THE WCF EXPERIMENTER

FROM THE EDITOR:

This will be my first issue of "The WCF Experimenter" in a long time. This newsletter has had a varied existence over the last ten years or so. It has come out as many as four times a year, and as few as zero times per year when there was no one to pick up the reins. It has suffered at the hand s of well-intentioned editors with too little time available to really devote enough of it to the publication and it has sometimes become almost a private newsletter of one ham's projects because too few amateur operators were willing to put pen to paper (an anachronistic term of course, these days everyone has a PC with a word processor program built in)

We are going to try again to maintain "The WCF Experimenter" as a quarterly newsletter that will be posted on the West Central Florida Section web site www.arrlwcf.org I have one article in this Spring issue that I did not write and I thank John Chaput, KK4LI for contributing a very readable and succinct effort on proper grounding of the radio room and the antennas associated with it.

In order for this e-magazine to be a success, the readers must provide not only direction as in "What do you want to see covered?" but also content. This effort cannot and must not be only written by just a few amateur operators. I will bet that almost every ham out there has created at least one unique solution to one of the many problems that confront us in this avocation.

All you have to do is write down what you did and why. If you can take a few pictures of the project so much the better. Understand that the job of an editor is to take the missives that cross his or her desk and using pretty standard rules of prose writing, clean up the text, smooth out the wrinkles, and generally get the author's work ready for publication. I have more than 25 articles published in QST and several more that wound up in "The WCF Experimenter over the years and I can assure you that what I sent in is always a bit different than what winds up in the pages of the publication. That is the job of an Editor.

So, please, think about the neat things you did to make your station work the way you wanted it to, and write them down and take some pictures or submit a few rough sketches. We will work with you, the author to make your work look great in the pages of "The WCF Experimenter.

Here then is the new edition of The WCF Experimenter with some articles from far and near for your enjoyment.

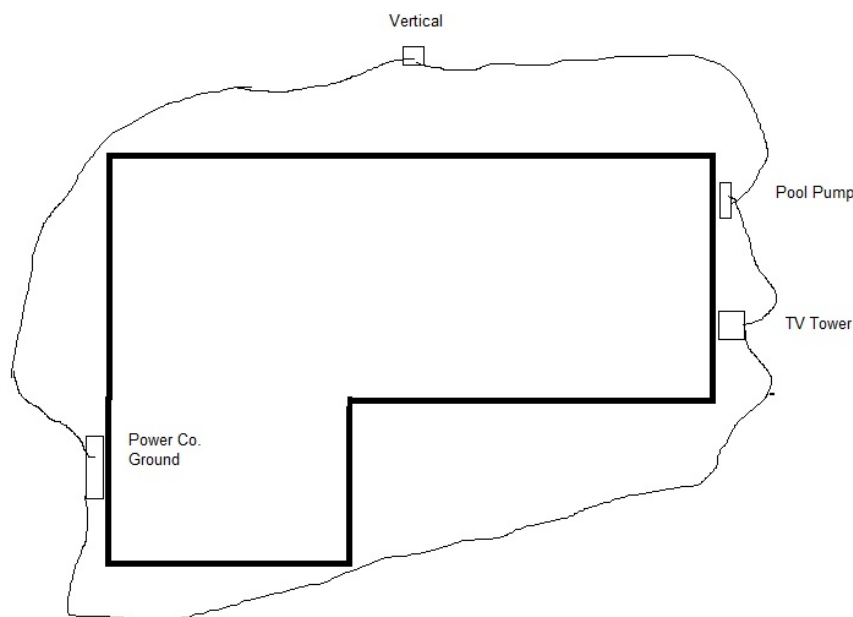# PRACTICAL GROUNDING

BY

JOHN CHAPUT, KK4LI

You cannot predict where lightning will strike, but you can definitely see where it has been.

1.   A ground rod here and a ground rod there invites trouble.

2.   It is better to use the power company ground as a starting point.

3.   A closed loop ground system is better than an open ended one. The closed loop helps to lower static noise on the HF bands

4.   All equipment should be connected to the same ground point. Do not connect your equipment in a "Daisy Chain" fashion. The potential voltages in the ground system should go up and down the same way for all your equipment.

5.   The better the soil conductivity, the better the lightning dissipation. Here in florida, our sandy soil has poor conductivity unless you are very near the coast where the water table is close to the surface.

6.   Lightning will travel to dissipate and if it does not have an easy path to ground it will go looking in your house wiring, gas lines, plumbing, telephone and TV cables

7.   If the ground wire is not buried too deeply, it can add to the RF ground radials of your antenna and thus lower static noise.

8.   If a lightning storm is forecast, disconnecting your antennas from the radios is highly recommended. This disconnect should take place outside the house, where the entry panel is grounded, not inside. If lightning can travel from the earth to the cloud or vice-versa, it will have no trouble at all jumping the few feet from the end of your coax to expensive gear inside the house.

9.   A simple ground for most 30 to 40 foot towers would be to run a heavy gauge wire (#4 or larger) from the tower leg to the power company ground wire. Use a split bolt and ground clamp to make this connection. Solder will vaporize instantly and remove any protection you thought you had.

10.   Sand or scrape the meter ground wire apply an anti-oxidation material and make the connection mechanically tight.
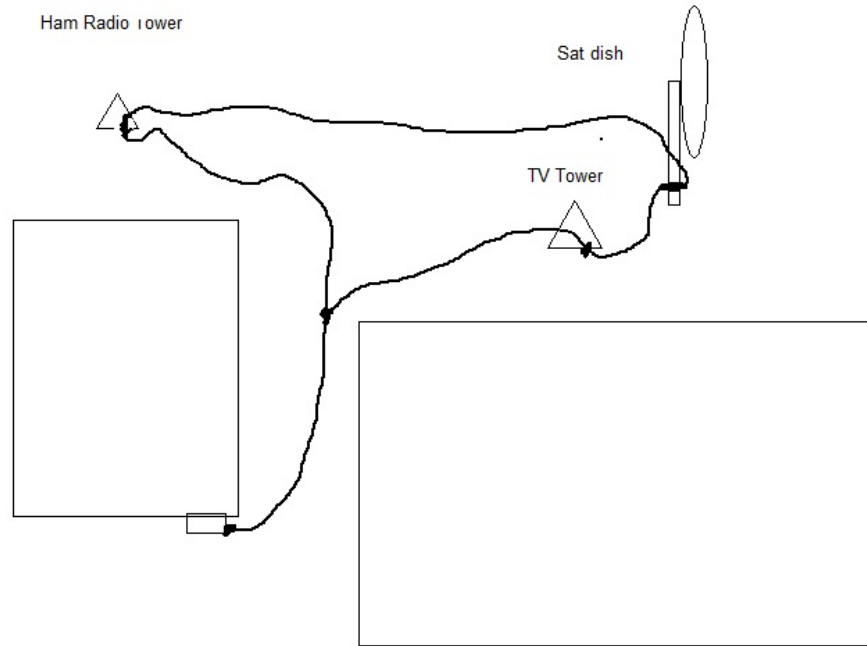
11. You can supplement this ground rod with another rod right at the tower leg. These ground rods should all be 8 feet long at a minimum.

12. If you can find them, porcupine dissipators work well on the top of the tower and on any projecting antenna mounting structures.

13. If you have multiple towers and or satellite dishes on your property and they are individually grounded, you have a major problem. A lightning strike or even a near miss will cause a current surge that will create a huge imbalance in the grounds and cause major damage trying to equalize the imbalance buy going through your gear.

14. A solution to this problem is to run a heavy gauge loop from the power company ground to all of the towers and /or dishes so that they are all connected to the loop. This keeps the surge from entering your home

DIAGRAMS

For Point 3

Vertical

Pool Pump

TV Tower

Power Co.
Ground

For Point 13 and 14

Ham Radio Tower

Sat dish

TV Tower

Powerpole General Assembly Instructions

Assemble the red and black plastic housings together correctly on the first try, they fit snugly and can be difficult to get apart. See the picture below for ARES /RACES standard orientation. Note that you can assemble the red and black insulated housings in other ways for special applications.
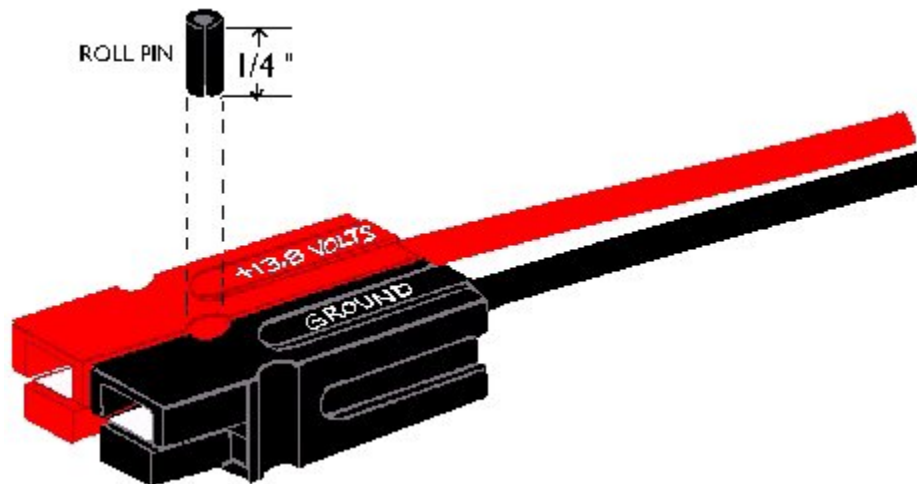

Put the connector housings together before putting the connector pins in, this is easier, especially when using heavy paired wire.

Before soldering or crimping the contacts on to heavy paired wire, orient the contacts so that they are both facing the correct direction so that they go in the housings without twisting the wire.
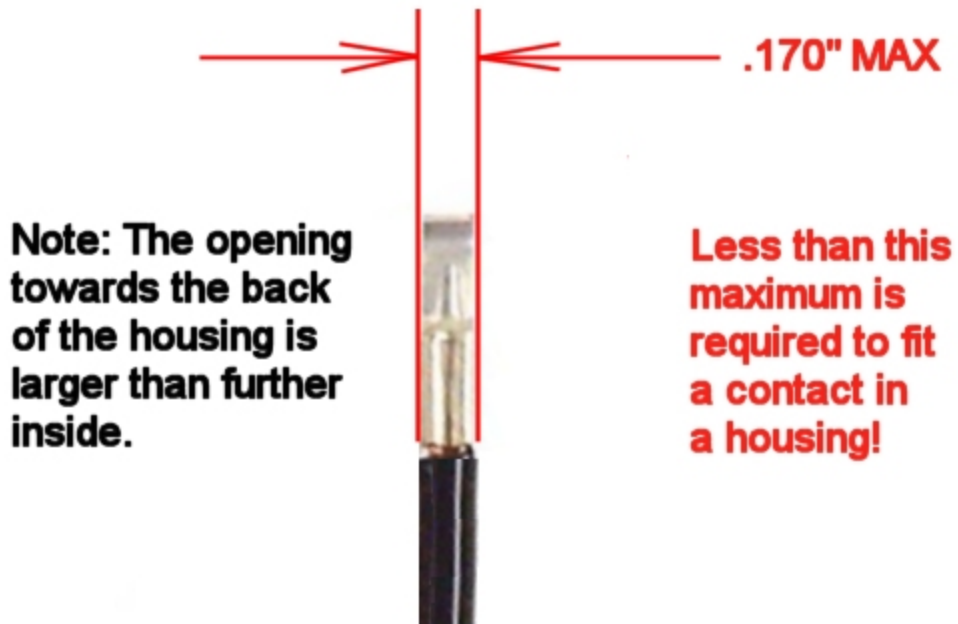
The plastic housings are held together with dovetail joints. Always slide these joints together! They will be damaged if you try to snap them together or apart. They ONLY slide together in one direction. This should be obvious by looking at them carefully.

Powerwerx recommends the use of slotted retaining pins. Others do not like the possibility of them falling out in service. If your application is critical and that you want to make the pairing permanent you can use a cyanocrylic glue (Crazy Glue) to hold the connector bodies together.
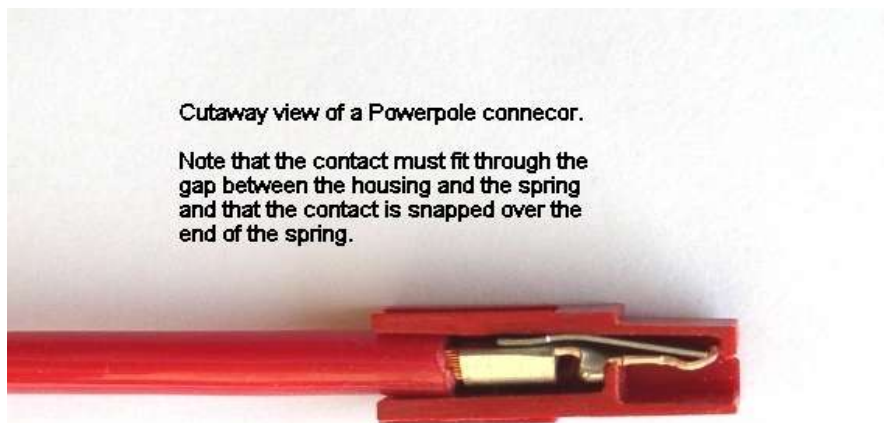

The contacts go in the housings in only one way. Insert the contacts with their sharp edge down against the flat spring that is in the housing. They should slide in and click. If you do not hear a click or they are not fully seated, fix them. When they are inserted fully you should notice that the contact and it's wire "floats" slightly inside it's housing. When looking in from the front of the housing the contact tip should slide over the top of the internal hosing spring. This is the clicking sound that you hear.

Be careful when crimping. You may make the contact out of round and it will not slide into the contact easily. This may occur with different types of crimpers and various gauges of wire. To fix this situation you may have to rotate the contact 90 degrees from the original crimping orientation and re-crimp either with the original crimper or a pair of pliers. In any case you need to make the barrel of the contact round again so it can slide in the housing.

.170" MAX

Note: The opening towards the back of the housing is larger than further inside.

Less than this maximum is required to fit a contact in a housing!

YOU WILL NOT BE ABLE TO INSERT THE CONTACTS INTO THE HOUSINGS IF THEY ARE TOO WIDE AFTER SOLDERING OR CRIMPING!

Cutaway view of a Powerpole connecor.

Note that the contact must fit through the gap between the housing and the spring and that the contact is snapped over the end of the spring.

CORRECT!

The contacts are in proper alignment and ready to push in. Listen for a click on each one to make sure they are fully inserted.

WRONG!

Contacts are up side down in relation to the housings and the colors are backwards.
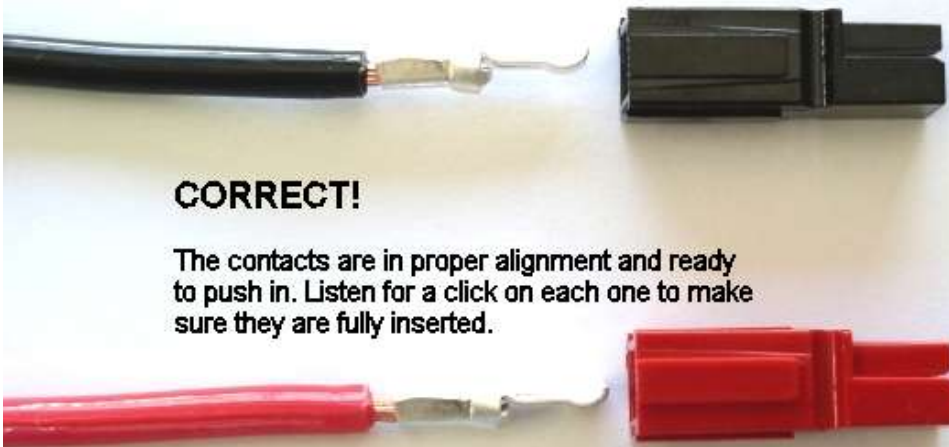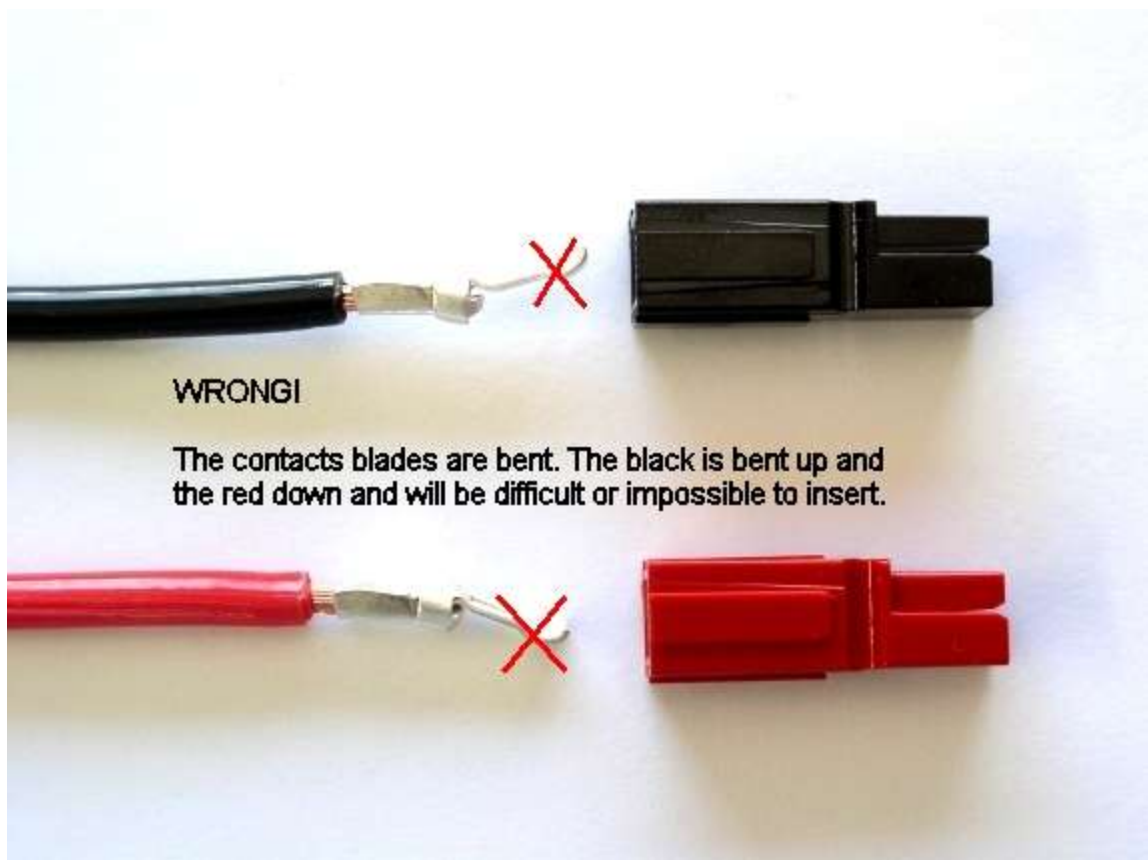
WRONG!

Contacts are at an angle and will be difficult or impossible to insert.

CORRECT!

The contacts are in proper alignment and ready to push in. Listen for a click on each one to make sure they are fully inserted.

WRONG!

The contacts blades are bent. The black is bent up and the red down and will be difficult or impossible to insert.

Tug slightly on the assembled connector to make sure the contacts are locked in place. If you have trouble getting the contact to lock in to the housing you may have squashed the contact wider deformed it some how. Look at the side profile of the contacts before and after crimping, you may have to bend it back straight before inserting it in to the housing.

When soldering the contact pins, be careful not to use too much solder. Keep the solder inside, where the wire goes. If a blob of solder gets on the outside of the connector body you may have trouble putting the contact into the housing. If you get solder on the contact surface area you will not make a good contact.

When crimping the contact pins use a crimp that contains the wire completely inside the pin and doesn't spread the connector apart. A good crimp is one where the dimensions of the crimped portion are no more than an un-crimped pin. If the crimp is flattened out you will not be able to easily push the pin in to the body. If you bend the contact blade in relation to the crimp area you should straighten it before putting it in to the body.

It is possibly to use larger or smaller gauge wire with the 30 and 45 amp connectors. The 30 amp contacts will work with difficulty with #10 wire if you cut the end cleanly and carefully put each and every strand of that wire in to the pin. It may be is easier to use 45 amp connectors on #10 wire. Using 16 gauge or smaller wire in a 30 amp contact requires that you double or triple up the wire to fill the crimp receptacle of the contact to get a good crimp.

A properly crimped contact should have a minimum hold on the wire of more than 25 pounds. A pair of connectors should snap together with 6 to 8 pounds force.

Last but not least, MAKE SURE you have the polarity correct before plugging in you equipment. "Measure twice, cut once" as the saying goes.

Read more:

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The Basic Tool Kit for Ham Radio

Geoff Haines, N1GY

Just recently, I was rereading an article from QST, published back in 1978. While that may seem to make the information dated, the topic is as important today as it was then. The subject is tools. Many people try to use the same tools that they have in their toolbox for working on cars or around the house. While some items make the transition ok, others are best left in the garage. Here then is the list, along with some comments.

1.   Soldering IRON. Please note I said IRON, not GUN. The soldering iron should be 25 to 40 watt or thereabouts. If you can afford it, get a variable heat soldering station. The power of the iron can then be adjusted to the job at hand.

2.   Soldering GUN. Soldering coax connectors properly needs lots of heat, delivered quickly to the connector shell without needing so much time that the coax dielectric melts also. Power wires like 8 to 12 gauge wire also need a big iron. Here is where the big gun type is good. Get at least 140 watts and preferably a dual heat gun.

3.   Needle nose pliers. Buy smaller not bigger. Get the ones with a side cutter built in. Check the alignment of the jaws by looking sideways at a light source through the jaws when closed. If light shows through the jaws, components may slide through too.

4.   Cutters. Also known as "Dykes" short for diagonal cutters. Again buy smaller rather than bigger and check jaw alignment before purchase.

5.   Wire Strippers. As with the previous tools, buy the best you can afford. They will last so much longer that the extra cost will be money well spent.

6.   Screwdrivers. Some dream of having every screwdriver size and model. The interchangeable tip type works well, but if you use one type or size often, get a separate tool in that size. Generally, you need a small, medium and large Phillips type, and similar flat bladed sizes. A good addition is a small set of Jeweler's screwdrivers for those very small screws in mike connectors and the like.

7.   Electric Drill. The main thing is to ensure that the chuck will accept a bit as small as a Number 60. Try to find a 3/8" capable chuck that will do the small drill bit also. That way you can also use the drill to run bigger bits like Multibits and the like.

8.   Drill bits, buy a good set. Also get a Multibit. This tapered bit is perfect for drilling several different size holes in aluminum or sheet goods like plastic. Expensive, but you won't want to be without one once you have used one. Sets of multi-bits often are on sale at discount tool stores and the like.

9.   Reamer and rat tail files. Once you start drilling holes in aluminum, you learn about burrs and sharp edges. Nuff said!

10.   Nibbling tool. This is a relatively inexpensive tool that allows you to cut any shape hole in aluminum. Very handy for those components that require a key way or special shape hole to prevent rotation. Also handy for mounting meters and the like in a panel or cabinet. Also can replace the need for chassis punches if used carefully.

11.   Tools from around the house. These include a hammer, hacksaw, ruler, scriber, pencil, and pocket knife. Use the last one carefully; the finger you save may be your own.

12.   Solder Sucker. If you do any amount of homebrewing or kit building, you know about mistakes. Not too expensive, the spring type is a little easier to use.

13.   Nut Drivers. You can find an inexpensive set at most discount stores. They will make a big difference when working in tight places.

14.   Tools from the garage. Here are some of the exceptions that do make the transition from the mechanics bench. Channelock Pliers, Adjustable Wrench, Vise-Grips (the smaller sizes), emery cloth.

15.   Electrical Tape. Buy good quality vinyl tape. The cheap stuff doesn't last.

16.   Heat shrink tubing. Easy to find at most hamfests and electronics shops. Buy an assortment at first, then replace the type and size you use the most.

That's the basic toolkit, if you plan on using it; I suggest reading the ARRL Hand-book section on Construction Techniques. Many thanks to Jim Bartlett, WB9VAV, for the original article. I don't know if Jim is still with us, the call sign is not.

73,

Geoff Haines, N1GY

The ARRL West Central Florida Section Presents:

FIRST ANNUAL
ARRL WEST CENTRAL
FLORIDA SECTION
TECHNICAL CONFERENCE

DATE: Saturday April 4, 2015

TIME: ARRIVAL AND CHECK IN - 8:00 TO 8:45 A.M.
CONFERFENCE OPENING - 9:00 A.M.
CONFERENCE CONCLUSION - 5:00 P.M.

LOCATION: Bert J. Harris Jr. Agricultural Civic Center
4509 George Blvd., Sebring FL 33875

COST: No Admission Charge

*THIS IS AN ARRL SANCTIONED EVENT
SOMEONE FROM ARRL HEADQUARTERS LAB WILL
BE JOINING US AS A SPECIAL GUEST !*

CONFERENCE REGISTRATION
May be made by several methods

ONLINE: http://www.arrlwcf.org
Starting on 1/01/2015

EMAIL: kt4wx@arrl.net

U.S. MAIL: Darrell Davis KT4WX
6350 Mills Road
Fort Meade, FL 33841

This conference is a conference on all technical topics in amateur radio.
It is not just limited to digital technology but will no doubt include that.
We are planning to have a variety of speakers in a variety of topics:
Topics that are included but are not limited to include: Antenna Design,
Mobile Radio Installations, HF Digital Communications, Digital Voice
Modes,Microcontrollers, Digital Signal Processing, APRS, WinLink2000,
and more.