

Mtg Fri 6:30 Sept 25, MCL Cafeteria in Kettering

Sept 2015

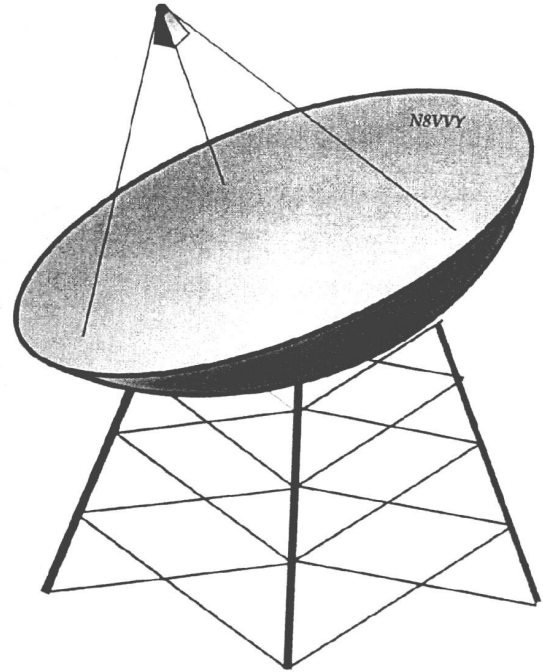
ANOMALOUS PROPAGATION

Newsletter: *The Midwest VHF/UHF Society*

Editors:

Gerd Schrick, WB8IFM
(937) 253-3993
WB8IFM@ARRL.NET

Steve Coy, K8UD
(937) 426-6085
K8UD@ARRL.NET



Material from this publication may be copied
with due credit to the source

Annual Society membership is \$ 12.00. Please
make checks payable to Joe Muchnij



Vol. 29 No. 9

www.mvus.org

Sept. 2015

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

De N8ZM.....	3
Anomalous Propagation.....	3
This and That.....	4
DARA in JA.....	5
Steve's Library.....	5
Early Morse Code.....	6
Re Physics.....	7
Switch Power Supplies.....	7
Earth's Magnetic Field.....	8
Spark TX.....	8
New (huge) Radio Telescope planned.....	9/10

MVUS Officers:

Pres. Tom Holmes, N8ZM,
Vice Pres. Bob Mathews, K8TQK
Secretary, Steve Coy, K8UD
Treasurer, Joe Muchnij N8QOD
Bulletin Editor, Gerd Schrick, WB8IFM

2 new Chairs:

Membership: Joe Muchnij, N8QOD
E-mail Chair: Jim Bacher, WB8VSU

Coming up Soon !!! AMSAT Symposium in Dayton! Oct 16, 17, 18 - 2015

Location: Crowne Plaza Hotel, 33 East 5th Street, in Downtown, Dayton.
The Crown Plaza is a 3.5 star Hotel which has been recently renovated.
For more information or to volunteer, please contact Steve Coy K8UD email:
K8UD@roadrunner.com

DE N8ZM. OK, it's late and I'm tired and Gerd wants this by Friday and I'm busy all day Thursday so it has to be done tonight. What's new?

And in case you weren't paying attention to my last epistle (which wouldn't surprise me), I gave the date for the September meeting (correctly, I might add) but given the passage of time, I'll remind you that it is/was 9/25/15. And by the time you read this that day will have passed. So what you should really do now is mark your calendars for October 23rd.

And while on the subject of meeting dates, it is that time of year when we look at the upcoming holidays and try to figure out when to have our November and December meetings. Once again, our 4th Friday meeting night in November falls the day after Thanksgiving, and traditionally we have held the meeting on that night. Anybody object to doing that again?

As for December, our meeting night lands right smack dab on Christmas Day, so I am guessing that is not a good night for anyone. So how about sometime the following week, say Tuesday or Wednesday, the 29th or 30th? Comments? Remember that this is our Holiday Party, or is supposed to be anyway. The YL's are invited and the idea is to just have a social gathering without a lot of tech talk, but it never seems to work that way so maybe I should just put that fantasy out of my mind.

And while I am out of my mind (was I ever in it?), I will mention that I have the 900 MHz repeater, a Motorola MSF5000 series thanks to Mark Young, N2OJD. I have the antenna and a temporary site picked out, with a possibly permanent one not very far into the future. Now if I could just get my hands on those mobile radios I sent to my buddy to program...

Oh, there's an FMY coming up soon for you frequency measurement aficionados. W8RKO has the details, I suspect. Always an interesting challenge, just for the fun of it.

Until next month..de Tom, N8ZM.

Anomalous Propagation, 9-20-2015 By Gerd, WB8iFM

On Sunday morning a group of German speaking hams from the East Coast meet on 7 MHz for a round table QSO. Most of us are regulars and we pretty much know each others set-up and signal he puts out. So it was a big surprise last Sunday (9/20/15...9-10 EDT) to find only rather weak signals. The lead station, located in North Carolina, which I usually copy with S9+25dB was barely S4, and so was most everybody else. Some could not hear each other. So the condition were not just poor, but really "the pits."

I can not recall a similar event in my entire career as a ham, and that is 64 years with a license and a few more w/o one. What was going on?

Usually, these days, when I get on the air, I check two numbers: the solar flux as an indication for the ionizing radiation from the sun, and the magnetic k-factor, which indicates the status of the magnetic field, as measured at a number of locations on earth and gives you an indication of "how active" this field is.

Here is how to look at these numbers: The flux should be around 100 or more for good conditions. The K factor should be below 3. The more it goes above 3, the poorer conditions get.

To visualize what happens, I consider the ionosphere as a large mirror type reflector like the surface of a big lake. The k-factor acts like a wind that hits the lake. When the k numbers get above 3 the surface of the lake gets wavy, choppy etc killing the propagation of the shorter frequencies for sure but if "the wind" is severe, even the lower frequencies are not safe. That is a rather plain explanation, but I think it captures the gist of it.

Sure enough, when I checked the k numbers, they went up into the red range then down again. But there was one interesting twist. The disturbance had peaked a few hours before our QSO and the values actually were almost back to normal when we experienced the "anomaly". By making this comparison you have to be careful to stay on the same time scale: The QSO being on local time, the K-factor going by UTC.

This and That 9-15

Traveling. “No ship carries us better to faraway lands than a book. [Emily Dickinson]

Treasure Trove. I picked up a text book years ago that has become more valuable as the years go by in a sense that it provides clear description and numerous graphs, tables and pictures of the subject matter. Its title: “Matter, Energy & Radiation.” This book is from 1941 and by J.R. Dunning and H.C. Paxton. Written at the outset of WW2, it contains a good description of the first successfully built a-bomb, without, of course, referring to the process as “making a bomb”. [Gerd, WB8IFM]

Observing Pigs. “There is something deeply and indefinably interesting in the swinish race,” the novelist Nathaniel Hawthorne wrote, in 1841, from Brook Farm, the Massachusetts commune where he was helping to care for pigs and other livestock. “They appear the more a mystery, the longer you gaze at them; it seems as if there was an important meaning to them, if you could but find out.” [Caleb Crain]

Resolution. The European Space Agency’s orbiting Rosetta spacecraft is expected to come within four miles of the surface of comet 67P/Churyumov–Gerasimenko in February 2015. The low flyby will be an opportunity for Rosetta to obtain imagery with a resolution of a few inches per pixel. [NASA 12-21-2014]

Children Playing Hide and Seek. Yes, as reported here, anthropologists know of no human society whose children do not play hide and seek. But I left something out. Other animals play the game, too. Otters do. So do young deer. [L.M. Boyd]

"Preposterous" comes from Latin meaning "before and after." Originally it was supposed to convey how ridiculous it is to put something first that ought to be last. Such as a cart before a horse. [L.M. Boyd]

TV. “I find television very educational. The moment somebody turns it on, I go to the library and read a good book.” [Groucho Marx]

Work. “Work is about a search for daily meaning as well as daily bread.” [Studs Terkel]

First Response. “Almost everything will work again if you unplug it for a few minutes, including you.” [Anne Lamott, Author]

Job. “If you have a job without any aggravation, you don't have a job. [Malcolm Forbes]

Individual. When people die, they cannot be replaced. They leave holes that cannot be filled, for it is the fate – the genetic and neural fate – of every human being to be a unique individual, to find his own path, to live his own life, to die his own death.” [Oliver Sacks]

Dissatisfied. 71 % of American voters are dissatisfied with the way things are going in the U.S. today, including 41% who are “very dissatisfied”. [Quinnipiac University]

No Gold Rush. The price of silver has dropped 27% in the past year, to below \$15 an ounce, out-pacing even gold's steep 16% slide, as investors continue to shy away from precious metals. [Wall Street Journal]

Coincidence. That's what we say when something happens that is unexpected, rare and unexplainable. But here is what *Einstein* had to say: “...they are God's way of of remaining anonymous.”

Report from Japan's Ham Radio Fair 2015 Sept. 3, 2015

By Steve, K8UD

This year the JARL (Japan Amateur Radio League) is celebrating their 90th year anniversary. The venue is located at "The Big Site", which is large enough to hold 5 complete HARA arenas. Besides the usual big vendors, ICOM, Yaesu, Kenwood, and Alinco, as well as several clubs and fleamarket booths were active at the show. Clubs such as CW, JAMSAT, Top Gun, Fist JARL, QRP Club, ADRF Club, Cut and Try club plus many other in attendance. The only new rig we knew of is the ICOM IC-7300. This is ICOM's newest HF rig. It should be FCC accepted by Hamvention next year.

The show opened up Saturday morning 10 am and for the next 6 hours we had a line waiting to talk to us. At times, there were as many as 70 attendees waiting to talk to us. Many of the guests told us of their past trips to Dayton and some are looking forward to coming to Dayton. We gave away all the pens, pins, flyers and programs by the end of the day.

The visitors came from all over Japan and all Prefectures. From Okinawa from the South to Hokkaido up north all areas of Japan were represented. We also had visitors from South Korea, Hong Kong, Malaysia, China, Indonesia, Australia and others South East Asian countries plus a few visitors from the US. Several AMSAT members and Rick Rosen from the ARRL were a few of the US delegates that stopped by.

Even though there were less than 300 booths, we were told that attendance was up 25% in relation to 2014, for a total 25,000 for Saturday. Sunday was a bit slower and we had more time to carry on meaningful conversations. The TIARA booth (Tokyo International Amateur Radio Association), which was across from us were very influential in obtaining reciprocal licensing agreement. Most all of the board members from JARL stopped by our booth and we were told we were the most visited booths, besides the big manufacturers.

For the DARA Japan Team: Jeff DeVoe, Will Serrato, Jim Simpson & myself, Steve Coy. The complete article is in the October issue of the "Carrier", the newsletter of the Dayton Amateur Radio Association.

Steve's Library (by the Editors)

As Steve was setting up his business on the edge of Dayton on Watervliet there was an estate sale across the street. So he went there and looked around. He did see a large number of shelves filled with books, apparently the owner had been an avid reader or a collector of books. Anyhow, Steve, could use these shelves so he asked for a price w/o the books. He was told the shelves were going to be sold with the books only. It turned out that the price was very good, even with the books, seemed like the heirs just didn't want to mess with the books and Steve only saw a minor problem in getting rid of the book, maybe he was thinking of putting them into the dumpster. So they were transported across the street and put in a downstairs room. Subsequently this became his library.

Soon Steve found that quite a number of books were in German and it turned out that the owner had been a German immigrant. Steve, myself and some friends soon found what treasure trove this library was and it has basically survived to this day for 20+ years.

On the following page you find just one example of an early Morse code table with some explaining about the make-up of the symbols and how best to go about learning them.

The entire book is on the Internet, this page from the Library of Congress.

THE TELEGRAPH.

a great number of turns of the wire around it. Now, if a current of electricity be sent through this wire, it will, by its passing through the numerous turns, cause the iron cores within to become magnetic and to possess the power of attracting with considerable force any piece of iron brought near to their ends.

THE MORSE TELEGRAPH ALPHABET.

<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>G</u>
<u>H</u>	<u>I</u>	<u>J</u>	<u>K</u>	<u>L</u>	<u>M</u>	<u>N</u>
<u>O</u>	<u>P</u>	<u>Q</u>	<u>R</u>	<u>S</u>	<u>T</u>	<u>U</u>
<u>V</u>	<u>W</u>	<u>X</u>	<u>Y</u>	<u>Z</u>	<u>&</u>	

Numerals.

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>0</u>

Punctuation.

<u>Period.</u>	<u>Comma.</u>	<u>Semi-colon.</u>	<u>Quotation.</u>
<u>Exclamation.</u>	<u>Interrogation.</u>	<u>Parenthesis.</u>	<u>Paragraph.</u>

The Morse alphabet consists of what are called dots, dashes and spaces. Combinations of these make intelligible signals. Many of the characters will be found to be the reverse of others; such as A is the reverse of N; B of V; D of U; C of R; Q of X; Z of &; so if the formation of one of these letters be obtained, its reverse is easily mastered. C, E, H, I, O, P, R, S, Z, Y, are merely represented by dots and spaces, and, if due regard be given to them, they will be found very easy to commit to memory,

In an article: “The great physics quest.” in the Sept 2013 Magazine ”Symmetry” Glenda Chui writes....

Whether through storm-tossed waves or jungle thickets, every expedition begins with a map. In this case the journey starts with the Standard Model, which describes the fundamental particles and interactions we know today. Like an ancient map of the known world, it expands to accommodate new discoveries; the Higgs boson, for instance, recently took its place on the Standard Model chart, alongside the 12 known quarks and leptons and four other particles that carry forces.

The Standard Model doesn't explain everything. Gravity, for instance, is unaccounted for, and what we know about neutrinos doesn't quite fit. And, in fact, the more physicists learn, the more baffling the universe looks.

Are there undiscovered principles of nature? How about extra dimensions of space? Why are there so many kinds of particles? Is there more than one type of Higgs boson? What are the dark matter and dark energy that make up 95 percent of the cosmos, and how can we find out more about them? How do neutrinos fit into our understanding of matter, energy, space and time? How did the universe come to be? Why are we, and everything around us, made of matter rather than antimatter?

Editor's comment: The experts are hard at it, but should not everybody be involved. Are hams not well educated in electronics and often have also knowledge of other subjects, but in particular are good at communicating and recording of observations. Chui compares the quest to excursions by explorers who set out into unknown territory and find new and amazing things. The complete article is on the Internet, or maybe available in your library. I recommend it. Gerd, WB8IFM

Switching Power Supplies* a More Common Noise Source than Power Lines, ARRL Lab Manager Says ARRL 4-16-15

ARRL Laboratory Manager and EMI Expert Ed Hare, W1RFI, [told](#) the [HamRadioNow](#) webcast recently that switching-mode power supplies are a more common noise source for radio amateurs than electrical power lines. *HamRadioNow* host Gary Pearce, KN4AQ, interviewed Hare on April 4 at the Raleigh, North Carolina, [RARSfest](#), where Hare also presented a forum, "Tall Tales from the ARRL Lab." Hare told Pearce that switching-mode power supplies are in -- or provide power for -- many home electronics these days.

"The old days of those iron transformers are gone," Hare said. "Every single one of these is a switcher. We're also seeing noise from pulse-width control motors." **Hare said the big culprits are "little wall warts," not switching supplies designed to power Amateur Radio gear.** Also, "Every TV you own has a built-in switcher, almost every device has a wall wart, and a lot of these are imported, not necessarily meeting the FCC rules, so we're seeing more reports involving those," he said.

Hare also told *HamRadioNow* that a few LED-type lightbulbs that are becoming more common also can be noise-generators, as are "grow lights" used for cultivating plants indoors. He said that the ARRL Lab can work with manufacturers to correct these problems, but the Lab needs model numbers and "specific information about the problems amateurs are having, so that we can put some of our resources toward helping."

Many interference issues can be resolved without FCC intervention, Hare said, noting that Commission enforcement is the last step, if other efforts fail. "We've been told by Laura Smith [of the FCC Enforcement Bureau] that she's going to continue to be engaged in this," he said, "so we're going to continue to send problems [in] that direction."

Hams experiencing RF interference problems can contact the ARRL Laboratory by contacting [Ed Hare](#) or ARRL Lab EMC Specialist [Mike Gruber](#), W1MG. The complete interview with Hare is in Episode 196 at [www.hamradionow.tv](#). -- Thanks to Gary Pearce, KN4AQ/HamRadioNow

The Earth's Magnetic Field: short-term variations From Wikipedia

The geomagnetic field changes on time scales from milliseconds to millions of years. Shorter time scales mostly arise from currents in the ionosphere (ionospheric dynamo region) and magnetosphere, and some changes can be traced to geomagnetic storms or daily variations in currents. Changes over time scales of a year or more mostly reflect changes in the Earth's interior, particularly the iron-rich core.[12]

Frequently, the Earth's magnetosphere is hit by solar flares **causing geomagnetic storms, provoking displays of aurorae. The short-term instability of the magnetic field is measured with the K-index.**

Data from THEMIS show that the magnetic field, which interacts with the solar wind, is reduced when the magnetic orientation is aligned between Sun and Earth - opposite to the previous hypothesis. During forthcoming solar storms, this could result in blackouts and disruptions in artificial satellites.

Earth's magnetic field, also known as the geomagnetic field, is the magnetic field that extends from the Earth's interior to where it meets the solar wind, a stream of charged particles emanating from the Sun. Its magnitude at the Earth's surface ranges from 25 to 65 micro Tesla (0.25 to 0.65 Gauss).

A spark-gap transmitter is a device for generating [electromagnetic waves](#) using a [spark gap](#).

These devices served as the [transmitters](#) for most [wireless telegraphy](#) systems for the first three decades of [radio](#) (1887–1916) and the first demonstrations of practical radio were carried out using them.

In later years somewhat more efficient transmitters were developed based on rotary machines like the high-speed [Alexanderson alternators](#) and the static [Poulsen Arc](#) generators, but spark transmitters were still preferred by most operators.

This was because of their uncomplicated design and because the [carrier](#) stopped when the telegraph key was released, which allowed the operator to "listen through" for a reply. With other types of transmitter, the carrier could not be controlled so easily, and they required elaborate measures to [modulate](#) the carrier and to prevent transmitter leakage from de-sensitizing the receiver.

After [WWI](#), greatly improved transmitters based on [vacuum tubes](#) became available, which overcame these problems, and by the late 1920s the only spark transmitters still in regular operation were "legacy" installations on naval vessels. Even when vacuum tube based transmitters had been installed, many vessels retained their crude but reliable spark transmitters as an emergency backup.

However, by 1940, the technology was no longer used for communication. Use of the spark-gap transmitter led to many radio operators being nicknamed "Sparks" long after spark transmitters ceased to be used.

Even today, the German verb "funken", literally, "to spark", also means "to send a radio message/signal".

World's biggest radio telescope, Square Kilometre Array

By Martin Redfern BBC Radio 4's The Biggest Radio On Earth



An artist's impression of telescope dishes at the heart of the network

Scientists from 20 countries are working on plans to create a vast network of radio telescopes, the size of a continent that could reveal the birth of planets and galaxies, the mysteries of dark energy as well as joining the search for signals from alien civilisations.

The Square Kilometre Array (SKA) takes its name from the size of its collecting area. But instead of a single radio dish 1km across, it will be made up of thousands of smaller ones.

"The dishes are going to be elliptical, about 15m (49ft) across," says Richard Schilizzi, Director of the International SKA project, "and very simple because they have to be cheap, especially if you want 3,000 of them." And that is indeed the number they are talking about.

From Australia, they will reach as far as New Zealand. The vast array is needed because the wavelength of radio waves is far greater than that of visible light.

An optical telescope can be 10 million wavelengths in diameter. Scale that up to the centimetre wavelengths of radio astronomy and you have a ... while a Western Australian SKA would reach New Zealand problem, says Simon Garrington, Director of the e-Merlin array at the Jodrell Bank Radio Observatory near Manchester.

"In order to get the same level of detail as a good optical telescope you'd need something 100km across. Clearly you can't build a single telescope a 100km across, but what you can do is build a network of telescopes and link those telescopes together," he adds.

The SKA should offer 50 times greater sensitivity and 100 times better resolution than any radio telescope array on Earth so far.

So far, partners from 20 countries are involved in the 1.5bn euros (£1.3bn) project which is not expected to be completed until about 2024, though phase one should be working by the end of this decade.

Competition to host the array is intense and has been narrowed down to two strong proposals, one for it to be centred in Western Australia, the other in the Northern Cape of South Africa.

"One of the most important things is to find a site that has very little interference from radio transmissions. If there's anything broadcasting a strong signal nearby it will blind the telescope, a bit like trying to see the stars when the Sun is up," explains director of the South Africa project, Bernie Fanaroff.

"You don't want mobile phone coverage, you don't want a lot of people around, you don't want cars around.

"In fact, when we were doing our initial tests we even found that a chap running the tests was causing interference by sitting down in a plastic chair," he adds.



A South African SKA would stretch to Ghana and Kenya ...

From Australia, they will reach as far as New Zealand.

In the completed array about 50% of the dishes will be in the central 5km, a further 25% out to 200km. But the final 25% will stretch out to more than 3,000km.

South Africa's bid would include dishes in Namibia, Botswana, Mozambique, Madagascar, Zambia, Mauritius, Kenya and Ghana.

"Australia's proposed core site, the Murchison Radio Observatory, is located in one of the most sparsely populated regions of the planet," says bid director, Brian Boyle.

"Moreover, Australia and New Zealand together provide the flexibility to place array stations across 5,500km."

The array will contain conventional curved dishes which can be pointed at an area of space and bring

the radio waves to a focus.



But other parts of the network will be flat plates which detect waves within the plates themselves. These will work as a phased array which can be directed instantly without moving thanks to sophisticated electronics which account for the time lag as the same radio signal reaches different parts of the network.

Chris Shenton, UK Project Manager of the preparatory phase of the SKA at Jodrell Bank says that this also allows the telescope to look in different directions at once.

"We can in fact deploy as many [detection] beams as we want, and the advantage of that is we could do multiple experiments simultaneously.

"For example, we could be doing a survey with one beam and very detailed observations with another."

Perhaps in 50 years we will be able to say yes, there is another technological civilisation fairly close to us"

End Quote Joseph Lazio SKA project scientist, NASA

Linking the network together will be no easy problem to solve.

The signals must be timed to a billionth of a second and it will take enough fibre optic cable to go twice around the Earth to link them. And then each pair of dishes has to be compared by computer.

Each telescope produces about 20GB of data every second - enough to fill a computer hard disk in minutes. "It will take a huge computing power," says Richard Schilizzi. "Our estimate is that it will need the biggest supercomputer on the planet."

There are several big science questions the array should answer, including how planets form, how gravitational waves stretch the fabric of the universe and how the first galaxies evolved.

Steve Rawlings of Oxford University hopes it might explain mysterious dark energy:

"The Square Kilometre Array is a time machine. As you look out to greater distances you're seeing the universe as it was when it was younger, and so you can map out the expansion of the universe."



Dark energy seems to accelerate that expansion and so we will be able to map out dark energy and perhaps discover what it is."

SKA project scientist Joseph Lazio at NASA's Jet Propulsion Laboratory in California is hoping for an even more exciting discovery - radio signals from extraterrestrials.

"Only with enough sensitivity, enough metal on the ground, as the SKA will provide, do you get to the point where you can hope to detect an earth-like planet around some of the nearest stars on the basis of artificial radio transmission.

"Perhaps in 50 years we will be able to say yes, there is another technological civilisation fairly close to us."

In the meantime, the international steering committee for the SKA is meeting this week to decide where their headquarters office will be.

The choice is between Holland, Germany and Jodrell Bank in the UK. Next year they hope to decide where the array itself will be built.

Brian Boyle is sure it will make major discoveries, expected and unexpected. "The SKA. will be a truly transformational scientific instrument. We will discover things that we have not even thought of."

BBC Radio 4's [The Biggest Radio on Earth](#) is broadcast on Thursday, 31 March 2011 at 2100 BST. Or catch up afterwards via [iPlayer](#)