

Hardware and Installation by David Anderson

These days it seems we have become dependent on the need to either obtain or impart information. With the advent of computers, e-mail and cell phones we are forever sending or receiving messages of one sort or another. Stop and think about it - when was the last time that you went through a whole day without checking for or sending an E-mail message?

So what can be done when you head south on that Caribbean cruise – you can't just cut off those lines of communication? Fortunately, there is a solution – a **single-side band** (SSB) system, interfaced with a modem. Hook up your trusty laptop and you will be back in business!

This is where the fun starts – what to buy. There is an abundance of communications equipment in the market place – transceivers, tuners, modems, and computers from numerous manufacturers each claiming to be the best thing since sliced bread. Remember that your objective is to end up with a system that works, works well and works reliably. Let me emphasize that word – **system** – you don't want to end up with an assortment of components that won't co-exist with one another.

Today's single-sideband transceivers are sophisticated pieces of technology, with many different configurations available. As with most electronics, the price goes up with additional features and power capabilities. The output power of common marine SSB equipment is 100 - 150 watts – anything more is unnecessary. Kenwood or ICOM transceivers are popular with the cruising community. Hams usually opt for a Kenwood TS-50S or an ICOM 706MKIIG, while the most popular transceiver with non-Hams is the ICOM M710.

An automatic antenna tuner is an essential system component. Automatic tuners use microprocessors and complex internal software to match the antenna to the transmitter. This is no small task as the impedance of the antenna varies dramatically with frequency. Only when the impedance is matched does the maximum transfer of power take place between the radio and the antenna. Without a proper match some of the energy from the radio doesn't make it past the tuner and is reflected back into the boat. (An imperfect match between the radio and antenna is one of the reasons that lights on your electrical panel glow and voltmeters bounce when transmitting on SSB.)

Finally there's the modem. There are a number of modems or controllers (TNC's) on the market, although the SCS PTC-II and the Kantronics KAM+ are the most popular with cruisers. The KAM+ is a second-generation controller, with a simple micro-controller and programmable analog filters. The SCS PTC-II is a third-generation controller with a powerful digital signal processor (DSP) to handle the modem functions plus a 32-bit microprocessor for the digital chores. The choice is economic, with the PTC-II offering much faster and more robust connections at a higher cost ... so

– bite the bullet and choose a Pactor II Pro, you'll be glad you did!

But where to buy? Increasingly I run into clients who try to "economize" by purchasing system components via the Internet – while this can sometimes result in cost savings, in practice it often doesn't work out that way. You may be buying someone's problem; warranty and after-sales support are often minimal or non-existent and typical first time SSB buyers often lack the knowledge and experience required to select appropriate components. Help! This is usually when I get called in – to get the assorted components to talk to each other and work together as an integrated system. Usually it can be done, but labor expenditures eat up the component savings. On the other hand there are times when that "bargain" just will not co-operate with other system components and the "right" component still has to be purchased.

Don't underestimate the difficulty of installing a SSB system. It is not technically difficult, but it is laborious. Do the job well, use proper materials and you will be rewarded with a system that will provide many years of reliable service. Cut corners and you will be wondering why you spent all that money on a SSB system that half the time doesn't seem to work anyway. Self-installation of a SSB radio system will take at least one weekend for you and a competent friend to install properly. As with anything on a boat, attention to the details will make a huge difference in performance.

Likely the biggest challenge will be installation of your RF Ground Plane. A good RF Ground Plane is vital to system performance. This counterpoise is half of the antenna system and can be thought of as the springboard used by the signal to jump off the boat and into the atmosphere.

While installation of an RF ground plane is different for every boat, the basics remain the same. The idea is to attach all big metal items on the boat together with copper strap and end up with a minimum of 100 square feet of metal surface area. Start at the Automatic Tuner, which should be mounted aft, close to the feed point for the antenna. From the tuner, run copper strap forward attaching it to the engine, any metal tanks and a keel bolt. Try to use the widest copper strapping that will fit – 12", 5", 3", 2" or ½". It takes time and all joints must be neatly soldered. No Pain, No Gain. Think metal surface area.

The cost of high quality materials is minimal compared to that of your other SSB system components. Marine materials are expensive, but over the long haul the performance benefits are well worth the extra cost. Tinned wire and connectors for corrosion protection; wire of the proper type and size; heat shrink tubing to keep connections dry; and flat copper strap are each part of a good installation. The basic techniques are; make good soldering connections; keep all connections bone dry and provide good electrical connection surface area contact.

Selecting, purchasing and installing a system that will serve you well can be a daunting proposition. Do yourself a favor and seek the help of your local marine HF radio specialist to select a transceiver / tuner / controller combination that fits your needs and budget. A professional is also able to help with the design and installation of the primary antenna for your vessel along with that most important item – the RF ground plane. It's an investment that will repay you many times over.

STAND SURE MARINE specializes in the design, installation and supply of components and materials for marine single-sideband systems. One stop shopping for all your marine communication needs.

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