

# *The Static*

An evolving publication of the Hill  
Country Amateur Radio Club



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

It is just great to hear so much activity on the repeater. More and more folks are “doing the deal” and learning new and different things.

By the way, where were you when all of the weather hit on Monday evening, March 19? It was a bit crazy to say the least. As procedures were followed, Curtis, AD5UZ, opened the Skywarn net assisted by Harvey, K5HV with several folks checking in. This all started about 6:50. As the evening progressed, it was time for the regular HCARC FM net. Harvey was net control for the evening so he moved forward with the net, using his handi-talkie. After a very successful Monday night net, Skywarn kicked in again. Harvey continued to facilitate the

net and was joined by several other operators. At the stroke of midnight, Harvey, Fred, W0LPD, and Jeff, K4YPT were still holding down the fort. Others who participated during the evening in addition to Curtis were Gale, KM4DR, Neil, W9CNC, Terry KF5NHK, Kevin, KD5WX, Charlie, AF5AO, Scott, N9BMR, James, KD5KDY, Len, K5LEN. Terry even got out to check where roads were blocked so that information could be reported. I hope I have included everyone. Through the use of Echo Link, information was sent to the National Weather Service at New Braunfels. They are co-located with the radar folks.

This is a wonderful example of the service that can be provided through the use of ham radio. Thanks to all who participated in this effort to establish communication and share valuable information.

73,

Marilyn KE5DDR

## **Field Day Update**

CQ CQ CQ Field Day CQ CQ CQ

Have you been to the club shack and had a chance at getting your feet wet with the logging program? It's really not difficult to operate but takes just a little practice. There will be some more chances to get involved and test the waters in a very fun environment without the pressure of trying to work that next station.

Sherry KC5CIK is working on putting our information table together, She needs a few more photos from the club so if you have any that we can use on the info table please email a copy to me and I will see that she gets them. Many thanks to Sherry, I know she will put together a wonderful display to show off HCARC at field day.

I have sent in a request to meet with the County Commissioners Court in April and invite them to field day this year. I have a press release ready to be sent out to the local news papers. I need you to look at the paper you are reading and send me an email address of the news paper's editor or a point of contact for this type of article. As of today I have not received any email addresses and without that information I will not be able to get coverage in your local paper. This all needs to happen rather quickly so it gets the word out to all. I am shooting for a press release in late May or early June. So even if you think someone else is going to send me an email with the info please send one my way and I will weed out the dupes the old fashion way, not a problem I just need the info. Your info is important so please get it sent in via email.

[jnblavender@hctc.net](mailto:jnblavender@hctc.net)

Calling all Operators, Now hear this, NO wait --- Now read this it's not too early to start thinking about what modes you want to be operating at field day.

We will have lots of time available for you to get at a radio and make contacts.

I would like to start signing up for operating slots in our April, and May meetings. I can always be reached by email if schedules change or plans change. I would like to see that everyone gets a chance at the controls.

I have a list that was put out at our January meeting and have started a

spread sheet as to who wants to do what. We just now need to figure out the when.

Equipment at the ready. I have rounded up 5 radios for all the stations, but we are a computer and a back up computer short so far. If you have a lap top computer that you are using for a dust collector because of a recent upgrade in computing components please take a minute to think about letting us use it on field day. It will need to be able to run windows XP or later so we can use the logging program. We now have two 5KW generators for field day, and one 2.5KW back up. The power is on, almost ready for Lights Camera Action.

Still needed are many of the small items that will make or break an event. I am putting together a list of items and will have the list at the April meeting so please take a minute at the next meeting to go over the items and if you have some of them put your call sign by the item as an indication you will supply that item for field day.

Don't forget Fred WOLPD will be taking orders for T-Shirts for field day and or for any event without the Field Day logo on the shirt. Please remember to bring your wheel barrow full of one dollar bills and a pen to fill out the order form if you want one of these one of a kind T-Shirts. I can't wait to get my shirt with field day an my call on it.

Thanks to WOLPD for offering and putting this together for us.

Field Day in a nut shell well almost. Things are coming together nicely and all is progressing towards a great event this year. I will be asking those of you who signed up to help in the coming weeks ahead to provide some assistance in the perspirations and preparations. As always email is the

best way to send me info. I am looking forward to a great event this year.

Jeff

N4YPT

## Feature Article

### OMEGA WAVE WOBBLE

By Bob Nelson N5EW

One morning at McDonalds Fred W0LPD suggested that a revolving drum mounted antenna was an idea worth consideration. My first thoughts were "pain to build" and "why." However, over time (nobody ever accused me of thinking quickly) the possibilities slowly became apparent, these included improved range due to r-omega wave wobble, possible D-Layer penetration and very narrow band FM modulation due to r-omega induced Doppler shift. Lets skip over the difficult construction considerations for now and examine the potential merits of such an antenna.

As a drum-mounted dipole antenna revolves around its axis at omega ( $\omega$ ) RPM every point on the antenna is constantly moving in both the x and y directions. The value of the deflections  $\delta x$  and  $\delta y$  and velocities  $\delta V_x$  and  $\delta V_y$  are:

$$\delta x = r \cos \omega t$$

$$\delta y = r \sin \omega t$$

$$\delta V_x = 2\pi r \omega \cos \omega t$$

$$\delta V_y = 2\pi r \omega \sin \omega t$$

As these equations clearly show, any point on the wave emitted by a revolving drum antenna is not only moving outward with normal laminar wave flow behavior it is also wobbling up and down as a sine function of the drum rotation and its velocity is shifting as a cosine function. The result of these added motions is wave turbulence that tends to cause the wave to adhere to the earth's surface as it goes out providing vastly improved ground wave propagation. Eventually the turbulence is damped out by wave bending energy requirements and the wave returns to normal laminar flow. It is expected that this benefit is a function of the cube root of  $\omega$  so very high rotation speeds may be required. Further as  $\omega$  increases the dreaded wave whip effect must be considered.

It has been postulated that turbulent radio waves may weave their way thru D-layer atmospheric ionization. The tighter packed F layer will refract these waves just as it does laminar waves. This might potentially allow worldwide 40-meter communication 24 hours a day. This is highly speculative but is well worth further study.

Another benefit is narrow band CW and digital FM modulation. The formula for the received frequency ( $F_r$ ) as a function of original frequency ( $F_o$ ),

drum rotation speed ( $\omega$ ), its radius ( $r$ ) and the original speed of the radio wave in the medium ( $c$ ) is as follows:

$$f_r = f_o[1/(c+2\pi r\omega \cos \omega t)]$$

This allows for one upshift and one downshift per drum rotation per dipole. By transmitting a pulse at the correct point in rotation a + or - may be transmitted.

Pete W1CPP suggested that skip distance might also be a function of  $\omega$  and front to back gain might be achieved by using the correct drum diameter and optimal dipole switching.

Now let's look at construction considerations. Little is known about spinning drum antenna communications. Among the unknowns are optimal turbulence frequency, turbulence generation as a function of  $r$  and  $\omega$ , variable  $\omega$  requirements, and number of antennas on the drum.

This is an opportunity for the club to make a name for itself in amateur radio. I recommend a research effort starting at 2-meters. This allows relatively simple and inexpensive antennas and simplifies field measurements. Perturbation of the variables should allow us to gain enough knowledge of rotating drum mounted antenna communications to evaluate its potential. If this proves to be a promising idea then we can look at its possible application to government, military and commercial interests with

the intent of applying for research grants. As HF frequencies are considered research may become exceptionally complex and expensive. For example at 20-meters the optimal solution could be a 26-foot drum 30 feet long with 36 dipoles spinning at 10,000 rpm. The engineering and material costs alone would be staggering not to mention the vacuum chamber required. The idea of examining 80 and 160 meters boggles the mind. There are some serious safety considerations here.

In summary an investigation of a rotating drum mounted antenna system is a sound club project that could lead to a major new aspect of amateur radio and radio communications in general. Further, the Kerrville area is rich with retirees from every branch of science, engineering, production and management making it an ideal location for a major research effort.

### **Some observations from a casual contester**

We have some first class contesters in the club. John Hueckstaedt, John Guida and Gale Heise come to mind. We are the richer for having them in our group. Over the weekend of 2, 3, 4 March the SSB DX contest was in full swing and propagation was pretty good. I casually worked the event on 10, 15, 20, and 40 meters. It was fun to work foreign stations and pick up a few uncommon states along the way. There are a number of niches in ham radio and chasing DX may not be your interest. But even if you are mildly amused by

that you can work a number of countries during the contest periods. You'll find contests to match your operating preferences be it SSB, CW, PSK, or RTTY. If you are proficient with your chosen mode and know the required exchange you'll do just fine.

Another skill acquired during contests is the ability to copy call signs in the voice mode. If you are reluctant to jump into a contest just tune around and listen and copy call signs of the operators. With a little tinkering you'll soon learn how to get the most out of your receiver. You will also get to listen to a variety of skill levels in operating. If you decide to jump in find stations that do not have big pile up until you are comfortable with this fast paced activity. Gale Heise manned the club station during the CQ WWW WPX contest on 24 March and logged over 70 DX stations on N1MM. Two entities he worked were Namibia and Cape Verde (a somewhat rare DX.) We'll soon know how many DX contacts we have confirmed on our way to a DXCC award for the club. We still need to work Rhode Island and Maine for a Worked All States award. If you have not had the opportunity to use the N1MM logging software or work some of the different modes from the club station, keep your eye on the Reflector and stop by when the station is on the air.

If you would like to sample contesting, you can check out the following internet resources.

[www.sm3cer.com](http://www.sm3cer.com) This is a Swedish site but has lots of English content

<http://hornucopia.com/contestcal/contest>

[cal.html](#) Gives a 12 month look for your convenience.

<http://www.contesting.com/> General articles on contesting.

[http://www.dxzone.com/catalog/DX\\_Resources/Contest/](http://www.dxzone.com/catalog/DX_Resources/Contest/) Lots of information and calendars.

<http://www.ctdxcc.org/> Something close to home – the Central Texas DX and Contest group.

This is enough to keep you busy for a while – enjoy.

### **A basic primer on antennas**

Hams talk a lot about antennas and with good reason. It has been said that for every dollar we spend on a rig we should two dollars on the antenna system. If you're looking for a good primer (or refresher) on antennas, check out this website.

<http://www.ad4dx.com/pdf/basic-antennas.pdf> This is 60 pages of good reading that you can save on your computer or print it.

March 09, 2012

## **Solar Storm Strikes Earth's Magnetic Field Without Major Disruptions**

Jessica Berman



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Photo: AP

This NASA image shows a solar flare erupting on the Sun's northeastern hemisphere, January 22, 2012.

The Sun's surface erupted with a series of solar storms this week, sending a barrage of electrically charged particles crashing into the Earth's magnetic field. So far, the solar blasts have caused only minor disruptions to terrestrial communications systems. But more solar eruptions are on the way over the next few days. The Sun is mid-way through an 11-year solar storm cycle that can have a major impact on human activities here on Earth - and in space.

Solar storms can disrupt electric power grids, triggering black-outs and false alarms at power stations, as well as interfering with high frequency radio communications.

Alex Young is a solar scientist at NASA's Goddard Space Flight Center who studies Sun storm activity. Young scanned an official alert issued Thursday by the National

Oceanographic and Atmospheric Administration [NOAA] after the first waves of solar activity reached Earth. Concerns ranged from passengers on high-flying commercial airliners to lunar orbiting satellites.

"Delta [Airlines] is taking alternate routes for seven flights. And let's see: There was an excessive current seen in a particular satellite. And that means that some of the data was impacted and they had to put the satellite into a safe mode. This was for the GRAIL satellite," said Young.

The twin GRAIL satellites, operated by the US Space Agency NASA, are orbiting the moon, collecting data on the lunar surface. Delta airlines flies some routes over the North Pole from the US to points in Asia because it is a shorter distance than flying closer to the Equator.

Had NASA and Delta not made these adjustments, Young said, magnetic energy from the solar storms, which is most intense at the Earth's poles, could have seriously disrupted radio communication and caused serious damage to sensitive electronic circuits, especially critical to the NASA mission.

"If the precautions weren't taken, then you'd have the chance of parts of the electronics and parts of the cameras on the spacecraft would be basically destroyed. And something like that, there's no way you could go up and fix it," said Young.

Young said the biggest concern during solar flare events is that they often are accompanied by massive eruptions of matter and energy into space called

coronal mass ejections, or CMEs.

If the CMEs are ejected toward the Earth, they arrive like a tsunami of electromagnetically charged sub-atomic particles, traveling more than 965 kilometers per second. Young said when that energy wave strikes Earth's magnetosphere, it disturbs this protective shield.

"And causes it to wiggle, kind of like ringing a bell, and that generates electrical currents in the upper atmosphere. This can excite particles that stream down into the atmosphere in northern latitudes and that creates the aurora borealis."

Solar scientists can predict with great accuracy when CMEs will occur and whether they will impact Earth. What they can't forecast, says Young, is precisely which way the solar winds will be blowing when they interact with the planet's magnetosphere.

"If it's oriented northward, which is the same direction as the Earth's magnetic field, then the interaction is not particularly strong. But if it's oriented southward, then the two are opposite, the Earth's [magnetic field] is northward and the CMEs is southward, that actually causes a stronger interaction and releases more energy," said Young.

Joe Kunches is a space scientist with NOAA's Space Weather Center in Boulder, Colorado. The Sun is in the middle of an 11-year solar storm cycle, and forecasters at NOAA expect more gusts of electrically charged particles visiting Earth within the next week.

Kunches notes a solar wind event

occurred at the end of January.

"So, about six weeks ago, we had somewhat similar circumstances. Now it's here again. I think we're going to get used to seeing similar pulses come off the Sun over the next few years, and they may be as often as one every couple of weeks, one a month, something like that," he said.

Solar storm forecasters also say 2013 could see stronger solar wind activity before the storm cycle winds down.

While this storm was widely announced and fretted over, it had little effect on power systems or communications. ed.

### **...on the radar**

While it has not been announced yet, the Texas QSO party will probably be held the weekend of September 29, 30. One of the goals of a state QSO party is to get every county of the state on the air and in Texas that is 254 opportunities. I have talked with Alan Cone, a club member and Red Cross volunteer, about the possibility of setting up the Chapter's Emergency Response Vehicle for HF communications and operating from all eight counties our Red Cross chapter serves. This would require two or three volunteers to be with the vehicle to set up and operate and some more volunteers to operate N5HR. There are also some sparsely populated counties west of us that you might want to consider operating mobile or portable from to give those counties a presence during the QSO party. Here's another opportunity to have some fun with ham radio. If you are working on a Worked All States Award, working from

an uncommon county should attract a number of QSOs.

**What is county hunting?** There are many aspects within Amateur Radio and County Hunting is just one of them. The goal of County Hunting is to make a two way contact with a station in each of the 3077 counties in the United States. [CQ Publishing](#) offers a large certificate and plaque for confirmation of each of these contacts. The award is also available to Short Wave Listeners on a heard basis which must also be confirmed.

#### **Where can I find county hunters?**

County Hunting can occur anywhere on any of the Amateur Radio frequencies. The majority of County Hunting takes place on organized nets mainly on the 20 and 40 meter bands. *The 20 meter Mobile Emergency and County Hunters Net* meets on 14.0565 CW and 14.336 SSB 365 days a year conditions permitting. You will find many of the mobiles will QSY (move) to 40 meters, 7.056.5 for CW and 7188 for SSB.

#### **Where can I find more information about County Hunting?**

The major organization for County Hunters is the Mobile Amateur Radio Awards Club (MARAC). Membership in MARAC has several advantages. First you are supporting the County Hunting Effort in a direct way. Second you receive a great monthly publication called the County Line Road Runner which has up to date information on the awards that have been issued and many of the County Hunting activities that take place around the world. Third you receive a discount off of the awards that you send to the mobile such as last county awards as well as the awards that you apply for yourself.

For more information on MARAC visit the [MARAC Web Site](#) and you will find more information and a MARAC Membership Application on line!

MARAC has a computer program for tracking the USA-CA Award as well as the many awards offered by MARAC. More information on Logger can be found here - [MARAC Logger](#)

Of course, you can always participate on a less formal basis just by finding a clear frequency and getting on the air.

#### **Skywarn Training**

A Skywarn Training session will be held on Saturday, April 28 at St. James Lutheran Church in Harper. Training starts at 9:30 A.M. St. James is on US 290 on the west end of Harper. Thanks to Curtis Eastwood for putting this together. Keep an eye on the Reflector for follow up on this.

#### **Rare DX contact**

There is a DXpedition located on Manitiki atoll in the Northern Cook Islands. They will be in place until April 10 on several bands. They are using the call sign E51M. Here's a web link for more information.

<http://www.dxcffee.com/eng/2012/01/02/e51m-manihiki-atoll-north-cook-islands/>

You can probably find them spotted on DXWatch.com at this link.

<http://www.dxwatch.com/dxsd1.php?f=0&t=dx&c=E51M>

Questions, comments and suggestions  
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