MIDWEST VHF-UHF SOCIETY

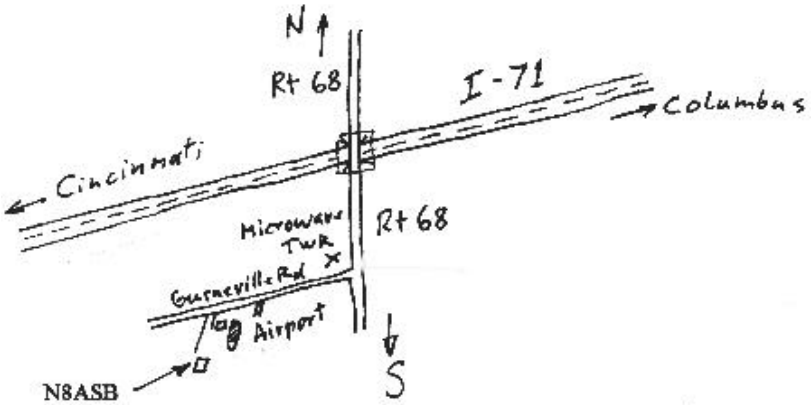
Vol. 21 No. 6 www.mvus.org
August 2007

August Picnic Saturday the 25th See below!

MVUS Sunday Net at 14:30 UT **(currently 10:30** AM **local time, EDT).**
The net frequencies are primarily **144.280 Mc and 28.960 Mc.**

Contents

Sat, Aug 25th MVUS Picnic at Daun's, N8ASB. Details, see next page!



Upcoming Events

HF Frequency Measuring Contest **: Sat Oct 13, see back page**

Microwave Update 2007. **Oct 18-20 10 days left to register at the reduced price of $79. Sept 1st, the price goes up to $89 and will be**

$99 starting Oct 1.
www.microwaveupdate.org

AMSAT Symposium**: Oct 26,27,28 Pitsburgh, PA… www.AMSAT.org**

DE N8ZM

Oh Good Grief, Charlie Brown, August is almost over!

And that means it is time for the annual MVUS Picnic and Tech session. As usual, we will be at the home of Daun and Karen Yeagley near Wilmington. MVUS will bring the burgers and dogs, as well as the drinks. Please bring a small (8-10 people size) side dish, dessert, or snack. Experience tells me that the boys like to munch on chips and such before we eat. I expect to be prodded towards the grill at around one o'clock, so expect to eat around 1:30. Give or take the effects of the weather, which at this point looks likely to be pretty dry, we will be outside under the canopies playing with antennas, etc.

Expect to have available a spectrum Analyzer to 26 GHz, 6 GHz signal source, and 20 GHz Network Analyzer. Unless someone has an HP 346 style noise source, I won't be able to do noise figure this time. That should be adequate stuff to use for most testing, though. If you have any specific test needs in mind, be sure to let me know so we can try to engineer something for you.

As always, your family is invited. The ladies always have a good time chatting, and before the day is over we MUST sing Happy Birthday to Marilyn Dakin. It's a tradition.

So come on out to Daun's any time after 10 AM on the 25th to join in the fun!

Note to Rod Owen: I'll have your amplifier with me. I am putting it in the car tonight!

The last I checked, the tower work for the 1296 beacon has not yet commenced, which is disappointing, but it does give us more time to get things right. It would be great if that work could be completed before Fall ends. There are a number of folks with radio projects who are in the same boat with us; we'll all just have to be patient.

I guess the economy is in pretty good shape, despite the doom and gloom messages from the markets. All of you seem to be so busy that I haven't heard of very many new ideas for fun projects lately. Maybe after Labor Day things will ease up a little.

A couple of great conferences coming up soon are the TAPR DCC (www.tapr.com) in Hartford and Microwave Update (www.microwaveupdate.org) near Philadelphia. I think most of you are familiar with the MUD conference, having hosted it here last year. The TAPR DCC may be unfamiliar to you , but it attracts the sharpest folks who are involved in the digital aspects of ham radio communications. If you are interested in attending either one, let it be known at the picnic and maybe there will be some carpool opportunities available.

Also, coming up on October 13th is the MVUS sponsored Midwest Frequency Measurement Test. Spearheaded by John, N8UR, we will be transmitting signals for folks to measure, and they will be on the air long enough (we hope) that there will be some time to study propagation s effects both during daylight and evening hours. If you know John, you know that he has developed a rather unhealthy obsession for things related to time and frequency. He is creating a highly accurate source and complementary measurement setup so that we should really, really, really know what frequency we are on. Come on along for an interesting day!

See you at the Picnic!

Tom, N8ZM..

Remotes. Our remote now contains 59 buttons, and not only are there days when we can't figure out how to change the channel, there are times when we can't even find the button to turn the set on or off.
[D L Stewart]

The View from Space. "I can see the earth's horizon. It is such a pretty halo … It is very beautiful … I can see the stars floating by through the Visor. It is a very beautiful spectacle. The flight is continuing through the shadow of the earth. I am watching a little star in the illuminator. It is going from left to right. The star has disappeared. … I am watching the earth, flying over the sea … [Yuri Gagarin]

English Measurements. The mile was turned into 5,280 feet; a rod became 16 ½ feet and a furlong 660 feet. That fits 8 furlongs into a mile. And a furlong can be made from 10 chains, where a chain is 66 feet long. Thus a mile can be measured with chains: 80 chains make exactly one mile. [Beakman & Jax]

Gauss. "This was the hardest mathematical textbook in German," his pedantic and rather sadistic elementary schoolteacher objects. "Nobody could study it in a day, and most particularly not an eight-year old with a running nose." But after half an hour of questioning, the teacher turns pale in recognition of the boy's genius…
[from "Measuring the World" by Daniel Kehlman]

Cable Going Digital. For the first time last year there were more digital cable subscriptions than analog. Of about 65 million cable households nationwide, 33 million have digital cable. [National Cable & Telecommunications Associates]

Certain. "The displayed time remaining may not be correct under certain circumstances." [Sony] Your law professor would be proud of you! One of my teachers used to say: "Whenever they say 'certain', most likely they have not a clue what they are talking about." [Gerd, WB8IFM]

Mountain Climbing. "But as the climb goes on, you grow accustomed to the exposure, you get used to rubbing shoulders with doom, you come to believe in the reliability of your hands and feet and head. You learn to trust your self-control." [Jon Krakauer]

Obsession. For years he tried to make rubber survive the heat of summer. "There is probably no other inert substance which so excites the mind", he said, and when his brother-in-law said, "Rubber is dead" he replied "I am the man to bring it back". [Charles Goodyear]

Bureaucrats. "The most despicable of men, petty, dull, almost witless…a holder of little authority in which he delights, as a boy delights in possessing a vicious dog." [Cicero]

Freshwater. Experts say that if all the water in the world could fit into a gallon milk jug, the available freshwater would fit in the bottle cap. Not all freshwater may be drinkable. Some is in the form of ice; some is too polluted to drink. [Andrew Fahlund]

Sunday New York Times. The issue in front of me must have weighed ten or twelve pounds. It could've stopped a bullet at twenty yards. I read once that it takes 75,000 trees to produce one issue –and it's well worth every trembling leaf. So what if our grandchildren have no oxygen to breathe? [Bill Bryson]

Laptops. Some interesting facts from the *"Consumer Reports"* (June 2007) about laptops. Cost of one is about $1000, for an Apple $2000. The displays are adequate, only Apple is good. Features are a little above adequate. Speed is just adequate. Speakers are mostly poor, a few are adequate. Battery time is 2 to 3 hours, only Apple is 4 hours. Weight is 6 pounds. Summed up, newer laptops are cheaper, faster but still have lousy speakers.
[Gerd, WB8IFM]

Rain Scatter (7-07)

By Lloyd, NE8I

Recently there has been a large, and growing amount of rain scatter activity here in the Midwest. Not to mention snow scatter. I have done it for several years now. This is a collection of observations, and a couple of stories on the subject.

Normally, when a storm approaches everything in the ham shack gets disconnected and unplugged. Well, we have been missing a large number of band openings as a result. I first heard of rain scatter at a Central States conference years ago, where some Oklahoma and Texas stations were doing it on 5 GHz, with converted phone company surplus. There were several talks and presentations given. Mostly was about the size of rain drops, theories, ideas, rates and physics. Skolnik's Radar handbook is a good reference on that, if you want formulas and such. Talked with lots of more experienced operators and stations over the years. Too many to list here. Add to that, stories from 2M FM repeaters about band openings on VHF. But mostly complaints, band openings causing problems with the local 2M FM repeater operations, who are trying to do public service work during the storm. Like watching the weather.

Rain scatter, is the propagation created by the rain, snow, winds, hail and storms. Typically, it sounds like VHF aurora, CW being the best performing mode, everything sounds like a hiss. Distortion is severe for SSB, and digital modes. If the signals are strong enough, FM works. So far, 5 GHz, 10 GHz and 24 GHz seem to be the best bands for rain scatter. However, even bands like 902 work, if the storm is just right.

There are plenty of articles on the subject of rain scatter. With lots of ideas, theory and formulas. Plenty of computer prediction programs. The one I like, is available free on the internet, and was designed by K0SM, Andy Flowers. It puts a number of things together, displays national weather radar, and runs a number of distance and other calculations. Currently, the MAMS web site and NLRS have some good rain scatter coordinating and activity. But, don't forget the telephone and VHF links, EG 144.260 or 432.120.

Station requirements are a good question. Running power helps, but, on 10 GHz, I have done rain scatter with 10 mW and a small dish. Perhaps the biggest thing is to make certain the station is in good working order, and keep using it, regularly. Microwave Activity Days (MADs) help there. They are on the first Saturday mornings of the month. Beacons are quite helpful too for checking out the equipment and, of course, propagation..

A big help with the current rain scatter is more activity, we need new stations coming on. This is an especially good mode for microwave rovers, and those who track storms and coordinate weather forecasts. When I look at the weather map, I make a few of my own observations and guesses. Experience helps here. I pretty much know which stations are on and where they are. Then I make a few calls, or send messages.

I would suggest that there are 4 modes for rain scatter. First, there is **refraction**. Second is **reflection.** Third is **transmission,** inside the storm. Forth is **illuminating** a cooperative cloud. The first two modes are at a distance from the storm. Perhaps, these are the most popular. You don't have to disconnect anything. Home stations do not have to worry about lightning. Distances of up to around 600 miles are possible on 10 GHz. However, 5 GHz and the other microwave bands do also quite well. Refraction, using storms to bend a signal, works well, but, there are many details that affect results, like the height of the storm clouds, size and severity of the storm and such. Storm cells can have all sorts of different activity happening at any given time. In my experience, a storm half way between both stations on a direct line works best. Then the storm needs to be intense enough. Some angle to the storm can work or help. That depends. You have to try! At the right angles to the storm cell, you can get that storm to act like a mirror. Had this experience recently with a storm at the North end of Lake Michigan. With K8EB we worked N4PZ in Chicago from Muskegon during MAD.

One suggestions: look for storms with tops over 20,000 feet. As for transmission: when both stations are inside a rain storm (or snow storm) you can experience some unusual effects. Such as: it does not matter where you aim the antenna. The forth case, is working a station via aiming at a storm cloud where a station has managed to illuminate the

entire cloud. This works usually at short range. Wherever I aim at the cloud, there is that station. Still trying to understand that situation. I have observed that case and combinations of cases several times on Lake Erie. If you add lake tropo to it you really can get some highly unusual and confusing results.

Here are some more suggestions learnd from trying out various things over the years:. Maps or computers give a suggested heading. Move the antenna around. Signals do not always go where you expect them to.

One problem with VHF/UHF and microwaves in the Midwest, is trying to be above the trees which really helps. That is important for the Microwave rover locations. The Great Lakes provide lots of good rover sites. The lake itself gives you a wide clear shot maybe over 180 degrees. One observation: rover stations, location, rain, cell phones, computers and computer connections don't always mix well, or work when you want them. One of K8EB's (EN73 Grand Rapids) recent experiences on 10 GHz was working a rover station in Minneapolis, who was operating from inside his garage, with the garage door open. So, with the right conditions, directions, horizon, a tower with antenna over the trees is not always a requirement. The rover station can work from inside the garage. Best story there, is WA8VPD operating in the basement, aimed up, out a basement window. In many of the rain scatter openings, you get sort of a rainbow effect. As a rain shower starts up, signal scatters, increasing rain intensity, the signal spreads out, forming a circle, a rainbow. With intensity, the circle keeps expanding. Aim for the circle. A storm varies in intensities, creating numerous circles and other effects. One can work over hills, obstructions and buildings this way. This can get interesting, and be fun. The only way I can work WA8VPD 12 miles away, is via this mode. A big hill is in the path.

One of the best rain scatter experiences we had a few years back. It was a 10 GHz contest in August on Lake Erie's Perry Park (EN91km). There were WA8RJF, WB8TGY and WA8VPD. We were on the edge of a series of severe storms, and heard lots of rain scatter. Problem was, everyone was stuck operating on 10368.100. Heavy QRM. Trying to sort out signals was fun. It started raining and I grabbed one of my ultra portables, a battery, a key and set up inside a wooden pavilion to operate. Only one of us could use that station. We got to aim in all different directions, to explore and look at the available rain scatter signals, It was fascinating. Oh boy, there were signals. Loud, spectacular. The contest helped, having all the stations on. One of the few times you can call CQ on 10 GHz and get an answer. One of my better experiences, I think the group would agree on that one. I have caught some of these experiences on video tape.

Other bands deserve a mention. 5 GHz usually works really good with rain scatter. In the first January contest when I had 5 GHz, I was at a location where normally I could not work WA8WZG. It was snowing. But on 5 GHz success! There he was, loud !

I have noted that each type of storm, rain, or snow, has a different sound to it. The other day, I was over at WW8M, EN72, he was working K2YAZ in EN74 on 10 GHz rain scatter. They qsy-ed to 5 GHz, then 3 GHz and 2 GHz. All the paths worked. Heard the same rain scatter noise hiss on the CW signal as on 10 GHz. Tried 903. Could hear some of that noise, but also the CW signal was coming through, so could not claim that one. But, it was there. That was a good storm cell, half way between, on a direct path. Normally, that path is blocked by high hills, and does not work on those bands.

24 GHz, is another interesting band. I have done some rain and snow scatter there. Maximum at this point has only been about 25 miles or so. There are not many 24 GHz stations on, but more are showing up every year. In spite of the water absorption and all, the scatter is there, and it works. Ice, and ice storms reflections on 24 GHz are really interesting. Everything coated with ice becomes a mirror. How about 47 GHz, good question. Don WW8M and I have seen several promising experiences there.

Soon will be the 2007 10 GHz cumulative contest. A few more good Microwave Activity Day's, and who knows? More fun experiences.

73,
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Open House (EME)

The Mid-America Microwave Society held an informal get-to-gether last Saturday (8-11-07) at the former Voice of America (VOA Bethany) site. It was a beautiful day and quite a handful of hams showed up. Steve, K8UD, and I got there a little late as some were already leaving and Mike, KA8ABR, was about to cover up the dish mounted equipment.

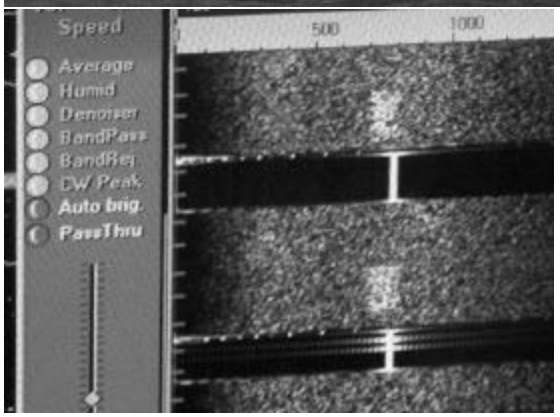
The VOA short wave station was built at the beginning of WW2 to reach the world and report about the war. The motto was: “The news maybe good or bad – We shall tell you the truth.” It was designed and built by the Crossly Corporation whose powerful WLW station and unique antenna was just down the road.

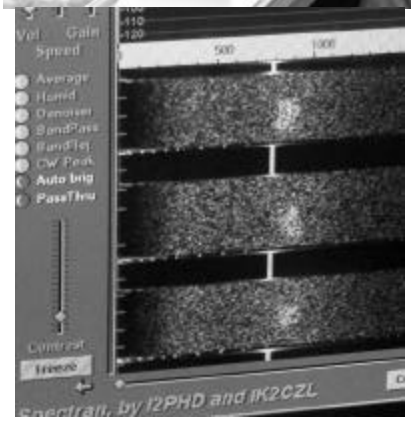
After WW2 the station was very active with a wide network of similar stations around the US and the world during the long years of the Cold War. However, the Bethany site was decommissioned after the Cold War ended in the 1990s. All the mighty short-wave “curtain type” antennas were taken down, a lot of acres of land was sold and the rest, including the building, given to the community for a park and a museum. As a consequence the landmark antennas are no longer visible from the I 75 freeway to alert you to exit and I have actually overshot the site on one occasion. There are now restaurants and several big stores and a total of 4 red lights before you come to the old VOA site.

The West Chester Radio Club in conjunction with the museum operates a Ham Radio station and the microwave group uses a remaining 25 foot dish for 10 GHz EME. This was, of course, the main reason for our visit.

Below you find three pictures, the dish, Mike, KA8ABR, at the station and a waterfall display of an EME test in CW using a power of only 4 watts. The echoes were clearly visible although the sound was a little bit harder to pick up.

Later, Jim, N8ECI, gave an excellent presentation on stable oscillators which are very important in helping to find your and everybody else’s signal at the higher microwave bands. He showed us a unit he is building and we have a brief description in the following issue of our newsletter. [Gerd, WB8IFM]





Software: I2PHD + IK2CZL

An Excellent Site…10GHz Contest 8-18-07

By Mike Suhar, K8RKO

N8ECI, and I operated from the former VOA Bethany site for the 10 GHz contest. We obtained permission to set up on top of the sledding hill in the VOA Park. However, we could not leave the vehicles up there. That hill was perfect and the weather was perfect. The hill is an estimated 130 to 150 feet above the surrounding land, giving us 360 degrees visibility. Jim's best DX was with a station in Ann Arbor, MI, which must at a distance of 200 miles. Jim borrowed the transverter from the 25' EME dish at VOA for this occasion.

A few other members of the West Chester club stopped by during the day.

We had a strong breeze all day on top of that hill, A gust of wind caught Jim's 2-meter antenna and sent it crashing to the ground.

My own station ended up being unusable from the start. I saw the magic smoke exit my rig after I was doing a quick swap of batteries, inadvertently using the wrong polarity. I am not sure how bad the damage is to my white box. Will have to do some checking and repair.

VOA Building seen from the hill station>>>

Jim, N8ECI

Jim, N8ECI in the windy operating position

The "smoked" Station of Mike, W8RKO

Lake Erie Rover Sites

By Lloyd NE8I/Rover

Perry Park, EN91kt. Next to the nuclear plant on Lake Erie E of Painesville. End of Perry Park Road, off US20. Paved access. Good for all rovers. The park has a parking area right up against the edge of the bluff, which is about 50 feet above the Lake. Excellent horizon. You can park right up where you need to be. Good operating horizon. Well-maintained park. Nice wood fence. Has a nice open pavilion. During rain, have operated on a picnic table from there. Operated there a few times. I have not been to the **Geneva** site, EN91mu, but reads good. Always good to find new Rover sites along the lakes.

Downtown Cleveland. Lake Erie State Park is another good one. EN91dm Right off I-90 at Dead Mans Curve. I operated from there a couple of times. Tremendous signals. Strongest signals I have ever put into Michigan. Regular Lake Erie Tropo path. Right down on the Lake. Fantastic signal paths into Ontario and Michigan. Lots of parking. Paved. Good for all rovers. However, it is a busy park, in the big city. Near the Science Museum, the USS Cod submarine, the Mather freighter (museum) and the Rock and Roll hall of fame.

Further West:

Vermillion, EN81uk, all rover, paved, on top of a bluff, 50 ft above the Lake.

Marble Head State Park (light house) EN81pm, SR163 all rover right on the Lake, but very limited parking.

Port Clinton EN81mm, also on SR163, again all rover, but very limited parking, right on the Lake.

Crane Creek Sate Park EN81oj Off SR2. Lots of parking, all rover, on the lake, but lots of trees between the parking lots and the Lake. Also has a walk up observation deck, which gets you to the treetops. Near the ranger station.

SE Michigan

Sterling State Park (Monroe, Mi**)** EN81iv. Exit 15 on I-75. Center parking lot best. Lake Erie Metropark EN82jb. I-75 Exit 29. Both have good parking, on the Lake. Both have park fees to enter. Terry AA2LY mentioned

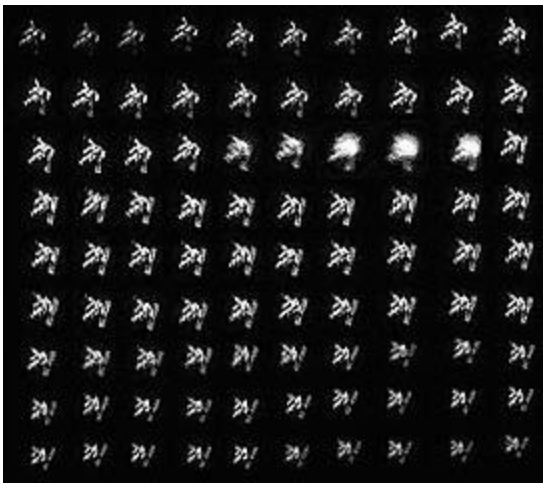
Luna Pier EN81gt. Small city park. Limited parking, on the lake.

GP Hill. EN82em, New Hudson Mi. I-96 155B exit. Lyon Community Park. Many miles inland, but good hill site overlooking the Lake. Furthest West parking lot at the top of the hill. gravel road and gravel parking lot. All rover operating site. Problem is, nice holiday weekend; parks are likely to be pretty busy. Recommend getting there early. For those traveling through Toledo, I-280 is under construction, but open. The new bridge is not done yet, but quite spectacular. Longest Bridge in Ohio.

The Canadians have a pile of good rover sites on Lake Erie. Well worth to have an Ontario or Lake Erie map, so you can see where you are going in regards to the lake.

Photographing the Space Station (NASA)

SS FLARES: Assembly of the International Space Station continues apace in Earth orbit, and with each new flat surface added to the station, the odds improve that you might see an "ISS Flare." Dave Storey of the Isle of Man, UK, photographed this one on June 11th:



"A hole in the cloud cover developed this evening and I was able to have a go at chasing the ISS with my 6-inch refractor," says Storey. "As I tracked the station through the finder scope, the station flared when sunlight glinted off a flat surface."

The space station in the night sky ordinarily rivals Jupiter or Venus. When it flares, it can double in brightness--or more. That's something to see; the trick is knowing when to look.

HF Frequency Measuring Test Coming Up.

The Midwest VHF/UHF Society (located in Southwest Ohio) is pleased to announce that the first annual MVUS Frequency Measuring Test will be held on Saturday, October 13, 2007**. There will be two transmission periods: the first at 14:30 EDT (1830 UTC), and the second at 21:30 EDT (0130 UTC Sunday). Transmissions will be on the 80M, 40M, and 30M amateur bands from** Dayton, Ohio **under the callsign W8KSE.**

Our goal is to transmit a signal known in frequency to parts in 10e-12 (i.e., less than 0.0001 Hz error at 10 MHz) and stable to at least that level during the course of the transmission. The transmitted signals will also have very low phase noise. Frequencies will be measured at the transmitter site with a system capable of microHertz resolution referenced to a GPS disciplined oscillator, and will also be monitored by another station in groundwave range that can measure the frequencies with similar accuracy.

The MVUS Frequency Measuring Test is intended to supplement, not replace, the ARRL FMT. Our transmission format is still under development, but we plan to offer significantly longer key-down times to allow not only
accurate frequency measurements, but also propagation studies (e.g., measuring Doppler effects as the ionosphere changes during the course of the test).

Further information, including approximate transmission frequencies, will be posted at http://www.febo.com/time-freq/FMT. You can also send email with questions or comments (or, after the test, your results!) to "fmt@mvus.org".

For discussion about off-air frequency measurement, we suggest you check out the FMT-nuts mailing list, sponsored by Connie Marshall, K5CM. For details, go to http://tech.groups.yahoo.com/group/FMT-nuts/