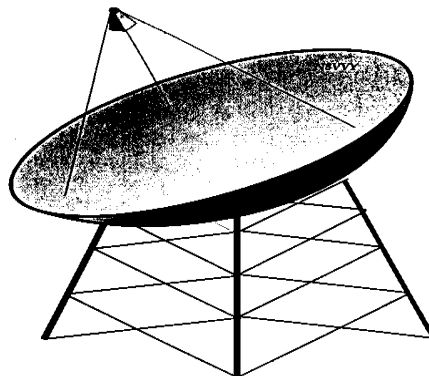


Anomalous Propagation

The home page of

The MIDWEST
VHF-UHF
SOCIETY



Vol. 17 No. 3

March 2003

Club Memorial Call W8KSE

Our **March Meeting** is on Fri. 28th at 7:30 PM at the Perkins Restaurant at SR 73 and I-75.

Discussion Topics: 10 GHz Activity, Hamvention and more.

The Midwest VHF/UHF Society brings together hams with strong interest in building and experimenting at the higher frequencies including microwaves & light. The society provides exchange of ideas with monthly meetings and a technically oriented newsletter (called Anomalous Propagation). Noise figure and antenna measurements are performed at the Hamvention or on demand. Building projects are undertaken and surplus or special parts are procured. The society has presently 90 members, most from the tristate area (OH,KY,IN) but also from other parts of the US. Why don't you join us, membership is \$ 8.- per year (foreign \$ 15.-). Mail your check (made out to Gerd Schrick) with name/call, address & telephone number to: Gerd Schrick, WB8IFM, 4741 Harlou Dr. Dayton OH 45432.

The Society meetings are on the 4th Friday of the month at 7pm except for May, July, and December when the Hamvention, Central States Convention and the Christmas Party take their place. The meetings are held at the Perkins restaurant located at the NE-corner of I-75 SR 73.

The Newsletter appears monthly except for May, July and December.

Officers for 2002/2003: President Tom Holmes, N8ZM (937) 667-5990

Secretary Steve Coy, K8UD (937) 426-6085

Treasurer Gerd Schrick, WB8IFM (937) 253-3993



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SVHFS Conference Huntsville, Alabama April 25-26, 2003 (see Back of this News Letter)

For reservations call the Marriott Reservations Department, toll free, at (888) 299-5174, the hotel at (256) 830-2222. When making reservations, mention the Southeastern VHF Conference to get the special rate (\$ 75.-). Make your reservation by Thursday April 3, 2002.

Dayton Hamvention, May 16/17/18, 2003

Achtung ! Due to rising costs Dues are increasing in May, see "De N8ZM" on the next page.

Dues in any amount can be made throughout the year and membership will be prorated accordingly.

De N8ZM

Well, believe it or not, today as I write this it is the first day of Spring, which should give you some idea of how close I cut getting this done in time for Gerd to get Anom Prop out before the meeting. After seeing way too much white stuff (our friends in Colorado no doubt would tell me I don't know what too much is!), the grass is finally starting to turn green again. Which means it is time to start thinking again about getting out to do antenna work and, maybe, get on the microwave bands. Those of you who are on the club's e-mail distribution have already seen a note from Brad Totten proposing a 10 GHz operating day. The basic premise is to set up at several promising high spots around Dayton and try out our 10 GHz stations. We have discussed a couple of possible sites, and I am sure that you guys will have ideas for a few more. The only criterion is that it has a reasonably unobstructed view towards some of the other locations where someone is set up.

There are a number of details that need to be worked out, like time, date, location, liaison frequencies, and who brings the potato chips, but that is why we have regularly scheduled meetings. So plan on being a part of the discussion. Brad's original proposal was to use a meeting night for the activity, which now that the days are getting longer, could be a possibility, but there was also some discussion that a weekend day would give us more time to play. SO please have some thoughts on that in mind, as well. Proposed dates would be in late April to avoid crowding Hamvention too much.

Speaking of which, I still do not have the details on our booth space for the show, but hope to by Friday.

Meanwhile, we need to start planning what we are going to have in the booth, and who will be "doing time" there to represent us. We are fortunate in that we are the only VHF organization to have a booth inside, and we should promote our aspect of ham radio on behalf of all the VHF and microwave groups around the country. I would guess that we should have some 10 GHz equipment on display, at least. Of course, we will also be collecting dues and enrolling new members. But I am looking for ideas for something in the GEE WHIZ! Category that we could do to attract attention to VHF weak signal work. Hamvention's theme this year is Year of the Youth, so it would be appropriate for us old geezers to try to do something to attract some young blood to MVUS and to VHF in general. If you have any ideas, please share them with us at the meeting; we still have enough time to pull something flashy together. I'd also like for the space to be an attraction for all VHFers to use as a place to meet. Maybe we could set up a test bench to provide VHF and microwave test signals. Let me know what you think!

Thanks go to Bill Eaton, K9AYA, for donating a PIN modulator for our 10 GHz beacon. We also got an offer from Jim, WB9SNR; he had some lower 6 GHz PIN modulators that might work at 10 GHz to offer.

Another subject we might want to discuss at the next meeting: should we offer to send the newsletter by e-mail to members who so desire. Membership dues would be reduced accordingly. Jim, WB4GCS, suggested this.

See you Friday! Tom, N8ZM.

10 GHz Activities in Michigan

By Lloyd J. Ellsworth, NE8I

Two new 10 GHz stations, using Macom white boxes are operational; KB8U, Russ near Hillsdale in EN71 and K8EB Erwin near Grand Rapids in EN63. Both have 2-foot dishes. There are four more **white boxes** that I know of here in Michigan, and I have been working to help encourage the owners to get them on 10 GHz.

I am setting up a conversion assembly line in my basement. I invite anyone interested over for the conversion, probably on a weekend in April or May. I will send out word as soon as things are firmed up.

After the white box conversions, I will be moving on to the Qualcom beacon assembly line project. The goal there is to build about a dozen 10 GHz beacons to install around the region. I will keep everyone posted.

The NE8I/Beacon on 10368.275 +/- in EN82jm is getting used mostly to check out snow and rain scatter and learn more about this propagation mode. It will be on and off the air for a while as the 1W amp is installed and tested.

Mark, WB8TGY is working on encouraging, generating and coordinating activity for this year's 10 GHz + cumulative.

This and That 3/03

- · E-bay Fraud. A major scam casts doubt on how effective E-bay's "Fade" (Fraud Automated Detection Engine) is. E-bay maintains that less than one hundredth of 1 percent of all listings is fraudulent. But with 180 million items for sale in the fourth quarter of 2002, E-bay could have hosted as many as 18,000 fraudulent auctions in the last three months of last year. [Rachel Konrad]
- · Kahkis. What you need to start the car in Boston.
- · Air Pollution. According to the EPA, 70,000 Americans die every year from air pollution, largely caused by cars and trucks. The other day, we were doing some cross country skiing on a bikeway that ran parallel to a freeway and the xyl complained about auto exhaust in the air. We don't usually notice this in the summertime. Clearly, the lack of greenery makes the pollution worse and it lingers about longer. [WB8IFM]
- · The Celsius Poem. 30 is hot, 20 is nice, 10 get on your coat, 0 is ice. [NASA]
- · Queen of the Internet. "People don't understand that all that's on the Internet is other people." [Esther Dyson]
- · The Big Dipper. In a recent presentation about dip meters, Al, KP4AQI, related the following story. A disaster agency was looking for some powerful dipmeter. You see, ordinary dipmeters only work in close proximity of the test object. Here the objective was to search for humans trapped under several feet of concrete rubble. It turns out that a human body shows a resonance around 9.5 MHz. But it takes about a 100 Watt dip oscillator coupled with a very sensitive meter to do this job. [KP4AQI]
- · Big Bird. Walking through our local "Home Depot" I came across the bird feeder section and noticed some huge feeders I had never seen before. I guess they go nicely with these big houses they now build. These feeders are definitely suitable to accommodate pileated woodpeckers, crows, and possibly Canada Geese. [WB8IFM]
- · It's the Humidity. Having survived 5000 years, the pyramids are now in danger from visiting tourists. Each person who enters the interior of the pyramids leaves behind an average of 20 grams of water in breath and perspiration. When Khufu's pyramid was closed for cleaning in 1998, the humidity level inside was 80%, and the walls of the Grand Gallery had salt deposits as thick as 2 centimeters in places. [Tony Stroud & Hawass]
- · How was the Winter? Now with spring upon us, this is what an honest weather reporter * had to say: "Let's take a look at how winter forecasts fared - it wasn't good." [*Jamie Simpson]
- · Dying from Old Age. A strange thing happened the other day. I noticed that the 4' fluorescent lamp that illuminates our stairway to the basement was not doing a good job anymore; or were my eyes fooling me. Well, the xyl confirmed the light was "kind of dim". So I exchanged the tube and "voila" the old spunk was back. A 4 inch section on one end of the old tube was really black! Usually a fluorescent goes bad by a failing start mechanism, but this was the first tube that I had seen die of "old age". [WB8IFM]

Resistor Pick-a-thon

By Gerd, WB8IFM

We met at Steve's business, Consolidated Electronics, on Sat, 22 March for the scheduled resistor picking. Six of us showed up, as it turned out just the right number to fix up 16 sets each of $\frac{1}{4}$ watt and $\frac{1}{2}$ watt sets of regular carbon film resistors. As we trickled in, Steve was just about finished printing the 1,888 3x5 envelopes that we had decided on to hold the individual resistor sizes.

These envelopes are widely available, a handy size, and they fit into a shoebox. John, N8VZW, had already used this approach and I have used this system for my 35mm negatives (remember those?). As it turned out, shoebox size varies and not all have the proper width. But it ought not be too hard to find the right size.

Steve had the resistors and envelopes nicely laid out on tables and everybody (except Steve) had a nice sit down workplace for stuffing the envelopes. We got started at 10 AM and finished up just before 2 PM. This included a $\frac{1}{2}$ hour lunch break, where Steve treated us to pizza, which was brought in. Participating were Mike, WB8GXB, Daun, N8ASB, Tom, W9NBS, Bruce, ND8I, and, of course, Steve, K8UD, and myself.

Everybody took home a complete set of $\frac{1}{4}$ and $\frac{1}{2}$ Watt resistors. The sets contain 59 values with 12 of those most common ones in quantities of 20 and the rest at 5 ea. Price range: \$ 11.- for the $\frac{1}{4}$ W and \$ 14.- for the $\frac{1}{2}$ W.

Steve will have a bunch of sets available at the next meetings.

Rover Sites / Descriptions

By Rich, W2RG

1. **Devou Park:** 39.0794 W, 84.5358 N. EM79rb. A high hill overlooking the Ohio River and downtown Cincinnati. At the parking area, the horizon is mostly unobstructed from northwest through northeast. At the edge of the bluff (about 60 meters from the road), the horizon is mostly unobstructed from almost due west to slightly south of east. The rest of the compass is obstructed by trees, buildings, and terrain. Located in Covington KY. Driving from Ohio, cross the river via I-75, take the first exit in Kentucky. Head toward Ludlow KY and watch for signs for Devou Park.

2. **ODOT:** 39.4359 N, 84.2812 W. EM79uk. The horizon is low with minimal obstruction for several miles looking southeast through southwest. Ohio Dept. of Transportation buildings lie to the west. The terrain rises steadily to the north, heading towards the Otterbein site. Trees and other obstructions lie to the east. Located near Otterbein OH on the west side of Hwy 741 south of Hwy 63. During business hours, check in at the main building and obtain permission to operate from the site.

3. **Otterbein:** 39.4437 N, 84.2766 W. EM79uk. The horizon is low and unobstructed for several miles looking southeast through west. Warren County maintenance buildings lie to the northwest. The terrain rises slightly but with little obstruction from north through northeast. A line of trees lies a short distance (500 meters?) to the east. Located near Otterbein OH on the east side of Hwy 741 north of Hwy 63. Enter from 741 at a small side-street heading into the Warren County maintenance facility. Follow the road around to the right past the short silos.

4. **VOA:** 39.3556 N, 84.3565 W. EM79ti. A large public park. The horizon is low and unobstructed in most directions depending on the location within the park. Located west of Mason OH. As of summer 2002, the only entrance was from Tylersville Road, though a new entrance on the north side of the park was under construction. Huffman Dam: 39.8 N, 84.1 W EM79WT el of spillway 835'

5. **Huffman Dam:** 39.8 N, 84.1 W EM79WT el of spillway 835' The dam is at the intersection of Rt. 4 and 444. From Dayton go north on 4 a few hundred feet past the cloverleaf, then turn right. Coming south on 444 turn north (right) on 4 then turn right to the dam. Visibility is to the south across Dayton.

6. **I-675 / 35 Overlook** 39.77 N, 84.09 W EM79WS el 920' Landmarks: bikeway access, gazebo, church & cemetery on Dayton Xenia Rd. (old 35) Coming from Dayton on Linden Av. Which changes to Dayton Xenia at city limits, continue under 35 the I-675, the overlook is on your right.

7. **I-75 / 725 Overlook** 39.63 N, 84.23 W, EM79VP el 1000' est. This site is located at the SW corner of the intersection and has a clear view to the north all across Dayton.

8. **Beacon**

More about Noise

By Gerd, WB8IFMB

At the last meeting, we had a lively discussion about “noise”. This was because of my comments and arguments for choosing the low noise preamps for the “white boxes” in the February newsletter. Therefore, let me again try to make this a little clearer.

Dbs are not a good way to characterize the noise being generated in receivers. That is because db is just a number or, as somebody at the meeting pointed out, a ratio. Dbs can be added and subtracted helping in figuring out the gain or loss in an amplifier chain. Applying this general rule to a receiver with a 1 db noise figure and compare it to a receiver with a 4 db noise figure we would expect for the latter to produce twice as much noise. However, the real difference between those two receivers is 7.7 db or 6 times as much noise not two times as the three dB would indicate.

In the 1930s noise figure was associated to our room temperature, which was, at the time, a choice as good as any. But as frequencies were pushed up the VHF, UHF, and microwave ladder, room temperature became more and more irrelevant. There is, however, still some use for the noise figure. For cables and other attenuation (relays, circulators etc) between the antenna and the receiver input, those items being at room temperature, the noise figure is exactly equal their attenuation in db.

I suggested to use noise temperature instead of noise figure. If you do this, all calculations become real simple. You see, the noise generated by a device is directly proportional to the noise temperature. In exact equations you find the term kTB for noise power, where k is the Boltzman constant, and B is the bandwidth. The bandwidth B in our calculation is almost always the same, so we only need to consider the noise temperatures of the different components in order to compare our systems.

The equations to convert noise figure (NF) into noise temperature (T) is: $T = 290 (10^{.1NF} - 1)$

And to convert noise temperature into noise figure:
 $NF = 10 \lg (1/290 T + 1)$

Noise **factor**, by the way, is the number which the noise figure represents: e.g. 0dB = 1, 3dB = 2 etc.

Let's go through an example to quickly calculate a system noise temperature:

Frequency 400MHz, sky temp: 350, LNA .4db, cable loss including connectors 1db, antenna relay .2 db
Converting all the dbs into temperatures we obtain: 350, 280, 750, and 140. Immediately, the high temperature for the cable stands out and confirms my old saying, any cable is a bad cable! Try to do without. Adding up the individual temperatures we obtain a combined (system noise temperature) of 1520. Let's say you eliminate the cable (mounting the preamp at the ant). Now we have 770, which is half the noise or a 3 db improvement. *)

One variable is important, the **sky noise** temperature, also sometimes referred to as antenna temperature. This expression is sort of accurate, but totally depends on what the antenna is looking at. At 400 MHz the sky temperature varies from a low of 150 to a high of 2800. For 136 MHz these temperatures are 2000 and 36000. How does this affect your antenna, which is usually pointed at the horizon? Well, the ground reflects the sky into the antenna (which explains the importance of a nice flat ground in front of your antenna) and since the earth rotates, different parts of the sky determine the noise temperature. EME programs usually provide sky noise temperatures around the moon, and satellite tracking programs give you the sky noise in the neighborhood of the satellite being tracked. Some programs can be manipulated to give you the sky noise in the azimuth you are interested in.

At higher frequencies the noise temperature gets much lower (between 1 and 10 GHz we talk about the “microwave window”), which explains that much less power is needed for communication. One last comment; although the sun is not a radio intensive star, but rather emits mostly light, it nevertheless radiates enough power across the radio spectrum to cause signal blackouts. Sun noise is often used to check and confirm the performance of a low noise microwave set-up.

*) Assuming the additional noise contribution by the then following rx is negligible. An example: rx NF 6db=86000 LNA gain 23 db=200. Additional noise at input of LNA 8600:200 = **4.30**

SVHFS Conference Huntsville, Al, April 25-26, 2003

By Tom Shutters, K4FJW

Be sure and take the family. This conference is near the Space Center and there are two days of fun filled activities for the family. My XYL(Patty) really enjoyed the Oak Ridge Conference last year and is looking forward to this year's conference. It looks like the ladies may have more fun in Huntsville than we do.

Antenna Measurements on Friday start the event off. The "back scratcher" antenna competition will be very interesting and should produce some real antenna science.

Listing of presenters: (starts Friday and continues Saturday)

Owen Wormser, K6LEW, Receiver test procedures
Steve Kostro, N2CEI, unknown
LB Cebik, W4RNL, long boom yagis
Paul Goble, ND2X/5, 23cm amplifier and Generic talk on Russian tubes
Dale Parfit, W4OP, Omniangle, Moxon and End-Fedz antennas
Chris Imlay, W3KD, general counsel for ARRL, unknown
Don Crain, W4OC, unknown
Bruce Clark, K0YW, Project Diana
Ray Rector, WA4NJP, QRO antenna relays, plus two other unknown short ones
Chris Gare, G3WOS, 8877 six meter travel amp
Ott Fiebel, W4WSR, unknown
Al Ward, W5LUA, unknown
Tom Whitted, WA8WZG, unknown.
Bob McGraw, K4TAX, lightning protection

The SVHFS Auction is on Saturday afternoon, and Ray Rector (WA4NJP) is the auctioneer. Last years auction was worth the trip to the conference, and I have heard through the grapevine that Ray has been practicing his auctioning skills to bring even more pandemonium than last year.

Saturday night we have the banquet with plenty of friends and good food. After the guest speaker, the Certificates for winners in the Friday morning antenna measurements are then given. Then the big event of the evening occurs when the "2002 K4UHF Award" is presented.

The conclusion of the Saturday night event is capped with a prize drawing enjoyed by all. Last year some of the guys left with enough prizes to cover the expense of coming to the conference. There is also a table for the wives who have their own drawing.

<http://www.svhfs.org/conference.htm>