

ANOMALOUS PROPAGATION

Newsletter: *The Midwest VHF/UHF Society*

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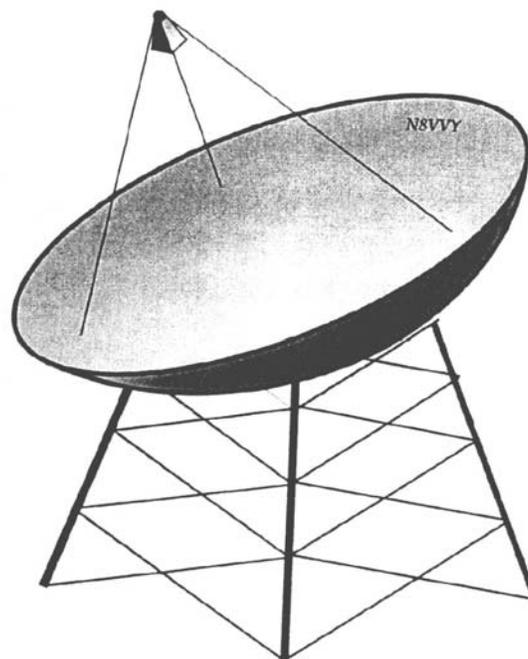
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Annual Society membership is \$ 12.00. Please
make checks payable to Joe Muchnij



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www.mvus.org

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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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**A Very Merry Christmas
& a Happy New Year
from all of us**

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DE N8ZM 11/12/15

With the holidays fast approaching (do they ever approach any other way after your 14th birthday?), it is probably time for me to announce the meeting dates for November and December, so here they are: November 27th (the day after Thanksgiving) and December 29th (the Tuesday after Christmas). Both will be at the MCL Cafeteria where we regularly meet, and the starting time will be the usual 6:30 to eat. 7:30 to start the meeting. Of course the wives are always welcome, especially in December.

Another matter I need to bring up is that now is a good time to renew your membership in MVUS. The benefits include receiving our sort-of monthly Anomalous Propagation newsletter (see elsewhere for Gerd's explanation of 'sort-of monthly'), a booth at Hamvention where you can meet friends and other MVUS members as well as just sit and chat for a while, and the chance to hang out with a bunch of really great folks who share a strong interest in anything related to ham radio, technology, and science. They also bring a wealth of knowledge on a wide range of subjects and are willing to share it. That by itself is priceless! And the dues are really cheap by radio club standards...\$1/ month! How can you pass up a bargain like that? We'd love to have you continue to be a part of our group, so make a note to send in your renewal as soon as you finish reading this issue of Anom Prop! Thanks!

Speaking of Hamvention, there has been a lot of news in the ham radio press and just plain rumor-mongering that the show will not be at HARA in 2016. All I know for sure about that from my participation on the committee that produces the show is that all of our plans are geared towards again being at HARA. If that changes, be assured that there will be official announcements made so that you'll know where to find the show. Wouldn't be good business to move and not leave a forwarding address, would it?

Also, the VHF/Microwave Forum at the big show will again be moderated by Tony, WA8RJF. Tony's long experience and activity on the VHF and higher bands makes him especially capable of bringing together the best presentations for the rest of us to learn from. Be sure to make time to attend this great forum. And don't miss out on any of the TAPR, AMSAT, and various digital forums either. Even though TAPR and AMSAT have been around for a long time, they are still where it's at on the leading edge of ham radio technologies. And the various digital modes and mesh networks are really cool and revolutionizing our hobby, so check 'em out!

MVUS member John Ackermann, N8UR, has finished the design of an 8-port switch he calls the TASS, Totally Awesome Switching System. John loves to describe all of his projects as a Totally Awesome something or other. I won't go into the psychological implications of this naming obsession but I will tell you that all of his TAx projects are well thought out and very good for the intended usage, but with other applications in mind as well. So maybe he can be forgiven for a little bit of marketing hype in his product names. Anyway, if you are interested in what the TASS can do, go to TAPR.org and look in the kits section. Full disclosure: I am the TAPR Treasurer, but it's a volunteer job so the only payback that either John or I gets is the satisfaction of seeing something cool made available to hams.

Happy Holidays to all of you, and I hope that 2016 is a great hamming year for all of us!

See you at the November and December meetings! Tom, N8ZM

This and That 11+12-15

Earth and Sun. On a scale model in which the Earth is a **dust mote**, the Sun would be one inch away and the size of the period at the end of this sentence. The nearest star would be another period $4\frac{1}{4}$ miles distant.

[Farmer's Almanac]

A Coal Train... rumbling across Montana is a mile and a half (2.4km) long, yet carries barely day's full for a large power plant. The US burns more than a billion tons of coal a year.

[National Geographic]

Scientific Discovery. "There are three stages: first people deny that it is true; then they deny that it is important; finally they credit the wrong person."

[Alexander von Humboldt]

Ultimate Critic. "The reader is the writer's only unrelenting, genuine enemy. He has everything on his side; all he has to do, after all, is shut his eyes, and any work of fiction becomes meaningless.

[Novelist Shirley Jackson]

Progress. "Medical science has made such tremendous progress that there is hardly a healthy human left."

[Aldous Huxley]

Advice. "Anyone who goes to a psychiatrist ought to have his head examined."

[Samuel Goldwyn]

Horsetrade. When a horse is offered for free, you should not open its mouth.

[Latin Proverb]

Incomplete. "Had I been present at the Creation, I would have given some useful hints for the better ordering of the universe."

[Alfonso X, King of Castile]

Minimum. "No more things should be presumed to exist than are absolutely necessary." [William of Ockham]

Magna Carta - 1215 "Except by the lawful judgment of his peers or by the law of the land....To no man will we sell, or deny, or delay, right or justice."

Collimated light.... is **light** whose rays are parallel, and therefore will spread minimally as it propagates. The word is related to "collinear" and implies **light** that does not disperse with distance (ideally), or that will disperse minimally (in reality).

[from the Web, get it?]

Mathematics. "The purpose of mathematics is to simplify the logical understanding of the physical world."

[Willard Gibbs]

Advice: "To be simple is the best thing in the world; to be modest is the next best thing. But i am not sure about being quiet."

[G.K. Chesterton]

Smart. "Horses are smarter than people. You don't see no horses standing in line to bet on no people.

[Shotgun Foley, racetrack groom]

Future. "I have seen the future and it is very much like the present, only longer. --"

[Kehlog Albran]

Hammer. "If one only possesses a hammer, everything is treated as if it was a nail."

[Saying]

Satellite News (11-2015)

AO-85 (Fox-1A)..... AMSAT NA

AO-85 (formerly Fox-1A) is the first of AMSAT's Fox-1 series of 1U cubesats. Launched as part of ELaNa XII on the October 8th, 2015 NROL 55 Atlas 5 launch from Vandenberg, California, AO-85 is in a roughly 65 degree inclination, 518x810km orbit with apogee over the northern hemisphere.

AO-85 carries a U/V FM repeater operating at up to 800mw. Uplink was planned for 435.180, but initial reports indicate it may be closer to 435.172 due to unforeseen temperature differences. Downlink is 145.980 and includes Data Under Voice (DUV) FSK telemetry simultaneous with repeater operation. A high speed data downlink at 9600 bps is available for experiment and high resolution data. In addition to the amateur operations, there are a number of scientific experiments on board the spacecraft. Vanderbilt University is providing a Low Energy Proton radiation experiment, and Penn State University – Erie a gyroscope experiment.

From Oscar News by HB9SKA, Nov-2015

New Satellite: Oscar 85, (AO-85) ex Fox 1A.

The first of the foxes, a 4" cubesat is available now as an FM Repeater. The downlink is very strong and should be audible with just about any antenna! The frequency:145.980 MHz, varies with the temperature of the Tx: -500Hz at 10degreeC to - 2kHz at 40degreeC.

The uplink frequency is generally reported to be close to 435.170 MHz. The repeater lacks sensitivity, when activated and kept on using the 67Hz CTCSS tone. A likely cause was confirmed an unfortunately cannot be corrected.

Some real DX:

Oscar 7, (AO-7) 7530

Andre, DO9OAM, worked KA4G (FM17jm) using the mode B transponder. The distance, a respectable 6,658 km. Andre was using just 10W and a 2x10el cross yagi on the 70cm uplink and a 10el 2-m Yagi on rthe downlink.

...and some "Old News" regarding Oscar 29 (FO-29) / 24287

Frank Griffin, K4FEG and Erich Eichman, DK1KB report a successful contact, that took some calculating. First the distance bridged calculated to 7,538.7km. Such extreme contacts are only possible every 4 to 6 months. Then there are only 3 orbits where it might work. The 3rd and last try was a success. The elevation at Franks QTH was only (calculated) .1degree take off ant at Erichs QTH 1.4degree. This was not an "easy contact" and vouches for the quality of Erichs program: SatPC32.

AURORA SURPRISE PROMPTS ROCKET LAUNCH 26 Jan, 2015

A geomagnetic storm erupted during the early hours of Jan. 26th, sparking a surprise display of bright auroras around the Arctic Circle. Scientists took the opportunity to launch four sounding rockets from Alaska's Poker Flat Research Range to study the effect of solar storms on the upper atmosphere. Photographer Jamie Adkins created this composite shot of the rocket salvo:

Richard Collins, a principal investigator from the Geophysical Institute at the University of Alaska, Fairbanks, explains the purpose of the launches: "Recent solar storms have resulted in major changes to the composition of the upper atmosphere above 49 miles (80 kilometers), where enhancements in nitrogen compounds have been found. These compounds can be transported into the middle atmosphere where they can contribute to ozone destruction."

But do these ozone-destroying compounds actually make it down to the ozone layer? "Meteorological conditions do not always allow such transport to occur," he says. Instruments on the rockets were designed to investigate those conditions--specifically, how turbulence and diffusion might cause compounds to mix downward in the atmosphere.

Two of the rockets released trails of trimethyl aluminum (TMA) vapor, creating whitish clouds that were photographed from several ground stations. Miguel Larsen, a principal investigator from Clemson University in South Carolina says "this will help us trace turbulence in the atmosphere/space transition



region, and thus, the way atmospheric properties are mixed vertically."

Browse Spaceweather.com's photo gallery for more pictures of the colorful experiment.

Going back in Time :



1964 Stamp

& 1952 Transistor

This 5-cent stamp honoring the nation's 250,000 amateur radio operators was first placed on sale through the Anchorage, Alaska, post office on December 15, 1964.

Designed by Emil J. Willett, the stamp portrays a radio broadcast wave and a portion of a radio dial. It was in Alaska that "hams" wrote another chapter in a long public service record by maintaining communications following an earthquake. It was issued on the 50th anniversary of the American Radio Relay League.

This stamp was printed by the rotary process and issued in panes of fifty stamps each. An initial printing of 120 million stamps was authorized.

Reference:

Postal Bulletin (November 19, 1964).

This stamp came out just over 50 years ago. It shows amplitude modulation as displayed on a monitor scope and a large analog dial on the right. SSB was still a novelty and all processing was done in analog fashion.

The Transistor is making its Entry

Newspaper Article, Abstract, from the 5-1-1952 Rheinische Post (translated)

Newest transistor models: Micro TV Camera and Wristband Radio

Radio, TV, Radar and many other magic tricks of electronics are not thinkable without the electron tube. Millions upon millions of those sensitive glass bulbs are in use. Now, there is a new invention, developed enough to compete with the tubes. This is the transistor, a quite uncomplicated amplifier, unbreakable, extreme economical and not larger than a coffee bean. After three years of intense work in the laboratories of Bell Telephone, the transistor is now ready for mass production. Already today 20,000 are produced every month. The Transistor will make it possible to implement many future dreams: the vest-pocket quality radio, the TV camera the size of a Leica.

From the September Contest.

Just a Sample From the October issue of *Cheesebits*, very interesting. There is much more, take a look!

From Wayde K3MF

I am not in a good location being 70 feet BELOW average terrain so I pointed my EME array at the moon 4 x 2m x 20 1 KW on 2 meters. 21 QSO's off the moon.

On 6 meters I was using an 80 meter dipole 100W.

432 using my EME array 8 x 25 K1FO's 1.2 KW . On 432 QSO's are possible but the other stations have to be pointed right at me because my array is very narrow. 432 EME was out of the question, moon and sun lined up and I had 12 dB sun noise.

I had 55 QSO's total. Score 2501.

50 MHz. 6 QSO's 4 grids.

144 MHz. 43 QSO's 32 grids.

432 MHz. 6 QSO's 5 grids.

Running "Instant Track" in DOS

By Steve, K8UD

As most of you have used DOS programs before the WINDOWS platform came about, many still have these old faithful programs in storage. With most windows programs up to WindowsXP, you could create a dos partition within the windows program. After VISTA, windows 8 and Windows 10, this is no longer possible. Now there is a stable dos shell program which will emulate DOS with very good stability.

The Program is call DOSBOX. And this can also run on MAC, Linux and other programs. To run it, go download the program from www.dosbox.com. Originally, this was developed for gamers that did not want to stop playing

their favorite DOS Games. However, ham operators can also use it on older programs, such as the very popular "Instant Track" satellite program, "Quick track", UpDown and many other programs. Once you have it downloaded, go ahead and install the program like any other windows programs.'

Once installed, run DOSBOX and two windows will pop up. One loads the config file and the other will give you the traditional Dos Prompt > To give you a short cut or a better understanding on an actual use, I did set up Instant Track and these are the steps I used:

First thing you install Instant Track on the hard drive, so I use `C:/Link/IT/` next I copied all files from the diskette onto the IT directory. The next step is to mount the hard drive with the directory. I use this command `mount c c:/Link/IT`

by default DOSBOX loads in drive Z: Once you have mounted your virtual DOS Drive, simply type `C:` and you will be in the directory that you want.

In my case, I am now in the IT directory. You are now done. just type `IT` and it should run the program. When I first ran this, it opens in the original screen size, 640x480, so if you like full screen, type `ALT-Enter` and it should pop to full screen.

Run the program and use all the keys within the program as you would normally. When finished, you can also use `Q` to quit. When you are back to the dos prompt, just type `exit` and the DOSBOX will close.

Remember the batch files you created to make it easier to run dos programs. Well, you could recreate those same batch files and place links on your desktop for easy access, but then where is all the fun in running programs by the old dos prompt.. Have fun.

73 de K8UD Steve Coy

Long Winter Nights

So you got your station in order and working fine, you checked your antennas and they are OK and ready for the winter. Time to relax and get ready for the x-mas season, get presents for your family and friends and maybe something for yourself. But what about the long winter nights?

I am subscribing to the "Funkamateur", a German Ham Radio magazine that rivals the German national club magazine "CQ-DL" and even compares favorably to our "QST". The November Issue had a bunch of articles that only indirectly had to do with Ham Radio. Sure you had to be a ham but the subject of the articles had to do with other problems.

I will briefly describe a few: 1) A Cat Fitness Machine. 2) A 5el Yagi for FM Radio DX.
3) How to expel/drive off moles. 4) LEDs in your house (3 pages) 5) CB radio with digital modulation.

The Magazine has 111 pages, 23 devoted to advertising in a separate section. The format is 8"x11.5".

Here a few words about the individual subjects:

1) Cats like to chase light spots, the device uses two mirrors and a laser beam to motivate the cat.

2) This broad banded Yagi pulls in far away FM radio stations.

3) Moles cannot see, but their hearing is excellent. The device generates a number of annoying noises and the moles will gladly move away. (to your neighbor?!)

4) This article, on three pages with 7 pictures and one graph, gives an excellent overview of the present offerings of LEDs. In the introduction the old incandescents and fluorescent lights are explained. The LEDs beat them all. However, as efficient the LEDs are, some heat is generated and needs to be dissipated. Weak points are the power supplies, not the LEDs. It leads to the problem that perfectly good LED lights fail because of poorly designed power supplies, especially Chinese products are prone to failure. I have about half the lights in the house replaced with Leds. Some lights, especially the 4foot fluorescents and the recessed ceiling lights, take some thinking and trying out, even some rewiring with new power supplies. Steve, K8UD, changed a few in his business and it took him 1 hour for each fixture.

5) This is something to think about. It caught me up on evaluating the digital modulation technique. We all got used to the PC and the dig TV, the telephone, the modems and the codec ICs. But with Ham Radio, CW and SSB still dominate.

A company in Hildesheim, Germany, "Stabo" offers an HT: "Freetalk Digi" which is in the class of a CB or Family Radio and operates in the 440 MHz region. It works according to the DPMR (digital mobile radio) standard. It comes free and clear from any rent, fee etc. Power output is .5W. The range is pretty much like the (old) analog Hts. The difference, like with your TV, is that the signal is either there or not. The manufacturers seem to forget that one of the attractions of digital is speech compression with resulting savings in bandwidth or longer range. This is practiced a lot by the cheaper mobile phone providers. Cost of the HT is Euro 150.

Wikipedia History of AO-40

Design, construction and launch

Following the failure of the Phase 3A launcher, design studies were undertaken and construction started for two successor satellites, that became AO-10 (Phase 3B) and AO-13 (Phase 3C) respectively.

After the launch of AO-13, design commenced for a Phase 4 satellite. This idea was later shelved, and design of Phase 3D (on-orbit name: AO-40) was undertaken under direction of the project team based in Germany, involving [amateur radio](#) payloads from many countries in [Europe](#).

Assembly was done at AMSAT's Spacecraft Integration Facility in the 'Free Trade Zone Building' at the Orlando International Airport, [Orlando, Florida](#) from 1994 to 2000.

It was launched on 16 November 2000, on an [Ariane 5](#) launch vehicle from [Kourou](#), in [French Guiana](#), and reported cost was 4.5 Million USD.

Operational problems

On 13 December 2000 at 11:23 [UTC](#), transmissions from AO-40 ceased during the exercising of its 400 [newton](#) motor. The Command Team were able to infer that there had been an explosion caused by pressure in the propellant pipes caused by malfunction of the control valves. A protective cap that was supposed to be removed from the motor before launch, was inadvertently left in place. When the motor was fired, pressure built up where it shouldn't, and destructive failure occurred. The loss of the motor caused AO-40 to be left in an equatorial orbit that the satellite was not designed for.

As a result of this incident several pieces of radio equipment no longer functioned or were not able to be commissioned. Following strenuous efforts by the Command Team, signals were restored on 25 December 2000 at 2145 UTC when Command Team member Ian Ashley (amateur radio call sign ZL1AOX) of [New Zealand](#) successfully sent a 'reset' signal to the satellite. Onboard cameras were used to establish the attitude of the satellite, and the [magnetorquer](#) system was used to [spin-stabilize](#) the satellite.

During June 2001, gas from the arcjet motor was vented to raise and stabilize the [orbit](#) of the satellite. The spacecraft got a lot higher than expected. Subsequently, the communication packages and cameras were gradually re-activated.

Failure

On 25 January 2004, [telemetry](#) from the main battery was observed to go to an extremely low voltage by Stacey Mills (amateur radio call sign W4SM), a member of the Command Team. This caused the onboard Internal Housekeeping Unit (IHU) [computer](#) to cut power to the [transponder](#) payloads. Just prior to the loss of control of the satellite, the auxiliary battery came online in parallel with the main battery. When the main battery failed, it effectively short-circuited the auxiliary battery, killing the spacecraft. Many attempts were made to disconnect the main battery, but insufficient voltage was available to drive the relays. One day an open-circuit failure may occur in the main battery, in which case the spacecraft may come to life again. Though the command team believe that the main battery failure was probably a consequence of damage done during the event, and it is likely that similar damage was done to the auxiliary battery, making an eventual recovery of AO-40 unlikely.

On 9 March 2004, Colin Hurst (amateur radio call sign VK5HI) of [Australia](#), a member of the command team, heard a change in the level of radio noise at the expected [beacon frequency](#) during the period 0310 to 0320 UTC (orbit 1541).

All telemetry captured by the command team, and its network of helpers, is archived on the web at the [AMSAT](#) website.