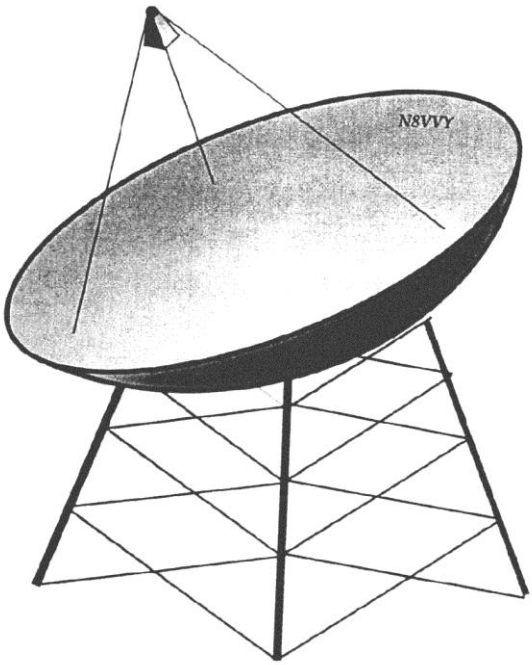
ANOMALOUS PROPAGATION

Newsletter: ***The Midwest VHF/UHF Society***



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MIDWEST VHF-UHF SOCIETY

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Beacons: 1296.079 **W8KSE** EM79ur Dayton, OH---- 2W to Big Wheel at 800' AGL.

Listen for the **K9AYA Beacons** at EM79qk, 2W @ 10,368.000 MHz
both are copied by K4TO daily. 1W @ 5,760.000 MHz

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Dayton will be hosting
The 2015 AMSAT Space Symposium

to be held on Friday through Sunday, **Oct 16, 17, 18 - 2015**
Location will be at the Crowne Plaza, 33 East 5th Street, in Downtown, Dayton.
The Crown Plaza is a 3.5 star Hotel which has been recently renovated.
We are looking for volunteers to fill some important vacancies in the roster.
Let's get involved and make this an event that will be memorable.
For more information or to volunteer, please contact Steve Coy K8UD.
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DE N8ZM: Don't shoot the messenger! Both Puxatawney Phil and Buckeye Chuck are probably thinking that about now. One of them is no doubt going to be proved wrong about their predicted arrival of warmer weather. At this point I don't really care which one called it correctly so long as the thermometer starts regularly registering numbers above freezing, and SOON!

It just occurred to me that most of my columns this time of year start out with some gripe about the weather. I wonder why?

This just in: As I sit here trying to think of things to write about this month, I hear a chain saw buzzing. Not 100' from my office window there is a guy up about 40' topping out a tree, in 12 F temperatures! He just took off a branch that was over 12" at the base and some 30' long. This tree is about 30" at the base and I expect to see that fall soon. Like a lot of neighborhoods, mine has been devastated by the Emerald Ash Borer plague. Thankfully, ham towers are made of steel. (Weren't you wondering how I was going to tie that into ham radio?)

Probably no need to mention that Hamvention will be here in about 10 short weeks. I have our booth reserved and we will be in the same location (SA332) as far as I know now. There had been some talk by the show folks about re-arranging some areas but I have not yet heard that it will affect us. As always we could use your help to staff the booth. Mike Schulsinger has told me he plans to be there almost full time again but he isn't Superman and deserves to get a break from that now and again so that he can see the show too, and attend to other business. Let me know if you can help out as I need to order the badges soon.

The VHF/Microwave forum will be at 3:15 on Saturday, this year moderated by Tony, WA8RJF. Tony is a well-known VHF contester and will do an outstanding job of bringing in great speakers. BTW, Tony tells me that he was unable to arrange for the annual VHF Weak Signal dinner this year, so may I suggest the TAPR/AMSAT Banquet instead? See the AMSAT web site under Events for details.

Mike Suhar, W8RKO, has been a busy boy lately with several projects moving forward through his efforts. We collaborated on a new circuit board layout for the noise sources that eliminates the hand re-work we were doing on the original boards. This will speed up assembly and should provide more consistent performance. Also, Mike is working on the driver amp for the 1296 beacon amplifier. This project was delayed by some computer issues that Mike ran into, as well as finding the right package data for the amp chip. Mike also plans to have our beacons back on the roof at HARA for Hamvention, with the frequencies moved to put them into the designated beacon sub-bands so that we avoid the wrath of the kilocycle cops that we experienced last year. More on those beacons in future columns.

It has been a while since I mentioned this, but since it popped into my head it seems like a good time to remind all of you to get your MVUS dues caught up. They really aren't very much per year and you get a very fine newsletter in your email or snail mail box. If you are not receiving Anom Prop via email and would like to, send me your email address and I will add you to that distribution list. Saves us money on paper and postage and gets it to you faster! And it saves Gerd time since he doesn't have to get them printed (Thanks! to N8QOD for that part of it), address them, add stamps and then trot them off to the USPS for delivery. It's a good deal for everybody!

Our meeting this month is on 2/27 at the MCL Cafeteria at 6:30. See you there!

Tom, N8ZM

This and That 2-15

Columbus, Ohio. Was built from scratch in the center of Ohio around 1812. After some shops and houses, then a penitentiary, the brick capitol was built and by 1816 the legislature moved in and began ”that continuous and monotonous grind of passing laws one winter and repealing them the next.”

[From Jeff Trailor's “Ohio Pride”]

Dayton, Ohio. The Wright Brothers from Dayton, were ready to fly on the morning of Dec 17 in 1903 at Kitty Hawk, N.C. A toss of the coin gave the honor of the first flight to Orville, and he took off on a fight of 12 seconds covering 120 feet.

On the Eagle. On 26 Jan in 1784, Benjamin Franklin in a letter to his daughter wrote that he was not pleased about the choice of bald eagle as the symbol of America. He wished it had not been chosen as a "representative of our country" because, he said, it is a "Bird of bad moral Character.”... "Like those among Men who live by Sharping and Robbing, the eagle is generally poor, and often very lousy."

Edison. Asked about Einstein he said: Can't tell you much about him....because I don't understand his theory (laughing). [PBS Special on Edison, Jan. 2015]

Friends. “Take care of your friends, because there will come a time when you are not much fun to be with and there is no reason to like you except out of longstanding habit.” [Garrison Keillor]

Failure. “Failure is success in Progress.” [Albert Einstein]

AC...DC. Edison was for DC, Tesla for AC. AC won for the one reason that AC could be easily transformed to higher or lower voltages as required. There are, of course, instances where DC is preferable over AC, as in transporting energy over greater distances. This problem is now being attacked by using switching power supplies for the conversion. [Gerd, WB8IFM]

Touchless flush toilet. “Simply wave your hand over a sensor in the tank and it will trigger a flush powered by 4 AA batteries. Available in 10 colors, starting at $820 in white. [Lisa Boone]

Ideas. Landscape painter Grant Wood, known for his iconic portrait of a farmer and his spinster daughter, explained once, that despite his travels and European training, all the really good ideas came to him while he was milking a cow. [Garrison Keillor in his Writers Almanac for 2-13-15]

Change. The washing machine has changed the world more that the Internet has.

[Ha Joon Chang in 23 Things They Don't Tell You about Capitalism.]

Lethal. Well over one million people get killed every year on the road. {World Health Organization]

Racket. More than half the people who have a fridge are annoyed by its racket according to a study by Korean engineers (2006). [Scientific American 3-2015]

E-mail on the way out? The young ones are not using it. It's considered “uncool”. Applications from recent college graduates leave the e-mail address field blank. [David Pogue, Scientific American]

Gold found. 13Lbs of gold coins, more than 1000 years old, were found at the bottom of the sea recently. “Gold is a noble metal not affected by air or water. Several coins in the assemblage were bent and exhibited teeth and bite marks, evidence they were 'physically' inspected.” [Newspaper report]

Elliptical orbit

The AU is the average distance from the Earth to the sun. Earth makes a complete revolution around the sun every 365.25 days — one year. However, Earth's orbit is not a perfect circle; it is shaped more like an oval, or an ellipse. Over the course of a year, Earth moves sometimes closer to the sun and sometimes farther away from the sun. Earth's closest approach to the sun, called perihelion, comes in early January and is about 91 million miles (146 million km). The farthest from the sun Earth gets is called aphelion. It comes in early July and is about 94.5 million miles (152 million km).

Factor of 2.

Not all brains are the same and not all teachers grade mathematical problems the same way. Some are only interested in the result and don't care how the student arrived at it. Other teachers are just the opposite. If the answer is false, but the problem solving approach is right, that's ok.

Now, one of the best known errors is to slip a factor of 2 into an equation and I think there probably is a "wiring error" in some brains of otherwise mathematical talents. I heard from a teacher who did never attach great importance to that kind of error.

Einstein, when he came out with his new theory of relativity, made such an error. Einstein had predicted that the huge mass of the sun would bend the light of a distant star that was in the sky close to the sun but the only time instruments of the era (1907) which could detect this still tiny deviation was during a solar eclipse. He was lucky, the first expedition set out to make such a measurements did not make it in time to the area of the eclipse. Einstein detected his error and measurements during the next eclipse confirmed his prediction. [Gerd, WB8IFM]

Telephone Repairman
by Joseph Millar

One morning in the February light
he has been mending cable,
splicing the pairs of wires together
according to their colors,
white-blue to white-blue
violet-slate to violet-slate,
in the warehouse attic by the river.
We live so much of our lives
without telling anyone,
going out before dawn,
working all day by ourselves,
shaking our heads in silence
at the news on the radio.

He thinks of the many signals
flying in the air around him,
the syllables fluttering,
saying please love me,
from continent to continent
over the curve of the earth.
When he is finished
the messages will flow along the line:
thank you for the gift,
please come to the baptism,
the hill is now past due:
voices that flicker and gleam back and forth
across the tracer-colored wires.

Writer's Almanac / Garrison Keillor

Wireless Electricity by Gerd, WB8IFM

The 2 hour Edison Special on Public TV in January was quite impressive. It started with the light bulb, whose time is now over and the mechanical phonograph, now a museum piece. Then a lot of time was spent with delivering the electric power. Edison was going the DC route which required many local power stations. But there were alternatives:

Not mentioned in the show, was that a young engineer, Tesla suggested to go with AC. Edison disagreed and Tesla went his own way. The advantage using AC, of course was, that the voltage could be changed using a transformer. Thus it was possible to transport the electricity over greater distances and at the point of usage reduce the voltage to manageable levels for individual users. Companies like Westinghouse got into that deal, and that is basically the way we use Electricity to-day.

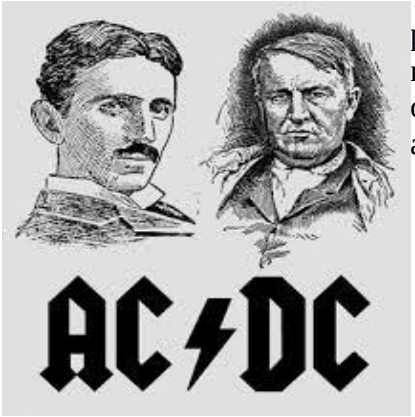
But Tesla had bigger ideas: he was thinking: we can send messages by wire, and we can send messages wireless. Why not try sending electricity over the air? That is a super idea, it would do away with most of the overhead wires that now spoil the landscape. I would always point to that fact if someone would question the size of my antennas.

My recommendation would be, move the electricity as we do now with huge overland lines between the huge power stations and the cities and villages, then in the build-up areas put the wires underground. Wireless, for what we do with the electricity: cooking, washing, cooling, heating etc., is not feasible, except for what we might label exotic uses. Of course, this would not turn off the true inventor, as the PBS special made abundantly clear. Edison had lots of ideas that went nowhere. But that's the thing about an inventor: he will try it anyway.

In my teen years I got interested in wireless and I remember one trip (by bicycle), when we went about 20miles out of town to the site of our local BC station. As this was in the late 1940s, after WW2 and we lived in the British occupied zone, the British military had built an antenna and radio station right next to the German one. There was a tall fence around both stations but a nice asphalt road was looping around in as figure 8. We (I think there were 2or3 of us) all had a vertical antenna on the bike and a crystal detector headphone receiver, as we drove the figure 8 and listened to the one than the other station and thus got a pretty good idea how the signal, both on medium waves, spread out from the vertical towers.

Next, we stopped in some bushes and small trees close by and just through some wire into a tree, possibly a 30' long wire! At the end of the wire we could draw tiny sparks. Then we connected a 6V 50ma light bulb (those were used at the time for bicycle tail lights... and we could get it to glow!

So, in principle, radio waves could definitively “transport” electricity. I case was talked about in Germany, where on the edge of a big city, where land was scarce, a radio tower had been erected very close to a garden colony, that's where people picked up RF and had light bulbs they used in their little cabins. No sure how severe this problem was for the radio station, but it made a nice story.



The experiments Tesla performed were truly monumental but, of course, did not lead to any practical use.

Two down, one to go! by Tom, N8ZM

A visit to the Very Large Array in New Mexico

For some reason I have developed an interest in large antennas of the kind used for radio astronomy. I don't know if it is a fascination with the mechanical engineering required to create them or simply the coolness of listening for signals from outer space. Whichever it is, I have been fortunate to be able to visit two of the biggest and best: Arecibo in 2013, and just last fall, the Very Large Array in New Mexico. If you saw the Jody Foster movie Contact, you saw the VLA. If you aren't familiar with it, the VLA consists of 27 dishes, each 82' (25 meters for you metric types) in diameter, which are spread out across the high desert some 50 miles west of Socorro, NM. They are movable along three railroad tracks laid out in a 'Y' with each leg some 13 miles long. This allows the radio astronomers to create interferometers with variable resolution to suit the needs of their observations.

I had seen pictures of it, as well as the Foster movie, so I had a pretty good idea of what to expect when I got there, but nothing in 2D can convey the effect of driving up to it and seeing it all spread out in front of you. Naturally, from the time you first spy it until you actually get to the Visitor's Center takes about 20 minutes, so there is a lot of time to enjoy the view.

The dishes are all aimed in sync, of course, and when we arrived mid-morning they were all pointed straight up, in bird bath position. When we left they had all moved to the position that you see in the photographs. Really cool!

Because it was early November, thus cold and windy, there were only a few tourists like Barb and I visiting, so we had the place almost to ourselves and the full attention of the lady who runs the gift shop. (Barb has a knack for striking up conversations with people). She was noteworthy because she was unusually knowledgeable about all of the activities and a lot of the technology even though that wasn't her job description. As a side note, she told us that she lives 40 miles away.

The Visitor's Center is very nice and there are several nice displays about the history and current activities of the VLA. There is also a 25 minutes movie, narrated by Ms. Foster, about radio astronomy and the VLA's role in it. After she spent a week there shooting her movie, she became so enthusiastic about the place that she helped produce their movie.

The facility has its own version of the VAB that NASA used to work on the space shuttle; it's not quite as big but it will hold one of the dish assemblies with plenty of headroom to work on it. And work on them they do, since these are as much a mechanical device as electrical. There is almost always one dish undergoing preventative maintenance, repairs, or upgrades. There are some links on the VLA web site showing the process they went through to change the main azimuth ring gear on one dish. Go to http://www.vla.nrao.edu/ to find them.

There are also some displays that have some historical significance to radio astronomy at the site. One is the Ron Bracewell Sun Dial. Sundial is kind of an understatement as this thing really provides much more information than just the time. Bracewell was an Australian who made significant contributions to the study of the universe and this sundial is dedicated to him. In addition to the time it also serves as a calendar of sorts since there are markers for the shadow location at the equinoxes (equinoxi?) and solstices. It takes up a couple of hundred square feet but it is a work of art as well as functional.

Another interesting display was the 7.5 GHz receiver attached to a steerable horn antenna that you could aim at different parts of the sky to measure the energy. There was a simple analog meter mounted on it that showed the relative level of noise as you aimed the horn around its range. Very cool and very simple, but effective at showing what Grote Reber and others discovered over 80 years ago without the benefit of fractional dB noise figures.

What about the 'one to go' in the title? The closest of the three major US radio astronomy sites to my home is the NRAO in Greenbank, WV. You'd think I would have gone there first but it hasn't worked out. Every June the Society of Amateur Radio Astronomers (who, by the way, will have a booth at Hamvention), holds their annual conference there. They attract both pro's and amateurs to deliver some astounding papers on radio astronomy topics. It just always seem to work out that I have somewhere else to go when that event rolls around, but maybe this year?

Pictures: US-Government Property No Trespassing. Tom and a few Dishes. Pedestal close-up Dish Maintenance building
7.5 GHz RX with Horn Antenna, Visitors can aim the Antenna to any point in the Sky and watch a Voltmeter

Japan Launches Asteroid Mission

On Dec. 3, 2014, the Japan Aerospace Exploration Agency (**JAXA**) successfully launched its **Hayabusa2** mission to rendezvous with an asteroid, land a small probe plus three mini rovers on its surface, and then return samples to Earth. NASA and JAXA are cooperating on the science of the mission and NASA will receive a portion of the Hayabusa2 sample in exchange for providing Deep Space Network communications and navigation support for the mission.

Asteroid Explorer "Hayabusa2" is a successor of "Hayabusa" (MUSES-C), which revealed several new technologies and returned to Earth in June 2010. Image Credit: JAXA and Akihiro Ikeshita

Hayabusa2 builds on lessons learned from JAXA's initial Hayabusa mission, which collected samples from a small asteroid named Itokawa and returned them to Earth in June 2010. Hayabusa2's target is a 750 meter-wide asteroid named 1999 JU3, because of the year when it was discovered by the NASA-sponsored Lincoln Near-Earth Asteroid Research project, Lexington, Massachusetts. This is a C-type asteroid which are thought to contain more organic material than other asteroids. Scientists hope to better understand how the solar system evolved by studying samples from these asteroids.

"We think of C-type asteroids as being less altered than others," says Lucy McFadden, a planetary scientist at NASA's Goddard Space Flight Center in Greenbelt, Maryland. "Bringing that material back and being able to look at it in the lab — I think it's going to be very exciting."
Auroras Underfoot (signup)

On Nov. 17, NASA and JAXA signed a Memorandum of Understanding for cooperation on the Hayabusa2 mission and NASA's Origins, Spectral Interpretation, Resource Identification, Security – Regolith Explorer (OSIRIS-REx) mission to mutually maximize their missions' results. OSIRIS-REx is scheduled to launch in 2016. It will be the first U.S. asteroid sample return mission. OSIRIS-REx will rendezvous with the 500-meter-sized asteroid Bennu in 2019 for detailed reconnaissance and a return of samples to Earth in 2023.

Hayabusa2 and OSIRIS-REx will further strengthen the two space agencies' relationship in asteroid exploration.

The missions will also help NASA choose its target for the first-ever mission to capture and redirect an asteroid. NASA's Asteroid Redirect Mission (ARM) in the 2020s will help NASA test new technologies needed for future human missions for the Journey to Mars.

Comets and asteroids contain material that formed in a disk surrounding our infant sun. The hundreds of thousands of known asteroids are leftovers from material that didn't coalesce into a planet or moon in the inner solar system. The thousands of known comets likely formed in the outer solar system, far from the sun's heat, where water exists as ice.

Larger objects like dwarf planets Pluto and Ceres also formed in the outer solar system, where water ice is stable. Pluto and Ceres will soon be explored by NASA missions New Horizons and Dawn, respectively. Asteroids and comets are of unique interest to scientists, though, because they could hold clues to the origins of life on Earth.

These missions have greatly increased scientific knowledge on Earth about our solar system and the history of our planet. Many scientists suspect we could find organic material in asteroids and comets, like amino acids—critical building blocks for life, which could help answer questions about the origins of life on Earth. These questions drive us to continue exploring the intriguing asteroids and comets of our solar system.

Multiple missions that are operating in space or in development by NASA and international partners could bring us much closer to answering that question in our lifetimes and also help identify Near-Earth Objects that might pose a risk of Earth impact, and further help inform developing options for planetary defense.

Follow the latest missions and discoveries at:
http://www.nasa.gov/asteroid-and-comet-watch/
Credits: Production editor: Dr. Tony Phillips | Science@NASA

Drones: Good News and Bad News

Lou Frenzel in Communique (12-1-2014)

While formal rules won't stop unlawful use of drones, it may curtail it. Let's encourage the FAA to speed up its efforts to define what we can and cannot do with drones.

What is your take on the booming drone movement? Is it positive or negative? Like most technological developments, drones have their upside and downsides. Growth of the drone business has been spectacular the past few years and it is now so influential that the government is ready to act to regulate it. The decreasing prices have let business adopt them and are producing a whole new class of consumer hobbyists. This has led to some misbehavior that could produce some unexpected disasters. I'm not a big fan of government regulation, but this seems to be one area that needs some oversight.

The good news about drones, or unmanned aerial vehicles (UAVs), is that they have had a very positive impact. Military drones have been highly effective in surveillance activities saving lives and protecting property. And military drones are the ultimate way to attack the bad guys cheaply and safely. Drones are also doing a great job of patrolling the U.S. borders. Police departments use drones to hunt for lost persons and to improve crime prevention and fighting. Commercial uses of drones have also been effective in farm crop and environmental monitoring, weather-related observation and mining surveying. Movie companies and commercial photographers are using drones to get spectacular aerial videos and photos to aid their businesses. The iconic drone is a quadcopter with a video camera. Even video camera maker GoPro will offer its own version in the near future.

Related

The bad news is that some individuals are misusing the technology. So what else is new? With the cost of a quadcopter drone with video camera now priced below $1000, even individuals have taken up the drone "sport" just like radio controlled model airplanes have been a sport for decades. This is not bad in itself, but it has lead to some unsafe and unsavory practices by a few reckless individuals. Spying on neighbors or competitors is one questionable use. Hunters are using drones to stalk animals. More worrisome is drone usage near airports. Already commercial pilots and tower controllers are reporting a significant increase in sightings and near misses. While a typical quadcopter is no competition for an airliner, it could have disastrous outcomes if it is sucked into a jet engine or otherwise causes pilot over reaction. Since plastic quadcopers do not show up on radar, this is a problem. No wonder the government wants to regulate this.

The Federal Aviation Administration (FAA) has already declared that commercial use of drones unlawful. This is very restrictive as there are many beneficial applications of drones that deserve a chance. The FAA has also indicated that recreational use of drones is OK except that users must stay at least five miles away from an airport or report flights to the airport and keep the drone flying below 400 feet and within sight. That seems reasonable to me but not to some who have obviously violated these guidelines.

The FAA is in the process of developing some formal rules and regulations that we won't see for a while. These new policies are expected to require drone operators to have a license to fly. This seems like a good idea given how tricky a quadcopter is to fly safely. It is a learnable skill but still like flying a plane. While formal rules won't stop unlawful use of drones, it may curtail it. Let's encourage the FAA to speed up its efforts to define what we can and cannot do with drones. And let's hope it is fair and reasonable so that the commercial uses of drones can prosper.