

## ***The Static***

An evolving publication of the Hill  
Country Amateur Radio Club



### **...and now a word from the prez.**

Dashing Through the Snow.....well, almost. Even though we still have the warm weather, the stores think it is time to get ready for Christmas. Since that is the case, I will put in writing the plans for the Christmas Party for the Hill Country Amateur Radio Club. We will gather in Ryan Hall at First Presbyterian Church in Kerrville located on Jefferson Street across from the side of the Red Cross building at 11:30 for a noon meal. There will be a marker close to the street indicating the exact entrance. The meat will be furnished so please bring a dish of your choice. Some folks say, "We might have only sweet treats if you don't tell us what to bring!" Well, that's the fun of a pot luck meal. Hopefully we will have a variety. Tea, coffee, and bread will be

The Static

November 2012

furnished. As we have done in the past few years, there will be no door prizes. In place of door prizes, we will bring donations of non-perishable food to be delivered to CAM....Christian Assistance Ministry Food Bank. It would be very helpful if your donation could be in a grocery bag with a handle. We always have a good time so please mark the time and date so you will remember. There is not a regular meeting of HCARC in December.

While I am mentioning our club meetings, let's give a little thought to programs for next year. At the November meeting, you will be given the opportunity to list items of interest to you that could be developed into a program. What do you want to learn? The simplest questions and needs for information are often the very best programs. Also, if you know a person who could or would present a program, please have the name and contact information for that person. If you would be interested in presenting a 'tech corner' discussion before the meeting, please list that on the page provided as well.

While you are thinking about Christmas, I imagine some of you are checking radio magazines and on-line for your new radio toy. Happy shopping!

I look forward to seeing you at the November meeting, Nov.1, as well as the Christmas Party. 73,

Marilyn KE5DDR

## **Texas QSO Party**

On September 29 Gale Heise, KM4DR and Bob Richie, K5YB went mobile in 8 southwest Texas counties to work the Texas QSO Party. The trip had a somewhat slow start because of a bike race in downtown Kerrville that extended to Loop 534. Our trip took us down Texas 173 to US 90 to Del Rio where we stopped for lunch at Don Marcelino's. If you eat there and go away hungry you have only yourself to blame. From Del Rio we took US 277 to Texas 41 to I 10 and returned to Kerrville. We travelled 327 miles in an elapsed time of 7 hours 40 minutes. We had 75 contacts on 20, 40 and 15 meters with the latter providing the most results. We worked 32 states and Ontario, Canada. The eight counties we worked were Bandera, Medina, Uvalde, Kinney, Val Verde, Edwards, Real, and Kerr. We used the club call N5HR and equipment included Gale's FT 857 with an ATAS antenna. The log will be uploaded to LoTW. We had a great time and only ran into a little rain Medina County near Hondo. We recommend other teams try this activity in the future.

## **What Every ham Should Know – Part 3**

This month we're going to take a look at antennas. There are few areas of ham radio that are the subject of as much hype as antennas. Let's try to cut through some of this trash. As always, this is my opinions and others may have different

opinions. Feel free to ask questions and discuss to your heart's content.

The first thing you need to know about antennas is that the dimensions are in wavelengths. This includes the dimensions of the antenna, the height of the antenna above ground and the distance the antenna should be from other conducting or lossy objects. For 80 meters, our lowest HF band, the wavelength is 80 meters, what a surprise! A half wave antenna for 80 meters is 40 meters or approximately 135 feet long. It should be as high as possible off the ground, but at least a quarter wavelength or about 60 feet. You should keep it at least a quarter wavelength away from objects like power and telephone lines, metal roofs, gutters and downspouts, etc.

That probably sounds pretty discouraging. Well, don't let it bother you. Virtually every ham antenna ends up being a compromise. You need to understand that from the start. You can use small antennas on 80 meters and you can fit them into small spaces. They won't work as well as a full size dipole high off the ground, but they will work. The point is that since you have to make compromises, don't let yourself get wrapped up into doing other parts of your installation exactly according to an article in some magazine.

First a few antenna fundamentals. There are really only a couple distinct types of antennas. I would break the antenna

world down into only two basic types. First you have dipoles and second you have travelling wave antennas. Before you stop reading, take a look at vertical antennas: A quarter wave vertical mounted on the ground is a dipole. The vertical radiator is one half of the dipole. The other half is the mirror image of the vertical radiator reflected by the ground. If you have a poor ground, you have a poor reflection and a poor other half of the dipole. If you want a vertical to work, you need a good ground! In any event it is a dipole.

A loop antenna is a magnetic dipole. The equations used to describe a loop antenna are the same equations used to describe an (electric) dipole with the magnetic field parameters and the electric field parameters interchanges. I don't know about you, but my goal is to work other stations in the far field region of my antenna. In the far field, the equations used to describe the propagating electromagnetic wave are identical for both the loop antenna and the dipole. The only place they are different is in the near fields which do not radiate. In the far field you can't tell any more about an electromagnetic field than its amplitude, frequency direction of propagation and polarization. A loop antenna is a dipole.

The second distinct type of antenna is a travelling wave antenna. Some examples of travelling wave antennas are rhombics, vees and Beverage antennas. All these antennas involve a travelling

electromagnetic wave guided by the metallic antenna. The antenna size is usually one or more wavelengths and for unidirectional operation, the antenna is terminated in its characteristic impedance at the end distant from the feed point where the transmission line is connected. Note, an inverted vee is not a vee antenna, it is just a configuration of a dipole. A real vee antenna is best described as half a rhombic.

There are numerous gain antennas which all start off as some variety of a dipole. There are two basic ways to increase the gain of a dipole, one is to use parasitic elements as a yagi does or use several identical elements fed in phase, a phased array. There are no secret techniques. Any well designed antenna of the same size will have about the same gain as any other well designed antenna of that same size. There is no magic.

Now let's talk about size. Every antenna that is smaller than a half wave dipole will have less gain than a half wave dipole. This includes antennas with loading coils, antennas with traps, small loop antennas, mobile whips, etc. A guess at the loss in gain is to look at the length of the shortened antenna to the length of an equivalent full size antenna. For example, a 15 foot vertical compared to a full size quarter wave vertical for 80 meters is going to be between 6 and 12 dB worse. Size matters.

The Static

November 2012

OK, I think we're about ready to decide where to put our antenna. I hope you have thought about where you are going to put your station. I hope you have also decided what kind of transmission line you are going to use to connect your transceiver to your antenna. Now we're going to decide where we want to put our antenna. Perhaps the easiest antenna to assemble is a wire dipole. For HF it should be a half wavelength long. This is a challenge on 80 meters, so what is the shortest dipole we can probably use for 80 meters. You can probably go as short as a quarter wavelength if you have a good antenna tuner and you are willing to accept some compromises, it will not perform as well as a full size dipole and it will be a challenge to match even with an antenna tuner but you can have some fun with it. Operation on all HF bands requires a minimum antenna length of roughly 65 feet. With a tuner it will work on 80 at least a little and on 40 and above it should be fine. It should be about 30 feet above the ground. If you can't get it that high, try to get the center as high as you can and let the ends droop a bit (Yes, that's called an inverted Vee). If the dipole is straight, great, if it's not, it will still probably work. Get it as straight as you can. Potential antenna supports are trees, a pole on your roof, a pole in your yard, etc. A lot of hams successfully use dipoles strung in attics, along wooden fences, under the eaves, etc. You can too.

The Static

November 2012

There are a couple of don'ts. Absolutely do not run an antenna along, under or over power lines. No matter how often this is said, there is always someone who will try. It is unsafe. Do not run your transmission line along, under or over power lines either. It is also unsafe. In addition you should keep your antenna as far away from power lines as you can to reduce the amount of noise you pick up. You may have to reach a compromise with your spouse on appropriate locations for wires in your yard.

Another antenna choice is a vertical. Verticals don't require less room than a dipole but they don't require 2 or 3 tall poles. If you want to try a vertical, you will require a ground radial system. The radial system will take up as much room as a full size dipole but at least it is on or under the ground. A lot of vertical manufacturers claim that you don't need a ground radial system for their antenna. Don't trust them! There are a couple different schemes to replace the ground system with a "counterpoise" which is small and simple compared to a ground radial system. My belief is that the counterpoise does indeed allow you to match the vertical to a 50 ohm transmission line, however, it doesn't do anything for the antenna's radiation efficiency. I believe that most of the power is lost in the ground. If you want to try a vertical without a ground radial system, go ahead. It will work better than nothing and the tradeoff between a counterpoise and a ground radial system is just one of many

compromises you are allowed to make. Be sure you don't install the vertical where it can fall onto a power line. A vertical close to a power line is no safer than a dipole near a power line.

When you're choosing your antenna location, remember to consider where you're going to put your station and what kind of transmission line you're going to use and how you're going to get the transmission line into your station.

Some of you have probably read my comments on Windoms on the club reflector. No, I'm not a fan of them. Here again, you get to make the choice. Remember that you probably aren't going to be able to install your Windom in the pristine location described in the instructions so be prepared to play around with it a bit to get it to match your transceiver. They do work and many people use them.

Of course everyone dreams of a 100 foot tower with several large yagis on it. They are great, but that is probably not where you want to start. I haven't really priced a large tower/antenna installation, but I suspect you're in the ballpark of a new car! Gone are the days when you could get a Tribander Jr for less than a hundred dollars, put it on a telephone pole in your back yard, and turn it with a TV rotator and be the big signal on the band. To be really competitive these days requires a large investment. Having fun on the other hand

The Static

November 2012

doesn't require much at all. You can certainly work the world on a short wire in your backyard. You won't work DXCC in a weekend, but you can still have a lot of fun operating and learning until you're ready to take the next step.

For several years I used a dipole that was about 80 feet long and 10 feet off the ground on 80, 40 and 30 meters. I had a lot of fun with it and ended up with 45 states on 80 meters from NM. I also worked all states on 40 and 30 meters as well as several countries. I had a lot of fun. It was a lot better than nothing. You can do the same, all you have to do is try.

That's all for this month.

73,

Kerry

**And for a different take on antennas** John, **KL7JR**, has just put together a new book on using CB base and mobile antennas on the HF bands. John tells some interesting stories of his travels in the far North and sunny beach locations. John has used the short mono-poles in some interesting configurations and seems to work a lot of DX. His present location in the Dominican Republic with the Atlantic Ocean 150 feet from his QTH helps. If you're interested in experimenting with antennas this is an inexpensive way to gain experience. You will receive the book as a PDF file for \$12.95 and if you have questions or want to order

a copy contact John at [KL7JR@yahoo.com](mailto:KL7JR@yahoo.com)  
Payment is accepted through PayPal

If you are looking for coax, connectors, sealants or other components, here is a link for ABR Industries, a Texas firm that handles such items.

<https://www.abrind.com/Home/CoaxGuide>

## Teen electrocuted while working on unplugged computer

A 16-year-old is stripping down a family computer, which is unplugged. He dies. An autopsy reveals electrocution burns.



by [Chris Matyszczyk](#)

(Credit: KCTV-5 Screenshot by Jonathan Skillings/CNET )

Those who don't know about electronics assume that if you unplug a device, it becomes safe.

Perhaps that's what a teenager from Shawnee, Kan., might have thought when he reportedly worked on his family computer.

It was unplugged, yet the teen died in what seemed inexplicable circumstances. [According to KCTV-5](#), an autopsy revealed electrical burns on the unnamed teen's body, which experts conclude happened after he gained access to the computer's power supply.

He was reportedly stripping the computer down for parts.

The Static

November 2012

Clearly, not all the details surrounding this case have been revealed. It is unclear how long the computer might have been turned off.

Still, though many teens now fancy themselves as technological experts, it's as well to consider whether it's worth it, especially as some replacement parts can be cheap.

As computer repair expert Dave Bradshaw told KCTV-5: "It's a \$20 power supply. Why tear into it?"

He added: "You're taking your life into your own hands."

**BE CAREFUL**

**And just when we thought the cloaking devices from Star Trek were science fiction...**

**Strange 'cloak of invisibility' invented by MIT could lead to new era of electronics**

**By Staff | [October 13, 2012](#)**

Credit: Flickr

new approach that allows objects to become "invisible" has now been applied to an entirely different area: electronics.

It's the latest attempt create a cloak of invisibility and scientists say it could usher in a new era of electronics.

A team comprised of MIT graduate students has reportedly created a model that allows particles to "hide" from passing electrons, which could lead to more efficient thermoelectric devices and new kinds of electronics.

Normally, electrons travel through a material in a way that is similar to the motion of electromagnetic waves, including light; their behavior can be described by wave equations. That led the MIT researchers to the idea of harnessing the cloaking mechanisms developed to shield objects from view — but applying it to the movement of electrons, which is key to electronic and thermoelectric devices.

The study was led by Bolin Liao, former postdoc Mona Zebarjadi, research scientist Keivan Esfarjani, and mechanical engineering professor Gang Chen. The study is [described in a paper](#) in the journal *Physical Review Letters*.

Previous work on cloaking objects from view has relied on so-called metamaterials made of artificial materials with unusual properties. The composite structures used for cloaking cause light beams to bend around an object and then meet on the other side, resuming their original path — making the object appear invisible.

“We were inspired by this idea,” says Chen, the Carl Richard Soderberg Professor of Power Engineering at MIT, who decided to study how it might apply to electrons instead of light. But in the new electron-cloaking material developed by Chen and his colleagues, the process is slightly different.

The study comes as scientists have conducted a number of experiments to test whether creating an invisibility cloak is possible. Earlier this year a team of U.S. scientists announced a key breakthrough. [Researchers at the](#)

University of Texas in Austin cloaked a 7.2-inch cylindrical tube from light in the microwave part of the energy spectrum, the first time an object had been cloaked in practice.

...hmmm,. The first thing you know somebody will come up with glasses that make radio waves visible.