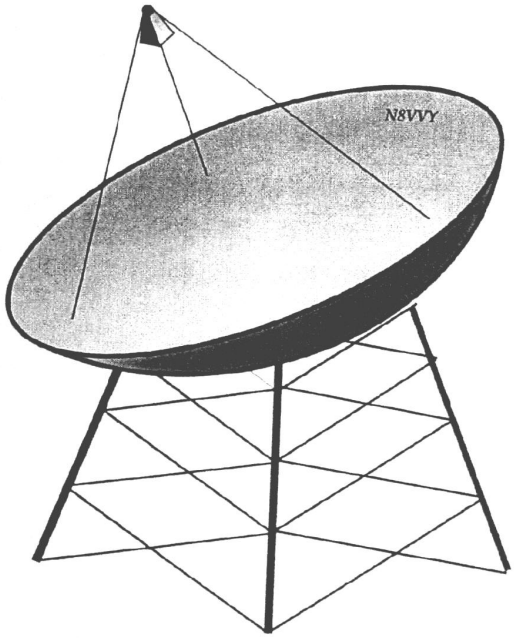
Mtg Fri 6:30 Feb 26 at the
MCL Cafeteria in Kettering

Feb 2016

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

Annual membership is $ 12.00. Make checks payable to Joe Muchnij, N8QOD.

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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E-mail: Jim Bacher, WB8VSU

*

Membership/correspondence/payments ($12/year):
Joe Muchnij, N8QOD
1214 Cottingwood CT
Bellbrook, OH 45305-8765

DE N8ZM Well, it's that time again so here goes another lame attempt at information, gossip, and humor. You've been warned so proceed at your own risk.

Last month I put in a plug for the ARRL, which I hope convinced some of you to join up. Since I wrote that piece, it was announced who the replacements would be for three critical positions at the League. President Kay Craigie, CEO David Sumner, and CFO Harold Kramer have or are retiring from their respective positions and the replacements have been announced. All three have been in some way involved with the League for many years, with Dave Sumner topping this list at 34 orbits. Whether you agree with everything that has been accomplished by the folks in Newington or not, you have got to respect the effort and energy that Dave has brought to his job in those years (his 'job' is to play radio?), not to mention a skill set that includes strong technical and communications capabilities as well as first class diplomatic skills. If you have read his editorials in QST, you know that he understands what ham radio is about in all of its different aspects. Despite the criticism in some circles that ARRL is only concerned about HF operations, I can tell you that Dave is often heard on during the VHF and microwave contests. As a matter of fact, his XYL thinks 10 GHz operation is tremendous fun!

As I know very little about his replacement, I can't predict much about the future although I have great faith in the ARRL Board's judgement. But regardless, amateur radio has lost the full-time services of a visionary and a gentleman. Somehow, though, I doubt that Dave will stay on the sidelines for very long. Happy Retirement, Dave!

Now on to the more normal topics for this column. I doubt it will surprise anyone that Hamvention will be here soon, but that always means that it is time to be thinking about our booth there. I have not signed us up yet but I'm pretty sure we will back in the same location, and hopefully many of you will find time to help out with the setup, staffing, and cleanup. For the last several years, there have been just 3 or 4 guys who have carried the ball, and I know they would love to have some help, if only to give them a chance to see the show! See please get in touch with me if you can help out. The work isn't hard and the pay includes a ticket and maybe a parking space at the arena. There is a limit to how many parking spaces I am willing to pay for, hence the maybe. So first come, etc.

I have had it confirmed that the VHF/Microwave forum will start at 3:15 on Saturday, moderated by Tony Emanuelle, WA8RJF. Tony is working on lining up the speakers and will likely have that information available in the next few weeks. The complete forum schedule will be published on Hamvention.org as it becomes available, so check it out. There will also be forums on TAPR, SDR, and other digital ham radio topics which are becoming more and more mainstream. Try to find time to attend as many forums as you can; they are an educational opportunity that shouldn't be missed!

I know many of you have heard rumors and seen news reports about the viability of HARA Arena, but I have it on good authority (the General Chair is a good friend) that all is well for this year. Going forward, there are a number of unpredictable factors for 2017, but a lot of work is being done to assure that the Dayton Hamvention will happen. There are a lot of alternatives being considered, but out of respect for my friend's efforts to negotiate with multiple players in this situation, I did not ask for particulars. It's not something I need to know, and I have a tough time keeping my big yap shut about such things anyway. When the world needs to find out the details, they will be announced. Until then, just have faith.

Some of you have asked about the unofficial MVUS flea market space, and I believe that Daun, N8ASB, has made the arrangements for us to be in the same location as in past years, 1902-1905. Stop by and say hi!

Well, I've probably exceeded my allotted space for this month so I'll end with a simple see you on Feb 26th!

de Tom, N8ZM

This and That 2-16

Fluorescent Green. This will glow green in the dark when hit by light. How about "Green Ice cream"? Cool, until you hear the price. Presently a scoop will cost you around $ 200.-.
[Nova on PBS, 2-3-16]

Idiots. The **TSA** (Transportation Security Administration) intercepted a record 2,653 guns at airport checkpoints last year. The report doesn't say whether that meant 2653 different idiots tried to carry guns onto airplanes or it was the same idiot 2653 times. Either way, it's an amazing number that defies explanation. [D.L. Stewart in the Dayton Daily News]

Velcro. "My kids and I love the sneakers with '**self-closing straps"**, but the sticky side fills with lint, and they don't stay closed very well. I use an old stiff (hard bristles) toothbrush to remove the lint..
[K.C. in a Heloise Column] … I am glad to hear that a few people (or kids) still use Velcro as we "old guys" call it. As far as I know, this fastening method is still used a lot in manned space operations to fasten all kinds of things not just shoes to your feet. Editor]

Galileo. 2-15-2016 was the birthday of scientist and writer Galileo Galilei, born in Pisa, Italy (1564), who defended the scientific belief that the Earth was not the center of the universe and was tried by the Roman Inquisition for heresy. He once prophesied that, in the future, "There will be opened a gateway and a road to a large and excellent science into which minds more piercing than mine shall penetrate to recesses still deeper." Galileo also said: "In questions of science, the authority of a thousand is not worth the humble reasoning of a single individual." [Garrison Keillor in "Writer's Almanac"]

Heat Reduction. The Oct. 2015 issue of "NASA Tech Briefs" has a dramatic picture of a city taken from space in false colors in Infra Red. Clearly visible is the vegetation (peoples backyards) in cool green color while hot gases (in yellow), emanate from cars on freeways and other roads meander way upwards into the air. Houses have red color from air conditioning units. ` [Ed.]

Voodoo Economics. Just picked up some medicine tablets and on coming home studied the paperwork/instructions that come with it. I had paid a little over $3 for the 3-month supply. Was I surprised to see the "Retail Price" listed as $ 596.92. If nothing else, if I was an economist, this retail price would give me a headache! [Gerd, WB8IFM]

What does "Singapore" Mean? A: City of Lions. [L.M. Boyd]

Who first came up with the phrase "conspicuous consumption"? American economist Thorstein Veblen, man of foresight. He said "technicians' eventually will run the world because nobody else will understand it. He died in 1929. [L.M. Boyd]

"Our Kind". When I say that, I mean people who like pizza. Our kind eat 90 acres of pizza a day. Pepperoni mostly. [L.M. Boyd in 1990]

City Air. Inhaling fine particles from car exhaust, power plants, and other sources can damage the heart and lungs in much the same way that cigarette smoke does:clogging arteries, increasing inflammation, and raising heart rate and blood pressure. [The Week, 3-2-2012]

RF Explorer 6G Combo Handheld Digital Spectrum Analyzer By Seeed Studio (109990063) MCM Part #72-12855

0 stars No reviews yet

Price ~ $ 365.-

RF Explorer is a handheld digital spectrum analyzer, a very affordable tool for work in all popular frequency bands. It is based on a highly integrated frequency synthesizer and double balanced mixer which offers high performance, compact size, low consumption and low cost.

It has been designed to be used equally well outdoor and indoor, and can be connected to a PC for extra functionality using the standard mini-USB 2.0 connector.

This model includes a 6G baseline unit plus an RFEMWSUB3G Expansion Module conveniently assembled and tested. It comes with two SMA connectors and three antennas: a nice Nagoya NA773 wideband telescopic antenna for all Sub-GHz frequencies, a rubber duck 5.8 GHz and a whip helical for 2.4GHz band. Additional, specific band antennas may be needed to cover efficiently some of the frequencies supported.

The combination of these two models offer coverage for most used communication frequency range used in modern communication technologies including WiFi, Bluetooth, Wireless Audio and Video, LTE, GSM, GPRS, Satellite, CATV, DTV, etc.

Price for both: $364.99

This item:RF Explorer 6G Combo Handheld Digital Spectrum Analyzer$359.00

5VDC 2A Regulated AC Power Adapter - 48" Cord Micro USB Plug$5.99

GaN Amplifiers power 30 MHz to 7.5 GHz

This GaN power-amplifier family serves applications ranging from radar to video data links, with broad operating bandwidths as wide as 100 MHz to 6 GHz.
Feb 11, 2016 Jack Browne | Microwaves and RF

Gallium nitride (GaN) has become the semiconductor material of choice for high-frequency discrete and integrated-circuit (IC) power devices. In fact, its transition from the laboratory to commercial products has been quicker than the push toward gallium arsenide (GaAs) in the 1980s. Fueled by funding to private industry by the U.S. Defense Advanced Research Projects Administration (DARPA), GaN devices made their first large-scale appearance during the mid-2000s in IED jammers. Less than a decade later, GaN devices can be found in commercial, industrial, military, and even medical electronic applications.

Many suppliers now offer GaN devices, but few provide short delivery times. One exception is Pasternack Enterprises with its line of GaN high-electron-mobility-transistor (HEMT) power amplifiers (PAs) that cover frequencies ranging from 30 MHz to 7.5 GHz. All are available from stock, and designed to meet MIL-STD-810 environmental test conditions.

Electric cars and the coal that runs them

By Michael Birnbaum Nov 23 , 2015

ROTTERDAM — In this traffic-packed Dutch city, electric cars jostle for space at charging - stations. The oldest exhaust-spewing vehicles will soon be banned from the city center. Thanks to generous tax incentives, the share of electric vehicles has grown faster in the Netherlands than in nearly any other country in the world.

But behind the green growth is a filthy secret: In a nation famous for its windmills, electricity is coming from a far dirtier source. Three new coal-fired power plants, including two here on the Rotterdam harbor, are supplying much of the power to fuel the Netherlands' electric-car boom.

As the world tries to reduce greenhouse-gas emissions and combat climate change, policymakers have pinned hopes on electric cars, whose range and convenience are quickly improving. Alongside the boom has come a surging demand for power to charge the vehicles, which can consume as much electricity in a single charge as the average refrigerator does in a month and a half.

The global shift to electric cars has a clear climate benefit in regions that get most of their power from clean sources, such as California or Norway. But in areas supplied by dirtier power, like China, India and even the Netherlands, which is on track to miss ambitious emissions targets set for 2020, the electric-car jump has slimmer payoffs. In some cases, it could even worsen the overall climate impact of driving, experts say.

Eiffel Tower Dimensions (2015)

It stands 985 feet 11 inches (300.5 meters) on a square base measuring 328 feet (100 meters) on each side.

The first story platform is at 189 feet (57.6 meters), with sides 232 feet (70.7 meters) long. The second story platform is at 379 feet (115.5 meters), with sides 134 feet (40.8 meters) long.

There is an intermediate platform at 643 feet (196 meters) -- this is only a point to change elevators. The third story platform is at 905 feet (275.8 meters).

Later a 66-foot (20-meter) television antenna was attached, which extended the tower's total height to 1052 feet (320.7 meters).

The vintage poster shows the Eiffel tower in 1889 when it was built as the entrance for that year's World Fair. It was retained and became a permanent symbol of Paris and France. At the time it was the world's tallest structure and stayed that for the next 41 years.

About Gravity:

What does Art do? It makes you Think!

I was reminded of this, when I heard the news that Gravity Waves had been detected and recorded on September 18, 2015, stemming from the merger of two black holes into one. The news hit only in February of 2016, and indicated that a lot of head scratching must have gone on in the scientific community and the announcements were mostly from the press, so had not very valuable or critical details. The only name mentioned often was Einstein, and , of course, he couldn't comment.

So I was glad to see a write-up in the weekly Kurzweil Newsletter (Feb 12), where I got the few numbers mentioned below.

The introductory comment refers specifically to a play “Galileo” by Bert Brecht, which I saw as a student a long time ago. In it there is a scene where “Galileo” discusses his “Theory of the Heavens” which seamed to be too simple for his guest who suggested God could very well have created the universe much more complicated. Saying this he described a very complicated curve with his arm and hand in the air. Galileo then repeated this ridiculous gesture saying: “If that is true then God would have made our brain the same way, so we could cope with that kind of universe!”

As far as using your brain and your senses exclusively there is, of course, Einstein, who ran no tests or experiments other than in his imagination.

So here are some of the essentials from the news: In the US there are presently two facilities specifically built to research gravity and specifically look out and interpret Gravity Waves. They are called LIGO (Laser Interferometer – Gravitational Wave). One is at Hanford, Washington State , the other at Livingston, Louisiana. So these are several thousand km apart. Both picked up the same signal , on September 18 at 9:51 UTC, however, with a 7 msec delay for the Hanford site. The origin (direction) of the waves was from the southern hemisphere. Knowing the position of the black holes it should be easy to calculate the speed of these waves between the two LIGO stations. With the speed of light the delay would indicate a distance of 2,100 km.
[Gerd, WB8IFM]

LIGO Facillity at Hanford

What is LIGO?

LIGO is the world's largest gravitational wave observatory and a cutting edge physics experiment. Comprised of two enormous laser interferometers located thousands of kilometers apart, LIGO exploits the physical properties of light and of space itself to detect and understand the origins of gravitational waves.

Though it's called an observatory, LIGO is unlike any other observatory on Earth. Ask someone to draw a picture of an observatory and odds are it will look something like the photo on the right: a typical telescope dome on a mountain-top. As a gravitational wave observatory, LIGO bears no resemblance to this whatsoever, as the photo of the LIGO Livingston intererometer below clearly illustrates.

Aerial photo of LIGO Livingston, Louisiana, showing all of one 4 km long arm and part of the other (off to the right). The visible arms are concrete structures that protect the vacuum tubes from the elements. (Credit: Caltech/MIT/LIGO Lab)

Although LIGO will search for gravitational waves from space, and it is called an "Observatory", LIGO is *not*, strictly speaking, an astronomical facility. LIGO is truly a physics experiment on the scale and complexity of some of the world's giant particle accelerators and nuclear physics laboratories. Though its mission is to detect gravitational waves from some of the most violent and energetic processes in the Universe, the data it will collect will have far-reaching effects on many areas of physics including gravitation, relativity, astrophysics, cosmology, particle physics, and nuclear physics.

Since LIGO has the word "Observatory" in it, however, it is helpful to first describe how it differs from the observatories that most people envision. Three physical differences significantly distinguish LIGO from an astronomical observatory:

First, LIGO is blind. Unlike optical or radio telescopes, LIGO cannot see electromagnetic radiation (e.g., visible light, radio waves, microwaves) nor does it have to because gravitational waves are ***not*** part of the electromagnetic spectrum. In fact, electromagnetic radiation from space is so unimportant to LIGO that it is completely isolated and sheltered from the outside world. LIGO can't (nor does it need to) see anything. Rather, it 'feels' for invisible gravitational waves.

Second, LIGO is the opposite of round. Since LIGO doesn't need to focus light or radio waves from stars or other objects in the Universe, it doesn't need to be dish-shaped like telescope mirrors or radio dishes, which focus electromagnetic radiation into images. Instead, LIGO's eyes on the sky are more like ears. LIGO's ears consist of two perfectly straight and level 4 km (2.5 mi.) long steel vacuum tubes, 1.2 m in diameter, arranged in the shape of an "L", and protected by a 10-foot wide, 12-foot tall concrete enclosure that protects the vacuum tubes from the outside world.

Third, LIGO cannot function alone. While an astronomical observatory can function and collect data just fine on its own (some don't by choice), gravitational wave observatories like LIGO *cannot* operate solo. The only way to definitively detect a gravitational wave is by operating in unison with a distant twin so that local vibrations are not mistaken for signals from gravitational waves. There are some very good reasons for this, which you can learn about in LIGO's Dual Detectors.

These are the three most prominent physical differences between LIGO, a *gravitational wave observatory*, and astronomical observatories.

LIGO's detector is a laser interferometer. To learn more about this useful scientific instrument and about LIGO's versions, visit What is an Interferometer and LIGO's Interferometer.

Button Cells: Properties of Different Chemistries Wikipedia 1-29-16

Silver cells may have very stable output voltage until it suddenly drops very rapidly at end of life. This varies for individual types; one manufacturer (Energizer) offers 3 silver oxide cells of the same size, 357-303, 357-303H,and EPX76, with capacities ranging from 150 to 200 mAh, voltage characteristics ranging from gradually reducing to fairly constant, and some stated to be for continuous low drain with high pulse on demand, others for photo use.

Mercury batteries also supply a stable voltage, but are now banned in many countries due to their toxicity and environmental impact.

Alkaline batteries are made in the same button sizes as other types, but typically provide less capacity and less stable voltage (it drops gradually in use) than more costly silver oxide or lithium cells. They are often sold as cheap watch batteries too, and sometimes by people who do not know the difference.[1]

Zinc-air batteries use air as the depolarizer and have much higher capacity than other types, as they take that air from the atmosphere. Cell have seals against air which must be removed before use; cells will then self-discharge in a few weeks, regardless of use.

For comparison, the properties of some cells from one manufacturer of different types and of diameter 11.6 mm and height 5.4 mm are listed:[2]

- Silver: capacity 200 mAh to an end-point of 0.9 V, internal resistance 5–15 ohms, weight 2.3 g
- Alkaline (resp., manganese dioxide): 150 mAh (0.9), 3–9 ohms, 2.4 g
- Mercury 200 mAh, 2.6 g
- Zinc-air 620 mAh, 1.9 g

Examining datasheets for a manufacturer's range[2] may find a high-capacity alkaline cell with a capacity as high as one of the lower-capacity silver types; or a particular silver cell with twice the capacity of some particular alkaline cell. If the powered equipment requiring a relatively high voltage (e.g., 1.3 V) to operate correctly, a silver cell with a flat discharge characteristic will give *much* longer service than an alkaline cell—even if it has the same specified capacity in mAh to an end-point of 0.9 V. If some device seems to "eat up" batteries after the original supplied by the manufacturer is replaced, it may be useful to check the device's requirements and the replacement battery's characteristics. For digital calipers, in particular, some are specified to require at least 1.25 V to operate, others 1.38 V.[3][4]

Datasheets for some cheaper cells, particularly alkaline, are not available, so it is not possible to say whether capacities are about the same as for documented types.[5] Discussions on web forums suggest that they can be very poor.[6]

In some ways the size is the most important property of a button cell: cells of different chemistry are to a considerable extent interchangeable. In practice only cells of fairly similar voltages are made in any given size; there is no "CR1154" 3 V lithium battery mechanically interchangeable with a 1.5 V silver or alkaline size 1154 cell. Use of a battery of significantly higher voltage than equipment is designed for can cause permanent damage, but use of a cell of the right voltage but unsuitable characteristics can only lead to short battery life or failure to operate equipment.

Button Cell (Wikipedia)

2-24-2016

Button, coin, or watch cells

A **watch battery** or **button cell** is a small single cell battery shaped as a squat cylinder typically 5 to 25 mm in diameter and 1 to 6 mm high—like a button on a garment, hence the name. Button cells are used to power small portable electronics devices such as wrist watches, pocket calculators, artificial cardiac pacemakers, implantable cardiac defibrillators, and hearing aids. Lithium cells are generally similar but somewhat larger; they tend to be called either lithium cells or batteries or **coin cells** rather than button cells.

Devices using button cells are usually designed to use a cell giving a long service life, typically well over a year in continuous use in a wristwatch. Most button cells have low self-discharge and hold their charge for a long time if not used. Higher-power devices such as hearing aids, where high capacity is important and low self-discharge less so as the cell will usually be used up before it has time to discharge, may use zinc-air cells which have much higher capacity for a given size, but discharge over a few weeks even if not used.

Button cells are single cells, usually disposable primary cells. Common anode materials are zinc or lithium. Common cathode materials are manganese dioxide, silver oxide, carbon monofluoride, cupric oxide or oxygen from the air. Mercuric oxide button cells were formerly common, but are no longer available due to the toxicity and environmental hazard of mercury.

A metal can forms the bottom body and positive terminal of the cell. The insulated top cap is the negative terminal.

Cells of different chemical composition made in the same size are mechanically interchangeable. However, the composition can affect service life and voltage stability. Using the wrong cell may lead to short life or improper operation (for example, light metering on a camera requires a stable voltage, and silver cells are usually specified). Sometimes different cells of the same type and size and specified capacity in mAh are optimised for different loads by using different electrolytes, so that one may have longer service life, than the other if supplying a relatively high current.

Tx \ Rx				
	0	∞	3	3
	∞	0	3	3
	3	3	0	∞
	3	3	∞	0

Fig. 7 -- Interaction of various polarizations (extra attenuation in dB).