MCWA NEWS

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MCWA OFFICERS & STAFF

President ..... Jim McDonald, N7US

jim@n7us.net

Vice Pres. . ..Dave Cooper, KA9OZP

coopernet@sbcglobal.net

Secretary ... Marc Marino, WA9YVL

Treasurer .... Barry Nelson, K9YVT

barrycnelson@yahoo.com

Programs ..... Jack Hudson, W9MU

Newsletter.....Jerry Heien,N9AVY

n9avy@sbcglobal.net

VE TESTING

Testing by appointment only

7 PM 3rd Tuesday every other month

May 15 , 2012

Cost is $15 one time charge for session; no matter how many elements taken. Must show original license and/or CSCE if upgrading. Valid photo ID needed. SS#.

Steve, KB9OLD
847/477-3518

Meeting Notice

Tuesday, April 6
7 :00 - 7:30 - Socializing
7:30 - Meeting

Program: The ever knowledgable Jack Hudson, W9MU, will give us the benefit of his years of expertise on traps. These are the traps used on antennas, not the ones for catching rodents and other critters !

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Join Us ?

After the meeting for pizza & beverages at the Village Squire in Crystal Lake (Rt. 14 just West of Rt 31). We usually have anywhere from 6-20 people and the cost generally works out to $10 per person with pizza.

Treasurer's Report

Opening Bal.	$3860.69
Interest	.31
Dues	90.00
Checks	0.00
End Bal.	3951.00

Barry, K9YVT

3/27/12

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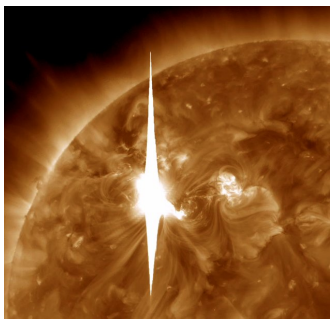

Solar flare headed towards earth. *[NASA Photo]*

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MCWA NEWS

April 2012

Stretching Into More DX

DX is well these days. We have two factors in our favor: We are seeing more daylight and Cycle 24 is holding up. Two conditions have been working against us: Solar storms and thunder storms. Nevertheless, the overall trend for DX is good.

I was looking at my log for the month of March to date and the QSO's are approaching 200. This has been accomplished with minimal time, 200w and OCF dipoles. A few catches were with an 80m single band dipole.

160m and 80m have been noisy. Our early spring has brought thunderstorms across the USA which greatly affect these bands.

Some of my more memorable DX catches were A35YZ (Tonga) on 10m and 5N7M (Nigeria) on 12m. The whole world is open these days. For Europe 20m has been favorable in the late afternoon. For Asia I recommend 15m for two hours either side of sunset. Gray Line propagation has been especially useful on 15m these days.

Another observation is that 20m has started to stay open almost 24 hours on some days and we are still near the Equinox. This will only improve into summer.

The CQ WPX Contest of March 24- 25 was very revealing about current conditions. Although 10m was reasonable during daylight, 15m was wall-to-wall stations running high signals into the night. 20m stayed open around the clock during the contest and it was wall-to-wall with operators. 40m was jammed (It was worse than wall-to-wall at night---more like a blurrrrr of 40 over 9).

During the month of April look for signals from Market Reef, Southeast Asia, India and several African countries. Special operations have been posted for these areas.

Get the antennas tuned up! If you wait too long the mosquitos will carry you away! 73 Dave KA9OZP

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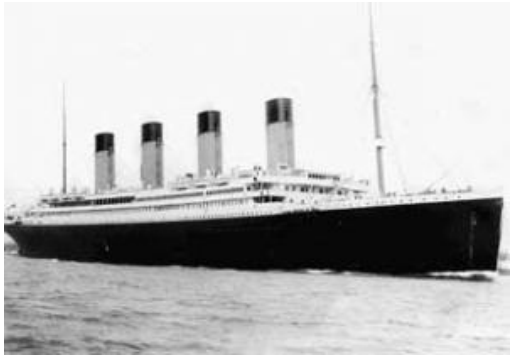
April 13 -14 , 2012, station W4S will be QRV honoring the RMS Titanic who hit an iceberg and sank 100 years ago. 1500 people lost their lives.



MCWA NEWS
April 2012

... *DE N9AVY*

Editorial

FCC Reduces Forfeiture for Florida Man Accused of Using Unauthorized Equipment

03/06/2012

In November 2011, the FCC issued a Notice of Apparent Liability for Forfeiture (NAL) in the amount of $10,000 to Michael Perry of Cross City, Florida. In a Forfeiture Order released on March 6, the FCC reduced the forfeiture that Perry must pay to $450. Perry was accused of operating a radio transmitter without the requisite FCC authorization and his failure to operate a Citizens Band station, "willfully violat[ing]" Section 301 of the Communications Act of 1934, as amended and Sections 95.409 (by operating an unlicensed and non-certificated CB transmitter) and 95.411 (by operating an unlicensed radio transmitter with two amplifiers) of the FCC's rules.

On November 1, 2011, the Enforcement Bureau's Tampa Office issued the NAL to Perry "for operation of a radio transmitter without the requisite authorization," the Forfeiture Order stated. "Agents from the Tampa Office determined that Mr. Perry operated a non-certified CB transmitter and two linear amplifiers on CB channel 28 (on frequency 27.2850 MHz) on March 31, 2011.

of the record evidence, the NAL proposed a $10,000 forfeiture against Mr Perry for violation of Section 301 of the Act and Sections 95.409 and 95.411 of the Rules. Mr Perry submitted a response to the NAL, denying that he operated the non-certified CB transmitter and amplifiers, and requesting cancellation or reduction of the forfeiture based on his inability to pay."

In view of the record evidence, the NAL proposed a $10,000 forfeiture against Mr Perry for violation of Section 301 of the Act and Sections 95.409 and 95.411 of the Rules. Mr Perry submitted a response to the NAL, denying that he operated the non-certified CB transmitter and amplifiers, and requesting cancellation or reduction of the forfeiture based on his inability to pay."

According to the Forfeiture Order, the FCC based the reduction in accordance with Section 503(b) of the Communications Act, Section 1.80 of the Rules and the Forfeiture Policy Statement: "In examining Mr Perry's response, Section 503(b) of the Communications Act requires that the Commission take into account the nature, circumstances, extent and gravity of the violation and, with respect to the violator, the degree of culpability, any history of prior offenses, ability to pay, and other such matters as justice may require. After full consideration of Mr Perry's response in light of these statutory factors, we affirm our findings in the NAL that Mr Perry violated Section 301 of the Communications Act and Sections 95.409 and 95.411 of the Rules, but reduce the $10,000 forfeiture proposed to $450, based solely on his documented inability to pay."

Perry has until April 5 to pay the $450 fine.

It seems that if this guy can afford an amp & non-certified CB transmitter, he's getting off way to cheap on this one offense. No doubt he's now boasting to all his good buddies how he got his fine reduced from $10K down to $450 by playing "Let's Make a Deal". It'll be business as usual down in Cross City, FL until he gets caught again.

This is one reason that CBers/Freebanders have bad reputations in the ham community. No doubt you'll find some of these scofflaws on our bands today.

On the Record With ... ?Cornel Topala

By KEVIN P. CRAVER –

Cornel Topala of Algonquin uses Morse code Wednesday while at work in Wauconda to communicate with someone in Washington. Topala is a self-employed builder of endoscopy machines and a ham radio expert. His ham radio group is one of the best in the U.S.

Growing up in Romania, Cornel Topala fell in love with amateur radio.

With that love came a desire to be able to speak and broadcast freely – something he knew he could not do under the Communist regime of Nicolae Ceausescu.

He immigrated to the United States in 1980 at age 21, got married and started his business, CorTek Endoscopy, which builds medical equipment.

His Wauconda business houses the radio equipment for W9CA, or Whiskey Niner Charlie Alpha in ham radio speak, which is the name of the local ham radio operators' club. The club has a national reputation because it frequently wins its class in the American Radio Relay League's annual Field Day competition.

The competition, meant to see how many contacts a group can make worldwide in 24 hours, has a very practical purpose. Ham radio operators are a critical backbone for emergency response when disaster knocks out phone service and other communications.

Senior reporter Kevin Craver, who just bought a shortwave radio to revisit a childhood hobby, interviewed Topala after hearing that he has reached every location on Earth recognized by the radio league but one – the small island of Malpelo, more than 200 miles off the coast of Colombia.

But Topala, of Algonquin, had an announcement to make ...

Craver: How in the heck did you get to leave Ceausescu's Romania?

Topala: I applied for a passport to leave the country. It took me 11 months to get the passport, and they stripped me of Romanian citizenship. I wrote 485 letters to Ceausescu, all in those 11 months.

Craver: It's fortunate for you, but why didn't Ceausescu just have the Securitate [the former secret police] take you away?

Topala: He could have. I don't know why he didn't. I didn't fit in the Communist regime. I wanted out.

Craver: Your interest in shortwave and ham radio started early, yes?

Topala: We had a shortwave radio; otherwise, all you had to listen to are the two government TV and three government radio stations. We'd get Radio Free Europe, Voice of America, BBC, and that's how I got interested.

Northwest Herald March 12, 2012

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AMATEUR RADIO

Craver: So, you've reached every location on the planet but one, right? Some little island off the coast of Colombia?

Topala: Now I have them all (laughs). I just reached them in January. I've been trying for this island for 15 years. There's only one person there on the island. Its call sign is HK0NA.

The island is so rugged – it's just a big rock sticking out of the water. You get to it by taking an inflatable boat to a rope ladder. It's only rocks and birds.

Craver: My hobby, birding, is similar in a way to your hobby. You reach stations and check them off, and I check off species that I've seen or heard. So how many different regions does the ARRL recognize?

Topala: There were 341, but one got scratched off the list, so there are 340 active ones. Others have gotten scratched in the past – I actually have 343 locations, and I know people who have 397.

Craver: Tell me about the annual contest that your group participates in.

Topala: In June we do Field Day. Operators have to work under emergency conditions. You're not allowed to use commercial power – you have to work on a generator.

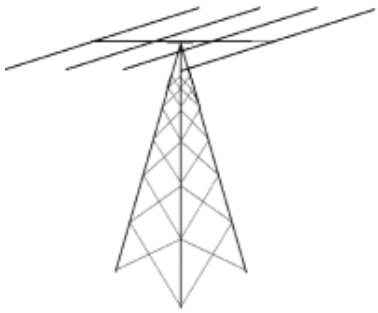
Craver: I hear you and your group stepped up to help in the aftermath of Hurricane Katrina.

Topala: In that particular case, there were stations like us down there. People go up to them and say, for example, I have relatives in Chicago, New York, New Jersey, whatever. They'd get lists of names and phone numbers, relay it to me, and I'd call you and tell you your cousin, your mother, whoever is fine. They may not have a roof, but they're fine.

In any kind of emergency, the ham radio operators jump in to help.

Craver: What do you think will happen to your hobby in the Internet age?

Topala: I think ham radio will always be here. The Internet is very useful, but it's very fragile. It could go down at any time.



ARRL Warns Members to Be Aware of Bogus E-mails

03/12/2012

ARRL members with arrl.net e-mail accounts have recently received bogus e-mails, notifying them of a bill that needs to be paid. The e-mail instructs the reader to click on a link to view the bill; clicking on the link could release a virus that can infect your computer. Please be aware that these e-mails are not coming from the ARRL. “If you receive an e-mail like this and it looks like it originated from ARRL, please do not respond,” explained ARRL IT Manager Michael Keane, K1MK. “The best thing you can do when receiving bogus e-mails is to simply add them to the spam list in your computer’s e-mail program and delete it. Please don’t forward it to ARRL HQ -- we will have already seen it and are already responding to it.”

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NOISE

This article is about intrinsic noises—that is, noises that arise within an electronic circuit itself, making the response of the circuit to external inputs less than ideal. It is intended for readers who know, in general terms, what an amplifier and an analog-to-digital converter (ADC) are intended to do. The terms discussed include white noise, pink noise, popcorn noise, shot noise, avalanche noise, and thermal noise, as well as noise figure and noise floor.

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Noise Sources

All ICs contain inherent noise sources. In amplifiers, they can be modeled as zero-impedance voltage generators in series with the input (en) and infinite-impedance current sources in parallel with the input (in). The noise from these intrinsic sources has different characteristics, depending on how it arises.

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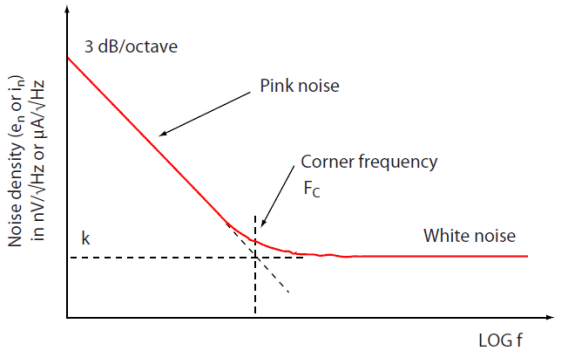
The noise from these intrinsic sources has different characteristics, depending on how it arises.

Other characteristics can be derived from noise. For example, an amplifier's noise figure (expressed in dB) is the amount by which the amplifier's noise exceeds the noise of a perfect amplifier in the same environment. It's generally only used in communications work.

White Noise, Pink Noise, And Noise Floor
A system's noise floor is the base level of its intrinsic noise. Anything below the noise floor is "buried in the noise." It largely comprises white or "broadband" noise. Observed in the frequency domain, it is the flat part of the circuit's intrinsic noise spectrum.

Distinguished from white noise, pink noise (also called flicker, or 1/f noise) occurs below a certain value called the corner frequency. In that lower region, it increases inversely with frequency at 3 dB/octave (see the figure).



On a spectrum analyzer, "white" noise is the flat part of a circuit's intrinsic noise spectrum. "Pink" noise is more intense at lower operating frequencies, rising out of the white noise approximately at the "corner frequency" and increasing at 3 dB/octave at lower and lower operating frequencies.

(Actually, there is no hard corner. The transition occurs gradually. You can determine corner frequency by extending the straight-line portions of white and pink noise and noting where they cross.)

Pink noise only occurs under conditions where current is flowing. It's a manifestation of charge carriers being captured arid released randomly. In bipolar transistors, silicon dioxide., that's due to contamination and imperfect surface conditions at the base-emitter junction. In CMOS devices, it's primarily associated with extra electron energy states at the boundary between silicon and silicon dioxide.

In expressing white noise, it's necessary to specify bandwidth. If F is frequency:

$$E_N = \sqrt{\int_{Ff_1}^{F_2} e_n^2 dF} \quad (1)$$

or more simply:

$$E_N = e_n\sqrt{F_2 - F_1} \quad (2)$$

or:

$$E_N = e_n\sqrt{\Delta F} \quad (3)$$

If F1 is much lower—say, 10 times lower—than F2, then it can even be approximated as:

$$E_N = e_n\sqrt{f_2} \quad (4)$$

That is, it can be approximated as simply en times the square root of the upper frequency limit.

In general, voltage or current noise spectral density in the 1/f region is:

$$e_n, i_n = k\sqrt{F_C}\sqrt{\frac{1}{f}} \quad (5)$$

where k is the level of the "white" current or voltage noise level, and FC is the 1/f corner frequency. A good low-frequency, low-noise amplifier will have a corner frequencies below 10 Hz. JFET devices and general-purpose op amps have values up to 100 Hz. Very fast amplifiers may achieve their high speed at the cost of a high FC, but that doesn't matter that much in a wideband application.

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To obtain a value for RMS noise, the noise spectral density can be integrated over the bandwidth of interest. In the pink noise region, The RMS noise from F1 to FC would be:

$$E_N(F1,FC) = e_n\sqrt{F_C}\sqrt{\int_{fF_1}^{F_C}\frac{1}{f}df} = e_n\sqrt{F_C\ \ln\left[\frac{F_C}{F_1}\right]} \quad (6)$$

where en is the voltage noise spectral density of the white noise, F1 is the lowest frequency of interest in the pink noise region, and FC is the corner frequency. Note that the corner frequency for a voltage noise need not be the same as the corner frequency for current noise.

Voltage noise is expressed in nV/?Hz, and current noise may be expressed in terms of ?A/?Hz. One characteristic of 1/f noise is that the power content in each decade is constant. Another thing to keep in mind is that white noise has equal energy per frequency. Its RMS value is set by f2. Pink noise has equal energy per octave. Its RMS value is set by the ratio of f2 to f1.

In the white noise area above FC, the RMS is given by:

$$E_N = e_n\sqrt{F_H - F_C} \quad (7)$$

Combining the last two equations, the total RMS noise from F1 to Fn would be:

$$E_N(F1,F2) = e_n\sqrt{F_C\ \ln\left[\frac{F_C}{F_1}\right] + (F_H - F_C)} \quad (8)$$

At higher frequencies, the term in the above equation containing the natural logarithm becomes insignificant, and the expression reduces to:

$$E_N(F_1,F_2) = e_n\sqrt{F_2 - F_1} \quad (9)$$

Shot Noise

Shot (Schottky) noise is a component of white noise. It occurs whenever a current passes through PN junctions. Barrier crossings are random events, and the total current is the sum of those random elementary current pulses. The expression for shot noise is:

$$I_N = \sqrt{(2\ qI_b\ \Delta F)} \quad (10)$$

where q is the charge on an electron (1.6 x 10-19 C), Ib is the bias current, and ?F is the bandwidth in Hz. If Ib is expressed in pA, that simplifies to:

$$I_N = 5.7 \times 10^4\sqrt{I\ \Delta F} \quad (11)$$

Thermal (Johnson) Noise

Then, of course, there is thermal (or Johnson) noise, from the thermal agitation of electrons in the gain-setting resistors, and:

$$E_N = \sqrt{4\ kTR\ \Delta F} \quad (12)$$

where k is Boltzmann's constant (1.374 × 10-23J/K), T is Kelvin temperature, R is resistance in ohms, and ?F is bandwidth in hertz. For convenience, 4kT = 1.65 × 10-20 W/Hz. The lower the resistance, the less the thermal noise. Halving the resistance decreases the noise by 3 dB because R is under the radical sign.

Popcorn Noise

Popcorn or "burst" noise is rarely encountered these days because parts are screened for it in the fab. It represents step-function voltage changes at the output of an amplifier caused by random current-gain transitions in bipolar transistors, which then cause variations in input offset. Since if it happens at all, it happens at low frequencies, it's part of 1/f noise.

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Avalanche Noise

Avalanche noise is also rare. It's encountered in PN junctions operated in reverse breakdown modes. It occurs when electrons acquire enough kinetic energy under the influence of the strong electric field to create additional electron-hole pairs by colliding with the atoms in the crystal lattice. If that happens to spill over into an avalanche effect, random noise spikes may be observed.

Combining Noises

It's rare to encounter only one source of intrinsic noise. If those sources are uncorrelated, they can be combined as the square root of the sum of the squares:

$$E_{N\_TOTAL} = \sqrt{E_{N1}^2 + E_{N2}^2 \ \ldots} \quad (13)$$

Thus, the total effect of two noise sources that have the same energy is a 3-dB increase in total noise energy. More importantly, any noise voltage more than three or five times greater than any of the others will dominate, and the others may be neglected.

The key components of amplifier noise are the white noise, which is flat above the corner frequency, and the pink noise below the corner frequency, which increases inversely with frequency at 3 dB/octave.

Reference

Analog Devices' Op Amp Applications Handbook, (2006) edited by Walt Jung.

Webcast: Noise Optimization in Sensor Signal Conditioning Circuits (Part I)

Related Content:

Free Noise With Every ADC (While Supplies Last)
What's All This Noise Stuff, Anyhow? (Part 1)
What's All This Noise Stuff, Anyhow? (Part II)
3D Integration Fosters 1mm-By-1mm Class D Amp
Technology Can Only Benefit From 2012's "Collaborate To Innovate" Theme

Credit: Electronic Design.com

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Well, don't let anyone say we never had a real technical article with all those frmulas and electronic mumbo jumbo. - *ED.*

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No, it's a "Go-Kit" not a Goat -Kit !