

Vol. 18 No. 1

[www.mvus.org](http://www.mvus.org)

Jan 2004

Club Memorial Call W8KSE

**10 GHZ Beacon: 10368.750 KA8EDE EM89ap OH Xenia (50 mW 16 slot waveguide at 89feet)**

Our **January Meeting** is on Fri. 23<sup>rd</sup> at 7:30 PM at the Perkins Restaurant at SR 73 and I-75.  
Discussion: 2004 Plans.

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### Upcoming:

**January 24-25, 2004 ARRL VHF Sweepstakes**  
Begins 2:00 PM EST Saturday – ends 11:00 PM EST Sunday  
<http://www.arrl.org/contests/rules/2004/jan-vhf-ss.html>

### **The First and Only Multi-Multi FMT** (More about it on pages 7 and 8)

In the dubious achievement category, in November, 2003, a group of hams from the Midwest VHF-UHF Society operated perhaps the first and only multioperator, multi-measurement station in the history of the ARRL Frequency Measuring Test. N8ASB, WB8GXB, and N8UR gathered (with some onlookers) in N8UR's basement. Meanwhile N8ZM, who was called away on a business trip, tried to copy the W1AW signal from his car in a rest area on Interstate 75 (the first ever FMT rover station?), but unfortunately ignition and inverter noise got the better of him.

We all used different gear for our measurements, but (except for the peripatetic N8ZM) used a common antenna (Gap Titan vertical) and frequency reference (HP 5065A Rubidium standard). [John, N8UR]

**DE N8ZM** Good Grief, Charlie Brown! It's almost three weeks into 2004 already. I hope all of you had an enjoyable and happy holiday season, and have made a good start on your New Years' Resolutions. I'm looking forward to another fun year of MVUS activities; hope you are too.

To get the year off to a great start, I am happy to report that the last of the club's radar detector inventory has been liquidated (OK..sold), to our friend Al Rutz at SHF Microwave Parts, and we now have an additional \$1230 in the bank. That should help fund our beacon projects, and other new projects we haven't thought of yet. In general, I believe we should use the income from membership dues to take care of operations expenses, like publishing this newsletter, and let income from projects like the radar detectors fund our technical endeavors. We are fortunate that we have been able to raise money for this purpose fairly easily, and the situation gives us the opportunity to pursue things that we could not otherwise.

Which begs the next question...what do we want to tackle in 2004? We still have some beacon goals on the table, and frankly, it doesn't seem fair to rely solely on Bruce, KA8EDE, to do the construction work. And, as Bruce's work schedule has taken a large portion of his time lately, he really doesn't have time for even his own projects. SO any ideas you have about how to keep our momentum going would be helpful.

One project/opportunity we have coming up quickly is for a beacon site about 800 feet above the local terrain. The offer includes a run of 1-5/8" feedline from the ground to the antenna, and an indoor site for the equipment. From discussions we had at the November meeting, we figure that a beacon for 2304 or lower is feasible, as the coax hits cutoff at about 2.6 GHz. All we would put on the tower is the antenna, and we would have to generate enough power to put a decent power level into the omnidirectional antenna. We have ruled this site out for the 10 GHz beacon as the limited access to the antenna end of the coax precludes putting the complete assembly on the tower. Of course, the 10 GHz project is still alive in my mind at some other, more accessible location.

For the 2304 project, we need people to take on the following tasks: omni antenna, ID'er, LO/multiplier/PA chain, packaging, and overall management of the project. Our time window is somewhat short, as we must be ready to go when the tower climber grabs his safety belt. Lets kick this around at the meeting, and any other project ideas that you have.

Other things to discuss at the meeting include our booth at Hamvention, the VHF/UHF microwave forum program, and as always, whatever else comes to mind.

Oh, I almost forgot. The January VHF Sweepstakes is this weekend, starting at 2:00 PM on the 24<sup>th</sup>, and ending at 11:00 PM the 25<sup>th</sup>. We'll be on the air (unless the wx precludes getting to our contest site), as N8ZM. Please look for us on 6, 2, 220, and 432!

See you on the 23<sup>rd</sup> at Perkins! Tom, N8ZM.

## **Dues Due**

We corrected the cover this month to reflect the increase in dues, decided upon some time ago. We will honor the renewals we got thus far, however. Good for us, most members are usually late though. So remember, yearly dues are now **\$ 10**. Please make check out to Gerd Schrick and mail to 4741Harlou Dr. Dayton OH 45432

## This and That 1-04

**Henry Ford Quotes.** When everything seems to be going against you, remember that the airplane takes off against the wind, not with it. And... Nothing is particularly hard if you divide it into small jobs.

**Insanity.** Doing the same thing over and over again and expecting different results. [Albert Einstein]

**Leaves.** How many leaves does a mature, healthy tree have? According to “Marilyn” (Parade Magazine) about a quarter million. So if you have a dozen or so trees, you are a (leaf) millionaire several times over!

**Flipping Burgers.** “Service economy” is an oxymoron because services require the tangible wealth that manufacturing creates. [William A. Levinson]

**No Change. Full Text.** In 1961 Newton Minow, head of the FCC said: “I invite you to sit down in front of your television set when your station goes on the air and stay there without a book, magazine, newspaper, profit and-loss sheet or rating book to distract you--and keep your eyes glued to that set until the station signs off. I can assure you that you will observe a vast wasteland.” If anything, it’s worse today than ever!

**Diana’s Butler.** Conspiracy theories are plentiful, but in no country more than in the US. Princess Diana’s butler who traveled once by bus through the US relates: “If you’ve done this, you know that every second person you meet on a Greyhound has had their body taken over by aliens.” [Don Melvin]

**A Heap.** (driving a car that has over 200,000 miles on it)...Gerard takes a perverse pleasure in being the senior model on the road. He feels an immediate kinship with drivers of similar heaps, akin to the instant sisterhood of pregnant women or the brotherhood of baldies. [Marti Attoun, CSM]

**Who is making these Bolts?** Recently I bought some stainless steel “hex cap screws”. They came in a plastic bag and were labeled: Packaged in the USA using parts made in Taiwan, China, Canada, USA or Korea. Now you know! [WB8IFM]

**Power Supplies.** “Read spec sheets the way you would an insurance policy, what the headline giveth, the small print (specifications about temperature coefficient, ripple) taketh away.” [George Rostky, Editor of a number of Electronics magazines died Nov1st, 2003]

**Job Market.** (or drivers wanted) “I checked Sunday’s job ads to see how many techies are in demand locally. Found nine ads headed “Computers”. Found 37 ads headed “Drivers”. Makes sense again – somebody has to haul around all the stuff made in China and Bangladesh.” [Leigh Allan, 11-13-02 Dayton Daily News]

**Hot Earth.** Well, if the center of the earth is hot as hell – they don’t even know that for sure – we should be able to tap into it and use the heat to warm our houses without burning so much oil. [Andy Rooney]

**Hooked on TV.** 30% of US children under 6 have played video games, and many of that age are actively asking for and helping themselves to what they want. Some 77% of them turn on the TV by themselves, and 71% ask for favorite videos or DVDs. [Kaiser Family Foundation Study]

**Bloated House.** “Today the White House has 132 rooms, 32 bathrooms, five full-time chefs, a tennis court, a jogging track, a movie theater, a billiard room, infrared sensors that can detect any movement on the ground, a SWAT team standing by on the roof... “... and on and on...” [Margaret Truman]

**Triple Wammy.** If you have a problem with your “high tech” toy, you are in for a rude surprise. There is lousy programming, lousy instructions and lousy or nonexistent customer support. My advice: keep after the manufacturer, use any reasonable method you can think of, but don’t ever follow instructions that don’t make sense. A surprise solution might come from an unsuspecting source. [WB8IFM]

## Mount Wilson Trip

By Gerd, WB8IFM

**Triumph of the Line of Sight.** Communication nowadays is so advanced; the average person doesn't realize that a wireless connection still requires antennas on both ends. Furthermore the wavelengths used are such that 99% require "line-of-sight". Now, from just about anywhere in the LA basin you can see Mt. Wilson. What better place then to put antennas right there on top.

Pasadena, an Indian word meaning valley between the hills, is situated right south of mount Wilson. In fact after about a mile or so going north you are at the edge of town where the road starts going uphill. We drove up the well-maintained road in the early afternoon of Fri Dec 26. Starting at an elevation of about 1000' (Pasadena is at 864') we climbed steadily higher towards the top at 5700' with the temperature dropping. The car occasionally made funny noises, which seems to be coming from the wheels. Then we noticed we were negotiating small patches of "black ice".

Approaching the top we did get a real good view of the antennas. We kept going, but as the view disappeared behind trees we turned around to get a good picture. Although the sight was impressive with probably a dozen or more antennas, we didn't realize that this was only a precursor to the total picture as there were a few more sites with equal numbers of antennas or more. It would be a major undertaking to count all the antennas, but my estimate goes into the hundreds. Somewhat off to the side is a huge tower with TV/broadcast antenna(s). Most antennas are VHF/UHF probably low to medium power. There are lots of satellite dishes also.



One of several sites on top of Mt. Wilson, overlooking LA

## WiFi QRM on AO-40's Downlink

From the AMSAT-DL "Forum" [Nov03 to Jan04]

**Scanning the Neighborhood.** When I turn my 1 m wire mesh dish with homemade patch feed horizontally around I pick up broadband signals between 2400,4 to 2401,3 MHz at S5 to S8 (sometimes higher) I live in an area with surrounding one family homes and I can identify the houses where the WiFi signal comes from. However, if I elevate the antenna those signals quickly diminish. That's my luck or I could quit trying to work through AO-40. [Ralf, DC1JU]

**Useful hints to minimize interference:** Use large (narrow beam) dish, use offset dish, their feed looks always to the sky, do not use helical feed but a properly tuned patch feed, furthermore prevent spillover, possibly by using a larger dish and under illuminating it. [DC9ZP]

**WiFi in your own house.** To save the cabling to my living room where I planned to use my laptop I used Wireless LAN. Result: it was impossible to conduct AO-40 operation. Changing channels didn't help. For the downlink a use a 60 cm dish with a G3RUH feed. So I sold the wireless and installed a cable.[Detlef Keutgen]

{AMSAT DL and DARC, the German Radio Club are considering shifting the downlink Satellite band for future Satellites. This is important for their P3E now being build.}

### Going Going...Gone (ARRL Bulletin)

FCC adds Part 15 spectrum **at 5 GHz**, turns down ARRL request

The FCC has made another 255 MHz of spectrum available in the 5.470-5.725 GHz band for unlicensed Part 15 National Information Infrastructure (U-NII) devices, including Radio Local Area Network (RLAN) devices. In a Report and Order in ET Docket 03-122 released November 18, the FCC said it was taking the action to alleviate crowding in existing allocations and to align U-NII bands in the US with bands elsewhere in the world. The FCC turned down an ARRL request to keep U-NII devices out of the 5.650 to 5.670 GHz segment to avoid interference with the Amateur Satellite Service. Amateur Radio secondary allocation is from 5.650 to 5.925GHz.

"We are not persuaded that we should either add or modify our proposed rules as requested by ARRL," the FCC said, adding that its dynamic frequency selection (DFS) and transmitter power control (TPC) requirements "will in fact protect amateur operations," although they're not specifically designed to do so.

Commenting in the proceeding September 3, the ARRL expressed concerns about "potential aggregate interference" from U-NII devices to Amateur Radio space stations in the 5.650-5.670 GHz band. The League did support other elements of the FCC's proposals, however, including a power limitation of 1 W EIRP, and said hams were willing to cooperate with the RLAN industry on other sharing-related issues.

In its comments, the League said the amateur allocation at 5.650 to 5.925 MHz "has been subject to 'death by a thousand cuts.'" The FCC's most recent action leaves Amateur Radio with "relatively uncompromised access" to a 25-MHz segment at 5 GHz--5.825 to 5.850 GHz, the ARRL said. That includes a 20-MHz-wide satellite downlink segment, 5.830 to 5.850 GHz. Federal government users are primary over the entire band.

The Commission said that because of the large amount of spectrum it's adding to the 300 MHz of spectrum already available for U-NII devices, **it expects the density of devices to be relatively low**. [wishful thinking! Ed.] "We believe that this low density of devices coupled with our technical requirements will provide adequate protection to all incumbent systems in the band, including amateur satellite uplink systems," the FCC said.

The R&O culminated a 2002 Petition for Rule Making from the Wireless Ethernet Compatibility Alliance (WECA), now known as the Wi-Fi Alliance.

## ARRL Frequency Measuring Contest, 2003

By Steve K8UD, and Gerd, WB8IFM

*The Invitation read: "A small number of observers are welcome to come to the N8UR Geekworks on Wednesday evening for the big event. (Nov 20) Plan to arrive by about 9:15 as things will get hectic when the time gets close and the door likely \*won't\* be answered after 9:30. The test only lasts 15 minutes, so we'll be wrapping up fairly quickly after 10:00.*

*Mike GXB, Daun, and I got our gear set up and wrung out this afternoon. Tom stopped by with his fancy stuff, but unfortunately won't be able to join us Wednesday. Bruce (The Other) and John Human also stopped by. A good time was had by all and many electrons were transferred."*

John, N8UR, has been interested in time and frequency measurement for some time. And he has accumulated an impressive collection of special quartz oscillators, frequency counters, even a rubidium source and more expensive and exotic equipment to numerous to mention here. Anyway, we paid another visit there last Wednesday, November 20<sup>th</sup>, to observe the action for the yearly ARRL Frequency measurement test.

When we got there, about 1/2hour before the test, everything was already set up and the operators were listening to WWV to get a reading/ calibration. This was probably the first multi operator FMC set up. Counting the two of us there were 7 MVUS members present. Participating in the contest were: Mike, WB8GXB, Daun, N8ASB and, of course John, N8UR, with separate measurement set up. All were using, however, the same wire antenna, and the same reference standard. Mike had built an isolation preamplifier to prevent his signal generator to interfere with the others.

Present to watch were: John, N8VZW, Mike, KA8ABR, Steve, K8UD, and Gerd, WB8IFM. Time showed again its relativity as it moved slowly approaching the point of measurement. So we took a bunch of pictures and marveled at the parade of sophisticated equipment, 99% HP!

Basically to measure an "over the air" radio frequency down to the decimal point, you compare the signal with a local signal source of known exact frequency. The comparison is done by measuring the beat note between the two as accurately as possible. This could be a time measurement that could be accomplished by clocking the time of a few beats (maximums). John, N8UR, was recording the beat note with the help of a pc soundcard and evaluated the recordings later using DSP etc. John claims his capability is by a factor of 10 greater than that used by the ARRL to set the transmitter. We would imagine, that should give him a good shot at winning this contest. The conditions were ok on 75 and 40 meters. On twenty, there was a signal but it might have been a spurious freq. 15 & 10 were dead in Dayton.

Time again proved its relativity as 10PM came up very fast and before we knew it, time was up. Now everybody relaxed, some more discussions, then we were on our way home in the night. You can get a more technical description from Johns website: <http://www.febo.com/time-freq/fmt>. An article, "**The ARRL Frequency Measuring Tests**," by Ward Silver, N0AX, in the October 2002 QST and available on the ARRL Web site at <http://www.arrl.org/w1aw/fmt/0210051.pdf> covers FMT basics

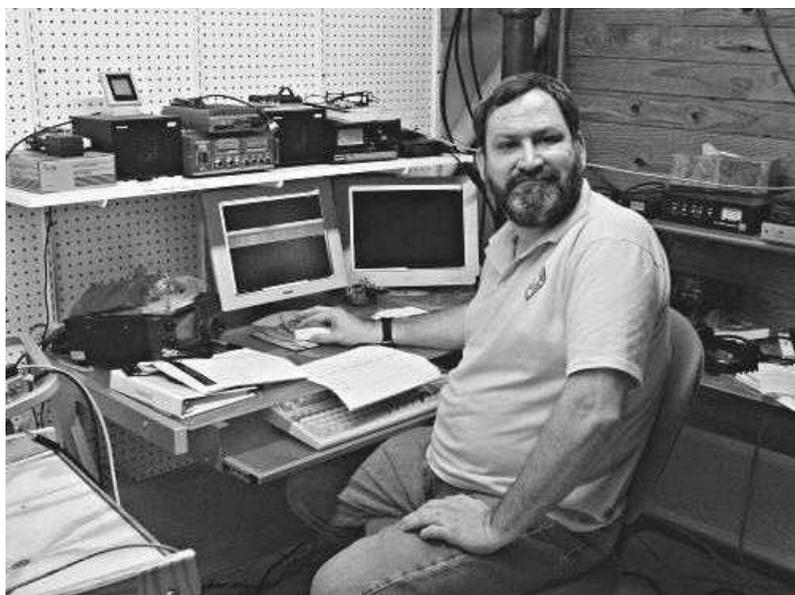
P.S. And here are the **official results**:

|  |  |   |
|--|--|---|
| 80 meters: 3585383.7 Hz<br>40 meters: 7050409.9 Hz<br>20 meters: 14050075.7 Hz<br>15 meters: 21053399.1 Hz | 80M 3 585 383.49 -0.210 58.6x10-9<br>40M 7 050 409.80 -0.100 14.2x10-9 | 80M 3 585 383.685 3 585 383.7<br>-0.015Hz -- 4.2x10-9<br>40M 7 050 409.949 7 050 409.9<br>+0.05Hz -- 6.9x10-9 |
| ARRL   | WB8GXB   | N8UR  |

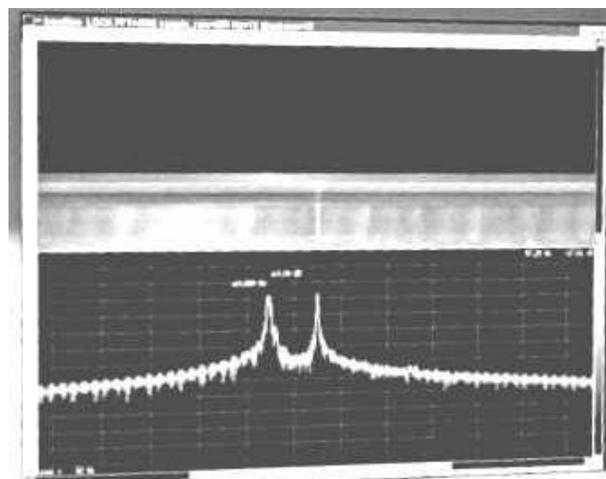


**Daun, N8ASB, checking time** He ran into some problems. Here his comments :

It was a good education doing this, and learning too that it's not as easy as it looks! I'm up for doing it again next year. 15KHz is just way too wide to figure out which is the REAL signal! I hope to try to change the IF filters on it to perhaps 2 or 3 KHz, and maybe a couple hundred Hz. so I don't run into the same problem as this time... Getting some more practice with the FFT program will help a lot too, including learning how to "calibrate" the sample rate. Daun.



**Head Honcho, John, N8UR,** and his display



*Mike built a buffer amplifier for the occasion:*

The buffer amp was required to prevent the signal generator from interfering with other measurement systems sharing the same antenna. The amp was designed to provide no forward gain but reverse isolation. The frequency range of interest was 3 to 30-MHz. The desired input and output impedance is 50 ohms to provide proper termination to the splitter on both sides.

**Mike, WB8GBX, taking notes**

**Hams pick up Signals from Mars Orbiters** (4 Jan 04)  
**By Charlie, G3WDG and Petra, G4KGC**

With Mars Express now in Mars orbit to provide a "tracking aid" we managed to find a signal from the Mars orbiter Odyssey using our 3m dish system on Sunday. The signal is approx 10dB weaker than MEX and much more difficult to find. With our relatively crude elevation and azimuth readouts we needed the signal from MEX to get the dish pointed exactly.

The signal is audible by ear (just!), but very clear on a waterfall display. 4Jan 04

|   |   |
|---|---|
| <b>System information:</b><br>Antenna: 3m Andrews 0.3f/D dish with CP feed antenna<br>Receiver: 0.8dB noise figure -> modified prototype WDG002<br>Waterfall display: AO40rcv<br>System noise temperature: ~84K | <b>Signal Levels</b><br>MEX Signal Level: ~30dB S/N in 1Hz bandwidth (Dec 2003)<br>Odyssey Signal Level: ~20dB S/N in 1Hz bandwidth (Jan 2004)<br>Sun noise: 16.2dB<br>Moon Noise: 1.95dB |
| <b>About the Mars Orbiting Spacecraft</b><br>Odyssey: 8,406.852 MHZ EIRP 90 kW  | MEX (Mars Explorer) 8,420.432MHZ EIRP 500 kW  |

**Central States: Call for Papers**

The 38th annual Central States VHF Society Conference will be held July22-25, 2004 at the Delta Meadowvale Resort and Conference Centre in Mississauga(Toronto), Ontario, Canada.

The technical talks and published proceedings are an important part of the conference. I would like to invite those of you wishing to share your knowledge and experiences to be a valued speaker at this year's conference. I also encourage you to seek out other people who could contribute to this year's talks. For those not wanting to present a paper, please consider submitting something for publication in the proceedings.

Mini talks of 10-15 minutes are a great way of sharing a special project or event in which you are involved. Antennas are of particular interest (especially to me). Anyone up for discussing the pro's and cons of some of these new weak signal digital modes? Longer talks are also welcomed.

The deadline for submitting final papers will be May 1, 2004. Submit your proposal as soon as possible to me in case there are similar talks in the works.

A speaker application form will soon be available, so contact me with your proposed paper or any related questions. Bob Morton, Technical Chairman and V.P. [VE3BFM@cshfs.org](mailto:VE3BFM@cshfs.org)

Best to you all in 2004 ..... Bob VE3BFM

## 2004 SVHFS Conference

Our 8th annual conference will be held, **April 23 & 24, 2004** at the Holiday Inn Hotel & Suites in Marietta at 2265 Kingston Court, Marietta GA 30067. Telephone 770-952-7581. Double \$69, King \$69, Suite \$109 Available Thursday, April 22 – Saturday 24 for reservations made by Friday, April 2. Be sure to mention "Southeastern VHF Society Conference" to get the special room rate.

Conference Registration

Wayne Gardner, N4FLM

[n4flm@comcast.net](mailto:n4flm@comcast.net)

### Program Highlights:

**\*NEW\* SVHFS/Mini-Circuits Annual Award for Design Achievement** Electronics design competition to encourage advancement in the state of the art in circuit design on VHF through Microwave frequencies or IF signal processing for this range. The winner of the design competition will receive a \$1,000 cash prize or a \$2,500 gift certificate for Mini-Circuits products. Second through sixth place winners would receive gift certificates worth \$200. Competition is open to any SVHFS member (registration for the conference includes your membership.)

**\*NEW\* Kick-Off Lunch** at 12 noon on Friday, with Gene Zimmerman, W3ZZ, the editor of the "World Above 50 MHz" in QST.

**\*NEW\* Worked All of 'EM Award** - Earn this new SVHFS sponsored award for working all of the EM grid squares EM00-EM99 on VHF bands. Card checking for this and VUCC will be available at the conference.

**Noise Figure Measurements** - Bring your antenna pre-amps for NF & gain measurement up to 47GHz.

**Antenna Gain Measurements** - Bring your home-brew or commercially produced ham antennas for gain measurement up to 47GHz.

**Backscratcher Antenna Competition** - Homebrew 2304 MHz antenna competition based on Mouser backscratchers from last year's banquet. The most gain wins!

**Printed Conference Proceedings** - Professionally done soft bound manuals published by the ARRL. One copy comes with your registration fee. Additional copies will be available at the conference.

**Flea Market** - Loads of ham radio goodies at great prices.

**Manufacturer Exhibits** - Past exhibitors include C3I, Down East Microwave, M Square Antennas, Max gain Systems.

**Annual SVHFS Auction** - Donated items auctioned to the highest bidder.

**K4UHF Award Presentation** - The K4UHF Award is given to recognize an individual's outstanding achievement or contribution to the VHF + amateur community.

**Saturday Evening Banquet with Guest Speaker and Door Prize Drawings** - Including "wives prizes".

The conference is on Friday and Saturday. Activities start Friday morning with registration, antenna testing, and pre-amp noise figure testing followed by the Kick-Off Lunch, afternoon presentations.

Saturday follows with more presentations in the morning and afternoon. The highly amusing Auction of Rare and Valuable Stuff is held after the presentations end in the afternoon. The auction is a fundraiser for the society and even if you don't plan on bidding, the auction is a real "hoot"! My sides hurt from laughing by the time the auction was over this year.

The Annual Banquet is Saturday night. We have a delicious meal followed by a keynote speaker. We recognize our K4UHF award winner along with presenting certificates for; antenna gain, pre-amp noise figure, Backscratcher Antenna winner and for the Fall Sprints.

**Technical Program/Presentations** are needed. If you would like to present a topic and have your paper published in the conference proceedings, contact the Program Chairman Ray Rector, [WA4NJP@bellsouth.net](mailto:WA4NJP@bellsouth.net)