

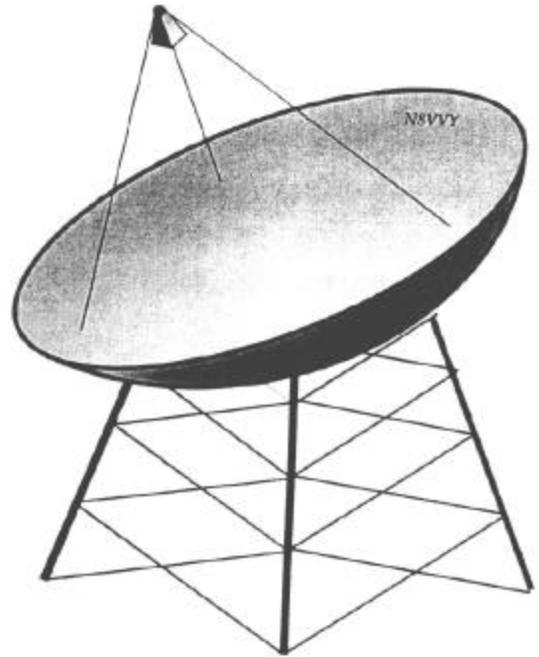
ANOMALOUS PROPAGATION

Newsletter: *The Midwest VHF/UHF Society*

Editors:

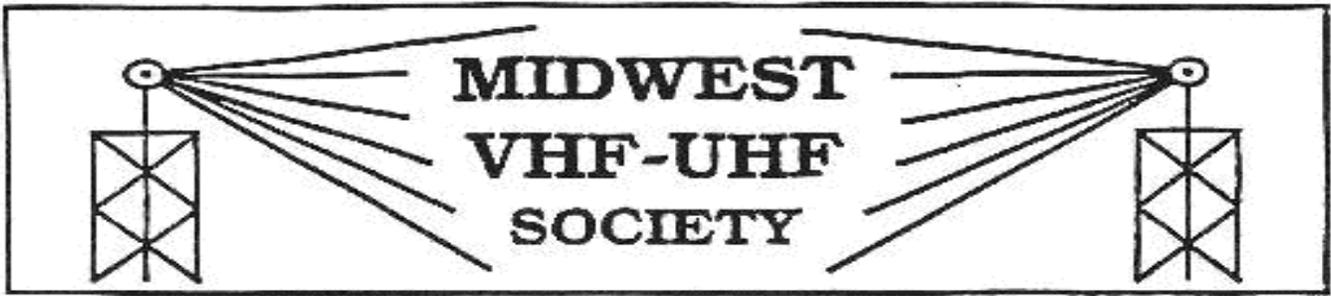
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Annual Society membership is \$ 12.00. Please
make checks payable to Gerd Schrick



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Sept 2014

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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Amsat Symposium 10 / 11 / 12 Oct, 2014 Baltimore MD

Qatari Es'hail 2 Satellite will Include an AMSAT-DL Phase 4 Amateur Radio Transponder

Gunter's Space Page has reported that the Es'hail 2 communications satellite will carry analog and digital Amateur Radio transponders. The new satellite, which will be operated by Es'hailSat, the Qatar Satellite Company, will be in a geostationary orbit, positioned at the 26° East "hotspot" position for TV broadcasting to the Middle East and North Africa.

Launch is planned for **late 2016**.

[ARRL Letter fr Sept]

MVUS Officers:

Pres. Tom Holmes, N8ZM, Vice Pres. Bob Mathews, K8TKQ
Secretary, Steve Coy, K8UD Treasurer, Bulletin Editor, Gerd Schrick, WB8IFM

This just in...

Well, not really; I've just always wanted to say that.

It's actually kind of old news but we did have a great picnic last month at Daun's. Probably a record crowd with folks from as far away as Toledo and a couple of guys I haven't seen in years! We had a lot of fun making measurements, talking about all kinds of things, and of course, eating. More about that further back in Gerd's write-up of the event.

This past weekend was the September ARRL VHF Contest, and the group that operates using the N8ZM call put together a very good effort. The Aurora that was supposed to happen as a result of a CNE earlier in the week did not seem to materialize as a 6m propagation enhancement, and other band openings were scarce as well. We also suffered a 2 second power outage which erased about 10 contacts from our log which included a couple of useful grids in FL. I shouldn't complain too much as we did work Puerto Rico, Ecuador, and Argentina on 6. Hopefully we learned our lesson about frequently hitting the save button and also to keep a laptop running on the network, linked to the logging computers. But a good time was had by all and we did post a respectable score if not one that breaks any of our previous records for September.

This is that time of year where we start thinking about our Fall meeting schedule and setting dates for our next three meetings (this President's job carries a lot of responsibilities and this is one of the heavier loads!). In October, the 4th Friday is the 24th, so should be no conflicts there. In November the 4th Friday is the 28th, the day after Thanksgiving and the ridiculously named "Black Friday", and we usually meet that night as well. In December, our usual Friday is the day after Christmas. Maybe that's not a good choice as it is the day everyone is out taking back the clothes that don't fit and using their gift cards. Would Tuesday the 30th work better for us? Let me know what you think.

This month our meeting will be on the 26th and I hope to see many of you there. And by the way, for those of you who have time on Wednesdays, many of the same guys who come to the MVUS meetings also meet for the aptly named Lunch with the Geeks at various venues around town. Contact Daun (daun@yeagley.net) if you would like to be on the e-mailing list for the latest news on where we are meeting. Lots of interesting conversation, much like an MVUS meeting, but without interruption from that President guy who seems to think we should have some sort of formal activity.

See you on the 26th!

De Tom, N8ZM

List of Attendees of the MVUS Picnic, 8-30-2014 at N8ASB, Daun's, Wilmington OH

WB8VSU	Jim	Dayton			
xyl	Jeanny	"			
N8QOD	Joe	Bellbrook	N8SPY	Gary	Dayton
KQ6EF	Rich	Toledo	WA8OGS	Joe	Cincinnati
K8TQK	Bob	Bainbridge	KB8GUE	Ron	Leesburg
N8JQR	Carolyn	"	N8ZM	Tom	Tipp City
W9NBS	Tom	Centerville	N8EYW	Barbara	" "
W8RKO	Mike	Centerville	W8EE	Greg	Cincinnati
K8UD	Steve	Beavercreek	K7DN	Matt	Urbana
WB8IFM	Gerd	Dayton	W8ULC	Red	Franklin
WA8RMC	Art	Westerville	xyl	Marilyn	"
WB8ART	Randy	Miamisburg	WA8HNS	Mike	Washington C H
xyl	Evelyn	"	N8ASB	Daun	Wilmington "Host"
			N8CSX	Karen	" "

This and That 9-14

Good Movie. "A good film is when the price of the dinner, the theater admission and the baby sitter were worth it."
[Alfred Hitchcock]

Forgotten Green Thing. We just got a new ice box. Its pretty much like our old one. But it's got better insulation and supposedly uses less electricity. One thing though turned me off: that little light bulb inside which "the little man turns on when you open the door" almost burned my fingers, when I tried to unscrew it. It was a compact 40W incandescent, which would make a nice compact heat bulb for a chicken coup. Fortunately a present regular size LED light rated 40 incandescent just fit. The light is the same but only 6 watts of electricity are used. And it will outlast this box and the next one. [Gerd, WB8IFM]

Sorry about that. Just read some of my stuff from the last newsletter and found lots of little boo-boos. Time was pressing and I thought I might get on w/o my proofreaders.
[Gerd, WB8IFM]

A Wonder. Isn't it a wonder men didn't make the devil a woman?
[Louisa Lawson, Suffragist 1848-1920]

Northern Lights. Aurora season is now fully underway around the Arctic circle. With the end of northern summer approaching, dancing green lights are beaming through the deepening polar twilight on a regular basis. Unlike lower latitudes, the Arctic does not require a full-fledged geomagnetic storm for aurora sightings.
[spaceweather.com 1 Sept 2014]

X-tal Detector. Crystal radio was invented by a long, partly *obscure* chain of discoveries in the late 19th century that gradually evolved...
[Wikipedia, 8-2014]

Making Money. A "blindfolded monkey throwing darts at a newspaper's financial pages could select a portfolio that would do just as well as one carefully selected by the experts."
[a critic, quoted by Carolyn O'Hara in "The Week"]

"Digital Reading." Picking up a physical book might do you some good...As we move towards digital reading, we're doing more skimming without stopping to ponder any one thought..
[Maria Konnikowa]

SPRITES OVER THE USA: This week, backyard photographers have been observing gigantic red sprites flickering over the USA. These electrical discharges, which occur high above thunderclouds, resemble enormous jellyfish and their glow can often be seen hundreds of miles away. A specimen highlighted on today's edition of Space Weather would dwarf Mt. Everest. More information and observing tips visit spaceweather.com. Google Images: Sprites lightning.
[Space Weather News for June 25, 2014]

On Patents. Benjamin Franklin never sought to patent any of his devices, feeling they should be freely accessible for the benefit of mankind!
[Compendium on "The Uncommon Man/ B. Franklin"]

Data Explosion. By the year 2020 earth's 8 billion people will generate 50 trillion Gigabytes of data per year. If that data were to be saved on floppy disks that were ubiquitous in the 1990s, you could stack them to the sun and back 300 times.
[Eric Starkloff]

The Ten Centimetre Solar Radio Flux 8-2014

Easier to measure than sunspots and good indication of the Ionosphere. (Ed.)

The radio emission from the sun at a wavelength of 10.7 centimetres (often called "the 10 cm flux") has been found to correlate well with the sunspot number. Sunspot number is defined from counts of the number of individual sunspots as well as the number of sunspot groups and must be reduced to a standard scale taking into account the differences in equipment and techniques between observatories. On the other hand, the radio flux at 10.7 centimetres can be measured relatively easily and quickly and has replaced the sunspot number as an index of solar activity for many purposes.

The 10 cm flux can be used as a daily index or averaged over longer periods to trace out the trends in solar activity. Typically the 10 cm flux is averaged over a month or a year although sometimes a 90 day average is made.

Even though 10 cm flux and sunspot number both indicate activity they have quite different scales. This is evident in the figure where the 10 cm flux never drops below a value of approximately 67 even during solar minimum when the sunspot number is very close to zero.

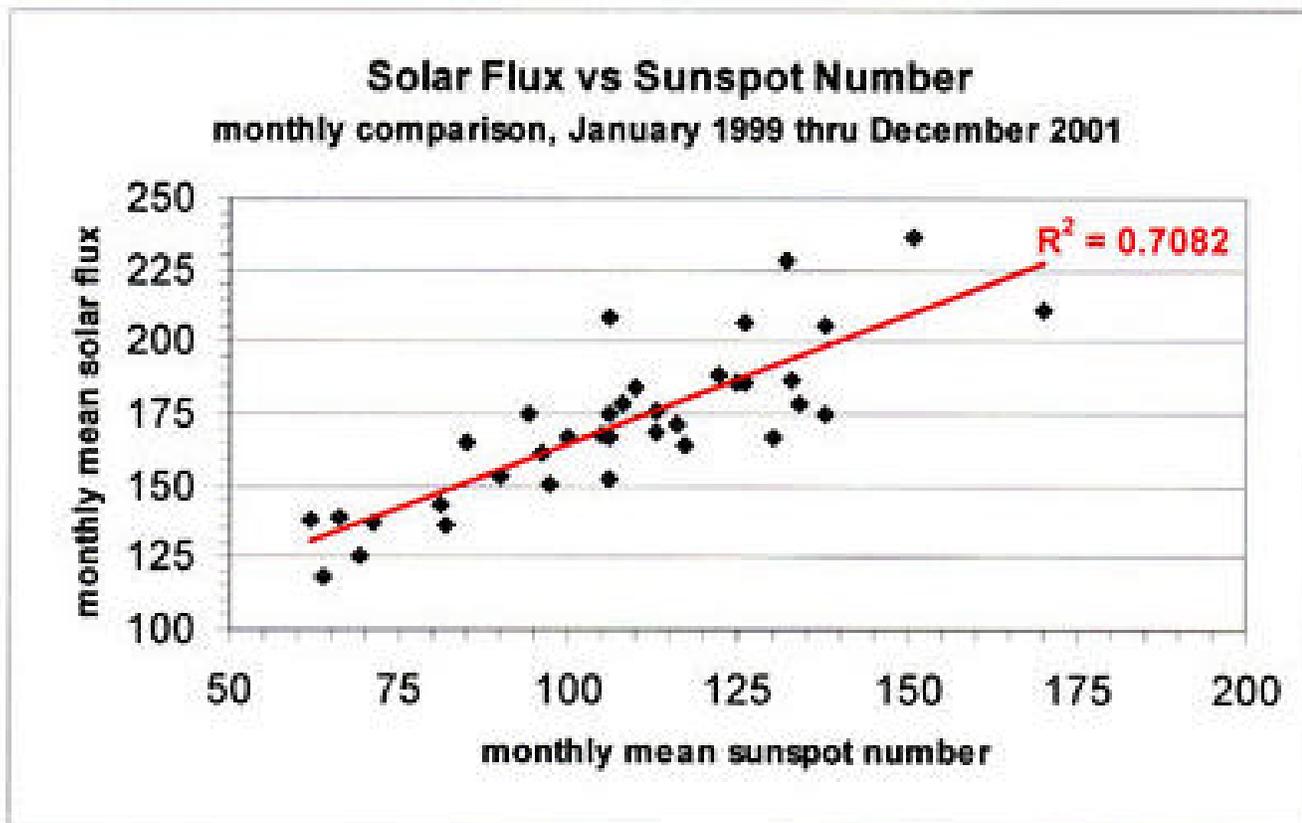
The figure is a plot of the monthly-averaged sunspot number against the monthly-averaged 10 centimetre solar flux for data between 1947 and 1990. The correlation between these quantities is evident but there is still considerable scatter even for monthly-averaged values.

The following equations are useful for converting between 10 cm flux (F) and sunspot number (R). The equations are valid on a statistical (ie, average) basis.

$$F = 67.0 + 0.572 R + (0.0575 R)^2 - (0.0209 R)^3$$

$$R = 1.61 F_D - (0.0733 F_D)^2 + (0.0240 F_D)^3$$

where $F_D = F - 67.0$



Lumens Demystified

Wiki Explanation 8-2014

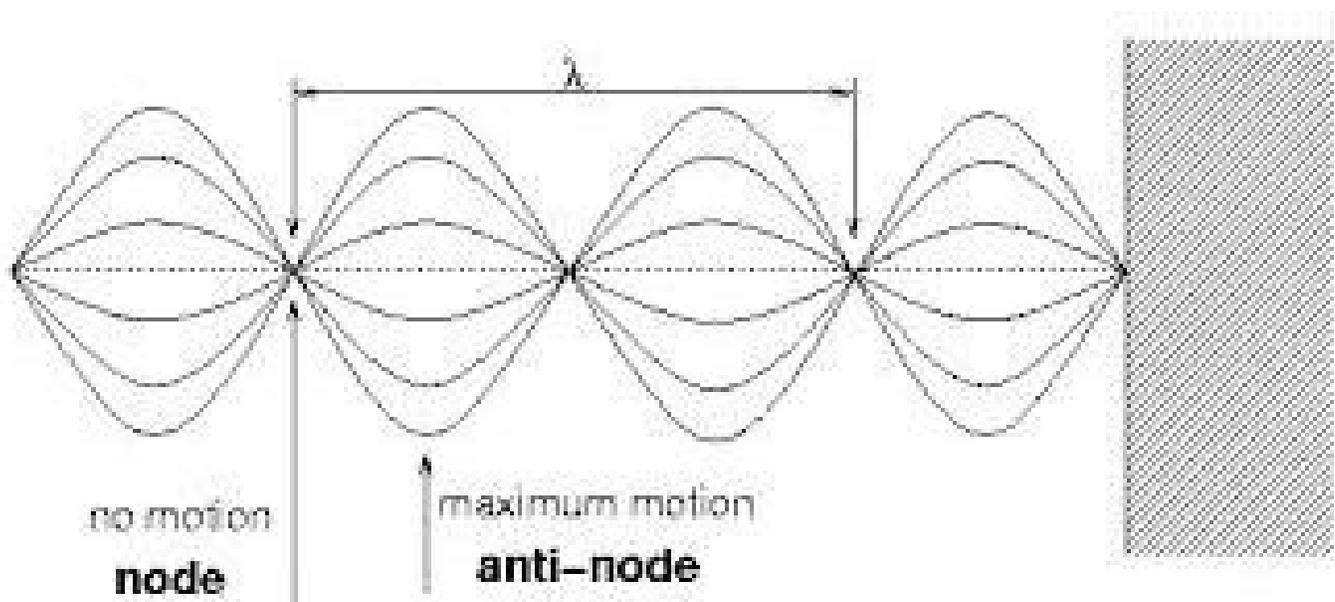
If a light source emits one [candela](#) of luminous intensity uniformly across a [solid angle](#) of one [steradian](#), the total [luminous flux](#) emitted into that angle is one lumen ($1 \text{ cd} \cdot 1 \text{ sr} = 1 \text{ lm}$). Alternatively, an [isotropic](#) one-candela light-source emits a total luminous flux of exactly 4π lumens. If the source were partially covered by an ideal absorbing hemisphere, that system would radiate half as much luminous flux—only 2π lumens. The [luminous intensity](#) would still be one candela in those directions that are not obscured.

The lumen can be thought of casually as a measure of the total "amount" of visible light in some defined beam or angle, or emitted from some source. The number of candelas or lumens from a source also depends on its spectrum, via the nominal response of the human eye as represented in the [luminosity function](#).

The difference between the units *lumen* and *lux* is that the lux takes into account the area over which the luminous flux is spread. A flux of 1000 lumens, concentrated into an area of one square metre, lights up that square metre with an illuminance of 1000 lux. The same 1000 lumens, spread out over ten square metres, produces a dimmer illuminance of only 100 lux. Mathematically, $1 \text{ lx} = 1 \text{ lm/m}^2$.

A source radiating a power of one watt of light in the color for which the eye is most efficient (a wavelength of 555 nm, in the green region of the optical spectrum) has luminous flux of 683 lumens. So a lumen represents at least $1/683$ watts of visible light power, depending on the spectral distribution.

Standing Waves Visualization



Using **All of Your Senses** to Troubleshoot

Jameco 9-2-2014

By Archie Stulc

I used to work as a radio engineer for a local radio station in Minneapolis. When I was a neophyte I experienced the cautionary tale from hell. It happened when the department's head guy – our contract engineer – had just gone on vacation. And, just as he had joked about before leaving, of course, the transmitter went down.

I got to the transmitter site only to be met by the general manager, the operations manager and a salesman for the radio station that lived nearby. Each one took turns asking me if I had done the things that I just did in the first few minutes of being there.

To get some advice and help, I called one area engineer and he basically said "hmmm... good luck." I called the transmitter manufacturer's engineering hotline and was told "it sounds like something in the start up sequence." No, really? That was all the help they could offer. (As it turned out, from the end of the story, they were actually right! ED.)

I called another engineer who actually came out to see if he could help. We both looked over the box, the schematics, checked voltages and pressed all the buttons again. No luck. Then he got called away... his transmitter was on fire! It was a bad day for radio in the Twin Cities.

Around the fourth hour of being there with the downed transmitter, I was finally alone and able to think step-by-step about what to do. I studied the schematic stage by stage and tested each stage in order. Everything seemed to be OK except for the "snap-thunk" sound just before the transmitter failed to start up again.

All Senses (incl. 6th sense!!!)

Professional-grade transmitters have safety interlock switches on each access door, presumably to keep engineers from turning into ash piles while on the job. It is strictly forbidden by the Federal Communications Commission (FCC) to operate the transmitter with any of those switches bypassed. But, every engineer does it... at least for testing.

So there I was with all of the panels open and the interlock system "bypassed like a Christmas tree" (if you saw Star Trek II: Wrath of Khan, you know what I mean). I started using more of my senses to try to figure out what I was missing. I'm looking, smelling and listening for any clue as to which component was causing the problem. I pressed the button and heard "snap-flash-thunk."

Flash? ...I pressed the button again and heard the "snap-flash-thunk" sound again. It sounded like it was coming from down in a corner. In that corner, the only thing that could make the thunk and vibration sounds that I had heard was a large contactor. I watched the contactor while I pressed the button again. "Snap-flash-thunk" – found it!

There was a 49 cent diode across the contactor coil for back EMF suppression that wasn't even on the schematic! It had burnt out and was arcing at start up. Fifteen minutes later, and after six hours of being off the air, we were back on.

That day I learned to use all of my senses, including my "sixth-sense" suspicion that the transmitter manufacturer didn't know everything.

Archie Stulc lives in Flagstaff, Arizona and is a retired radio engineer. His interests include computers, fixing things around the house, his cats and Dr. Who. Archie has been a Jameco customer since 1992.

2014 Activity Reports de Lloyd, NE8i

-- August 14---Microwave Activity Day. In the morning not much activity, heard on 144.260 : K2YAZ, KF8QC, and myself!

August UHF Contest; Drove 1000 miles roving: EN 74,73,72, 82, and EN64. Most stations worked were west of Lake Michigan. Bands used were 222 through 47 GHz, except 902. Most activity was on Saturday.

1st weekend of the 10GHz+ contest I ran the W8MMM club station. Bob, K2YAZ was rover this year in EN74. Saturday was the most active day. Rain scatter, all cw. Best DX was WB0LJC at over 400km. Heard several of the Lake Erie group on rain scatter, including VE3NPB. Called several times, but no answers. Along lake Michigan were rovers: K2YAZ and W9NU. Also there were several rovers in W9-Land.

Each 10 GHz+ contest weekend has been different. Unique in its own way: Stations active and propagation. Plan to be on "Rover" in September.

Sept. 6, 2014 Microwave Activity Day Report from EN73

I am on the road! TV channels looked real good this morning! Called CQ Microwave on 144.260no answers. Nothing else either. 8 AM ...was called by WA8VPD, so I stopped and set up at GP hill, EN82em, New Hudson, MI. I picked the gravel parking lot on the West side. K8RAY was set up on the East side. He was looking for Lake Erie activity. I was looking West towards W9 land. No signals. Called cq on 144.260, 1296.100, 2304.100 and 10.368.100... nothing. The night before there were heavy storms in SE Michigan. Some 300,000 homes lost power.

At 11 AM, RAY and I decided it was enough! I talked with WA8VPD on 144.260 for a while, made some plans for the Sept. VHF and Sept 10 GHz cumulative. Essentially one day Lake Erie, one day Lake Michigan. RAY and I had a good session on microwaves "this and that!"

Summary: 320 miles of driving. One microwave QSO. Still, worth it. It created activity!
73, Lloyd, NE8i, Farwell, Mi 48622.

Rolling Thunder! By Gerd, WB8IFM

Last August there were several night time thunderstorms passing through our area and as usual, after noticing the flash of light, I started counting and waited for the thunder. But when the thunder arrived it was not your regular distinct kind, but a long, maybe a 5 to 10 seconds of grumbling. That didn't make sense to me.

Low and behold, a day or two later, there was a good explanation of the phenomenon by our resident weatherman: **Jamie Simpson**. He is not just your ordinary weather person, but he is quite knowledgeable and the inquisitive type. So here is what he had to say:

Many of you may have been awakened the last several nights from the sounds of rolling thunder. This is caused by "ducting", which occurs when relatively cool air near the surface traps the sound of thunder under a storm. Warm air above cooler air inhibits vertical motion, acting as a lid, trapping the sound in the lower level of the atmosphere. ... The thunder sound bounces similar to a rubber ball between the ground and the layer of low hanging warm air (ducting) and creates the "rolling thunder."

MVUS Picnic 8-30-2014

A fantastic day with lot's of sunshine --- perfect for picnic and measurements. We met again at Daun's, N8ASB's huge piece of land near wilmington. There we used to set up a 100 + feet antenna range, good for antennas up to 144 MHz, and spend most of the day measuring all kind of antennas starting with 2m and ending up with 10 GHz. As the frequencies went above 2 GHz we would shorten the range and had to improvise a lot to get some numbers...

We had tables for the measuring equipment protected by canopies from the sun and possible rain. In recent years there were fewer antennas to be measured, a sure sign the designs had matured. We pretty much knew how to put together an optimum Yagi. Kent Britain "engineered" the cheap Ya gies. They were not only inexpensive, but easily put together. I built quite a few in a short time.

So we shifted to other measurement, like gain, noise figure or impedance. The fact that Tom, N8ZM and Daun, N8ASB were ex HP engineers and access and accumulated some high priced test equipment, measuring was more precise and faster than with your ordinary ham measurement instruments. I guess that explains somewhat the good attendance of the yearly picnic.

Another change was that we inherited from the University of Dayton a "Scientific Atlanta" antenna pattern test set, which kept the adventures types of our club busy trying to get it to work. We usually had one part working and another part failing. We even acquired an automobile trailer for transport. But we never got it working to our satisfaction. Later, Daun did set up a range where the test antenna rotated and picked up a signal from a short distance. That worked OK and we got some decent patterns. But problems with the computer and the software stalled the system.

I remember the last time we used that trailer was to haul "white boxes" from the East Coast or was it a deactivated large dish...years ago.

Anyhow this time, Matt, K7DN, brought a 4 bay vertical 2m repeater antenna he had trouble feeding. Using an Agilent N9912A FieldFox portable analyzer we checked the array, modified to work at the desired frequency. A bit of analysis showed that the individual dipoles were resonant at the right frequency but that the matching network cable harness was throwing things way out of tune. Our homework assignment is to find a way to do the matching without having to build a new harness.

It was Time for the picnic? Tom and Barbara did a super job bringing drinks, hamburgers, brats and hot dogs and everybody else had some side dish and/or desert. I counted at least three types of potato salad and umpteen types of cookies or sweets and cakes.

Tom did a good job at the grill and then conducted the obligatory "business" part of the meeting, trying to get out of his job as president. To divert attention from himself, he demanded a report from me and in great foresight I had jotted down a recent \$\$ number from our bank account and was able to pull it from my shirt pocket. Did I have anything else to say, I said no, hoping they would elect somebody else as treasurer. But it was all to naught. Bob, our vice pres tried to nominate Art, n8, but he wouldn't accept. So the entire clan, including Steve, K8UD, was reelected to serve for another year!

This year we had not one, but three birthdays to celebrate. We were discussing how to sing three times, but then decided, once was enough! Interesting, how some guys tried to cram in the appropriate names in quick succession.

Ted, KQ6EF, came the farthest, but not from California, he used to live there, but he moved around a bit and now has his QTH in Toledo. He had the longest way home, left around 5: 30 on his motorcycle.

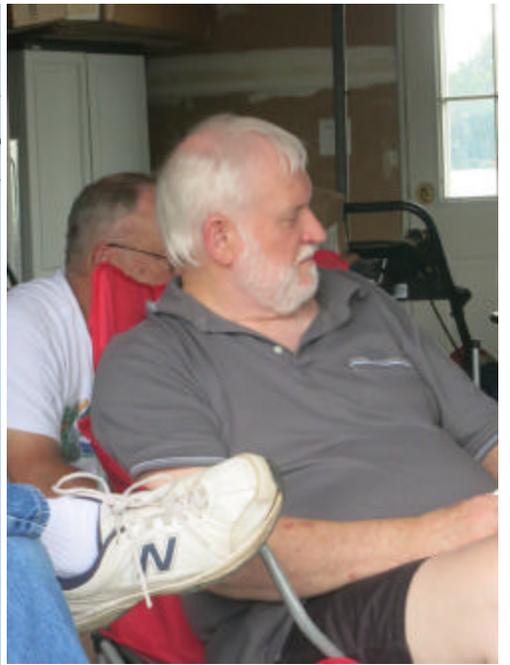
There were more measurements: we tested a number of preamp for NF and gain on 2m, 440, 900, 2304, and 10 GHz, as well as a cable TV preamp for 50 through 850 MHz using an HP 8970B NF Meter coupled to an HP 8971B Down converter with an HP 8672A Sig Gen for the LO. The cable TV preamp showed a pretty reasonable NF even though we did not correct for the 75 ohm mismatch. There were also a LOT of adapters in the measurement setup!

We also tested a 1296-144 Downeast Microwave Transverter to see if the RX side was functional.

Using and HP 438 power meter, we tested several ham quality SWR/Power meters for accuracy. We used a 2m/440 mobile rig as the signal source with 60 dB of power absorbing attenuators feeding the HP 8481 power sensor. Measurements were made at several power levels (5W and 10 W nominal). One meter was not functioning properly but the others looked to be accurate within ± 1 dB or better. Joe Muchnij has the data on this.

We had a great turnout this year, I counted 17 hams and about 1/2 dozen xyls(see list) and the food was really great! Who'd have thought that a cauliflower casserole could taste so good? and of course we sang happy birthday to all with September birthdays. I must say that we sound better every year, but then my hearing isn't what it used to be.

Thanks to Daun and Karen for once again hosting the event; it's really a great place to have a picnic.



Matt, Tom,
Joe.. Randy,
Bob

Gary..Rich



Jim & Randy



Art