our initial judgment. Tactical diameter deserves some consideration, since a channel narrower than a ship's tactical diameter is arguably a one-way street. Contingency plans to cast, hold station, or dredge anchor are all conversations about narrow channels. Tactical diameter suggests that channels less than 200 yards wide are narrow for our new Tenders. We pilot much narrower passages routinely, in most cases to moor in homeport. After all, our buoys are watching the shoals and hazards of the narrowest passages. However, new assessments of familiar passages might be prudent. Twice the tonnage and a wide beam may not want to ply all the waters our old *Balsam Class* Tenders knew.

Orienting and Maneuvering the Tender

Orienting the stern away from hazards is a fundamental principle of seamanship. In these Tenders, orienting the starboard quarter is more precise. Leaving and working hazards to port is desirable. The right hand turning propeller will most efficiently back and cast the stern to starboard. Trim is another shallow water concern. Reserve forward buoyancy induces light-load trim by the stern. This trim condition presents the exposed rudder and propeller to shoaling, while assisting the effects of shallow water. In contrast, no trim or even slight forward trim presents the bow to shoaling and locates liquid transferable weight forward. Peak and forward wing tank ballast water is like a kedged or dredged anchor – the prudent mariner's salvage insurance.

Emergency maneuvers deserve thought and discussion. Fundamental maneuvering assumptions and rules of thumb apply to these Tenders. They are propeller driven displacement hulls. The *Juniper Class Tactical Testing Report* of July 1999 is a valuable reference for emergency steering and backing maneuvers. In a hard turn at any speed, these Tenders advance about 2 ship lengths (150 yards) before turning 90° and transfer about 3 ship lengths laterally (225 yards) before coming about. Give-way and stand-on vessel discussions work outward from this turning data. Emergency backing is a longer conversation. The single controllable pitch propeller generates unique force vectors that make heading control a significant challenge in emergency backing. These Tenders need 6-7 ship lengths (400 yards) and 90 seconds of emergency backing to remove 16 knots of momentum. The bow sheers to port dramatically and uncontrollably throughout deceleration, even with full rudder and thrust commands. However, in MPCMS transit mode the *direction of swing* can be controlled through deceleration by first applying rudder, pausing momentarily at 20-30% ahead pitch, and then backing down hard. An emergency hard starboard turn and emergency-backing maneuver can be accomplished this way. In MPCMS maneuvering mode the *direction and degree of swing* can be moderated by

first applying rudder, pausing momentarily at 20-30% ahead pitch, then backing down hard while using thrust to moderate swing. Neutral pitch commands will reduce momentum rapidly, but remove steerage entirely. In summary, plans for emergency maneuvers should consider orienting the direction of momentum before trying to reduce it.

Potential Design Improvements

I recommend designing *upper sea chest openings* for the sea bay system. Tenders mark shoal waters for a living and strand more frequently than other cutters. They frequent shallow muddy bays and rivers. The salt water system needs to remain operable when the hull is just above or stranded on the bottom. Our 20th Century *Balsam Class* tenders had upper sea chests for these very reasons.

I recommend upgrading to *1.5-inch anchor chain*. Adequate holding power for routine and storm haven anchorages is important for a coastal Tender. The cost of chain is negligible. The hawes pipe and wildcat modifications would be relatively simple. The additional weight forward would be negligible for stability and beneficial for trim.

I recommend *increasing bow thruster horsepower*. The direct current electricity for 550hp is already available. A governor adjustment would be required.

I recommend increasing the sewage and grey water tank capacities to 2500 gallons and 3500 gallons, respectively. These tank volumes would fit into the existing spaces, could be fabricated in place, and would extend our Coastal near coastal on-scene endurance to five days.

In Conclusion

Our Juniper Class Tenders are state-of-the art ships designed and proven to accomplish a broad range of Coast Guard missions. Captains, Engineers, and Operational Commanders should view these ships in both traditional and innovative ways.

The Tender is a displacement hull, propelled by diesel power turning a single shaft. The thrusters add impressive maneuverability. The 17-knot speed adds efficiency for servicing and flexibility for multi-mission tasking. The high-tech electronic navigation, dynamic positioning, and machinery monitoring systems are reliable and redundant tools for watchstanders. The fine print reads, "These automated systems still require an extensive amount of manual settings, commands, and repairs from highly intelligent and well trained human beings." The increased tonnage and cargo capacity is dramatic. A relatively small and junior crew is managing twice the momentum and stability as our *Balsam Class* Cuttermen. The crane and inhaul winch are versatile tools of modern deck seamanship, making the buoy servicing evolution significantly safer and moderately faster.

In new and old ways, our Juniper Class Tenders provide exciting capabilities for our 21st Century Coast Guard.

Overdue for Servicing – FAQ

by CAPT Larry Jaeger (ret), Commandant (G-SEC-2)

What is "Overdue for Servicing"? An aid is considered overdue for servicing if its next scheduled serving date has passed without a visit by a servicing unit beyond the 90-day discretionary interval of the Commanding Officer/Officer-in-Charge allowed by the AtoN Administration Manual.

Who cares about how many aids are overdue for servicing? Hopefully everyone in the program. Commandant (G-OPN) and district AtoN offices track this statistic to measure how well we're keeping up with scheduled work. Every servicing unit should care about aids that are overdue.

How do Program Managers know what aids are overdue? Data is gathered from ATONIS. ATONIS contains a field for "Next Inspection Date." An aid is considered overdue if the Next Inspection Date is more than 90 days in the past.

Is there any other reason that can result in an aid being overdue? Yes, if it's a buoy then it is also overdue if either the Next Relief Date *or* the Next Mooring Inspection Date is more than 90 days in the past.

If the measure is based on ATONIS data, then can I blame problems on District? They never make the changes I want. You can't blame District for this one. The Next Inspection Date can only be changed by the servicing unit. District is locked out of this field; they can't change it.

Does the data provide statistics for each servicing unit? Yes, some units are doing very well and others are overdue on the majority of their aids. Here's a list of units that had the *lowest* overdue rate in their district as of August 6, 2004: (BZ!)

District	Unit	Overdue
1	USCGC BOLLARD	0%
5	USCGC JAMES RANKIN	0%
7	ANT Fort Pierce	0%
	ANT Key West	0%
8	USCGC KICKAPOO	0%
	USCGC SANGAMON	0%
	USCGC MUSKINGUM	0%
9	ANT Green Bay	0%
11	USCGC ASPEN	5%

District	Unit	Overdue
13	USCGC HENRY BLAKE	5%
14	USCGC SEQUOIA	4%
17	USCGC ANTHONY PETIT	2%

My unit is not on the list. How can I find out how many of my aids are overdue? Drop me an email at LJaeger@comdt.uscg.mil and I'll send you information on what's in ATONIS for your unit (% overdue along with a list of all your aids showing the Next Inspection Date). I'll send updated data unless you specifically ask for data from my 6 August run.

I've looked at the data you sent me and it's wrong. However, the data in my unit laptop is correct. Why is the Martinsburg data wrong? The data in the central ATONIS database is in Martinsburg, WV. The data in the central ATONIS database is the official USCG data. There are several reasons the Martinsburg data can differ from what's on the unit's laptop computer. They include:

1. Problems involving the exchange of data between multiple unit computers.

2. Problems involving uploads and downloads from Martinsburg (particularly those associated with specifying which data is to be transferred).

3. A little known system problem associated with allowing the "Inspection Interval" feature to automatically update the Next Inspection Date. If the only field the unit changes is the Last Inspection Date, then the unit's laptop will automatically update the Next Inspection Date using the Inspection Interval. Everything will appear OK in the laptop computer, but the next time the unit conducts a partial transfer to Martinsburg, the new Next Inspection Date will *not* be transferred. How to beat this? In addition to updating the Last Inspection Date, the unit should *manually* update either the Inspection Interval or the Next Inspection Date (updating the Inspection Interval to the same value is fine). This problem will be rectified in I-ATONIS.

My aids look good and I'm keeping up with my servicings. Why should I care about what's in ATONIS? Because, like it or not, others are using ATONIS data to measure our program effectiveness and make decisions regarding the future of the AtoN program. Information is a product of our efforts, and the quality of the information we provide to others is as important as the signal we provide to the mariner. The information in I-ATONIS will be used to generate LNMs, chart corrections, and the *Light List*.

I-ATONIS Update

by BM1 Brian Myers, NATON School

Before I begin, allow me to introduce myself. My name is BM1 Brian Myers, a new Aid Positioning instructor at the School. I replaced BM1 Thigpen who is actually now BMC Thigpen. I arrived from ANT South Portland just in time to get ready for the new I-ATONIS, so I will be learning the system along with you.

With the advent of I-ATONIS, it is important that the fleet be familiar with the system before its implementation because there will be no overlap from the old program to the new. To prepare for this, OSC has set up a collection of tutorials that will help guide you through the new program. The tutorials can be found on the OSC website at http://atonis.osc.uscg.mil/. New tutorials are being added or updated on a regular basis so check the site often.

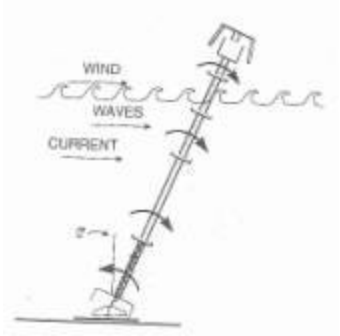
The latest updates are the "Entering Discrepancies" tutorials. It is worth the time to prepare yourself for the switch. Since Congress mandated that there be one central database for all AtoN, your unit's input into I-ATONIS will be reflected on LNMs, the *Light List*, and chart corrections. Therefore, your accuracy in using the system will now be seen by people other than just your fellow Coasties. It is also important to follow up on any discrepancies and enter corrections into the database to avoid advertising false information to the mariner.

Unfortunately, the Coast Guard doesn't have the money or resources to give the entire AtoN community I-ATONIS training. The responsibility will fall on the shoulders of the users to individually acquaint themselves with the new system. COs and OinCs should encourage their personnel to take the time to become accustomed to I-ATONIS before it's thrown in their laps. The website welcomes any questions or recommendations.

New DGPS Receiver

by BM1 Christian Lucas, NATON School

It's been a long time coming and now there is a new Positioning DGPS receiver that will be available to replace the Trimble NT200CG. Leica will make the replacement MX-525 DGPS receiver combined with the MX-420 Control and Display Unit (CDU). The receiver looks similar to the old MX-300 but is a completely different unit. Along with the receiver and CDU, units will receive a junction box made for the Coast Guard to simplify installation. The junction box has an input jack for the MX-525, and output jacks for the CDU and the positioning computer. All these connections are very simple and clear. The MX-420 is currently installed on the 49' BUSLs, 55' ANBs, and WLICs.



Collision Tolerant Pile Jetty Structure?

by John Barberi, D13 (oan)

Collision Tolerant Pile Structure (CTPS) Background: The CTPS was designed for use in high collision areas to replace frequently struck aquatic pile structures (e.g. the Houston Ship Channel that averaged four wooden pile structure allisions per week in 1997). The CTPS consists of three to four sections of 18-inch diameter pipe pile. The pile is knocked down during impact and returns to its normal vertical position. Three springs in the lowest section are pinned to a base cone assembly. These springs provide the restoring motion after a collision.

The CTPS project was abandoned and the Coast Guard was stuck with the "energized" base sections of the CTPS that had to be "de-energized" (12,000 pounds of tension) before the metal could be scraped. A complete CTPS costs approximately $23,000 (not including installation); the base section (energized section) costs about $11,500 alone!

D13 Problem: Due to the severe weather experienced in the Pacific Northwest between October and May, seasonal jetty lights were decommissioned each year, leaving the mariner without any aids on the jetty. These jetty lights marked notoriously rough "river bars" and mariners wanted a year-round light. Additionally, it required a Coast Guard helicopter to install and remove these structures.

A seasonal jetty light

D13 Solution: To provide the mariner with year-round aids on these jetties by utilizing the unused CTPS base sections. The idea was staffed through CEUOakland, CA for an engineering blessing and AFC-43 funds were identified for the installations.

Implementation:

1. CTPS Delivery to Astoria, OR: rather than pay a contractor to "de-energize" the bottom sections, 12 CTPS base sections were shipped from Texas to Astoria where modifications including foot pegs and an external lighted buoy solar battery box were adapted for use on the CTPS. Next, the entire structure was sandblasted and painted either green or red and affixed with retro reflective tape and numbers. Dayboards were not installed because they would not survive in the extreme harsh weather and high seas common in the Northwest.

2. Concrete Foundation for the CTPS: a nine-ton concrete sinker form was fabricated for the foundation of the CTPS and included an internal reinforcement bar basket. To secure the concrete foundation to the jetty rock, 16 three foot long by one inch diameter stainless steel pins were driven to a depth of 18 inches. Two concrete "buckets" were rented for the helicopter delivery of ten yards of premixed concrete for each CTPS installation.

3. Equipment Delivery to Jetties: equipment, supplies, concrete, and the modified CTPS were delivered to the jetties by HH-60 Jayhawks from Air Station Astoria and HH-65 Dolphins from AIRSTA North Bend, OR.

4. Lighting Equipment: standard lighting equipment was initially installed (solar panel, secondary batteries, and 155mm lanterns), but the solar panels didn't survive the winter surf. Now, a Carmanah 702-5 fully self-contained LED Lantern is on each CTPS.

Cost: $5000 per CTPS installation. AFC-43 funds were utilized (labor and helicopter costs not included; helicopter hours came from programmed AtoN support hours).

Final result: The first CTPS was installed in 1998 and the remaining five were installed in 2002. The mariner now has the advantage of six 24/7/365 lights. One more CTPS is planned for FY-04. Physical evidence that large/heavy objects (e.g. logs) have hit the CTPS is evident (i.e. paint chipped away) and the CTPS are still watching properly!

Coast Guard units involved in this project:

ANT Coos Bay
Mr. Doug Cameron
AIRSTA North Bend
AIRSTA Astoria
CEU Oakland
D13 (oan)
Mr. Sean McEvoy, Commandant (G-SEC-2B)

12/2 SO: Sun & Oil Resistant?

12VDC Power Cable Update

by BM2 Lee McMillan, NATON School

During a recent project at the School, a spool of 12/2 SEO cable turned up. A question was asked, if "SO" was sun and oil resistant, then what does the "E" stand for? In researching for the answer, we discovered that "SO" does not stand for sun and oil resistant. The "S" stands for "service" grade, and the "O" does stand for oil resistant. How many years were you taught, "sun and oil resistant?"

While the Short Range AtoN "Orange" Servicing Guide calls for 10/2 SO or 12/2 SO cable, 12/2 SO is typically used for 12 VDC minor aid applications. All cable used in wet or damp locations must also be rated for the environment, and will be stamped "-W" after the type designation (e.g. 12/2 SO-W). Standard SO cable is rated for use between -40°F and 140°F unless marked otherwise.

Technical Review

12/2 SO-W:
12 gage on American Wire Gage (AWG) standard, 2 conductor

Type Designations:

S	Hard **Service** Flexible Cord
E	Thermoplastic **Elastomer** Insulation
O	**Oil** Resistant Jacket
-W	Moisture & Sunlight Resistant "**Wet** Locations"

Power Lead Usage:

Black	Positive (+)
White	Negative (-)

12/2 NSN: 6145-01-291-2940

SEO type cable is authorized as an alternative. The "E" simply means a thermoplastic elastomer insulation is used. Its primary function is to increase the maximum operating temperature to 194°F, which may not be necessary or cost effective in most minor aid applications.

Appropriately sized ring or locking spade lugs are required at screw terminals, and ring lugs at battery posts. Soldering the terminals to the wire, and using a wire-crimping tool are recommended to prevent corrosion and eventual failure at the connection.

A power cable megohmeter test (Short Range AtoN "Orange" Servicing Guide, page 2-11) shall be performed at every discrepancy or scheduled visit. Many aid discrepancies are attributed to shorted or open conductors of the power cable. Feedback from the field indicates that all other lantern components are sometimes changed out prior to testing of the power cable. Save money and unnecessary trips to the aid, and prevent possible litigation by performing the test as required.

References:
Short Range AtoN Servicing Guide, COMDTINST M16500.19A
AtoN Technical Manual, COMDTINST M16500.3A
Underwriters Laboratories Inc. (www.ul.com/wire/)

Dual Solar Panel Mount

by BM1 Steve Worrell, USCGC KATHERINE WALKER (WLM 552)

KATHERINE WALKER has historically faced many aids with low voltages in the winter, especially in lower Raritan Bay and the Arthur Kill area near Fresh Kills landfill. The one likely source for this was a build up of bird guano from the high concentration of waterfowl in the area. Nixalite was tried with some improvement. I thought that if the panels could be mounted at an angle, it would discourage birds from roosting, and the guano would wash off easier. I modified a traditional 35W solar panel stand so that I could install two 20W panels at a 45° angle. The two panels were connected in a junction box at the base of the solar panel stand. LT Matt Rudick at D1 (oan) and Mr. Jon Grasson at Commandant (G-SEC-2) determined the solar calculations for this combination. Based on some approximations from Siemens, the dual mount panels were estimated to produce 60% more power than a single panel facing south at a 45° angle. Based on this, the solar calculations showed that the two 20W panels would work for a quick flash with 0.77A lamps. Another added advantage was that the solar calculations revealed that the system could operate with 200AH instead of the 300AH required for the flat 35W panel. This was a big advantage because it allowed us to use an external battery box for the aid. The one concern for this configuration was the possibility of overcharging the batteries. To check this, the dual panel system was set up to face directly into the sun at midday and the short circuit current was measured for the two panels. All tests showed it to be well below the industry standard for a self-regulating wet battery system (Delco). After testing the aid in the field for one year, the results have been excellent. While passing the aid throughout the year there has never been any guano on the panel and voltages have remained high.

The following are some battery voltage readings that were taken from the aid after deploying it in April 2002:

November 15, 2002	13.26 Initial
February 10, 2003	13.28 Initial, 12.76 Load
April 15, 2003	13.69 Initial, 12.89 Load

Deployed Dual Mount

Final Installation, note the Junction Box

What Should I Do With the Videograph-B Fog Detectors and old ACMS?

by ETC Roger Stephens, NATON School

The disposition message is out and we can finally rid ourselves of those Videograph-B fog detectors and old ACMS equipment; but let's not get rid of the ACMS equipment just yet, at least not until C2CEN has installed the NEW Tideland system, 1SG38-ACMS! C2CEN's SMEF advisory, SRAN 04-003 (Disposition Authority for Legacy ACMS and Videograph-B Equipment) provides disposition instructions for legacy ACMS equipment de-installed in conjunction with ACMS re-capitalization and legacy Videograph-B fog detectors de-installed in conjunction with installation of the CEVV-VM-100 visibility senor. It applies to all AtoN sites equipped with the legacy USQ-91 (V) ACMS, GCF-W-1221-LEACMS, or the CDNC-147.122/222 Videograph-B Fog Detector and their Maintenance units.

If you do not have this latest advisory, you can get it on the C2CEN Intranet web site: http://cgweb.lant.uscg.mil/c2cen/sran.htm.

For those units with existing ACMS monitoring systems, the new and much improved 1SG38-ACMS is on the way. Also, feedback information that I've received from the field indicates that the latest field change to the VM-100 Fog Detector (FC# 7) have had favorable results. This is news we've all been waiting for!

Videograph-B Fog Detector

Old ACMS

55' ANB Standard Evolution

by CWO H. Tony Farr, NATON School

MLCLANT conducted a Ship Structure and Machinery Evaluation Board (SSMEB) on the 55' ANBs in FY 2002 and determined that the boats were either at the end of their useful life expectancy or past it. Commandant (G-OCS) is diligently working toward a replacement, but the aging fleet of 55' ANBs will be required to stay in service at least through 2006.

Although the platform was not intended for reoccurring buoy deck operations, it has become a buoy tender out of necessity. Depending on the unit's area of responsibility, these boats could work buoys from 3rd class steel to 6th class foam and lighted buoys from 3.5X8 steel to 5X9 foam. Some ANTs mistakenly assume that since it is a small boat, the rigging requirements outlined in the AtoN Seamanship Manual (ASM), COMDTINST M16500.21 does not apply. Any Coast Guard asset that operates overhead lifting equipment or machinery is mandated by certain restrictions and requirements.

Since the evolution section of the ASM is vague, AtoN professionals from the School, HQ, 3 Districts, and 5 ANTs gathered at ANT Gulfport to evaluate the currently used 55' ANB buoy deck evolution during the week of 12 July. It's apparent that a Coast Guard wide standard evolution is non-existent and every effort is being made to establish one. We are still working on the safest evolution and guidance will be forthcoming. In addition, a 55' ANB Operators Manual is being developed by Districts, Groups, and ANTs and will be distributed to the field by Commandant (G-OCS) once it is completed.

Thanks to the team for their continuing work and a special thanks to the members of ANT Gulfport for their support of this effort.

BMC Lowry
BM1 Gonzales
MK1 Haden
BM3 Hemphill
MK3 McKinney
EM3 Barger
EM3 Massengill
SN Taylor
FN Grantham

Bridge Lighting

by Austin Pratt, D13 (oan)

Bridge lighting not only marks highway and rail bridges as hazards to navigation, but also assists the mariner in lining up the approach. These lights are subject to Coast Guard jurisdiction and discrepancies should be reported similarly to other AtoN with priority message traffic. Mariners will then be alerted to outages via broadcast notices and/or the Local Notice to Mariners.

Bridge lights are not found in the *Light List* with one geographic exception. In the *Light List Volume V*, bridges were added in the old Second District. There is one number for each bridge, not a number for each light. Bridge lighting is also not indicated on charts.

While bridge lights serve as private aids, they are regulated separately under 33 CFR Part 118. District bridge staffs in either bridge branches or bridge sections of AtoN Branches around the country administer these requirements. Annually, Coast Guard Auxiliarists inspect bridge lighting on thousands of bridges. Other mariners also commonly report bridge lighting discrepancies.

Radar does not always give a good return off bridges. Frequently, it isn't possible to detect the span openings or pier positions. Lights can provide close range confirmation of channel position as well as marking obstructions in the water.

Fixed bridges are generally marked by red lights on piers (support columns) or pilings, pile dolphins, fender systems, etc. Pairs of green lights in the center of spans mark either the channel axis or the perpendicular course to the bridge as ranges. These two colors are not generally used as lateral markings at US bridges.

Drawbridges have red lights marking piers similar to fixed bridges, but the draw spans will also have red lights marking the drawspans when they are closed. The red draw lights turn to green when the draws are fully opened.

Bridge lighting is not limited to the foregoing. District Commanders may require additional lights, RACONs, or daymarks. Sometimes three white lights may be posted vertically over green channel lights to mark the main span or increase visibility. One vertical lift rail bridge on the Columbia River has strobe lights and a flashing down-arrow to indicate closures in progress. A RACON at center span activates when the span is fully open.

Lights are required to be energized from sunset to sunrise or whenever the visibility is less than one mile. The candlepower must be sufficient to make the lights visible against background lighting at a distance of 2,000 yards 90% of the nights of the year. Tungsten filaments are not specified as a requirement.

Bridge lights are not required for non-navigable waterways or those on which no significant nighttime boat traffic occurs.

Commandant G-SEC-2'S Website

by Son Nguyen, Commandant (G-SEC-2)

The Ocean Engineering website, www.uscg.mil/systems/gse/gse2 has pertinent information for ANTs, Cutters, District Offices, and CEUs. Under "Products/Services," the AtoN Equipment List details all of the hardware maintained by the Signal & Power Team. The list contains the name of each component along with a picture of most entries, stock or part number, source of supply, and estimated price. The source of supply contains hyperlinks to ELC's website for MILSTRIP and XB repairable items, hyperlinks to manufacturer's websites for commercially available items, and generates an email to the commodity manager for headquarters released items. Additionally, prices for steel, plastic, river, and foam buoys are listed along with small and large buoy chain. This webpage is the best source to determine where to buy AtoN hardware.

Technical Data Sheets are provided to address unique procedures that are not yet published in our Commandant Instructions; e.g. the bench-test procedure for SACIIs, vibration isolation of VRB-25s, and FA-240 focusing procedures.

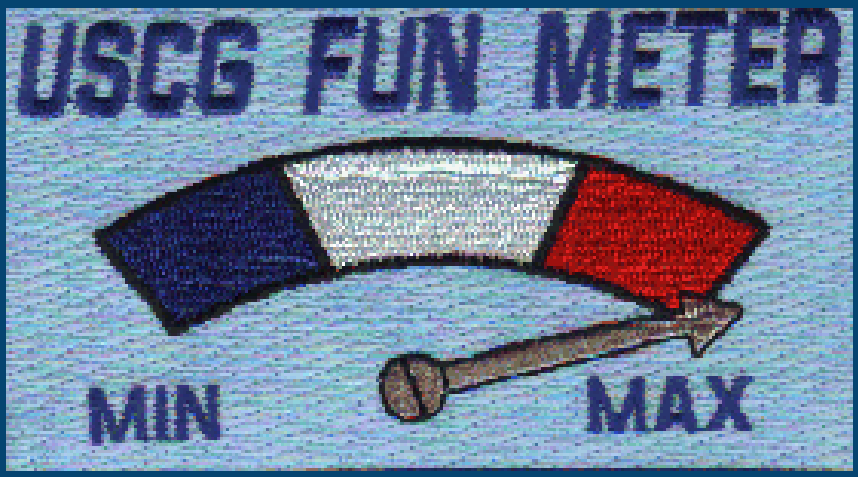
Drawings are provided for all standard lighthouse and range installations. We are in the process of converting them to Adobe PDF format so that they will be easier to download.

Popular Commandant Notices and guides are provided for easy access, including dayboard and retro film pricing agreements, Carmanah LED lantern policy, installation instructions, GSA schedule (recently revised), and instructions for LED lanterns currently under field test.

A list of required publications (some, like the Classical Lens Maintenance, can be downloaded) as well as software to evaluate two station ranges, solar designs, and the visual range of light signals are available under "Pubs/Software."

"Related Links" provides access to popular Internet sites pertaining to AtoN.

If you have any questions or suggestions for improvement, please contact me via email at snguyen@comdt.uscg.mil or by phone at (202) 267-1869.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