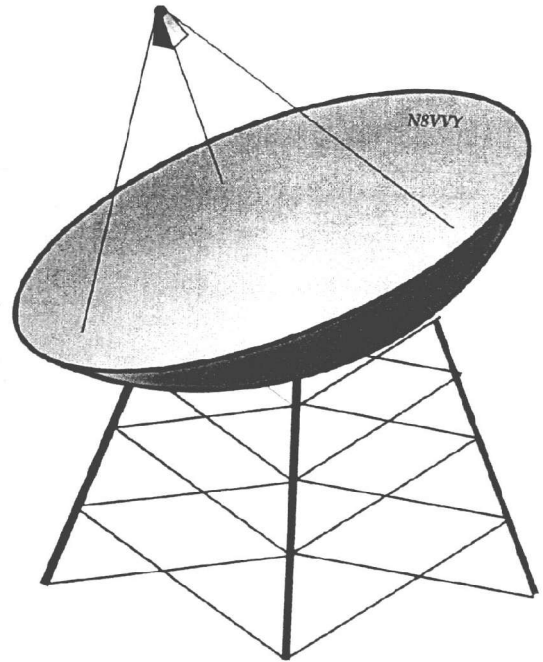# ANOMALOUS PROPAGATION

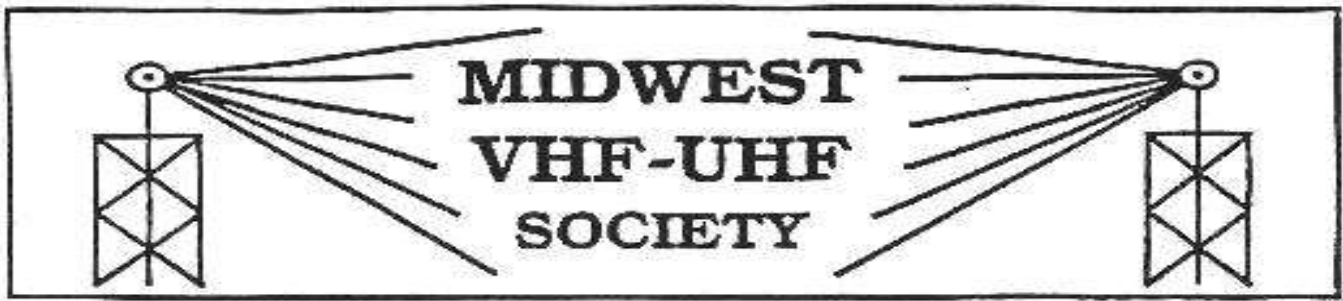Newsletter: *The Midwest VHF/UHF Society*

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

Beacons: 1296.079 **W8KSE**   EM79ur Dayton, OH---- 2W to Big Wheel at 800' AGL.
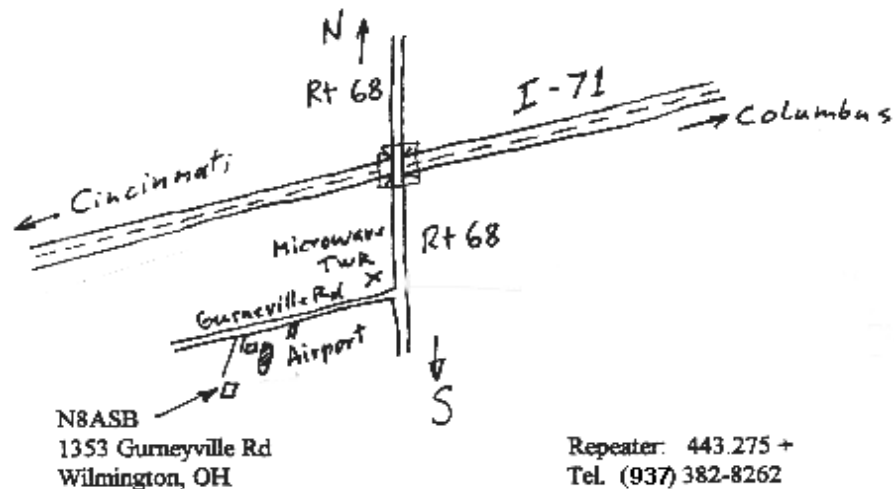
Listen for the **K9AYA Beacons** at EM79qk, 2W @ 10,368.000 MHz
        both are copied by K4TO daily. 1W @   5,760.000 MHz

Contents

2014 Annual Picnic and Measurements
At Karen and Daun Yeagley's place outside Wilmington Ohio
Allday Event starts at 11AM to late afternoon Details next page.

N8ASB
1353 Gurneyville Rd
Wilmington, OH

Repeater: 443.275 +
Tel. (937) 382-8262

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

DE N8ZM: So far August has been quite pleasant; we've even had some rain. Usually in these parts it quits raining about mid-July and doesn't start again until September. Hopefully this doesn't bode ill for our MVUS picnic coming up on the 30th at Daun's. As usual, MVUS will supply the burgers and brats, as well as beverages which those under 18 can consume legally. Usually that's water and soda's, both diet and otherwise. IF you like, bring a snack or side dish or dessert, but must enough for a half-dozen folks as we always have much more than we can eat. The fun starts at 11:00-ish, as usual.

If you have anything you'd like to have tested, please let Daun or I know ahead of time so we can be sure to have the right gear in place. I have already had requests for noise figure and gain on UHF preamps, and some power meter calibrations. We can do anything from DC to almost daylight if we know you are coming. Also, we can set up the antenna range if we know that is needed, and again a heads up is appreciated since Gerd has most of that setup and needs to know what to load up. Any questions? Call or write: n8zm@mvus.org or 937-528-9345.

I heard from Terry Price a few days ago that he will be shipping the 2304 beacon antennas shortly. That means we need to get busy designing the RF stuff to drive it. Steve, K8UD, has offered to let us test it from the roof of his building in East Dayton. That will make it easy to work out the bugs. From there we will have to find a higher site so that the beacon is useful over much of SW Ohio and beyond.

I am thinking that the beacon RF stuff could be patterned after our 1296 design, using a 10 MHz reference feeding a DEMI ApolLo source driving a homebrew power amp. Any other ideas are welcome, including some of the converted cell phone amplifiers that have become available in recent years.

As for the 1296 beacon, it is on the air using an FT-817 and a DEMI transverter, but W8RKO now has the 10 MHz Rubidium reference and the 1296 ApolLo in his possession, as well as the amplifier assembly. I think the only holdup right now is finding a 6 amp, 24 VDC power supply to run it. And probably finishing up construction of the driver amp. So we should be hearing that new setup on the air in a few weeks and Mike can have his radio back. He's been quite generous in keeping his gear tied up for over a year now, as well as having it go through a power supply failure.
Once we get these two beacon projects behind us, there is a request for a 432 beacon as well. You may have heard about some tests run a while back where we pumped some 432 power up the same coax as the 1296 beacon and were heard at least 50 miles away. The SWR of the 1296 antenna probably puts a lot of the 432 energy on the outside of the feedline which is more than happy to radiate it, pattern unknown.

As a reminder, since our picnic is at the end of the month, we will not be having an August Friday night meeting. Any business, such as the annual election of officers, will be taken care of at the picnic. See you there!
de Tom, N8ZM

PS de Gerd: For antenna measurements we need some pretty long 50' – 100' good cables (also some shorter ones) with good connectors. I got a good supply, but my "stuff" is dated and we've had some bad experiences over the years. So if you could bring some cables that would help! Make sure they are marked belonging to you, so there will be no trouble. There maybe just a few antennas. I need to know, so I can bring the proper masts and reference antennas.

E-mail: WB8iFM@ARRL.net

This and That 8-14

Battery or Cell? A Cell is what people often mean to say when they are talking about a battery, but the majority of the time the term battery is used to avoid confusion in customers. A cell is simply an electrochemical device that is capable of storing electrical energy and it will consist of both positive and negative plates, along with an electrolyte. [Consumer Talk]

Sweden. It is the home of many things I find fanciful: beautiful Nordic people, the nyckelharpa, excellent independent music, and the Movitz, a 75-foot long electric ferry whose battery fully recharges in only 10 minutes. [Via Wired]

Magic Band...Phil Russo, N8XA of Dayton, Ohio reported hearing EA8DBM (Canary Islands) for over two hours on 50.157 MHz on July 5 at 40dB over S9. [Ax, N8XA]

Sad Story. I had lots of things go bad with my computers. But I never had a mouse die on me. Not that the cat got her, no; but the left clicker refused to do its thing. A new mouse, laying in waiting, I forgot how long, replaced her. Steve, K8UD, tells me, this is not too unusual for a mouse. Its the cheap wires they use to connect with the computer that break and cause the problem.
[Gerd, WB8iFM]

Morse Code. Another tidbit from the ARRL pocketbook. These might come in handy. The code for $ is VU, and for the infamous @ is PN. [Gerd, WB8iFM]

Computer Commands. Yes, it is hard to design a tech product that works equally well for everyone. Remember Office 2003? It featured menus that collapsed, hiding commands to present a simpler face. With another click, you could expand the menus to their full majesty. It was a flop. It was impossible to learn the software because the menu commands were never in the same place twice. --- Apple once designed a help system with animated Sharpies drawing red circles around things on the screen that you were supposed to click. Nobody used it. (Nobody knew it was there.) [Dave Pogue]

Genie."Why they rub an old tin lamp or an iron ring, and then the genies come tearing in, with the thunder and lightning a-ripping around and the smoke a-rolling, and everything they're told to do they up and do it." ["Adventures of Huckleberry Fin" by Mark Twain]

Mobile Society. Americans don't walk much these days. But they drive a lot! The xyl and I share our economy car (a Diesel) and put on approximately 10,000 miles per year. In the last 11 years we have accumulated close to 100,000 miles. This would get us four times around the equator on an imaginary highway. [Gerd, WB8IFM]

Asleep at the Wheel. If you have ever fallen asleep at the wheel, you can count yourself among the 20 % of all drivers who say they've done likewise. [LM Boyd, 1994]

Hot Peppers. That's another interesting table of 26 Chili Peppers from the pocket book. They rank from no. 1=maximum to no. 26 = no heat. There are stronger ones, not edible. They can be used for "pepper spray." [Gerd, WB8iFM]

Arduino Defined   [from the Web }

Arduino is described by its makers as "*an open-source electronics prototyping platform based on flexible, easy-to-use hardware and software*," whatever that means. In short, it is a popular open-source electronic board that is capable of controlling just about any DIY hardware project. And there's a lot you can do with it.

As Ladyada explains:

"The 'what is Arduino?' is still a little vague, and that's the Arduino's strength. It's the glue people use to connect tasks together.The best way to describe an Arduino is with a few examples. Want to have [a coffee pot tweet](#) *when the coffee is ready? Arduino. Want to have a Professor X Steampunk wheelchair that speaks and dispenses booze? Arduino. Want to make a set of quiz buzzers for an event out of* [Staples' Easy Buttons](#)*? Arduino.*

[…]

"Arduino was mostly designed by artists for artists and designers...I think it's been the most important product/project in the world of educational electronics."

Arduino is sold under a Creative Commons Share-Alike (CC-SA) license, so you can make changes to the original Arduino board or how it's programmed and release it to the public, so long as you release it under the same CC-SA license. As you might expect, this has resulted in plenty of variations of the original Arduino board. Ladyada points to the [Gameduino board](#), which is made with DIY gaming in mind. And [Teagueduino](#) is essentially an Arduino board put together in a kit to help people learn how to program it.

Seeing as Ladyada's job essentially allows her to play with Arduino boards and create her own projects, we asked her for an example of her best and worst creations:

"I think [Arduino's] been the most important product/project in the world of educational electronics."

"Luckily I think I can answer this using the same project! The best/worst Arduino creation was an open-source Homeland Security non-lethal weapon project: "[THE BEDAZZLER](#)*: A Do-it-yourself Handheld LED-Incapacitator".*

"After attending a conference where the $1 million "sea-sick flashlight" (named "THE DAZZLER") was [demonstrated](#) *by the US Department of Homeland Security, we decided to create our own version using an Arduino. For under $250, you can build your own dazzler and we've released the source code, schematics and PCB files to make it easy. A great Arduino project for people who really like blinking LEDs. We also added in a mode selection so you can put it into some pretty color-swirl modes, great for raves and parties!"*

Notes from the SE VHF Society (SVHFS) 2014 Conference (April)

by Joe Muchnij, N8QOD

Steve Coy (K8UD), Tom Holmes (N8ZM) and I recently drove to Atlanta for the SVHFS conference. The three of us from Dayton again thank John and Jody Ackerman for some pleasant evenings, and for very comfortable sleeping arrangements in their home.

Several attendees, when seeing the grid square printed on our badges, asked about our specific locations relative to Bob (K8TQK) and commentedÿvery favorably onÿhis abilities.

Al Tirevold (WA0HQQ) ran an antenna range in the hotel parking lot. Among antennas tested were a 33 element Yagi for 432 MHz, a 25 element loop Yagi for 1206 MHz, and a 45 element loop Yagi for 2304 MHz. Measurements are posted on the SVHFS web site.

Marshal Williams (K5QE) discussed activating the EL84 grid square on shipboard, 20+ miles east of Key West. It was a very entertaining talk!

Charles Osborne (K4CSO) addressed BEACONSPOT internetÿlistings (e.g., www.BeaconSpot.eu or www.BeaconSpot.us) to edit and report latest info on beacons you maintain or hear. We need to add and maintain our beacons on the US site.

New beacons as of 28 April 2014: K4UHF/B EM73xu on Lanier Mountain GA; 2.5w at 144.287 MHz, 2.5w at 222.053 MHz & 3w at 432.352 MHz. Interestingly, our own John Ackerman, was listed as one of the trustees for the beacons.

SVHFS also designed beacons forÿ33cm, 23cm, 13cm, 9cm, 6cm & 3cm. 23cm & 13cm beacons (with K4uhf calls) were installed in SC in 2010 using single slot Alford antennas. A 2w beacon was later installed at EM85cb @ 2800' MSL {10,368.890 MHz} but no one has yet reported copying the beacon; Charles Osborne, K4CSO, cited Kent Britain's testing showing slot antenna azimuth gain variations greater than 10db as a possible reason for the dearth of reports.

Ben Lowe (K4QF) presented a novel method of calibrating 10GHz rover antenna azimuth using two small 2m antennas and a rat race combiner. He has the 2m antennas mounted on a short mast with axes slightly divergent. Combining their signals in-phase gives a strong peak when pointing at a known transmitter; switching the phase of one then while gives a sharp null, allowing very accurate positioning. The 10GHz antenna can then be positioned relative to that null.

John Ackerman described results of his experiments with low cost Rubidium oscillators for 10GHz.

Marshal Williams (K5QE) gave a very good introduction to VHF and above: "VHF 101" explaining techniques for building and operating a weak signal VHF/UHF station.

The 2015 SVHS Conference will be at the Kentucky Space Institute in Morehead KY, with Jeff Kruth (WA3ZKR) as chairman; his Grad Student, Jennifer, will be there (a photoÿÿof Jennifer explaining features of the first Kentucky nanosat appeared in Anon-Prop awhile ago).

Topping off a great weekend, I won a Yeasu FT-857D HF/VHF/UHF Transceiver at the banquet.

The Pocketbook

With all the new I-b-c pads about I have rediscovered my old pocketbook collection. Most pocketbooks kind of specialize in some specific area; so I found one on Electronics, another one on Space and a third on loudspeakers. Then I had one started by myself simply labeled "Quotes" where I had collected Quotes from all over mostly transferred in handwriting but also clippings just pasted in. You used to find good ones in fortune cookies, but recently the quotes have gotten to trivial to consider. I didn't have a pocketbook on Ham radio... sooo... doesn't ARRL offer one? Sure! So I got one, only $12, at the Hamvention. A nice YL (at checkout) even offered me I anniversary ARRL shopping bag.

Well, what did I find? It actually was not about Ham Radio but had numbers, tables, data, and equations from all different categories. But after I first got disturbed about finding tables that converted Celsius into Fahrenheit then By just randomly leafing through it I found some real winners. There was this table of the composition of a human body by elements. I have a sample, the first 6 Elements of a total of 46 that go down to the 1% level in this month's "This and That". Then there are the tables about life expectancies. Interesting! I got 6 more years, hi!

These facts and more are under the heading: General Sciences. This chapter is kind of smack in the middle of the book! So when you just open it, kind of halfway, you will be in that chapter. There are a total of 32 chapters. So there is a lot more to discover. It sure would make a nice gift for a student in his teens.

When I grew up (in DL) I got what is known as a "Lexikon". The subtitle for this is " the knowledge of our time". It is like a dictionary but wit the words explained by pictures, graphs, tables etc. Like in an encyclopedia only much more condensed but with all the essentials. I have one of the more recent editions and just learned that the first edition came out the year I was born. It also has brief biographies of all the famous people!

Just one last look at my new acquisition; Field Day was coming up and I just got my antenna mast and the guy ropes ready: here I find graphs of numerous knots and bends as the book calls them. I finally find the square not, close to the end of a 52 knot collection. Most seem very exotic to me. I solve 99% of my requirements with the good old square knot!

Fiddling with knobs! From a 1999 article! By Gerd, WB8IFM

...In general and in particular for contests you want a unit that performs with a minimum of fiddling and when you... apply this criterium, then immediately a number of units fall by the wayside. I don't know when and how it started, but manufacturers seem to assume, hams actually enjoy fiddling with knobs. Except they failed to recocnize that even a dimwitted ham will sooner or later realize the 20 knobs to just tune or adjust the frequency is too much.

So many controlls on equipment are totally unnecessary, but on the other hand important funktions may be missing or are shortchanged. Enough said.

Additional to Fiddling from today (8-2014)l

My Ts 2000 has "menues' which seems a good idea. You can program (after you figure it out) YOUR settings in and they will stay in regardless.

Another good idea (and so far as I know, has not been implemented is from Mike Wintzer... He used to work at Drake and he suggested that when they were planning the TR7, qa true Landmark 100W all-solid state transceiver. The idea incorporates a lid! The front panel contains all the controlls the designers can think of. You "set" the ones you never touch in normal operatios then close the lid and cover those controll up leaving only the essentials stick out. Seems like an excellent idea to me! BTY, I still use my TR7 which is now over 30 years old- nobody can tell the difference!

Wind turbines for low wind speeds defy Betz limit efficiency

May 29, 2014 by [Lee Teschler](#) in [From the Editor's Desk](#) Maschine Design

Wind turbine designers often pooh-pooh the idea of wind turbines able to efficiently work at low wind speeds. Archimedes gets around most such arguments by using a design that is closer to that of a water wheel than to traditional wind turbine designs.

Many designers of utility scale wind turbines dismiss the idea of using turbines to capture energy from light breezes and in areas where there isn't a lot of wind. Their argument comes from [Betz's law](#) which calculates the maximum power available from the wind. The law uses principles of conservation of mass and momentum of the air stream flowing through an idealized cylinder that extracts energy from the wind stream. Importantly, it assumes the use of aerodynamic propeller blades in the turbine. Betz's law says no turbine can capture more than 59.3% of the kinetic energy in wind. Practical utility-scale wind turbines can usually get to 75% to 80% of the Betz limit. So at low wind speed, there just isn't much energy left to harvest.

But one way to get around the problem at low speeds is to avoid using aerodynamic blades and instead use something that looks more like a water wheel than a traditional wind turbine. That is the approach used by a Dutch firm called [Archimedes](#) for its Liam F1 Urban Wind Turbine. The turbine blades are in the shape of an Archimedes screw, notable in that hydro systems often use Archimedes screw designs in pumping systems characterized by low head pressures. They also typically have an efficiency curve that is flat across a wide range of flow rates.

Marinus Mieremet, cofounder of Archimedes, puts it this way: "Generally speaking, there is a difference in pressure in front and behind of the rotor blades of a windmill. However, this is not the case wi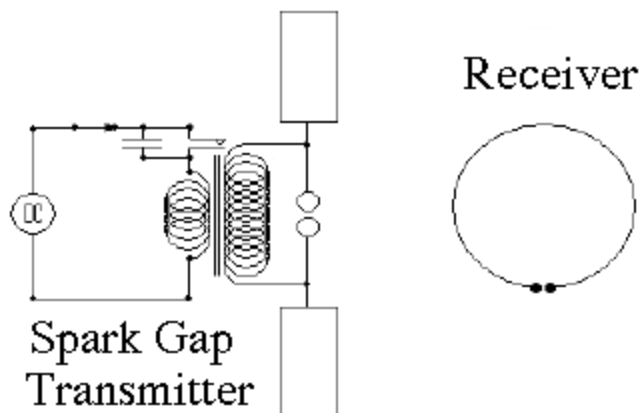th the Liam F1. The difference in pressure is created by the spatial figure in the spiral blade. This results in a much better performance. Even when the wind is blowing at an angle of 60 degrees into the rotor, it will start to spin. We do not require expensive software: Because of its conical shape, the wind turbine yaws itself automatically into the optimal wind direction. Just like a wind vane. And because the wind turbine encounters minimal resistance, it is virtually silent. " Mieremet also says the efficiency is about 80%.

The wind turbine cuts in at about 4.5 mph. Its maximum output is 1.5 kW which it reaches when winds hit a little over 11 mph. The firm says it is targeting home owners with the Liam.

Also, Archimedes isn't the first wind tubine firm to go with a design principle based on that of water wheels. [Wind Sail Receptor](#) in Nevada has a pinwheel-like design that functions more like a water wheel than like an aerodynamic turbine.

Hertz TX/RX set-up!

Receiver

Spark Gap Transmitter

Information Theory Applied (Loosely) to Cell Phones, Ham Radio and General Aviation

Jul. 26, 2013 by Don Tuite in Secondary Emissions

If talking on the cellphone in the car is so bad, why are ham radio operators exempt and what about pilots?

There's an article in the current *MIT Technology Review*, called "The Paradox of Wearable Technologies." written by Don Norman. He describes himself as, "a cognitive science professor (UC San Diego, Northwestern) turned executive (Apple vice president) turned designer (IDEO Fellow), and author of 20 books, including Living with Complexity and The Design of Everyday Things." The article was triggered by Google Glass, and it's about staying alive (or not) while you're distracted by your personal technology.

All of us have different capabilities for functioning in the presence of distractions. At one end of the spectrum is the classic being "unable to walk and chew gum simultaneously." The other is well represented by Norman's friend and associate, Thad Starner, who was a technical advisor to Google Glass.

Starner confessed to Norman that he was "very bad at multitasking." But he said that what he does when he attends a lecture with Google Glass is to, "put the physical focus of the display at the depth of the blackboard." Then since he has a special keyboard he keeps in his pocket, he could, "both pay attention and take good notes." This was, Norman says, "far better than with paper and pencil, when his attention had to shift from notebook to blackboard."

"The result is that during any interaction, he is far more focused and attentive than many of my non-computer-wearing colleagues: the act of taking notes forces him to concentrate upon the content of the interaction. Moreover, he has records of his interactions, allowing him to review what took place."

Distractions and Concentration

The article made me think about human communication in the face of distractions. Even if I had a one-handed keyboard that I could type on in my pocket, I doubt whether it would work for me. I get distracted easily. In fact, when I interview somebody at a tech company about a new product or technology, I need all my wits just to come up with follow-up questions. (What I do, is, I either rely on memory, nudged by the guy's Power-Point foils, or, if I'm talking to a CTO or other exec I need to quote accurately, I record the session on my iPad and send the audio file to an outfit in India that transcribes it.)

But getting back to everyday life, what this leads up to is the broad question of the distractions we create for ourselves with mobile technology. Politicians and the news media these days tend to focus on cell phone use and texting in cars. Both are acknowledged as bad, and a lot of people, myself included, would say that even hands-free phone conversations are too distracting for people driving in traffic.

My dilemma is, how do I reconcile that attitude with two of my hobbies: ham radio and flying? Here in California, talking on a cell phone in any mode except hands-free (actually, touching it at all) is grounds for a big fine . . . but amateur radio operators using their two-way radio gear, are explicitly exempt. And general-aviation pilots (like me before my FAA medical went away) couldn't fly in most populated areas without a two-way radio. What's with that? Are hams and pilots more mentally adept than the rest of humanity?

Not that I've noticed, so let me propose an alternative idea. Let me call it the **Shannon Effect**, after the father of Information Theory: **The lower the information content, the less distracting the communication.**

Take ham radio communications. Unless you're passing information in a disaster (or operating in a contest), one ham QSO is remarkably like every other QSO. You don't need to take notes. In fact, the next time you talk to this guy or that woman, the content of the conversation is going to be remarkably like the last time. The reason the legislature gave hams the exemption is because of the potential need for hams in emergencies, and you know what? We practice emergency drills just so that, in a disaster, the information we pass along is going to seem just as routine as possible.

Something similar happens in aviation. The information content of the messages is kept very low through the use of common phraseology.

"San Carlos Tower, Piper 9749Whiskey, Crystal Springs, with Juliet."

"49Whiskey, cross mid-field at or above 1200, enter right traffic for three-zero."

I repeat the instruction. Everybody on the frequency knows where I am and what I'm going to do.

Contrast that with cellular calls. Every one is different. You've got two people going back and forth, arguing their way through all possible options for something that's got to happen just so, at some specific time, that involves countless decisions to be offered and rejected or accepted. The information content is enormous and volatile. Do you really want somebody merging onto a freeway when their brain cells are that preoccupied?

No Contest

[From ARLP022 de K7RA] 5-30-14

Carl Zelich, AA4MI of Chuluota, Florida wrote: "Last weekend was the 'CQ World Wide WPX Contest (CW).' Not being a contester, I, of course, decided to explore the 'no-contest' bands.

"Activity was extremely quiet; you could count the number of stations on one hand. And the SFI (was) at 118 with a K at 1.

"Nevertheless I heard a very, very weak CW signal! Further investigation revealed FW5JJ in Wallis and Futuna!

"A few RST exchanges and a short QSO on 18.082 MHz on May 24 at 2156 UTC.

"After locating the country on my giant wall chart, I measured the distance at approximately 7,480 miles!

"Wow! And this was with 40 watts to a dipole under impossible, unpredictable conditions!

"The conclusion is to keep trying to communicate even when all indicators tell you to don't bother trying."

History of EME Wikipedia

The use of the Moon as a passive communications satellite was proposed by W.J. Bray of the British General Post Office in 1940. It was calculated that with the available microwave transmission powers and low noise receivers, it would be possible to beam microwave signals up from Earth and reflect off the Moon. It was thought that at least one voice channel would be possible.[1]

The "moon bounce" technique was developed by the United States Military in the years after World War II, with the first successful reception of echoes off the Moon being carried out at Fort Monmouth, New Jersey on January 10, 1946 by John H. DeWitt as part of Project Diana.[2] The Communication Moon Relay project that followed led to more practical uses, including a teletype link between the naval base at Pearl Harbor, Hawaii and United States Navy headquarters in Washington, DC. In the days before communications satellites, a link free of the vagaries of ionospheric propagation was revolutionary.

Later, the technique was used by non-military commercial users, and the first amateur detection of signals from the Moon took place in 1953.