

Oct. 2015

ANOMALOUS PROPAGATION

Newsletter: *The 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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*** This article was omitted from the newsletter last month. Sri!
It is also available on our website in the Sept newsletter.

Fort Wayne, Indiana, Hamfest..... 14/15 Nov-2015 coming up.

There is no input from Tom this month....his column will be back next month

The November Meeting will be the Friday after Thanksgiving on the 27th of Nov. CU there!

Re AP Newsletter. (10-27-2015)

At the meeting last Friday (13 in attendance), Tom, N8ZM, asked why there was no newsletter this month.

Well, we are running late for various reasons, but mainly because of a family related matter (son's wedding).

But, as you know the newsletter does not come every month. Three times a year, because of major events, we omit the news letter. So we send out a total of 9 per year. Those events are: the Hamvention in May, Central States in July and then there is Christmas. So the upcoming issues are for October, November, then January.

Lately we've been sending out the newsletter the last week of the month, which normally is week no.4, but this October has 5 weeks (lame excuse, I know!)

Re AP Newsletter.

There are two ways you can I.D. a particular issue: first you have the month and year on the front page in the upper right corner. As an example this years issue prior to the Hamvention was labeled Apr/May 2015.

On page 2, the contents page you have the Volume number, then a comma followed by the month of the issue. This will be the month the issue appears, so the numbers 5, 7 and 12 will be missing.

I hope this helps.

Another item: last month, I was in a hurry to collect the originals to hand over to Joe. We forgot the last two pages.

So this month we are printing these and, of course they will be referred to on the contents page.

Unfortunately with the ten pages, we are at the limit of the 1st one ounce postage, in fact we had to quit printing by Staples, because they switched to "better" paper, that got us over this limit.

Maybe we'll make an effort to locate slightly thinner paper, that permits us to print another 2 pages if we have the material.

73, Gerd, WB8IFM, Editor

August Storm Damage

10-29-2015 By Lloyd NE8i

With the **fall colors in full view**, drove up to Christmas Cove and to Miller Hill scenic overlook: EN74av. The August wind storm damage there is massive. Road is clear, site is useable, but there are hundreds of trees that the high winds knocked down. Lots of leaning trees. It is obvious, the road commish had to cut, and clear out hundreds of trees. In fact, along M22, the road etc logging crews were still busy cutting up trees, chipping branches, debris, stacking big logs. They will be busy for a while, looking at the piles of trees along M22 etc. Many houses, cabins, have gigantic piles of freshly cut and split wood beside them. Typically a few years worth of firewood. Miller Hill to down the hill, still looks great for 1 km paths, to about the 10 km to Sleeping Bear Dunes, and Points West Across Lake Michigan. Took a tour of Pierce Stocking Drive. There are many excellent microwave rover sites along that route.

Tustin Knob, South of Cadillac on US131 EN74gc. Stopped by there last week. Still looks great from the Observation deck. Great view. Thing is, from November 2, through the Middle of May next year, it will be closed. Same with GP Hill EN82em.

Christmas Cove, EN75ee, had not been there for a few years. Not much storm damage, but some beach erosion. Things have changed. The parking lot now has a fence along the lake, no direct accesses from the parking lot. If your dish is up 4 ft, it will clear the fence. The picnic benches are now gone. The property South of it, now has a plaque in the SE corner of the parking lot, noting it is a special use gift mumbo jumbo and has a pedestrian access to the Lake. There is a small paved area, with no vehicle access of any kind. It is perhaps about a 100 ft hike to the lake from the parking lot now. Still has a great horizon of Lake Michigan.

This and That 10-15 a

Oxymoronic. After a friend recommended that he join a secret Google project six years ago, Brian Torcellini suddenly found himself on the road to an occupational oxymoron. He became a driver in a driverless car. [Michael Liedtke, Ass. Press]

Breaking News. Ask a roomful of people to take out their phones, and you are bound to see several with cracked screens. Despite engineering breakthroughs, screen breakage has become a part of life, the leading type of phone damage. [Anick Jesdanun, Ass. Press]

HiFi. When was the last time you heard that term? It's been totally replaced by the "Boom...Boom" culture! [Gerd, WB8IFM]

Lawyer's Paradise. About the Automobile Warranty: "It's now two pages. The list what's NOT covered is three pages!" [D.L. Stewart]

The New Car. "After a month of driving I've mastered to turn on the radio. I'm hoping in the 35 months I have left on my lease I figure out how to turn it off." [D.L. Stewart]

Education. "Children must be taught how to think, not what to think." [Margarete Mead]

Art. "The artist should never try to be popular. The public should try to be more artistic." [Oscar Wilde]

Interesting Fact. "They know it and we know it and they know that we know that they know that we know it..." [R.v.R. van Loon Ch. 4]

Writer's Block. "There are two kinds of writer's block. One is when you freeze up because you think you can't do it. The other is when you think it's not worth doing." [Tom Wolfe]

Advice. "Advice is judged by results, not by intentions." [Cicero]

Change. "Not everything that is faced can be changed, but nothing can be changed until it is faced." [James Baldwin]

Granddad's Advice. "For once you begin to take the human race too seriously, you will either lose your sense of humor or turn pious, and in either case, you had much better be dead." [Introduction, page XXIV, R.v.R.]

Catnip. "Hackers can take over our cars! Our lives are at risk! No, they are not. Stories such as these are catnip to mainstream media and the technophobic public. Unfortunately, they leave out or under-play a detail or two that would take most of the air out of the drama: these aren't just any cars." [David Pogue in Scientific American, Nov. 2015]

Dave K4 TO reports the good news and bad news:

Good morning, 6 Oct- 2015

For the first time in several days (weeks?) we had enhanced conditions on the higher bands. The 10G beacon from K9AYA was 60 dB over the ambient noise. Many days in the recent past, I could not hear it at all.

At least my 10G is working. I am having problems on 2G for sure, and may have problems on 3G and 5G also. I guess it is time to bring down the box. I don't know if I am ready to climb that high yet.

I also have trouble with the 1296 antenna (again) and the 222 is showing a high VSWR. At least those two are "only" 60 or 70 feet up. I can probably get to those.

Time and energy and weather will have to cooperate if I get any of this stuff fixed. We shall see.

K8TQK and I were able to make a QSO on 10G this morning for the first time since we got his box back up.

73, Dave, K4TO

...and not so good...

on 17 Oct Dave writes:

I don't recall ever seeing Wm Hepburn's Tropo-ducting forecast looking so bleak. No, Make that black. There are no patches of enhancement shown anywhere in the Eastern USA except for the very bottom of the Texas and Florida southern parts. It doesn't start improving until next week, Wednesday.

73, Dave, K4TO

“Chapter 5: **The Sun.**”

The Sun, the star around which all of the planets in our solar system revolve, is a luminous mass of intensely hot gases, more than 300,000 times as heavy as the Earth and over a million times as large. It is, in fact our nearest star, though 'nearest' means that it is still 93 million miles away from Earth. The sun is practically our only source of heat; without it, life as we know it would be impossible. The same elements we have on Earth and other planets, though in very different proportions can be found in the Sun. More than 99% of the Sun is made up from hydrogen and helium in the ratio of 10 to one. Both of these elements, as gases, are extremely rare on Earth.

The Sun acts as a nuclear furnace, combining hydrogen atoms make the heavier helium, creating an enormous amount of heat and light. However, the Earth receives only a small fraction of this: 5% x10⁻¹² (pico). This is, however, plenty to keep nature and us alive.....

This paragraph is excerpted from Chapter 5: “The Sun”, from the book: “The Majesty of the Heavens” by Michael Dempsy and Joan Pick. This book came out in 1966, is very well written and contains lot's of well done color illustrations. It is a very good introduction into space and astronomy. It will particularly appeal to the visually inclined reader. [Ed.]

Energy from the Sun! Wikipedia 4-2015

[Solar energy](#) in orbit is abundant, reliable, and is commonly used to power satellites today. There is no night in free space, and no clouds or atmosphere to block sunlight. Light intensity obeys the [inverse-square law](#). So the solar energy available at distance d from the Sun is $E = 1367/d^2$ W/m², where d is measured in [astronomical units](#) (AU) and 1367 watts/m² is the energy available at the distance of Earth's orbit from the Sun, 1 AU.[\[46\]](#)

Fusion. (Time Mag. Nov.2, 2015)

A Miniature Sun on Earth.

This is a brief summary of a long article (by Lev Grossman) with photos in Time Magazine of Nov.2, 2015 (Vol186/18). Several dozen “Fusion Reactor Experiments” are presently going on in the world. This glut started out with a few Universities, large Corporations and Governments. With the promise of cheap, plentiful, carbon-free energy, smaller companies and entrepreneurs jumped in. Time compares the situation with the first powered flight or the moon mission started under Kennedy. Success of this process would certainly be a great development to help ameliorate global warming. In essence this is the miniature version of the process that takes place on the sun.

I recommend the article highly, it is 8 pages long (two of those pages contain 4 pictures of the impressive experimental hardware.)

WB8IFM

Gerd,

Some Comments to the article:

Fusion Energy Research has been going on for 60 years. I think we either need new physics or it is not going to happen.

[Carter Hall]

Excellent article, we'll eventually solve the fusion problem. [Justin Smith]

At The TAPR/ARRL Digital Communications Conference

Joe Muchnij, N8QOD

A number of interesting projects were discussed and demonstrated at the recent conference held near Chicago that that Tom Holmes N8ZM and I attended. MVUS members John Ackerman N8UR and Bruce Raymond ND8I also showed up. I'm only reporting those that most caught my interest – there were many others.

TAPR paid travel expenses for Zoltan Doczi, HA7DCD to come from Budapest and show his inexpensive QRPI 20m transmitter shield for the Raspberry Pi computer. The tiny shield contains low-pass and band-pass filters to eliminate spurious output and a static discharge protection diode to prevent computer damage from nearby high power transmitters; it is so small that the computer can still be housed in most stock plastic enclosures. Running +20dbm output power in WSPR mode and a random wire outdoor antenna at 2m height, he has made QSOs of more than 1000km. TAPR plans to market the shields.

Bruce Perens K6BP demonstrated a radio front panel program that runs inside the Web Browser of almost any computer or smartphone (except the Apple Safari) and is part of his *Algoram Katena*, a 50-1000 software defined HT that can be programmed to communicate using many different modulations, modes, and protocols. The computer/smartphone provides audio input and output as well as all control functions.

An international team that includes our own Art Towslee WA8RMC, is working on the open source software/hardware DATV-Express System to bring Digital ATV costs down to where amateurs can participate. Ken Konechy W6HHC reviewed progress since last year's DCC and demonstrated the latest version.

Daniel White AD0CQ gave a presentation of SatNOGS: Satellite Networked Open Ground Station. This was repeated at the AmSAT Symposium in Dayton the following week; my report from that event discusses SatNOGS in some detail.

Finally, Steve Bible N7HPR provided an extensive demonstration of modern 3D hardware modeling software.

Radio Telescope Effelsberg (Germany)

With a diameter of 100 meters, the Radio Telescope Effelsberg is one of the largest fully steerable radio telescopes on earth. Since operations started in 1972, the technology has been continually improved (i.e. new surface for the antenna-dish, better reception of high-quality data, extremely low noise electronics) making it one of the most advanced modern telescopes worldwide. The telescope is employed to observe pulsars, cold gas- and dust clusters, the sites of star formation, jets of matter emitted by black holes and the nuclei (centres) of distant far-off galaxies.



Effelsberg is an important part of the worldwide network of radio telescopes. The combination of different telescopes in interferometric mode makes possible to obtain the sharpest images of the universe. [Web-Info]

At The Dayton AMSAT Symposium

Joe Muchnij, N8QOD

At last year's symposium, held near Baltimore, I suggested to Steve Coy K8UD that Dayton should host one; he ran with that idea and made it happen - this year's meeting was held at the Grand Plaza Hotel in downtown Dayton.

Fox-1A was successfully launched from Vandenberg AFB on October 8th, and has been designated AO-85. Jerry Buxton N0JY provided an overview of AO-85 and other Fox-1 satellites. Fox-1B and Fox-1Cliff are scheduled for launch on the Falcon-9 rocket early next year.

Three universities presented their space activities and capabilities: Virginia Tech has agreed to participate with AMSAT in several efforts and Bob McGwier N4HY had a large contingent, our own Jeff Kruth WA3ZKR from Morehead State in Kentucky brought along a half dozen students (but not Jennifer), and Leo Almazan WA6LOS described University of the Philippines activities.

A number of interesting projects were discussed and demonstrated. I'm only reporting those that most caught my interest - there were many others.

SatNOGS: Satellite Networked Open Ground Stations was explained in some detail. . This was a bit of a repeat from the TAPR DCC, but a different presenter - Pierros Papadeas from Athens Greece. The project grew from the realization that our LEO satellites are only in view of a control ground station for a few minutes of its orbit and cannot be controlled at other times (FCC rules require the ability to quickly shut down spacecraft transmissions); similarly, most telemetry cannot be accessed by researchers and is lost, unless the satellite is able to store it and download it on command. The project aims to provide open access to a global network of ground station transponders able to track and access the satellites during most of their orbits, and a database allowing authorized individuals to prescheduled satellite links.

Dan Schultz N8FGV presented an update of his investigation into OSCAR-13's unexpectedly short lifetime. His analysis of elliptical orbit perturbations using NASA's simulation software resulted in a startling calculation that orbits with an inclination of 57 degrees and initial Right Ascension of Ascending Nodes (RAAN) between 237 and 307 degrees result in their perigee dipping into the atmosphere within 7 to 9 years after launch, while orbits outside this range live for nearly 20 years. He intends to repeat the simulation for the 63 and 12 degrees inclination of Molniya and geo synchronous transfer orbits while continuing to look for an explanation of this unusual RAAN sensitivity.

Amsat Symposium Summary

by Steve Coy, K8UD Symposium Chair 2015

Overall the Symposium was a success. We had 125 attendees and the proceedings book was the largest (436 pages) that I have seen in recent years. Everything went very smoothly, however, our keynote speaker, Frank Bauer did not show up until Saturday morning. His talk about AO-40 was very interesting and the GPS experiment outside the constellation made history. Everyone though that AO-40 was a disaster, but in fact has given the satellite community a better understanding of how GPS works. This paper would be good reading for anyone who has an interest in positioning satellites outside the GPS network. At the conclusion of the symposium, we had our own, Ron Moorefield and Nancy Makely hand out prizes to our guests. I am happy to say, everyone received a prize. On Saturday, Jim Simpson provided live video feed through USTREAM. Google to "ustream.tv daralive"

I like to thank all who supported and actively helped in preparing and conducting the Symposium. Well done!

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.

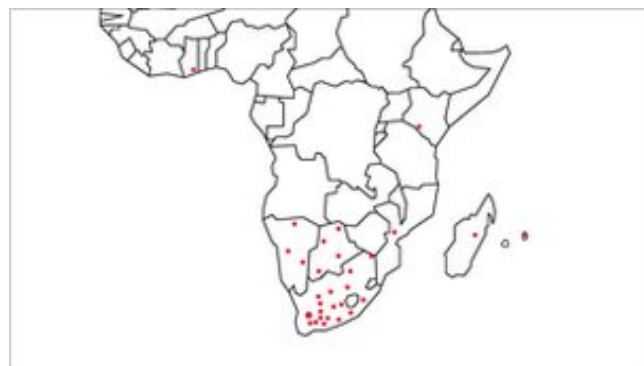
So far, partners from 20 countries are involved in the 1.5bn euros (£1.3bn) project which is not expected to be completed until about 2024, though phase one should be working by the end of this decade.

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](#)