

No meeting this month on account of the Microwave Update Conference in Sandusky OH Friday/Saturday Oct.24/25 at the Holiday Inn located at the Intersection of Rts. 2 and 250

Contact: Tom, WA8WZG@WA8WZG.com or (419) 732-2944

Big Ear: There will be a guided tour on Sunday Oct 26 at 10 AM! Location: on the right of Rt.23 coming from Columbus just before the intersection with Rt. 315 before coming to Delaware

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ESTATE SALE: Kenwood TS680S, 180-6mtrs xvcr, \$675; MFJ-989C 3KW hf antenna tuner, \$250; Pyramid PS-35 pwr supply, 12v/35amps, \$90; Cushcraft A4S, hf beam, with A744 add-on kit. \$245 (u-take-down); Rohn 25G tower, 30+ feet. \$70; Ham IV Rotor/control, \$260. Call Joe, WA8OGS, 513-385-4198 or Denny, N8DL, 513-451-2864.

Radio Tower - 80 ft. self-supporting, heavy duty Rohn SSV; 20 ft. sections; 6-1/2 ft. wide at the base; sections 7N thru 4N; \$2350. Also 60 ft. SSV; 2-1/2 ft. wide at the base; sections 5N thru 3N; \$1700. SASE for picture/specifications. Joe, WA8OGS, 513-385-4198, 6-9p.m.EDST.

*Suburbia is where the developer bulldozes out the trees then names the streets after them - Bill Vaughn
Drive safely, Speed can kill.*

Did you know that.....

there is a lot of interest in the 10 Ghz band in this area? So much so that we had over twenty people show up initially for the last meeting! Unfortunately, we were temporarily delayed by the failure of any of us who should have remembered, mainly me, to arrange for the key to the meeting room. After a bit of floundering around looking for a meeting place that would accept a bunch of guys with soldering irons, spectrum analyzers, and a box full of radar detectors (which suggests that the Police station was not such a great idea after all!) , KA8EDE got us fixed up with the Perkins restaurant over by I-75 and SR 73. They were very gracious and gave us the use of their front room to set up our workshop. Do you suppose the board of health would have any questions about any of this? The staff treated us well, and invited us to come back. Which we will. More in a minute.

The workshop went quite well, with Sam, WB8ZDF, holding court and doing several conversions while the rest of us watched and chatted. Bruce, KA8EDE, brought along some of his test gear to assist with checkout. Everyone seemed to enjoy the evening and the chance to share ideas. Sam is looking into phase 2 of this project, which is converting a radar detector into an FM transmitter. No word yet on how he is progressing, but I have a lot of faith that he will come up with something.

This month we will not have a meeting as several of us, including Gerd and myself, are going to be in Sandusky for Microwave Update '97, which is being sponsored by Tom, WA8WZG. Next month (November), our regular Friday is the day after Thanksgiving, and consistent with MVUS tradition, we will have our meeting, but at a different place. We have accepted the offer from the Perkins restaurant to have our meetings there on a regular basis, if only to see how this different venue works out for us. Since this is an eating establishment, we need to keep in mind that there are economic factors at work, but we simply need to try it out and see if it works to our mutual satisfaction. I remember from a few years ago when MVUS was founded that we used to meet in a restaurant, and that we moved to the bank partly due to the economic factor, as well as for the ability to have presentations with sound and video. Let's see how it goes!

The holiday season is fast approaching (at what seems like warp 7), and we should start planning for our annual holiday meeting/party. This is, of course, similar to the picnic except that we leave out the antenna test and just party! Last year we had a simple pizza (and whatever) party at the bank, which was quite nice. I'd like to propose the same concept for this year, again at the bank. If there is a strong desire for some other food or location, I can be easily persuaded to change. Let's talk about it in November, or drop a note to Gerd or me, and we'll go from there.

Now that I have been doing this presidential thing for more years than the by-laws allow, ideas for interesting programs are beginning to (or have for a long time!) come with greater difficulty. One suggestion, which I think I mentioned last month, is that the local chapter of the IEEE's Antennas and Propagation Society has invited interested MVUS members to attend and share in their monthly meetings, which frequently include presentations by someone who gets paid to have the same fun we do. This is not intended to supplant our meetings, but rather is an opportunity to broaden our knowledge base about the state of the art in these areas. One benefit would be that we could pick up on new ideas from other radio services and consider how we might use them. Let me know if you are interested, I can provide more info. IEEE or A&P society membership are not required to attend these meetings.

That's all for now. Next month, Gerd and I and maybe others will have our reports on the goings on at Microwave Update '97, and maybe some goodies to show off.

See you then...73, N8ZM.

This and That

2 m Single Yagi EME. On 21 September 1997 Dave, W5UN and Graham, F/G8MBI achieved the first single Yagi to single Yagi 2 m EME QSO in history. Dave was using a KLM 17LBX and Graham a Mike Stahl 8WL Yagi. Both stations were using maximum legal power but neither employed ground gain. Success was achieved on the third schedule attempt. (W2RS)

66 Years ago the well known Lyons Restaurant in England put into operation a new application of the selenium cell (photo detector), in the form of a door which opens of its own accord when any individual approaches it.

34 years ago, or 6 years after Sputnik, the first TV pictures were exchanged across the Atlantic between the US and Europe. In the 18 minute lasting exchange through the Early Bird satellite first the Statue of Liberty was shown, then the Eiffel Tower and finally a Cubs game from Chicago. I remember watching the enthusiastic crowd waving their arms when told they could be seen in Europe. (WB8IFM)

Noise at Microwaves. Low noise converters in the \$ 100 (or under) range are now offered for satellite TV with noise temperatures of 17 K (.25dB NF) at 4 GHz and 35 K (.5 dB NF) at 10 GHz.

Leonardo would have been good working with micro circuits. Most of his drawings are on very small sheets. Until well into his 60s he was producing postage stamp size drawings. He had an extremely steady hand. He lived on a healthy diet of fruit and water which he recommended to everybody. He also avoided seeing doctors.

Mother Nature's Field Day. We all know about those stringent zoning regulations about erecting and maintaining towers that we need to support our antennas. There are however a lot of unregulated tall structures that are unsafe and often subject to collapsing. We are talking trees here! This fact was drastically driven home in our area last summer when a sudden, very brief storm toppled numerous trees resulting in broken power lines and leaving 70,000 homes, some for 2 to 3 days, without power. (WB8IFM)

Bumping into it: Whenever I make a measurement, I must disturb the system. In order for us to know something is there, I must bump into it. (Werner Heisenberg, 1901-76)

These Pesky Harmonics. We all know about the RFI from computers or other "digital" equipment. At a recent Hamfest a foxhunter(2m) stopped at my computer display and implied I had a "fox" hidden in my monitor. Hewlett Packard is trying something new: they are "dithering" the computer clock so that the "harmonic" energy is spread over a wider frequency range with lower amplitudes, thus reducing RFI. (HP-Journal, Aug.97)

A Growing Number of investigations demonstrate that under the right circumstances false memories can be instilled rather easily in some people. (Elisabeth Loftas "Creating false Memories.")

Beat the High Cost of Shipping . "Rapid Fill", a new packaging system uses plastic bags that can be filled with air. It uses a beverage straw to inflate or deflate. The bag(s) conform and fill the empty spaces in the package and cushion its contents at the same time. They collapse to less than 1% of the inflated volume and can be reused often. (800-64RAPID)

Still Waiting for the Electric Car. In 1904, 88 different automobiles were offered on the American Market. Of those 63 were powered by gasoline, 4 by steam and there were 21 electrics!

September Contest Roving

By Red, W8ULC and Jack, AB4CR

We had a great September contest roving! We activated 14 Grids, starting in Knoxville and driving north on I-75 to near Ottawa on our 1,000 mile trip. We operated on 50, 155, 222,432, 903, 1296, 2304, (had 5760 but made no contacts), 10 GHz, and 24 GHz. We made contacts on CW, SSB, Narrow Band FM, and Wide Band FM. We made 708 QSO's (1,465 QSO Points) in 173 Grids. Our final score was 253,445. We were happy with this, for our first time operating together. Some of our operating highlights include the following:

- 1) Working 3 stations from 10 grids on 6 bands & one station from 10 grids on 5 bands,
- 2) In two locations, the local police "remembered the rover mobile from June" and suggested better operating locations --- they also wished us good luck in the contest!!
- 3) In EM-88 at the end of a residential street, we set up the microwave antennas and started making some contacts...we heard voices behind us and there were about 10-12 people there looking in the van asking questions about amateur radio...parents were glad their kids got to see amateur radio up close -- it was a good chance to educate about amateur radio even in the middle of a contest.
- 4) We had to tell about 5 or 6 people that we were NOT storm chasers,
- 5) We worked N8UM/4 from the four grids in Knoxville on 6 bands...903 and 1296 contacts were made with alligator-clip-led-loop antennas.
- 6) Our beams on top of the van did not "catch" any trees this time.
- 7) We heard W2SZ/1 Sunday night on 144 MHz...S8 Signal ---loud---probably MS -- no contact,
- 8) Brought 5 GHz equipment to work a well know single op in northwest Ohio...we both FORGOT to even try to make contact on 5760. (remember for next contest!)

All things considered, it was a lot of fun. We gave out a lot of points. Also have suggested that the rules committee consider opening the rover rule so that an unlimited number of operators can operate from the vehicle, for almost all rovers, unless someone gets a bus, you will be limited by vehicle space to three operators/drivers plus equipment per vehicle. Another relief driver/operator would be helpful for those late night/early morning drives.... Hope weather permits us to operate in January , see you then! Red & Jack.

2 m Mobile Ohio to Main

Ax, N8AXA who specializes in 2 m mobile had a meteor scatter QSO with Dave, K1WHS who operates a 2 m monsterstation from Maine. Dave has a 24 x 14 el Cushcraft 214B EME array (26dBd) and uses an 8877 amplifier delivering a cool KW output. In contrast Ax is using only 3 Watts and a 5/8 λ vertical on the roof of his car. The QSO took place at 6:13 UT on Aug.12, 1997. Ax's signal report S2!

Overland Roving

By Jim, WB9SNR

After a successful trip around Lake Michigan with my μ Wave setup, I finally got an opportunity to see how well I could do over a similar (500 km) overland path. I decided to try operating from the Louisville, KY area, since this was about the right distance from the Chicago area μ Wave op's, and would also be a new state for them on 3, 5, & 10 GHz.

Making contacts from this area turned out to be a lot tougher than across Lake Michigan, which wasn't really a big surprise. First, I had to find a decent operating location. While I found plenty of high spots in two days of searching, most were in residential areas where the roads were very narrow, and without shoulders. The thought of driving around in circles on somebody's front yard was not very appealing, to say the least. I finally settled for an off-road weed patch that I found on a ridge south of Radcliff, KY. This location (EM77bt) appeared to be very good, since it was about 200' above anything immediately to the north, and the horizon appeared to be several miles off, past the tops of several lower ridges. What I don't know, however, is if it was really higher than the last ridge on my horizon, since I don't have a topo map for EM77.

Even from this high spot, it took from Fri. (9/12) afternoon until Sun. morning until I managed to make a μ Wave QSO back to the Chicago area. Even then I was only able to work the closest station, WA9CGZ (EN61ch) at 423 km DX, on 5760 & 10 GHz at 8:45 AM CDT. We also tried 3456, but the morning enhancement fizzled out by the time we got to that band. This enhancement is something I've seen just about any time I try making μ Wave contacts in the early morning. It usually peaks about 1-2 hours after sunrise, then dies out pretty fast. I also tried to make 5760 & 10 GHz contacts with W9ZIH (EN51nv) at 522 km, but he was just too far away. Ron did hear a very faint 5760 signal from me a couple times, but I was never able to find his signal. This just confirms my earlier suspicion that your "best DX" over land will be about 50 - 100 km shorter than over water, under average band conditions.

Oh, by the way, I did manage to hand out a few points during the contest. I activated 3 grids in the Louisville area on Sat. (& Sun. morning), then headed for Champaign, IL, where I activated another 3 grids Sun. evening.

Didn't run up much of a score, compared to what I could have done with full time contesting, but still had a lot of fun driving through an area much different than the flatlands of IL & IN.

Call Used: WB9SNR/R Grid(s) Activated (6): EM78 EM68 EM77 EN60 EM69 EM59

QSOs	Pts/QSO	QSO	Pts	Multipliers
144 MHz	41	1	41	16
222 MHz	17	2	34	9
432 MHz	28	2	56	14
902 MHz	4	3	12	2
1296 MHz	5	3	15	3
2304 MHz	3	4	12	1
3456 MHz	3	4	12	1
5760 MHz	4	4	16	2
10368 MHz	3	4	12	2
TOTAL				
ALL BANDS	108		210	50
CLAIMED SCORE:				11760

Radio Signals from Jupiter and Io

by

Michael H. Brown W8DJY

Periodically sometime after WW II, amateur radio operators would hear strange signals on the 15 meter band. The most common signal heard was a periodic ocean wave noise that would vary in signal strength from the noise floor to 40 db over S-9. These signals would last for periods of 10 to 15 minutes. Other signal heard sounded like a periodic machine gun firing.

In the early part of 1955 Bernard Burke and Kenneth Franklin observed a strong, fluctuating noise at a declination of +22 degrees during a sky survey at 22 MHz. The noise was noted on 10 out of 31 nights. The source position agreed with that of Jupiter. It was first thought that this radio noise was generated by background radiation from Jupiter's surface.

In fact, the decametric radiation, is generated by a flux tube connection between Jupiter's small moon Io and Jupiter. This radio source is the strongest in our planetary system. An Io-B storm tends to repeat itself every 9.9 hours, although the direction of this radiation changes with Io's position relative to Jupiter. This proves to be a rather complex problem being able to locate the position of the radiated signals.

The bandwidth of this signal covers below 550 KHz through about 30 MHz. It peaks about 20 to 24 Mhz. The MUF is so high during the daytime Jupiter's radio signals just reflects off the E and F layers. Generally the MUF will drop below 20 MHz. by 7:00 pm EST letting these signals enter earth's atmosphere. Of course Jupiter must be in the sky when one attempts to listen.

To listen for these radio waves from Jupiter one only needs a 15 meter dipole hung N to S connected to a receiver tuned to a clear frequency near 21 Mhz. I would suggest an old communications receiver. Turn off the agc, make sure when you connect the antenna you hear an increase in antenna noise. A good test of performance is to listen to old prop driven airplanes as they fly over your QTH. Their ignition system will generate a very nice noise peak as they fly by.

I suggest that this receiver just be turned on at a medium volume as you work in your radio room. Note any changes in background noise, maybe keep a log. Over a period of about a month you should be able to notice a periodicity in the signals heard. Have Fun!! Tell your friends you've been listening to the planet Jupiter!

Jupiter

The largest planet, one-tenth the size of the sun, is a whirling ball of gas compressed to liquid in the interior. Jupiter's Great Red Spot, an intense windstorm three times larger than earth, was first observed 300 years ago. Among Jupiter's satellites, Io alone has an atmosphere - albeit a tenuous one - and vulcanos. The most violent eruptions eject sulfur and sulfur compounds hundreds of kilometers above the surface and may feed particles into the faint ring that encircles Jupiter. Another satellite, Europa, is covered with a layer of ice, which may overlies oceans of liquid water.

Distance from Sun: 778,300,000 km Revolution around Sun: 11.86 years Rotation: 9.9 hours

Diameter: 142,800 km Density: 1.3 x that of water Mass: 318 x that of Earth Temperature 130 C at cloud tops.

(National Geographic)

Elevation Angle for maximum Radiation of a horizontally polarized Antenna over Ground

Optical Spectrum Analyzer for Rf

We all know the spectrum analyzer. This is an instrument that takes a signal “apart” and displays it as a spectrum of frequencies. So, as an example, we can check our transmitter signal for harmonics and spurious frequencies. A conventional spectrum analyzer is just a sweeping superhet receiver with a calibrated display, most often with memory to retain the display while sweeping is going on. Although this sounds simple, it is non the less an indirect way of doing the analysis.

An optical spectrum analyzer does it optically in a more direct way, permitting “real time” analysis. One of my first assignments in the AF Avionics Lab (1964) was to operate an “optical correlator”. At the time this “device” was a large optical bench with a point light source, numerous lenses, filters, photo multipliers, ultrasonic modulators, and other pieces. Among its functions was a “real time” Fourier transform, which is “spectrum analysis” mathematically expressed. Back then electronic computers were in their infancy and their experts would readily admit that such a feature were way beyond even their fastest prototypes. I had a hunch, they were not doing it right...needed to think about the way they programmed. I am not sure whether we knew the word software yet. Anyhow it took many years before two scientists came up with the “fast Fourier transform” (FFT). How fast was it...pitifully slow. Today FFT-analyzers are in use for the lower frequencies and they do a marvelous job in DSP. The limitation is in the “analog to digital converters”, since everything fed to the computer has to be in digits. But progress is being made.

Following, I will try to give a brief explanation of how the optical spectrum analyzer does its thing, without going into too many details. The optical spectrum analyzer is fairly uncomplicated, straightforward and potentially an affordable instrument. Wouldn't it be nice to have one covering rf to microwaves in every ham shack like you have now a SWR-meter or a frequency counter.

Going back to basics and some memory from our science class in school we should remember the two things a lens or a (parabolic) mirror does: it “focuses” incoming “parallel” light rays into a (focal)point and it generates parallel light rays from a (point) light source at its focal point. Fig. 1

These are fundamental statements that have, however, certain limitations as might be expected when you try to use terms like point and infinity. However, it is just one such limitation that facilitates the Fourier transform. As my physics professor in college stated it: “the frame that holds the lens is more important than the lens and its glass.” It turns out that the contour or shape of the parallel light beam is actually converted into its Fourier transform at infinity. To visualize this one has only to recall the definition of “parallel lines”, which is, that they meet (or intersect) at infinity. Now if there is a pattern across the plane of parallel light generated by our unknown signal, the various lines will generate an “interference pattern at “infinity” (or at the focal point since we are using a lens). This is the Fourier transform of our signal or its spectrum. Fig.2

For a long time the optics people had observed these “peculiar” rings, spikes and dots, even have given them names without realizing that they were looking at a Fourier transform.

With advances in optics, to mention just lasers, CCD photo sensors, ultrasonic transducer/modulators (also called Bragg cells) and LCDs it is now possible to build a practical RF to microwave analyzer and we have hope such instruments will be accepted and eventually become affordable and commonplace.