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FLYER

WI-FI ADVANCES FOR YOUR BOAT

BY MARK KILTY

Have you ever decided where to anchor based on internet access instead of holding, fetch, and swell? You're not alone. Internet connectivity has become a tool people around the world rely on every day. Over the years, many advances and products have been made available for boaters to greatly increase their ability to connect to shore-side access points.

Internal laptop wireless cards are extremely low power, they use an antenna buried inside the laptop case, and in turn have a short range of effective use. They were built with the idea of connecting to a network in your home or office—so from your boat, you need something more powerful.

The simplest means of getting farther range are external USB-based wireless cards. Many are on the market, varying in ability and power. The maximum single port USB device transmits at 500 milliwatts or 27 dBm (laptops transmit at approximately 50 milliwatts). Some of the companies that manufacture these devices are EnGenius, Alfa, Ubiquiti, Rokland, and D-Link. All of these devices will give




you a much stronger output range because they transmit at a higher output level and have a much greater ability to process weaker signals. They are easy to install and use, as there is no external power required for the unit, and they were designed for all computer users. Some new units can go up to one watt of power, but how they interact with the USB ports on computers still has to be proven since they draw a significant amount of power from the laptop. Be aware that none of the USB units were built or designed waterproof.

Client Bridges can be used to repeat an onshore wireless signal on your boat, so your computer can then connect via it. Client Bridges were designed and built for wide area Wi-Fi networks. They will allow many computers to connect to the bridge, and the bridge then in turn will connect to an access point. There are a few marine products on the market that utilize Client Bridges, such as Port Networks (www.portnetworks.com) and IslandTime PC. Use of an external power supply is necessary, and the user interfaces were designed with network engineers in mind. These units are sealed and waterproof because they were originally designed for an outdoor environment with an Ethernet cable being run to the computer.

Wi-Fi is line of sight. Because of this, the location and type of antenna that is used in conjunction with either solution above is extremely important. The antenna should be mounted outside the boat with an unobstructed view. There are two types of antennas: directional and omni-directional. Directional antennas are higher gain, but point in a single direction. Directional antennas are very difficult to utilize in the marine environment as your boat is rarely stationary. An omni-directional antenna will transmit and receive in 360°, allowing the boat to move without affecting the connection.

An 8-9 dBi omni-directional antenna will give the best compromise of added range but not reduce the angle at which the antenna receives and transmits. This antenna will transmit and receive at a 20-25° angle vertically from the physical antenna. A 12 dBi transmits at about 10-15° and a 15 dBi at about 3-6°. Using a higher gain omni-directional antenna (greater than 9 dBi) forces you to place it at the same vertical plane as the access point you are trying to connect to, which will vary from port to port.

While using a marine Wi-Fi product or a solution you put together yourself, you may be tempted to run a long coax cable between the electronic gear inside your boat and the antenna outside. Coax cable has significant signal loss—and the longer the run, the bigger the loss. Certain types of coax cable are better, but ideally, little or no coax cable is used. The other cabling (USB/Ethernet) can be extended almost indefinitely with very little signal loss.

Today, having the ability to get online from the comfort of your own boat is a luxury all boaters want—and advanced solutions may be simpler than you think. 

Mark Kilty worked in the computer industry for 11 years and now sails in the Caribbean with Liesbet and Darwin helping out cruisers interested in Wi-Fi solutions for their boats. Read more at www.thewirrie.com or contact mark@thewirrie.com.

AN IDEAL WI-FI SOLUTION FOR YOUR BOAT

An ideal solution would take the following into consideration:

- A Wi-Fi adapter (USB/Client Bridge) with good transmit-power and receive-sensitivity.
- A single cable run between the computer and the WiFi device, with power being supplied by the computer, so installation is trivial.
- The Wi-Fi adapter should be mounted close to the antenna to reduce/eliminate the coax cable used in the system.
- The Wi-Fi antenna should be in the range of 8-9 dBi to avoid issues of vertical alignment with the access points.
- The antenna should be mounted high enough to clear obstructions on deck and with a clear 360° view. Most access points you will be connecting to will also be at sea level, so a clear line of sight off the boat is needed, but height is less important.
- The configuration on the computer should be no more complicated than what you are using today.



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