

Mtg Fri 6:30 Mar 27 at the
MCL Cafeteria in Kettering

Mar 2015

ANOMALOUS PROPAGATION

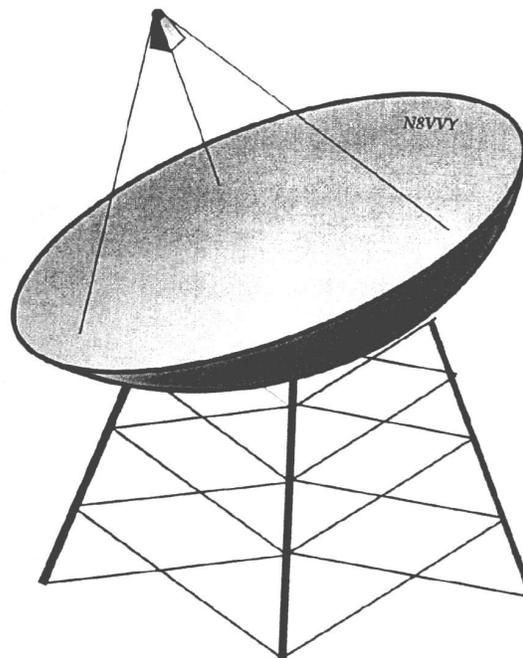
Newsletter: *The Midwest VHF/UHF Society*

Editors:

Gerd Schrick, WB8IFM
4741 Harlou Drive
Dayton, OH 454 32
(937) 253-3993
WB8IFM@ARRL.net

Steve Coy, K8UD
3350 Maplewood Dr.
Beavercreek, OH 45434
(937) 426-6085
K8UD@ARRL.NET

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Annual Society membership is \$ 12.00. Please
make checks payable to Gerd Schrick



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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 Hamvention, May 15-17 CU There !

MVUS Booth: SA 332

VHF/ UHF-Forum Sat 3:45-5 PM Room 3

Extra! 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.

We are looking for volunteers to fill some important vacancies in the roster.

Lets get involved and make this an event that will be memorable.

For more information or to volunteer, please contact
Steve Coy K8UD email: K8UD@roadrunner.com

MVUS Officers:

Pres. Tom Holmes, N8ZM,
Vice Pres. Bob Mathews, K8TKQ
Secretary, Steve Coy, K8UD
Treasurer, Bulletin Editor, Gerd Schrick, WB8IFM

DE N8ZM.

Not long ago I became curious to determine how long I have been writing this column. Digging into my collection of back issues of Anom Prop (and actually before that name was adopted), I concluded that it is somewhere around 20 years. If only I'd known that when I agreed to take on this job. You'd think I'd have been impeached by now!

In those 20+ years we have had a lot of fun and accomplished a lot. Remember the radar detector "business"? The antenna positioners and the trailer? And the 10 GHz "white boxes" and the work sessions at UD where we reworked them and tuned them up? And so many picnics, mostly at Daun's but at least one held at UD. Of course, for many years having a booth at Hamvention, and a couple of times putting on an antenna gain measurement session there. And how many different places have we held our dinner meetings (and mostly we changed venues for reasons other than being thrown out)?

This club wouldn't be what it is today without all of you, and sadly, more than a few who are no longer with us due to relocation to other parts of the country or to the Great Beyond. All are missed for their knowledge, friendship, participation, and contributions to making MVUS a remarkable organization. I don't think you could ask for a better group of people to call friends.

We are a pretty laid back bunch, which allows us to avoid getting caught up in power struggles

the bureaucratic jazz (I chose that over a cruder 4-letter word) that I think distracts many clubs from their real objectives. I am thankful for that, and I think it is what makes us special. And I think it is why we are still friends after all these years.

Well, that's my spiel for this month. I thought you deserved a break from the usual project reports and begging for volunteers, which will likely return in next month's column since that little gathering in May is rapidly approaching. So I hope to see you on March 27th at 6:30 at the MCL on Far Hills where we can indulge in our traditional fun conversations and miscellaneous bull-jazz.

73, Tom, N8ZM.

Lightning, Airliner

Every airliner is struck by lightning in flight at least once a year, on average. Passengers rarely know it at the time, in part because the airplane's aluminum hull conducts the charge harmlessly from entry point to exit. In fact, 1963 was the last year a strike caused an airliner to crash in the United States. An array of measures, some detailed here, have improved safety. But the use of composite materials in modern airliners like the Boeing 787, with a fuselage made predominantly of carbon fiber, has required additional design features, such as putting some metal back into the fuselage for lightning protection.

[From the Web]

This & That 3-15

Play with words: "Why is the man who invests all your money called a broker? And: " Is it OK to use an AM radio after noon? Finally: Why is abbreviated such a long word?"

Arithmetic. I installed two LED lights in the bathroom, one on either side of the mirror. They are replacing 60W incandescents and use just 10.5 Watts. If they burned one month w/o interruption, the power usage would be 14.4 kWh which would cost at our present rate \$ 1.73.
[Gerd, WB8iFM]

Smart Birds. "Birds are so smart! They fly south without maps, and build nests without blueprints. (you could add w/o GPS also! Ed.)
[Dennis the Menace]

Two from Ohio. "If the Grand Canyon were used as a national landfill, how long would it take to fill up? [M.B. Kettering, Ohio] and : "Why did God make cockroaches? - P.E., Sidney. Ohio.
[From "This Year's Most Dumbfounding Questions" by Marilyn vos Savant, 2003]

A Miracle? "There are only two ways to live your life...as though nothing is a miracle....or as though everything is a miracle...."
[Albert Einstein]

To switch or not. "I still haven't figured out how to record a program, and we've been with this company since the antenna disappeared from the roof. So there is no reason to believe I'll learn to operate a new remote in my lifetime.
[DL Stewart]

Could that be right? I read that the average American driver spends 6 months of his life waiting at a red light. Where there is room, roundabouts could be build, or we could use artificial intelligence. But the record is dismal with that "intelligence" so far.
[Gerd, WB8iFM]

Inventing. "To invent an airplane is nothing. To build one is something. But to fly is everything."
[Otto Lilienthal]

A cold winter. Nova Scotia is buried under so much snow that its police actually put out a warrant for the arrest of Old Man Winter - and you can be sure they were only partly joking.
[Elizabeth Renzetti in "The Globe and Mail"]

98% Ice Cover.-- The Great Lakes ice cover continues to grow as winter weather slams the country. Lake Erie had 98% ice cover on Wednesday (2-18-15), according to the Great Lakes Environmental Research Laboratory.

Software. Companies today prefer to use more state-of-the-art commercially available components, which tend to be small, smart, and driven by software. These components make our systems more flexible and powerful, but that flexibility comes at a price—the system can do many more things than thought imaginable.
[Jay Thomas]

Life of an Actor. "I like repetition, repetition keeps me green, like fresh!"
[Al Pacino on Charlie Rose]

5 Minutes. "A good looking lady reminded me."... I replied: "I am not going!"Of course, I was ready. Just wanted to experiment and see what would happen! [Al Pacino on Charlie Rose]

T, B&P. This is my recipe for a good working ham station. Tower, beam & power. [Gerd, WB8iFM]

Members' Comments 3-15

I was ready for winter to be over about 4 months ago! I think the last nice weekend we have had since the 1st of the year was the January VHF Contest weekend. I grew up in Cleveland and was very use to snow...Snow days did not happen when I was in school....cold weather and/or snow were no excuses for not going to school. School has been called off here the night before an"event."

I hope to be roving here in June - 50 MHz - 24 (or 47) MHz. Compared to roving in Ohio, Kentucky, Tennessee - there is a lot more activity here on the east coast. I hope to get up in the mountains and try to work into Ohio during the 'test.

73 - Jack AB4CR (3-3-15)

Quick Note from the Frozen North Woods. (3-6-15)

Our minus 20 degree weather produced some VHF+ band openings. KL7UW mentioned this to me and when I got to check it out. Yep, true! The colder it got, the stronger the signals. But no one was on! Everyone busy hugging their furnaces, buried under the blankets etc. Checked TV signals from stations 200-250 miles away, they were strong! As the temperature increased the signals dropped. Usually around minus 10. I set up a 24 GHz beacon plus some other bands. Checked them out on the way to the Post Office. At minus 20, stronger signals than usual! When the wx warms up, I will be back on Microwave Day, first Saturday of the month: April if it is nice, May, most likely. *73, Lloyd NE8i/r*

Here is your Chance.

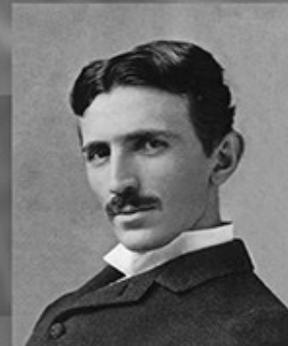
Occasionally I receive short notes and comments from members, mostly attached to a check for a year or two of membership. Often there are interesting items mentioned to help with the publication of our newsletter or AP. –

Why not take the extra time and write with some ideas and suggestions you might have. All hams have good ideas and what better way to expose them to the scrutiny of your friends at MVUS then have them appear right here on the comment page. What I am writing here would easily fit on a postcard, which today cost 34 cents.

Older Aps, going back many years, are available on the Internet. Take a look. Here and there a reprint or revisit of an article maybe a good idea! So let's hear from you! **Vy73, Gerd, WB 8 IFM.**

My project was delayed by natural laws. The world for him was not yet ready. He was too ahead of time in which it originated. But these same laws of nature will eventually prevail and the project will be repeated along with winning success.

Nikola Tesla



What Would Tesla Do?

Mar 2, 2015 by Lou Frenzel in “Line of Sight”

I am continually amazed at how the pioneers of electronics, and microwaves in particular, did their research and development with little or no test equipment. How can you design or repair anything without being able to measure key parameters? Yet with little more than basic meters, the early inventors were able to do a great deal. Hertz, Tesla, Marconi, and others actually got by without significant measurements. We can't do that today.

D'Arsonval meters were available even in the 19th century, but these mostly measured DC and later AC with rectification. RF measurements were particularly difficult if not impossible. Frequency and wavelength measurements were made with so-called wavemeters, just a tunable resonant circuit or cavity. Slotted coax and waveguide lines provided another way to measure wavelength. Luckily, someone figured out you could use a diode for mixing and downconversion, thereby permitting measurements at lower frequencies.

Related

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Despite the lack of real test gear, we were able to get radar, VHF/UHF/microwave radios, and satellites. I have to imagine that there was lots of seat-of-the-pants SWAG-ing going on, but it got done somehow. The early pioneers really had to invent their own measurement solutions along with their main objectives. Or they did not measure at all.

Just out of curiosity, I looked back at some of my early college radio and radar texts by Terman and others to see what they had to say about RF measurements. Not much, as I found out. Even the widely acclaimed World War II era MIT Radiation Lab series of books had little to say about measurements. Remember these books? There were 28 of them and only two that I remember covered measurement of any kind. An early employer of mine had a full set of these books that I would regularly reference. I wish I had a set even today. Lots of good, original theory and practice in there.

We are lucky today to have a wide range of great microwave test gear from multiple vendors. Signal generators, spectrum analyzers, power meters, noise meters, vector network analyzers, vector signal analyzers, and lots of other special instruments. We can even measure weird stuff like PIM. There is very little we cannot measure reliably. Given the massive complexity of modern RF systems and products, we should be thankful we have some measurement tools. Prices are very high, but undoubtedly justified in most cases.

For example, how does one test and evaluate a WiGig 802.11ad product? It uses OFDM on 60 GHz with MIMO and beam steering. 5G cellular will be just as difficult or worse. Good luck with that. Yet, there are a few companies that can provide instruments that will make those measurements. Still, I keep thinking about those researchers working beyond 100 GHz. What do they use? And how does one measure a THz signal, much less generate it?

Anyway, rest assured that there are a few test companies working on the leading edge of microwave, millimeter wave, and THz wave products. It may be a while before we see some of them, but eventually we will be able to use them—if we can afford them.

While our pioneers were able to get by with few if any measurements, we cannot do that today. We cannot design or otherwise deal with the complexity, government regulations, certification requirements, and other factors without precise and rigorous tests. Thank your test equipment vendors who allow you to do your work.

The Moon (coffee table wisdom).

By Gerd, WB 8 IFM

As we concentrate on Mars and beyond our closest object in space, the moon is neglected. EME has been the “holy grail” of ham radio for a long time, even DX peditions sometimes bring the bulky equipment necessary for popular EME (2m & 70 cm), but it is not a priority. With the use of signal processing (WSJT software) it is possible to do EME today with much less power and with smaller antennas as are customarily used now. The thing is though, if there was more activity, speak traveling back and forth to the moon, other possibilities might open up. So, Steve, K8Ud, has suggested to install some sort of a reflector on the moon to greatly multiply the reflected power for better EME.

Not all is lost, however. There are other countries at the present time, Japan and China come to mind, involved in moon exploration: So you might remember from last fall, that the Chinese sent a spacecraft to the moon which looped around, took a lot of super sharp pictures, came back, and a heavy capsule separated and landed safely in Inner Mongolia. On this mission also a separate Amateur payload was released and proceeded to the moon and than into deep space. This payload was a 2-m beacon and its signal was received by a number of hams from around the globe.

The purpose of the mission was to learn and prepare for future missions with landings on the moon, collecting samples and bringing them back to earth. It sounded as if there were valuable rocks there to collect and I have kept scratching my head of what these rocks might be.

Well, the other day I was looking down to the shelf below our coffee table, the place where we keep a collection of interesting books. Books that you read at one time and hesitated to put back on the shelf, where they are easily forgotten or even “disappear” among an unrelated category. What I saw was a corner of a picture from the surface of the moon. The Booklet: “Geological Museum: Moon, Mars and meteorites”. No idea when and where I picked this up, but most likely in the early 70s right after the heydays of the US lunar exploration period was coming to an end.

The booklet had lots of pictures, graphs and accompanying text. I soon found a segment under Geology of the Moon labeled : ”The lunar rocks.” And on the 13th line I found this sentence: “The second group comprises basaltic rocks rich in potassium (K), containing unusually high amounts of rare-earth elements (REE) and phosphorus (P). Theses are the so-called “**KREEP**” basaltic rocks which solidified from 4 to 3.8 billion years ago...

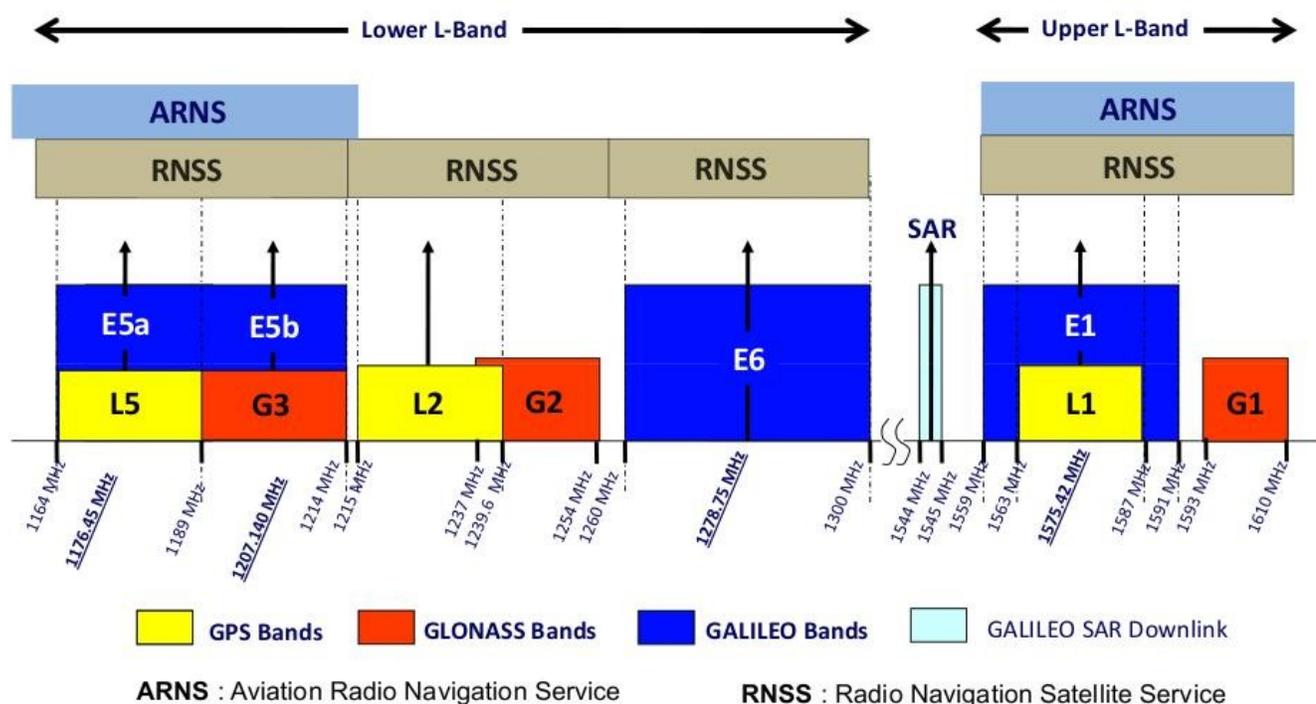
Now, there is a hint of what the Chinese might be looking for: the “rare-earth elements”. Actually these elements are valuable for the industry and are available on earth where they really are not that rare, but are so thinly dispersed in the minerals, that they are very hard and therefor expensive to extract. The Chinese must have done the arithmetic and decided there was money to be made by mining these on the moon and transporting them to earth. So next the Chinese will send landing craft to the moon and eventually have a busy shuttle service bringing minerals back to earth.

I read (regularly) the cartoon page of the local paper and never miss “Brewster Rockit”. It so happened that, I believe, two days in a row the strip depicted mining from space, one cartoon even showing a pipeline traversing the Brewster Spaceship.

Potential Conflict with our 1296 MHz Band

Our 1296 MHz band is allocated as a secondary service in the 1215.6 – 1350 MHz band allocated to Radio Location Services and Radio Navigation satellite Systems (RNSS) on a primary basis. Until recently the primary navigation service in the RNSS allocation was GPS and Glonass. Our Amateur allocation runs from 1240 to 1300 MHz. The Glonass System has their G2 allocation running from 1239.6 to 1254 MHz. Other than that the range is open up to 1300 MHz. That is about to change. There is a new kid on the block. The Gallileo navigation service is launching several new satellites this year. Gallileo is occupying a large portion of our 1296 allocation: 1260 -1300 MHz. Since RNSS is primary we could find our worldwide Amateur Radio allocation in jeopardy as our operation would interfere with the Gallileo system.

Reported by Mike Suhar, W8RKO



Cable Attenuation and Power

Compiled by Bill Olson, W3HQT

Attenuation (in dB/100 Feet) of Popular Coaxial Cables

| Cable Type | Frequency (MHz) | | | | | | | | |
|-------------------------|-----------------|-----|-----|------|------|------|------|------|------|
| | 50 | 144 | 220 | 432 | 902 | 1296 | 2304 | 3456 | 5760 |
| 0.085-in semi-rigid | 4.0 | 6.8 | 8.6 | 12.1 | 18.0 | 22.0 | 30.0 | 38.0 | 50.0 |
| RG-58 | 3.6 | 6.5 | 8.5 | 12.0 | 17.8 | 21.0 | 32.0 | 41.0 | 57.0 |
| 0.141-in semi-rigid | 2.4 | 4.1 | 5.1 | 7.4 | 11.0 | 13.0 | 18.0 | 22.0 | 30.0 |
| RG-8, RG-213, RG-214 | 1.5 | 2.4 | 3.4 | 5.0 | 8.0 | 10.7 | 15.9 | 22.0 | 31.0 |
| Belden 9913 | 0.9 | 1.5 | 2.0 | 2.9 | 4.2 | 5.1 | 7.3 | 9.8 | 15.0 |
| 1/2-in foam flex | 0.6 | 0.9 | 1.3 | 1.9 | 2.9 | 3.7 | 5.4 | 7.1 | 9.9 |
| RG-17 | 0.6 | 1.2 | 1.7 | 2.4 | 4.0 | 4.9 | 8.0 | 12.0 | ** |
| 1/2-in foam Helix (LDF) | 0.5 | 0.8 | 1.1 | 1.5 | 2.2 | 2.6 | 3.8 | 4.8 | 6.5 |
| 7/8-in foam Helix (LDF) | 0.3 | 0.5 | 0.6 | 0.8 | 1.2 | 1.5 | 2.0 | 2.6 | 3.2 |
| 7/8-in air Helix | 0.3 | 0.5 | 0.6 | 0.8 | 1.1 | 1.4 | 2.0 | 2.6 | * |
| 1-in 75-ohm Hardline | 0.3 | 0.5 | 0.6 | 0.9 | 1.3 | 1.6 | ** | ** | ** |
| 1-5/8-in foam Helix | 0.2 | 0.3 | 0.4 | 0.5 | 0.8 | 1.0 | 1.4 | * | * |

Average Power Rating (in Watts) of Popular Coaxial Cables

| Cable Type | Frequency (MHz) | | | | | | | | |
|-------------------------|-----------------|-------|-------|------|------|------|------|------|------|
| | 50 | 144 | 220 | 432 | 902 | 1296 | 2304 | 3456 | 5760 |
| 0.085-in semi-rigid | 470 | 270 | 220 | 150 | 105 | 85 | 64 | 47 | 38 |
| RG-58 | 250 | 145 | 120 | 80 | 55 | 45 | 32 | 22 | ** |
| 0.141-in semi-rigid | 1700 | 1000 | 800 | 540 | 380 | 320 | 260 | 180 | 130 |
| RG-8, RG-213, RG-214 | 1400 | 780 | 620 | 420 | 280 | 230 | 160 | 120 | 65 |
| Belden 9913 | 2800 | 1600 | 1300 | 820 | 550 | 440 | 320 | ** | ** |
| 1/2-in foam flex | 2400 | 1900 | 1600 | 1000 | 660 | 530 | 390 | ** | ** |
| RG-17 | 3200 | 2400 | 1700 | 1200 | 680 | 500 | 340 | 240 | * |
| 1/2-in foam Helix (LDF) | 2800 | 1600 | 1300 | 820 | 550 | 440 | 320 | 250 | 160 |
| 7/8-in foam Helix (LDF) | 6500 | 3800 | 2900 | 2000 | 1300 | 1050 | 750 | 580 | 430 |
| 7/8-in air Helix | 8000 | 5000 | 4000 | 2700 | 2000 | 1600 | 1200 | 950 | * |
| 1-in 75-ohm Hardline | 6500 | 3800 | 2900 | 2000 | 1300 | 1050 | ** | ** | * |
| 1-5/8-in foam Helix | 18000 | 14000 | 11000 | 7400 | 5500 | 4400 | 3300 | * | * |

interpolated from graphs and tables in various manufacturers' catalogs.

* above cutoff

** unknown