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KISS-SSB and the GAM Split lead Antenna

I find it interesting that there are still some people that cannot admit the KISS-SSB and the Gam Split Lead antenna work. The comments below are as a result of my many hours testing, solving issues and programming over 300 boats in Mexico over the past five years.

What I have found while testing HF SSB installations aboard Cruising Boats:

1. It is almost impossible to install KISS and Gam wrong.
2. The installation is so simple most Cruisers install their own system. Professional loose business.
3. KISS and Gam do not suffer from corrosion like other techniques used for grounds and antennas.
4. A Dynaplate may slightly outperform a KISS Ground initially. If maintained it will continue to provide a great RF ground. (Cleaning contacts and copper straps)
5. Most Cruisers are not Electrical Engineers, Radio experts, or even long term Ham radio operators. The KISS approach of KISS-SSB and GAM Split Lead antenna do not require a professional.
6. I have found many installations by “professionals” that were very poor and in some cases the radios did not work. They frequently take shortcuts to save time and cost after the installation price is set.
7. In one case a Cruiser also connect to the ships ground with a KISS-SSB and had SWR issues. We removed the ground and all was well.
8. During the Puddle Jump for 2012, the only boat in the fleet I could hear from Mazatlán when the PPJ was at the equator was a KISS-SSB ground and a backstay antenna.

The more popular the KISS-SSB and GAM Split Lead get the more I hear installers saying the devices do not work. Installers would love to have your \$2000+ for installation.

Cruisers that install their own systems take the time to do it right and typically have the best installations. Cruisers also become smarter on how the M802 works. That may come in handy if you end up in the middle of an ocean.

To my surprise, **I found this information within the Sailmail Primer.** I sent an email to the Sailmail technical support and specifically said: “I would appreciate a copy of the empirical data in order to understand the conclusions that resulted in the statements in the Sailmail Primer.” Since I have received no response from the technical support person, I can then only assume the comments are subjective and no real testing was conducted prior to making the statements. As a result I will address each of the Sailmail comments.

*Sailmail Primer Comment / **Made Simple for Cruisers Response***

GAM Split Lead Antenna

"We advise against the GAM split lead antenna, and the KISS SSB ground. Both can put more RF into the wiring and rigging of your boat and make RFI problems tougher to solve. It is better to use an insulated backstay and a counterpoise connection to the ocean."

There is no test data to support this statement. When a backstay or Gam type antenna is used, part of the radiated field goes into the boat. The better the overall system is the more radiation will enter the boat and adjacent rigging. The main issue Cruisers have replicating Sailmail is that Cruisers forget to select low power.



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The GAM antenna is a pair of wires attached an uninsulated backstay with a plastic extrusion. It is long enough to serve as an antenna on its own, but by coupling it to the backstay then it couples to the backstay and the whole rigging system becomes part of the antenna (assuming no insulators). This causes very high levels of RF interference around the boat as well as the potential for high voltages anywhere in the rigging.

When Transmitting on HF with a sloped antenna there is always RF coming into the boat. Components on the boat will pick up the HF signals. However, there is no indication or test data to indicate that the components will pick up more HF signal from a Gam antenna than a backstay. A vertical whip or fiberglass antenna high on a vessel will radiate less into the boat because of the vertical angle, but is not as effective for an antenna.

"An insulated backstay is the best approach, with the tuner mounted just below it, generally under the stern deck. If an insulated backstay is not practical (e.g. temporary use) then we would recommend a stand-alone whip antenna, or a wire antenna hoisted on a spare halyard."

An insulated backstay does preform slightly better than the Gam split lead antenna based on signal strength and antenna current tests conducted in Puerto Vallarta. The Gam split lead antenna always outperforms the typical whip/fiberglass antenna. This is as a result of the polarization of the transmitted signal being different that the sloped stay antenna. The rope wire antenna works well, but the commercial version uses poor connectors at the base of the antenna.

Backstay antennas, connections corrode and must be checked and cleaned to reduce reflected power. The Gam antenna is sealed and only has one exposed connection to the RF tuner that should be checked for corrosion.

KISS-SSB

"The ocean makes a terrific counterpoise, all we need to do is connect to it. The simplest and one of the best methods is a ground plate, basically a direct connection to the ocean. An external keel also works extremely well, connected with a wide copper strap (for low impedance). Alternately, interior metal (engine, tanks, metal screening, inside keel) can be connected with copper strap and used as a counterpoise, with surface area capacitively coupling to seawater through the hull (a function of surface area and spacing)."

I agree a grounding plate such as a Dynaplate or external keel make a good ground. The wide copper strap is OK, but the 1" tinned copper brad will outlast the copper straps and is a better RF conductor. If your vessel has copper laid into the fiberglass, this may be your best ground. All of the vessels tested with massive copper isolated from DC ground test very well.

The alternate approach suggesting engines and tanks often leads to connections between the RF ground and the DC ground. This recommended technique by Sailmail is called "Undesirable ground points" by Icom. This approach is considered the worst possible RF ground and is poor advice. Using the engine frequently causes an increase of stray RF starting pump and causing lights to flash during transmitting periods as it ties the RF back to the -12 VDC.

The above methods do require some maintenance activity by the cruiser. The connections are typically low in the boat and require cleaning and replacement of pieces in order to remain functional



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A few limited “professionals” indicate the KISS-SSB puts more radiation in your boat. That may be possible as my antenna current measurements indicate KISS-SSB radiates more RF into the air than some solutions including using the engine. More RF into the air the more RF into the boat!

The KISS-SSB is sealed and only has one exposed connection to the RF tuner that should be checked for corrosion.

The KISS is basically a single, short conductor used as a radial. There will be some coupling to seawater, but much of the signal will be radiated inside the boat where it does no good, and subjects the onboard electronics and people to high levels of RF. It is far better to use the ocean as the counterpoise and get the RF emissions out where they do some good and can radiate.”

The author of this comment does not understand how Kiss-SSB works. It is not used to couple to the sea, but provides the other half of the 1/2 wavelength antenna allowing the antenna to transmit. The popular AT 130 and AT 140 love the KISS-SSB. Reflected power is always minimal.

It concerns me that the technical support for Sailmail is an equipment installer. As an equipment installer there may be a conflict of interest as a result of loss of business as the anti-KISS and Gam statements are biased and appear to be subjective instead of factual. My testing and information from active cruisers indicates both products work. In the case of KISS-SSB, in many cases it appears to even outperform other solutions.

The Gam Split Lead Antenna and KISS-SSB have resulted in simplifying HF SSB installation such that most Cruisers now install their own HF SSB. Eliminating the cost of installation reduces the cost of HF SSB by thousands of dollars which allows more Cruisers to afford HF SSB. With HF SSB, DSC and commercial vessels implementing GMDSS on vessels over 300 tons, all Cruisers should have a DSC capable HF SSB on board.

Interesting note from the web:

“Communications Expert Gordon West Reports: I have done numerous SSB ham and marine radio checks with this system and have found no discernible signal losses, even when used with a well-grounded backstay aboard a steel-hulled vessel.” The Split Lead antenna’s. . . ”twin radiating elements. . . bang out a signal as if they were suspended in mid-air.” – from Sail Magazine’s “Ask Sail” column, October 2005.



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A recent email from a South Pacific Cruiser:

Hello, Commander, My name is William Ennis and we had a several-months-long correspondence as I was installing an Icom M802 system aboard our sailboat, Wings. For the season, we've left Wings on the hard at Vuda Point Marina in Fiji, so it's easy to see that we did survive the trip across the Pacific. The radio worked as advertised with the KISS counterpoise and GAM antenna. I could send email 3200 nm when needed, all the way to the San Diego Yacht Club, and had good luck with voice, depending on time of day.

As a Macintosh user, I had complete success running Windows 7 on top of Parallels, an emulation program, and used the newest version of Airmail. I have not gotten the Bluetooth to reliably work with our Pactor 7403, but it's often more convenient to work with the laptop on the nav station, anyway.

All of this is roundabout way of thanking you for your instrumental help to me in my install and afterward. Your kindness to me was exceptional since we have never met.

*William Ennis
Skipper s/v Wings*