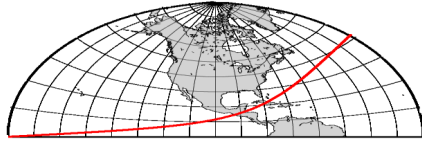




United States Power Squadrons®

Come for the Boating Education...Stay for the FriendsSM

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The Rhumb Line

Our Bridge Officers

Commander:

P/C David Danehy, P



Executive Officer: Vacant

Educational Officer:

D/Lt/C Frederick A. Costanza, N



Administrative Officer:

Vacant

Secretary:

Lt/C Grace Mahoney, P



Treasurer:

P/C Susan Kennedy, AP



Message of our Commander, David Danehy, P

Happy New Year! I hope everyone had a wonderful time with family and friends over the holidays. I enjoyed mine and wish it could continue just a little longer.

With the new year comes new opportunities to improve outcomes for our families, our place of employment and our Squadron. One opportunity is the pending merger with the Worcester County Sail & Power Squadron. Steve Mullen and his crew are working through the details of preparing for the merger and our Bridge will be assisting sometime in the near future. Our Executive Committee is researching new locations where we can have meetings so our new members from Worcester can find it easier to join in member meetings and activities.

Continued on page 2

Nobscot Calendar 2016

January 20th – Exec Com

February 6th – D12 Council Meeting

February 13th -21st – NE Boat Show

February 17th – Membership Meeting

March 7th – ABC Class @ Keefe Tech

March 12 – D12 Spring Conf. & COW

March 16th – Exec Com

April 2nd – Nobscot COW

April 20th – Membership Meeting

May 18th – Exec Com

June 15th – Nobscot Picnic

Summer Break

September 21st – Exec Com

October 19th – Membership Meeting

November 16th – Exec Com

December 21st – Christmas Holiday Party

I look forward to working with Steve and his active members to make them feel welcome. I hope we can share in the activities that have become traditional for them as they will, in turn, enjoy some of our traditions and activities. As we move forward I hope together we can create new events and activities that we can all enjoy.

I have worked with Commander Mullen in the past and he is a great leader who has a can do attitude. If he is representative of his Bridge and active officers, I see a bright future for all of us. I welcome Steve to share in this message with his own comments for Nobscot and Worcester Squadron members.

We hope to see you soon!

Best wishes,

Commander Dave Danehy

FAREWELL TO GRACE MAHONEY

By Ruth Hagen, S



On 13 January Nobscot Squadron and its Past Commanders Club honored Lt/C Grace Mahoney, P, with a farewell dinner at the Squadron's favorite Bella Costa Ristorante. The party was attended by 21 members and guests.

Grace is moving to Plymouth, to be near her family. For 30 years she and her late husband, P/C Jim Mahoney, AP, were a vital part of our Squadron activities. We remember the many festive Christmas parties that Grace and Jim organized and carried out at Nobscot headquarters, as well as all the highly enjoyable Squadron cruises and rendezvous they planned, organized, and directed so well on the good ship *Blue Chip*. Grace has earned 20 merit marks, serving superbly as Squadron secretary for countless years, as well as supply officer and assistant treasurer. We will miss her.

The party began with an appetizing Happy Hour, followed by a delicious Bella Costa dinner, with a special carrot-cake dessert. Grace was then commended by Cdr. David Danehy for her years of loyal service and presented with a silver starfish pendant and chain as a memento of her years in Nobscot.

We will always remember Grace, and we wish her Godspeed on her next adventure in life.



MARINE HIGH-FREQUENCY SINGLE SIDEBAND (HF/SSB) RADIO

Part 4

By P/R/C Don Hagen, SN, Radio-Tech Officer

HF Antenna, Antenna Tuner, and Ground Plane

HF Antenna. The antenna-ground system is a critical part of an HF radio installation, yet it receives the least attention and is the least understood. Let's start with the basic omnidirectional antenna for marine radio, a vertical standard dipole, shown in Figure 1.

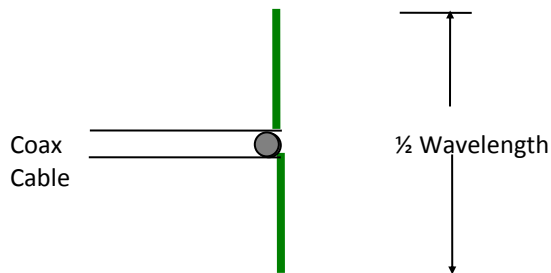


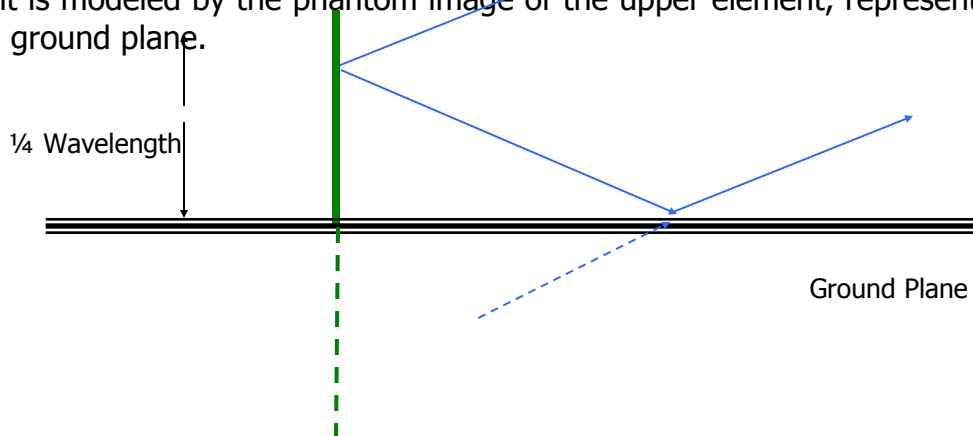
Figure 1. Theoretical Dipole Antenna

To establish the electrical resonance necessary for launching a radio wave, the length of each of the two antenna elements (shown in green) must be equal to the distance traveled by the electrons in one quarter of a cycle; so the overall length of the dipole antenna must be half a wavelength. Since electrons travel along the wire element at 95% of their speed in free space, the length of a half-wave antenna can be calculated from:

$$\text{dipole antenna length (in ft)} = 468 / \text{frequency (in MHz)}$$

For our VHF channel 16 (156.8 MHz), the required dipole electrical length is only three feet. However, for the HF band a dipole would be much too long to be practical. For example, near the middle of the band (10 MHz) the required length would be 46.8 feet.

Fortunately, in the early days of radio it was found that a reflective ground plane placed under the upper element can substitute for the lower element. This is shown in Figure 2, where the lower element is modeled by the phantom image of the upper element, representing the reflection from the ground plane.



¹. USPS Marine Electronics Student Manual ME-97, p. 10-1

Image
Antenna
Element

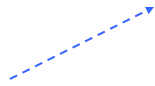
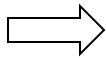


Figure 2. Theo-

retical Quarter-Wavelength Antenna

The blue lines show paths of two rays from the antenna: One moves upward, while the other is reflected off the ground plane, as if it came from the phantom image element. Based on the above, a typical HF antenna for a power boat is a 23-ft vertical whip. Sailboats normally use an insulated 26-ft backstay antenna. Both require a good ground plane and a tuner for adjusting the electrical length of the antenna for each frequency.

Antenna Tuner. Such a quarter-wavelength antenna is fed at its base. The antenna can be made electrically longer by inserting a loading coil (inductance) at its base, to slow the electron's speed of travel, or electrically shorter by adding a capacitor. The result is an antenna of practical physical dimensions with the proper electrical length for the working frequency. This tailoring function is the job of the antenna tuner.

Several manufacturers produce automatic antenna tuners. ICOM recommends the AT-140 for use with the M802 Transceiver and a whip antenna, and the AT-130/E for a backstay antenna. The tuner compares the phase relationship between the voltage and current at the antenna and then automatically inserts the proper value of inductance or capacitance². The shorter the cable length between the antenna tuner and the antenna, the more efficient the antenna system. For this reason an automatic antenna tuner is preferred, as it can be located near the base of the antenna. A manual antenna tuner would be installed where the radio operator could make the adjustments, which would usually require a longer cable length to the antenna.³

Ground Plane. A dedicated ground plane is not required on a vessel with a metal hull; but for fiberglass and wooden boats the biggest fault with an SSB installation is often the lack of an adequate ground plane (also called the counterpoise).

A good counterpoise should have at least 100 square feet of metal surface area. The conventional approach starts by connecting the engine and all large metal objects on the boat together with three-inch-wide copper foil. Then install several lengths of copper foil inside the hull on each side from bow to stern, at or below the waterline, and one or two lengths inside the bottom (above the bilge). Connect the copper foil to the antenna tuner.

Some fiberglass boat manufacturers mold a copper foil counterpoise into the hull during construction. This is adequate in itself. The old technique of attaching a copper plate outside the hull is no longer recommended, because it requires cutting holes in the hull, corrodes rapidly, and does not provide the best performance.

A few years ago a new marine SSB ground plane design arrived, called the KISS-SSB™. This uses several quarter-wavelength radial wires to resonate in the marine bands. The manufacturer states that this system is by far the easiest to install (30 minutes) and works as well or better than copper-foil bonding. It consists of a ten-foot length of one-inch diameter tubing enclosing each copper radial. The tubing prevents the corrosion that rapidly occurs on copper in salt air. The cost is less than \$200.

². *ibid*

³. USPS Marine Communication Systems Student Manual, Chap.7, p84

Nobscot Nautical Quiz

By P/C Robert R. Capobianco, JN

P/D/C James E. Mello, P has suggest to me that we initiate a monthly nautical quiz contest which will consist of a series of questions on marine matters. The first Member who gets all eight of the questions correctly will be a guest of the Squadron at the next Membership meeting. The Member who is the winner may also take a guest with him or her.

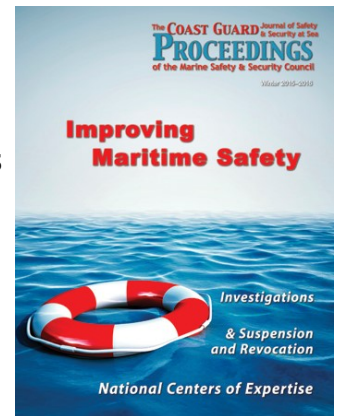
All entries should be sent to: jasmello@verizon.net. The earliest correct entry will be the winner. In the event of a tie, a run off quiz will be held to break the tie.

Jim has volunteered to be the judge and jury of this contest and his decision will be final. There will be no appeals! (Sounds *doctorial* to me.) His decisions and the answers will appear in the next *Rhumb Line*.

These questions have come from the latest issue of the "U. S. Coast Guard Journal of Safety & Security at Sea" known as *Proceedings*.

Answers to be based on INTERNATIONAL LAW ONLY

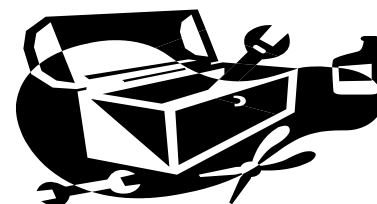
1. Your vessel is backing out of a slip in a harbor. Visibility is restricted. Which signal are you required to sound?
 - A. one prolonged blast only
 - B. one prolonged blast followed by three short blasts when the last line is taken aboard
 - C. one prolonged blast followed by three short blasts when leaving the slip
the danger signal
2. Which statement regarding the free surface correction is TRUE?
 - A. It is added to GM at light drafts and subtracted at deep drafts.
 - B. It is increased if the slack tank is not on the centerline.
 - C. It is decreased if the slack' tank is below the KG of the vessel.
 - D. The correction decreases as the draft increases.
3. You are steering 125° PGC. The wind is southwest by south, causing a 3° leeway. The variation is 6°E, the deviation is 2°W, and the gyro error is 1° W. What is the true course made good?
 - A. 121°T
 - B. 123°T
 - C. 127°T
 - D. 129°T



4. Which statement is true when the captain of the port or officer in charge, marine inspection issues an order of suspension to the operator of a vessel concerning oil transfer operations?
- A. It is always effective immediately.
 - B. It includes a statement of each condition requiring corrective action.
 - C. It must be in writing before it takes effect.
 - D. All of the above.
5. When a megohmmeter is being used to test insulation resistance, current leakage along the surface of the insulation is indicated by the megohmmeter's pointer responding in a very unique way. What would be the response of the pointer?
- A. dipping toward zero, then raising slowly
 - B. continually rising as test voltage is applied
 - C. kicking slightly down scale as voltage is applied
 - D. fluctuating around a constant resistance reading
6. The quantity or condition which is measured and controlled is known as the
- A. controlled variable
 - B. manipulated variable
 - C. set point
 - D. control point
7. Excessive side clearance between a piston ring and its groove will cause the ring to
- A. expand excessively under operating temperatures
 - B. scuff the cylinder liner excessively
 - C. hammer the piston land above the ring
 - D. hammer the piston land below the ring
8. The horizontal fore and aft movement of a vessel is called:
- A. yaw
 - B. sway
 - c. heave

Tech Tips

Subject: Tool Box By Jack Savilonis



I thought it might be a good idea to think about our boat's tool box. It should meet the needs of our boats and our repair skills. We have to be practical about this: how much can we really do out there? Here is a short list of some of the musts for your tool box.

- (1) Assortment of spare fuses (check your fuse box for amperage ranges)
- (2) Spare Fan Belts
- (3) Spare Cooling Hoses
- (4) Spare Fuel Filter
- (5) Spare Spark Plugs
- (6) Spare Prop.

Now let's think for a minute of just what you will need to change the spare parts you have. Check to see what size wrenches, sockets and extensions you will need to change the belts. How are the cooling hoses secured, screw type clamps or wire band type (corbin clamps)? Special pliers may be required. Prop Changing: correct wrench size, spare cotter pin. How are the fuel lines secured to the filter: screwdriver type clamp?

There's a pattern developing here! Do you see it? If you bother to have the part, have the tools that go with it. Here is a partial list of tools that I carry:

- Duct tape (best stuff ever made)
- Electrical tape
- Flashlight
- Water Pump Pliers
- Hammer
- Assorted set of screw drivers
- Ratchet Extensions Sockets including spark plug socket
- Metric Adjustable / American Standard Adjustable
- Test Light
- Battery terminal cleaner
- Assorted Combination Wrenches up to and including prop. nut size.

I am sure that there is much more you might want to consider. Adjust the list to fit your needs.

Lastly, I want to make mention of the most important tool that you could have on your boat. Imagine that you're 5 miles off shore and you have a complete electrical failure. You could be in trouble. Somewhere in that tool box should be a hand held V.H.F. radio and spare batteries for it. Remember to make your broadcast from the highest point in your boat (line of sight to the horizon).

Don't know what I am talking about? Then plan to take the Marine Electronics course!

Reprint from the June 2003 *Rhumb Line*

Tech Tips By Jack Savilonis

Question:

How can I keep connectors for things like my depth finder and trailer hitch from rusting up during winter lay over?



Answer:

Try this! Take a small paper bag and put in one of those small packets of silica gel. (those packages about the size of a sugar package that come with every electrical appliance that you buy). Then put the bag over the connector. Now put a small plastic sandwich bag over the paper bag. Wrap them tightly with a rubber band. The plastic will protect the paper bag and the silica gel will absorb any condensation near the connector.

Picture from: thomasnet.com

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