

August, 2010

Solid Copy de KC7Z

Newsletter of the North Kitsap Amateur Radio Club

PO BOX 2268 -- Silverdale, WA 98383-2268

Web page: <http://www.nkarc.org>

August 2010

The Prez Says:

This month, the General Meeting will be held at the Point No Point Lighthouse to coincide with us operating a Special Event station there.

It will be Potluck/BBQ. Think of what you would like to bring. The club will be providing: Napkins, plasticware, plates, cups, water, Hot Dogs (and Buns), Hamburgers (and Buns), Ketchup, Mustard and a smoked Turkey.

The signup sheet was sent out as a separate e-mail this weekend. Please respond back to me on what you intend to bring so I can update it. I'll send out the updated sheet periodically so everyone can see it. I'll also have it posted to the website.

All, is there anybody willing to bring a BBQ? I'll have the ribs and turkey smoked and ready already, but we will need a BBQ to cook the burgers and dogs.

73,
Dave/N7ORM

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VE Report

In my Solid Copy report of the last VE session I gave the name of the person gaining the Extra license incorrectly. The examinee was Greg Bajuk, Captain, US Navy (Retired). Not Boyd.

Also, the next VE exam session will be Saturday, September 4, 2010, not September 34.

Horace
K7ORY

Scheduled Upcoming Events

Club General Meeting and Club Potluck Lunch

Date: August 21st

Located: Point No Point Lighthouse, Hansville 10:00 AM

Lighthouses on the Air Event

Date: August 21st

Located: Point No Point Lighthouse, Hansville 12:00 Noon

Project Night: None

NKARC Breakfast

Date: August 28th, 2010

Located: Bowling Alley

Time: 9:00am

Board of Directors Meeting CKFS #51

Date: September 10th 2010

Located: Silverdale WAY next to Post Office

Time: 6:30 PM

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This is a test... This is a test:

Here is a math problem for the members.. "Tickle your gray matter". hihi

A driver is motoring down the highway. The SPEED LIMIT is 40MPH. The driver is traveling at 60 feet per second. Is the driver speeding??? Yes or No.

I have my answer (of course, it's right). I am sure that many others will have an answer as well. We will see.

Bring your answer to the Club picnic.

Ed, AK7H

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73's, Neil, WA7NBF

International Lighthouse/Lightship Weekend

Almost 300 lighthouses in more than 40 countries and territories -- from Argentina to Wales -- will be on the air for 2010 International Lighthouse/Lightship Weekend (ILLW). The event, held for the 12th year in a row, takes place Saturday, August 21 0001 UTC through Sunday, August 22 2359 UTC. Stations at more than 40 US lights are expected to be on the air for the event, and several stations will identify with special event call signs. NKARC will participate in the event by setting up a station at the Point No Point lighthouse located in Hansville. The club intends to have stations on air in as many modes and as many bands as possible including CW, SSB, and PSK-31. The location is a beautiful site on the shores of Puget Sound which may be a distraction to some operators. Remember that President Dave has set the location for the August Club Business Meeting along with a potluck lunch. Come and enjoy one of the most interesting field events the club participates in.

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Tally Ho the Fox:

Okay guys, now is the time to prove your prowess as a hunter. There will be a fox hunt at Fort Flagler State Park on August 28th. This is a great place to get out and hunt down that elusive radio signal. Information for the hunt can be found at:

<http://www.robin-wood.com/Ham/Fox/aug2010.htm>

It'll be maintained up until the night before. If you want to add a fox let me know the particulars to coordinate frequencies, etc.

I will have one loaner 2 meter antenna plus offset attenuator plus my newly designed 80 meter receiver/antenna. I will also have a VK3YNG receiver/antenna to loan when I'm not hunting.

Traditionally, this has been more of an intermediate hunt rather than for beginners but all should be able to have fun. Great location.

Great job with the Scouting event!

Thanks to those that helped make the Scouting event a big success...

Al	KE7RPR	Horace	K7ORY
Malcolm	NF7M	Dan	KF7AHO
David	AD7XU	Dave	N7ORM
Pete	K7RR	Jerry	K9CCZ
Carl	W7WCM	Kris	KF7GWG
Jonathan	KF7GEM	Ed	AK7H

We had over 20 Scouts/leaders show up, and all commented that they had a great time and had a chance to experience several aspects of ham radio. I think we've inspired several to get their licenses. The certificate Al created was a real work of art, and Jerry and Horace helped provide QSO's for several of the boys. Several asked if we were going to do something similar again next year, which tells me we put on something we could build on for the future.

We can talk about how to make it better on the nets or at club meetings.

Once again Herb was instrumental in getting us in early to set up, and run interference as needed.with DNR.

Thanks again to all!

Paul
W7PV

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Change Address or Call Sign?

Please notify the club secretary to update the roster if you changed your address, call sign or e-mail address. Include your phone number so that you can be contacted in case of emergency or for assistance. This will insure that you will get the latest news via the club newsletter. Either notify Warren (N7SI) at the meeting or drop a card to NKARC at PO Box 2268, Silverdale, WA 98383-2268. You can also send the changes via e-mail to Warren or Bob Tomas at bobto-

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mas@sprintmail.com

Learning CW

Some members have expressed interest in developing or improving their CW skills. If you are in that category please look at the following:

Zen and the Art of Radiotelegraphy.pdf;
<http://www.qsl.net/ik0yvj/enu/index.html>

Art and skill of Radio-Telegraphy.pdf
<http://www.qsl.net/n9bor/n0hff.htm>

Both are good books on the topic.

I would recommend the following software (all is free):

To learn the code I recommend G4FON Koch method CW trainer (version 9). Learn the code by mastering two letters than adding another, then another until you have a 40 character set mastered. Best to start with a relatively fast "actual character speed" say 20 or even 25 wpm... and an "effective code speed" adjusted to suite you... something slower than the 25 wpm. Just keep bumping up the "effective code speed" until it matches "actual character speed". This is a great way to quickly become a QRQ (fast CW) operator. download at

<http://www.g4fon.net/>

If you know the code but are working on speed especially in a FD or contest type environ:

Morse Runner (version 1.68) Free download from

<http://www.dxatlas.com/MorseRunner/>

Session length should be no more than 30 minutes and initially "run" as "single calls".

Another popular way to become QRQ is with the RufzXP program (version 1.1.2). This program sends you a call sign and if you successfully copy it tweaks up the speed... if you don't copy it tweaks it down. So the program is always push-

ing to increase your threshold. Download at <http://www.rufzxp.net/>

Bottom line.... use your 21st century computer to learn the 150 year old art of CW. Have fun and hope to hear you on the bottom portions of the bands.

Pete O.
K7RR

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QST QST QSTFor Sale:

Here are two items for sale that can help clean up that hard to hear signal:

MFJ-784B Tunable Super DSP filter. Recent price in QST \$279.95. (\$99.99)

The **MFJ-784B** tunable DSP audio filter can simultaneously eliminate heterodynes, reduce noise and reduce interference in nearly any mode. You get five tunable DSP filters, plus ten programmable filters. The automatic notch zaps hets, adaptive noise reduction reduces fatigue and the high-pass-lowpass & tunable bandpass filters give you effective tolls to dig out the weak ones.

Yaesu SP-5 with Timewave DSP moduel SP5/6. Invoice \$389.96 (\$99.99)

The **Yaesu SP-5** is a base speaker with audio filtering. It features a ¼ inch headphone jack on the front panel. Input A or B or may be selected. There is a multi-position [Low Cut Filter knob and High Cut Filter knob](#). The [SP-5 rear panel](#) has RCA phono jacks for Input A, Input B and Line Out. It features a metal cabinet and metal grille. The two front feet have a riser function to tilt the speaker upwards.

Contact Burt Boyd, W7IIT, at

w7iitburt@gmail.com

or by phone at 360.692.9865

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RACES/ACS Net Sessions:

The Kitsap RACES/ACS net is held on Sunday nights at 7:30 PM on the 145.43 repeater (-600 offset, 179.9 PL tone). Check in and be informed on emergency communications in Kitsap County.

The packet radio net in on 145.63 Mhz at 7:00 PM. Connect to K7EK-8. . If you cannot connect to K7EK-8 directly, connect to the ELYSSA node on the same frequency and then connect to K7EK-5.

Other nets include 10-meter HF Net on 28.330 Mhz USSB starting at 7:00 PM

6 meter FM net on 52.35 Mhz starting at 7:00 PM.

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Keep Kitsap Green:

Help the environment by properly disposing of discharged household batteries. This includes alkaline, regular zinc carbide batteries, and batteries with heavy metals such as ni-cads and lithium ion.

The Solid Waste Facility on Hansville Road accepts the batteries as past of the county-wide recycling pro-

gram. Ron Sefton, N7EM, reports the Poulsbo recycle center also accepts used batteries including lead acid types. The site is located immediately north of the Hwy 305/Viking way intersection. This is to the east of the "Walmart/Hwy 3 interchange". Otherwise, bring them to the meeting for transfer to the disposal site.

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Spring cleaning in the Shack:

During the annual spring cleaning in the garage, keep sorting through those gadgets and help make the XYL happy. Set the items aside and let your editor know that they are up for sale. Or trade. An ad can be placed in Solid Copy for the right price – free.

Another option is to discuss the possibility of setting aside a meeting to let members sell or trade for available items. The meeting could be scheduled in late spring or early summer. It might even be a tailgate party/ meeting. Remember—one man’s surplus (“garbage”) is another man’s treasure. That old TV antenna that you have been meaning to take to the dump can be easily converted to a six meter beam by somebody who needs one and is a little short of cash. The spool of wire will make a nice dipole antenna for the new kid on the block.

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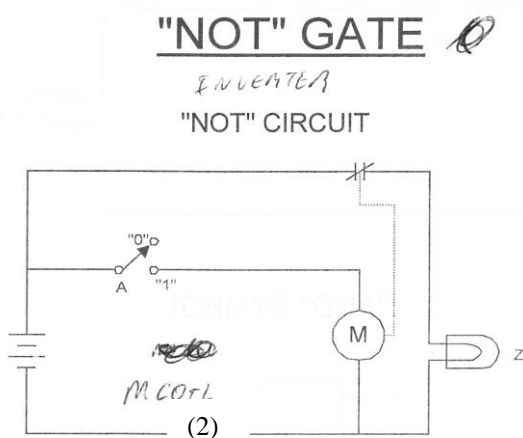
A to D Converters – How They Work – Part 5

Logic Circuits

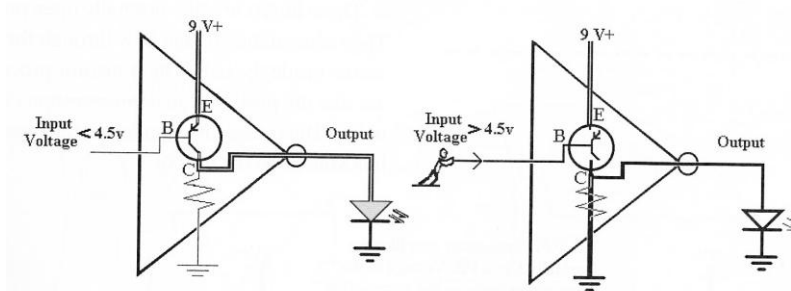
Welcome to the digital age!

Now that we have covered transistor basics we can begin discussing logic gate operation.

Logic gates are the foundation upon which digital circuits are created. They can be mechanical (like relays and switches), or they can be electrical (like vacuum tubes, or transistors). Logic gates have two forms of expression to describe their operation. Boolean expressions are mathematical expressions that describe the operation of the circuit. Truth tables are matrices that show the output state as a function for a given input state.

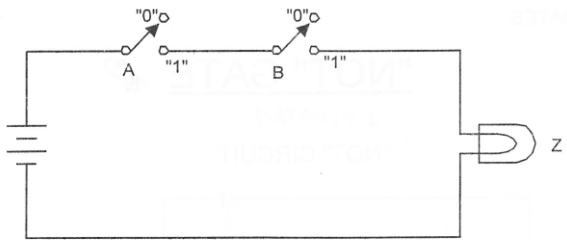


The NOT Gate is the simplest logic gate. For any given input, the output is not the same. Going back to the operation of the PNP transistor, if a positive voltage is applied to the base that is greater than that of the emitter, then current will stop flowing from the collector to the emitter. This will cause the transistor to act like an open switch. If a less positive voltage (more negative) voltage is applied to the base as compared to the emitter, then current will flow from the collector to the emitter. This allows the transistor to function as a closed switch. This is the basic NOT Gate.



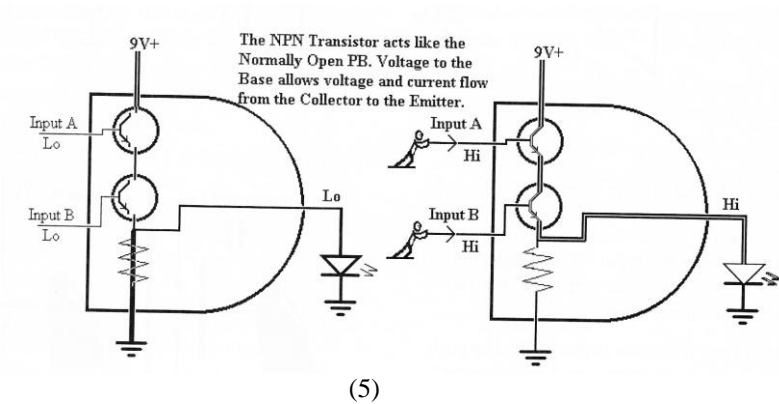
(3)

"AND" CIRCUIT



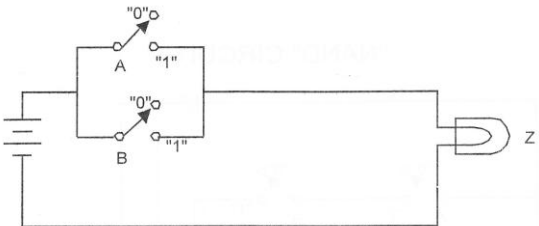
(4)

The AND Gate is similar to a set of two normally open switches in series. In this case, the switches are in the form of NPN transistors. Both transistors must be conducting (allowing collector-emitter current to flow) to have an output.



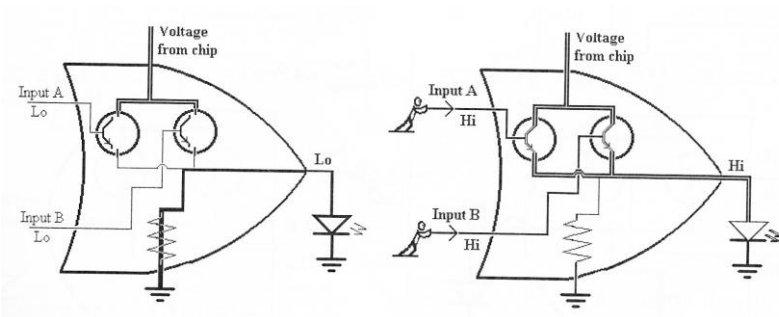
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"OR" CIRCUIT



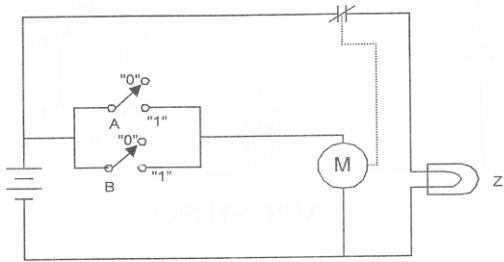
(6)

The OR Gate is similar to two switches in parallel. If either transistor conducts, then you will have an output.



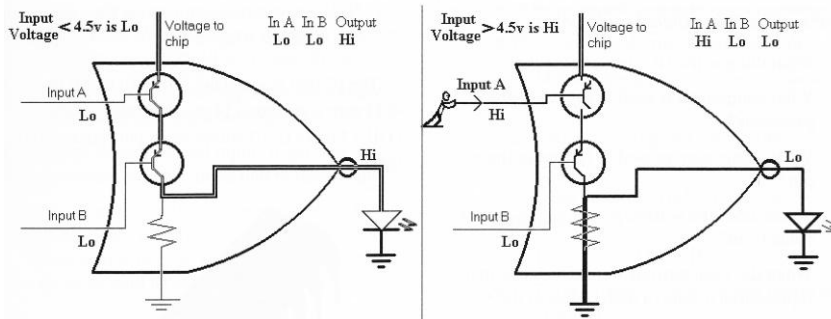
(7)

"NOR" CIRCUIT



The NOR Gate is similar to a set of two normally closed switches in series. If either transistor ceases conduction, then there will be no output.

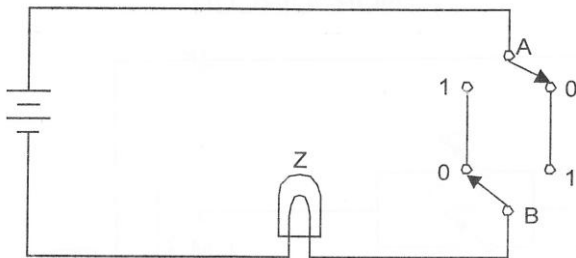
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(9)

"XOR" CIRCUIT

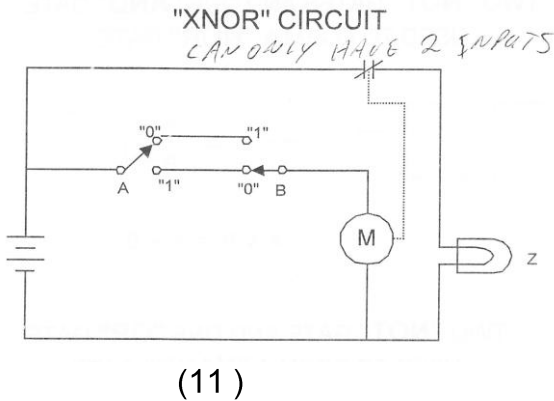
CAN ONLY HAVE 2 INPUTS



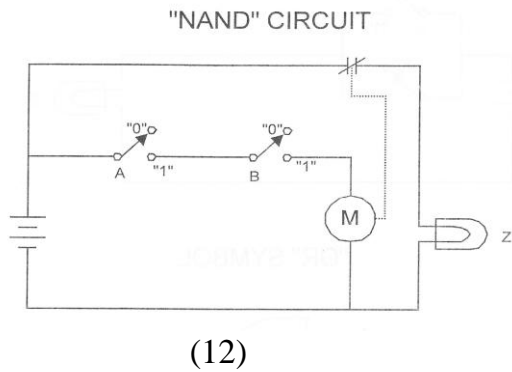
When placed into the context of transistors: If either transistor conducts, then there will be an output, and if both transistors are in the same state of conduction, then there will be no output.

(10)

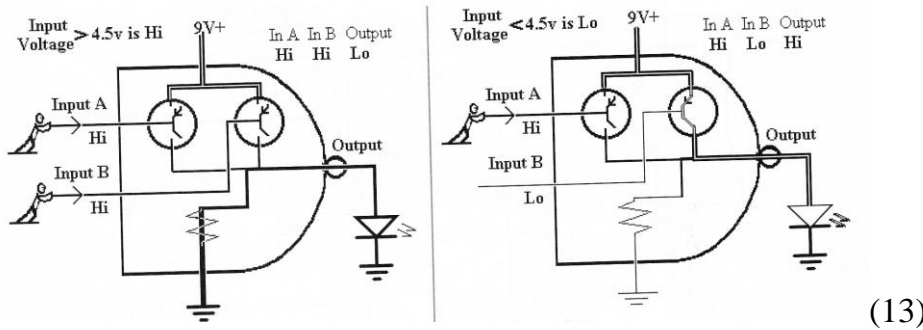
The EXCLUSIVE OR Gate is similar to two opposing switches in parallel. (A-School) Its operation is analogous with a two-way light in your house. If either switch is repositioned, then the light will come on, and if both switch positions match, then the light will remain off. When placed into the context of transistors: If either transistor conducts, then there will be an output, and if both transistors are in the same state of conduction, then there will be no output.



The EXCLUSIVE NOR Gate is just the opposite of the EXCLUSIVE OR Gate. Its operation is analogous to having the two-way switch in your house wired incorrectly. If either switch is repositioned, then the light turns off, and if both switch positions match, then the light remains on. When placed into the context of transistors: If either transistor conducts, then there will be no output, and if both transistors are in the same state of conduction, then there will be an output



There is one more type of logic gate to mention. The NAND Gate is just an AND Gate with an inverted output.



The Logic matrix table (Figure 1 following) shows the outputs of these circuits related to their input states.



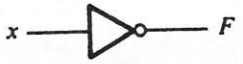





If I have done my job correctly, then at this point you should have an idea about what is coming next. If you have any questions about what has gone on so far, or you have not understood some topic, e-mail me at acerimmer@sithia.com. In the mean time try not to let the magic smoke out.

73, Kris
KF7GWG

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- (1) Table from Applied Engineering Principles Rev. 3, December 1995, Section 2.9.2
- (2) Drawing from Nuclear Field "EM" A-School notes of FN Stafford, June 1998, March 1998 Edition.
- (3) Drawing from Electronic Circuits for the Evil Genius by Dave Cutcher, Copyright 2005 by McGraw-Hill, Lesson 14, Pg. 55
- (4) Drawing from Nuclear Field "EM" A-School notes of FN Stafford, June 1998, March 1998 Edition.
- (5) Drawing from Electronic Circuits for the Evil Genius by Dave Cutcher, Copyright 2005 by McGraw-Hill, Lesson 14, Pg. 56
- (6) Drawing from Nuclear Field "EM" A-School notes of FN Stafford, June 1998, March 1998 Edition.
- (7) Drawing from Electronic Circuits for the Evil Genius by Dave Cutcher, Copyright 2005 by McGraw-Hill, Lesson 14, Pg. 57
- (8) Drawing from Nuclear Field "EM" A-School notes of FN Stafford, June 1998, March 1998 Edition.
- (9) Drawing from Electronic Circuits for the Evil Genius by Dave Cutcher, Copyright 2005 by McGraw-Hill, Lesson 14, Pg. 59
- (10) Drawing from Nuclear Field "EM" A-School notes of FN Stafford, June 1998, March 1998 Edition.
- (11) Drawing from Nuclear Field "EM" A-School notes of FN Stafford, June 1998, March 1998 Edition.
- (12) Drawing from Nuclear Field "EM" A-School notes of FN Stafford, June 1998, March 1998 Edition.
- (13) Drawing from Electronic Circuits for the Evil Genius by Dave Cutcher, Copyright 2005 by McGraw-Hill, Lesson 14, Pg. 58

Logic Circuit Truth Table

Name	Graphic symbol	Algebraic function	Truth table															
AND		$F = xy$	<table border="1"> <thead> <tr> <th>x</th> <th>y</th> <th>F</th> </tr> </thead> <tbody> <tr><td>0</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>1</td><td>0</td></tr> <tr><td>1</td><td>0</td><td>0</td></tr> <tr><td>1</td><td>1</td><td>1</td></tr> </tbody> </table>	x	y	F	0	0	0	0	1	0	1	0	0	1	1	1
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(1)

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A Simple Index for High Frequency Radio Propagation (Part 1) **Paul Voorhees, W7PV**

What's going on up there?

Being an avid DXer for decades, I've been looking forward to the new solar cycle, and hopefully the great openings on 10 and 15 meters that I remember from years past. As a new licensee in the 60's I vividly remember working the South Pole, and marveling at how my 75 watts could get there from Seattle. Fast forward to current day, and I find my self checking Spaceweather.com for evidence of sunspots, so I'll know when that KC4 station is about to come blasting through. When a sunspot finally showed up this past fall, I quickly got on 20 meters, only to find no apparent change in the propagation. Fifteen and 10 were dead as doornails, as had been the case in recent memory.

Looking at the bright side, I thought it probably took some time for the effect of the sunspots to reach our little planet, but after several days of no change, that theory proved useless, and it was plain to see I needed to 'phone a friend'. I wanted to know how sunspots affected propagation, how long it took from their appearance until some effect on propagation was noticeable, and what relative indicator could I use that would tell me how good propagation would be. I could find out how many sunspots were visible and what the values of various solar indexes, but these really didn't mean much to me in terms of how good propagation would be. So I sent out a few emails to people I thought were the experts, including a friend in Switzerland who has a PhD in solar physics. No responses. Finally I found some helpful scientists at the National Oceanic and Atmospheric Administration (NOAA), who studied this subject for a living.

However, within a short time, my perception of the world was shattered when Dr. R. P. Kane told me that "...sunspots do nothing on their own.... nothing comes out from sunspots as such which can affect the Earth." For me, this was worse than saying there was no Santa Claus.

After that shock passed, my next question was 'ok, what does get the ionosphere to the point where it bounces HF signals back to earth?' The answer was both simple and complex, and is the subject of what follows.

The real cause of ionization and increased HF propagation

The simple answer to what causes ionization in the ionosphere, and therefore the reflection/refraction of radio waves, is extreme ultraviolet (EUV) and X-ray radiation from the sun. That's it. It's not the emergence of sunspots, solar flux, solar flares, coronal mass ejections (CME's), or the Aurora Borealis. However, these topics are related and good to understand as well. The bad news here is that I'm told EUV reaching the ionosphere can only be measured from space, so I started looking some other kind of indicator.

The complex part of the answer to the propagation question is that propagation varies due to time of day, season of the year, latitude, and the wide variety of affects from solar flares and ICMEs (interplanetary coronal mass ejections). More on these later.

Okay. So EUV from the sun ionizes the gases or plasma in the ionosphere. That happens every day. The difference is that during a solar maximum, the level of EUV is substantially stronger than at a solar minimum. And, oh by the way, the emergence of sunspots and solar flux (2800Mhz radiation) correlate with levels of solar EUV, so these numbers can be viewed as indicators of solar EUV. While useful, they don't tell the whole story as you'll see.

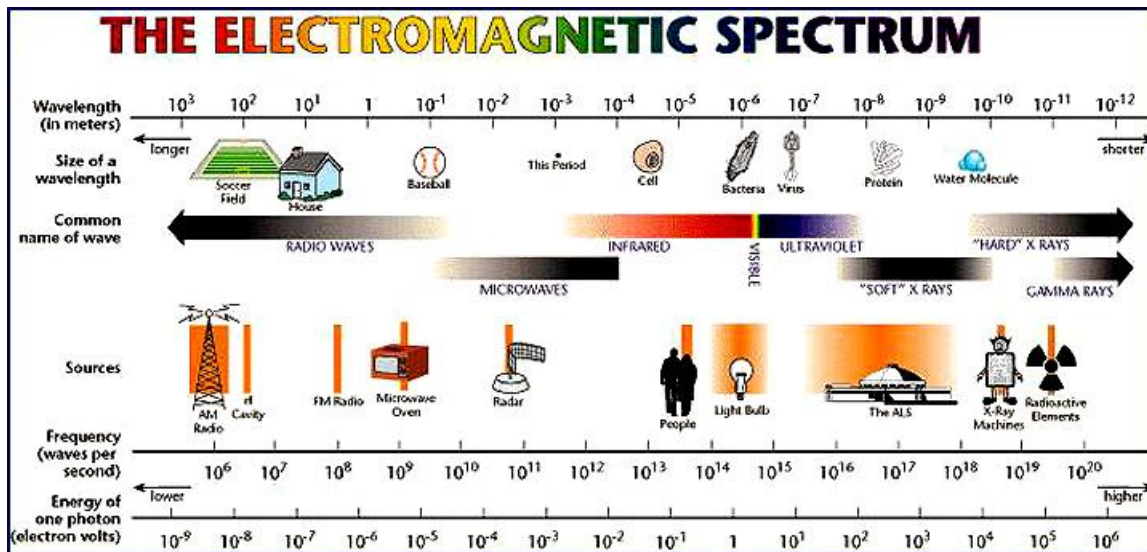
What really happens with EUV in the ionosphere?

My early experience contacting the South Pole with 75 watts was possible because ionized atmospheric gases refract/reflect high frequency radio energy in the ionosphere and "bounce" the transmitted signal back to earth. The signal may then be reflected back into the ionosphere and bounced again.

First a few definitions. The frequency spectrum above visible light, in order of decreasing wavelength, includes Ultraviolet (wavelengths from 400 nanometers to 100nm), Extreme Ultraviolet or EUV (100nm to 10nm), X-rays (10nm to

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1picometer), and Gamma rays (1pm or less). The ionization we are addressing primarily results from EUV, X-rays, and Gamma rays. In the chart below, EUV is between 10^{-7} and 10^{-8} meters in wavelength.



Source: NASA

For you physics buffs, here are the big pieces of the 'technical story' behind ionization. EUV, [X-Ray](#) and shorter [wavelengths](#) of [solar radiation](#) are *ionizing*, since [photons](#) at these frequencies contain sufficient energy to dislodge an [electron](#) from a neutral gas [atom](#) or [molecule](#) upon absorption. The reverse process is called [recombination](#) whereby a free negatively charged electron is collisionally "captured" by a positive ion to form a neutral particle. Recombination increases as the ion density increases. Similarly, as gas density increases at lower altitudes, the recombination process prevails, since the gas molecules and ions are closer together. The local ionization at any altitude is mostly a balance between production (ionization) and loss (recombination).

The more pedestrian explanation is that the energy in EUV and X-ray radiation is able to free electrons from stable atoms, and the resulting electron 'clouds' are what radio signals can bounce off of. At the same time, these free electrons naturally recombine, forming stable atoms. A net increase in free electrons is an increase in ionization. This process is like filling a leaky bucket with a hose; every minute some amount of water goes in, but quickly leaks out; when the incoming stream resembles more of a fire hose than a garden hose, the volume in the bucket becomes much larger.

Next Month: We'll talk about the ionosphere; how radio waves are reflected and significant solar events. In the meantime, keep your eye on the sun. Through smoked glasses of course.

73 & Good DX!

Paul

W7PV