

Meeting Fri 26 Feb.

Feb. 2010

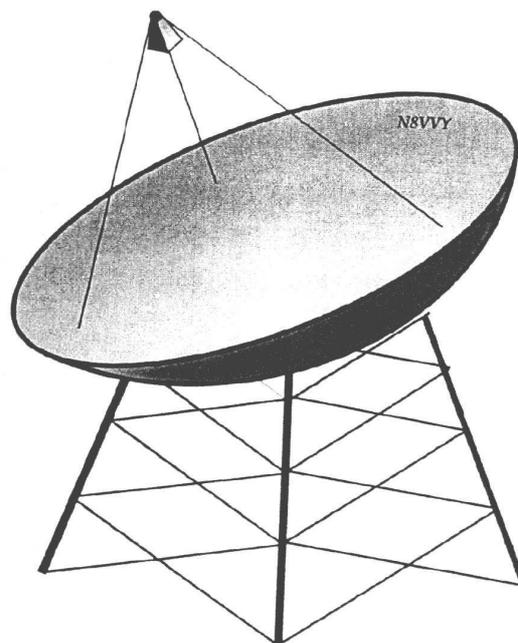
ANOMALOUS PROPAGATION

Newsletter: **The Midwest VHF / UHF
Society**

Editors:

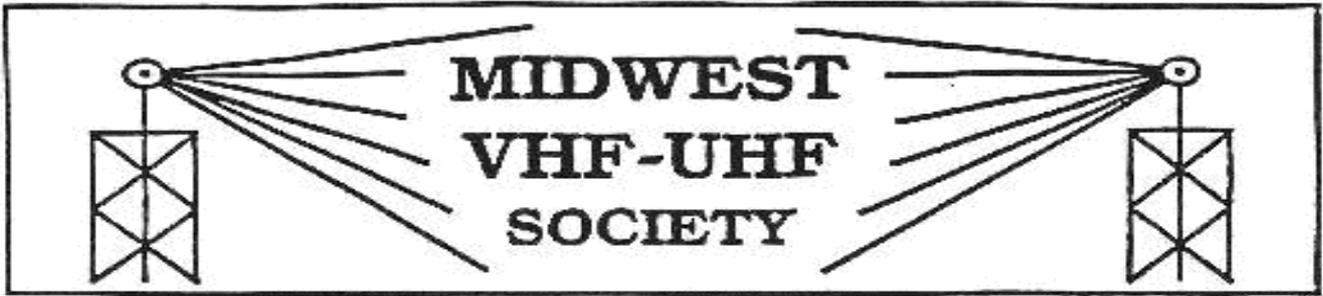
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Annual Society membership is \$ 10.00. Please
make checks payable to Gerd Schrick



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www.mvus.org

Feb 2010

Upcoming Meeting Fri 26th of Feb

at the Hometown Buffet near SR 725 and Yankee Rd. in Centerville

**MVUS Sunday Net at 14:30 UT (currently 9:30 AM local time, EST).
The net frequencies are primarily 144.280 Mc and 28.960 Mc.**

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Upcoming Events:

SE VHF Conference in Morehead Kentucky on 24/25 April, see page 3.

Hamvention 14/15/16 May

Rolf, DK2ZF, added an article by Bill, W5WVO, about High Speed Meteor Scatter (HSMS) and which software to use on the various bands! This is very good reading and might wet your appetite to get involved in this interesting and challenging aspect of ham radio. This article is reprinted on page 10 and we recommend highly that you read it!

DE N8ZM

OK, I can take a joke as well as anyone, but this snow has got to go. Right now I could go for a little global warming! Probably the only upside to it is that I am getting more exercise than usual from pushing the snow shovel and snow blower around almost daily. But I'd rather be getting some antenna work done if I have to be in motion outside. But at least it's mid February, so it can't go one too much longer, can it? Maybe I should be careful here, as I remember just a few years ago when we got a major snow dump in late March, actually AFTER the equinox, as I recall.

Spring will arrive however, and that will bring fun things to do with radio. The SE VHF Conference is in late April, Hamvention in May, of course, and then there is the June contest.

One bit of news: I have obtained permission from the folks at Hamvention to organize a weather balloon launch from the show site with the help of Bill Brown, WB8ELK. Bill is well known for his balloon launching activities around the country. MVUS will be sponsoring this activity (that means we are buying the helium), and helping Bill with getting things setup for the launch, and organizing the tracking/chasing activities. There is also the possibility of a full sized Hot Air Balloon with hams in it being launched from the show as well, but nothing is in concrete for that yet. Stay tuned!

There was a tour of the alternate site for our beacon and repeater a few days ago, and the site looks very promising. We are going to quickly install a low power version of the KB8ZR 443.5 MHz machine there for testing purposes. We are using this machine as the test mule because the hardware to do it is essentially ready to go. We should know more in a few weeks. We discussed also moving the transponder over there, but since it has a 1296 input, it would not be compatible with the beacon. And, Gerd, Steve, and John have a lot put a lot of work into installing it in its current location on Steve's building in East Dayton. So if the repeater tests are positive, the Wilmington Avenue site will become home for some of MVUS' gear. Although we are giving up a lot of altitude compared to the Channel 16 tower, we'll have much shorter coax runs. This means we'll have much closer to 10 watts at the beacon antenna. One reason for pursuing this is that the timetable and cost to MVUS for the Channel 16 tower work has become very fluid, and we do not want to wait any longer. If the tower deal does eventually materialize, we can always make a decision then. Meanwhile, we can work any bugs out of the gear more easily.

I am looking forward to the SE VHF Conference in Morehead, KY the weekend of April 23rd, as several MVUS folks will be presenting papers. Not to mention seeing Jeff's warehouse again. We have reserved 7 rooms at the HI Express there, and they are being claimed quickly, so if you are interested in going, let me know soon, or

else feel free to make your own reservations. But there are two other events in Morehead that weekend, so rooms are going fast. Also, we will likely try to organize some car pooling to save travel costs and because parking there will likely be tight. So again, let me know if you want to tag along with someone. I'm willing to help play matchmaker.

Our Hamvention booth has been confirmed, so here is my annual appeal for volunteers to help with setup, staffing, and tear down. With the balloon launch(es), we could possibly be the ground station and static display. Naturally, we'd also like to continue to be the focal point for the weak signal VHF folks at the show.

We also have a confirmed time slot for the VHF/microwave forum on Saturday morning, from 9:15 to 11:00 in Room 5. Red, W8ULC, and Mike, N8QHV, have a start on a list of speakers, but are always interested in your ideas.

As an FYI, check out the MVUS web site for a link to the FMT results. I think you will find them interesting. I am still working on getting the awards together and sent out, but should have that done soon. Thanks to everyone who participated and helped put it on. I think the final report will be found further back in this issue of Anom Prop.

See you on the 26th!

de Tom, N8ZM.

2010 Southeastern VHF Society Conference

**On April 23rd and 24th at
Morehead State University
in Morehead, Kentucky.**

Contact:

Update

I just wanted to give everyone an update on the upcoming **Southeastern VHF Society Conference**, Jim, W4KXY@ARRL.net

Registrations

Registration for the conference will be starting soon. Check www.svhfs.org for further information and updates.

Papers

The deadline for notifying Robin, K4IDC (k4idc@comcast.net) that you will be submitting a paper/presentation is March 5th. If you need help with preparing your presentation Robin has a lot of experience with PowerPoint. Just let him know that you need help.

Reservations

I also want to remind everyone who is planning to attend the conference to make your hotel reservations as soon as possible. There are two other events happening on the campus that weekend so hotel rooms will be in short supply.

Information on hotel rooms can be found at www.svhfs.org/lodging.html

This and That 2-010

Cinerama. Avatar, the new 3D movie has the potential to usher in a new, possibly home movie compatible age of 3D. In the old days Cinerama was the big novelty that eventually disappeared. It was a marvel of technology; the screen was huge and curved, enclosing an angle of 146 degrees horizontally. It was illuminated by three projectors. There were five speakers behind the screen, one each on the sides and one in the back. The camera, containing three systems, of course, was a monster weighing 850 lbs.
[Metro Goldwyn-Mayer]

More Sunspots. The past holiday season showed a marked increase in sunspots. Could we be "on the way up"? We have to wait and see!

Our Quiet Sun? "But it looks so constant"...that's only a limitation of the human eye. Modern telescopes and spacecraft have penetrated the sun's blinding glare and found a maelstrom of unpredictable turmoil. Solar flares explode with the power of a billion atomic bombs. Clouds of magnetized gas (CMEs) big enough to swallow planets break away from the stellar surface. Holes in the sun's atmosphere spew million mile-per-hour gusts of solar wind. --- And those are the things that can happen in just one day.

Final Thoughts. ...I also had never considered that remote auto tuners could possibly match an open or a short. This means that you could have a failed connection at the antenna without even knowing it.
[Phil Salas, AD5X in QST 3-2010: "Remote Automatic Antenna Tuners and the 43 Foot vertical"]

Doctor Bombay. Found an 11 year old newspaper, the "computer section", and it brought back memories. You see, in then days, the average person could, with some effort, obtain a sufficient knowledge of the computer to get some use out of it. Dr Bombay had a column and would answer questions from readers. Pretty much the "Dear Abby" for computer problems. Dr Bombay always had the answers and a lot of common sense and humor. So I read this column even though I might not have this particular problem. How things have changed. The computer industry has messed up the pc and with the help of the Internet is trying to really confuse and milk the consumer.
[Gerd, WB8IFM]

Chinese New Year. This year the Chinese New Year was on February 14, relatively late. The Chinese go by the lunar calendar where the year is measured by 12 lunar periods of 29 days each. The lunar year therefore is 11 days shorter than our solar year. So every few years the lunar calendar adds an extra month as we add an extra day every 4 years to make up a complete solar cycle. Of course, the extra month determines when New Year is, which is celebrated with the first new moon.
[Gerd, WB8IFM]

Mother Nature. Peter Cooper, of Fermi Lab, says, "Every experimentalist knows that the apparatus, or at least your understanding of it, is always at fault until demonstrated otherwise." He also says, "Nature is really unmoved by what I, or anyone else, believes."
[reported by Tom, N8ZM]

All that Snow. A man in Chardon, a suburb of Cleveland, has built himself a place where he really can chill out: a 625-square-foot 4 room igloo made of snow, of course, and equipped with cable television and a flat screen TV, surround sound and strobe lights.
[Associated Press]

Probability. You are probably more likely to be struck by lightning than to have your Toyota's gas pedal stick.
[DDN, Speak-up item]

Finally Sunspots. We've now observed sunspots continuously for the past 30 days, certainly a turnaround from the quiet conditions of the past few years. In fact, in ten weeks we have seen only three days with no sunspots, on December 25, January 6 and January 19. This is a little over 4% no-sunspot days, a nice contrast with all of 2009, with over 71% days with no sunspots.
[ARLP007 Propagation de K7RA, 19 Feb 2010]

First Bicycle. An enterprising individual propelled himself about the Green last evening on a curious frame sustained by two wheels, one before the other, and driven by foot cranks.
[New Haven Daily Palladium, April 1866]

Nuts. "Foot operated Walnut Cracker". New invention uses your leg muscles to easily crack the hardest Black Walnuts. - Fully assembled. Also available: blueprint w/instructional video.— [Ad in "Grit"]

Summary of test results for the Dec. 2009 FMT,

sponsored by the Midwest VHF/UHF Society.

Let me just start out by saying that we had a phenomenal thirty-nine entrants in this event. Many of the entrants appreciated our long-winded transmissions as they allowed the opportunity to take a more relaxed measurement, as well as being more convenient to catch the best propagation and fit into working (or sleeping) hours. Of course, this was not without consequences, as we did manage to cause problems for a major Canadian net, and also to a calling frequency for some digital enthusiasts. Of course, we apologized, and in the case of the Canadian net, we dropped our power from 15 to 5 watts.

Since I mentioned propagation, there certainly was some, as our 20 meter signal was heard by two stations in Japan, and on 40 meters, in Manchester, England! There are plots of the locations of all the entrants included here, one with a world view and the second of just North America, which I think will give you an appreciation of the distribution of the entrants. Due to time constraints, I have not done separate plots for each band.

So on to the results...

While we could simply have reported the frequency difference (instead of error, as I am trying to put a positive spin on this) for each entrant, we decided to over-engineer the process a bit (it's a club tradition; don't ask!) and calculate the frequency offset. This is the ratio of the difference of the measured and transmitted frequencies to the transmitted frequency. The result is then unit-less, although it really could be described as Hz difference per Hz nominal. This puts the performance of each entrant in terms that can be looked at easily in orders of magnitude, but does not change the overall rank order. It is much easier to plot this in a way that gives a good comparison of

performance. You will see those plots in this report also, one for each band.

So, the winners, by band, are...

80 meters: WA4FJC and K5CM at 1.83×10^{-10} (.183 ppb) offset tied for 1st place, and W3JW at 4.62×10^{-10} (.462 ppb) offset in 2nd, K6HGF at 1.3×10^{-9} (1.3 ppb) in 3rd place.

40 meters: A 3-way tie for 1st between AA6LK, K5CM, and K1GGI, all at 1.83×10^{-10} (.183 ppb); with W4UK with 1.6×10^{-9} (1.6 ppb) in 2nd, and W3JW at 2.03×10^{-9} (2.03 ppb) just squeaking by W1PW at 2.23×10^{-9} (2.23 ppb).

20 meters: K5CM at 1.83×10^{-10} (.183 ppb), K8YUM at 5.28×10^{-10} (.528 ppb), and N1RX at 6.70×10^{-10} (.670 ppb). Close behind was W1PW at 7.52×10^{-10} (.752 ppb) offset.

2 meters: There were only two entrants on this band. I guess the propagation just didn't favor us here. The winner is K9AYA, who is located about 20 miles from our transmitter site, and reported an offset of 3.85×10^{-12} (.00385 ppb)! The other entrant, W9ZB, is located just over 100 miles away, so his 3.23×10^{-7} (323 ppb) performance with what had to be a fairly noisy signal is still quite impressive.

You may have noticed that K5CM placed in the first rank on all three of the HF bands, a quite remarkable showing. If you have been around FMT activities for very long, you probably know that Connie Marshall is 'the man'. Connie often puts on his own FMT's, and can be trusted to lead the pack in any FMT he enters. For this reason, we are awarding K5CM a lifetime achievement award for his on-going efforts to promote and raise the standards for FMT.

Our plan is for every entrant to receive a certificate documenting their performance in this FMT, and the top finishers on each band will be receiving prizes, and although the details of those are not yet completely determined, I can tell you that there will be some nice ones courtesy of TAPR, MVUS, and ARRL.

When we announced this FMT, we also noted that we would be judging entries in a category called "most interesting comments". We were not disappointed by your efforts, as there were many. But the outstanding entry was from Ed, KB3SZZ, whose story about FMT helping the poor cheered us up immensely. Ron, G3SVW, also made us smile with the origins of his HP 3336A Synthesizer.

There were also numerous excellent technical write-ups about how you made your measurements and the hurdles you overcame. Dana, K8YUM, gave us a very detailed description of his set-up at the Arecibo observatory, although he apparently couldn't quite get the big dish feed off to the side enough to get any decent sky wave reception. But having a Hydrogen MASER as a frequency reference and serious amounts of memory to store recorded signals for post-processing seemed to offset having a mere vertical for receiving.

And K5CM (there's that call again!) gave us a very nice set of plots showing frequency vs. time for long periods, which allowed him to 'see' the effects of changing propagation on measured frequency. Others also noted these effects, and this study was one of the purposes of this FMT.

One interesting observation was reported by K5PA, who noted that his ICOM 756Pro would spread the signal as the passband tuning (PBT) was adjusted. This might be useful information for others to consider in future FMTs.

There are many interesting things to learn from your comments, and while it is tempting to my feeble brain to summarize them all here, my feeble fingers are telling me that enough keyboard pounding has occurred for one night. SO, I encourage you to read all of the comments which John, N8UR, has posted nearby. I think you will see that it is possible to make a very respectable showing in an FMT without the equivalent of a metrology lab in your basement. In fact, I see the point of all this as being to prove just that.

But don't take my word for it (if you knew me, you certainly wouldn't!), see what KB3MUN, N5LUL, and WA0EIR accomplished with very basic setups.

By the way, if you have already checked out the comments on the web page, please take another pass, as some of them were severely truncated by some miracle of modern computing technology, and N8UR has been working hard to get the complete text from everyone put up there for all to

see. Hopefully he will have this solved by now.

From all the folks here at W8KSE and the Midwest VHF/UHF Society, we want to thank you for your participation and enthusiasm for this FMT. We had a lot of fun pulling it together. Sometime in the future, we would like to do another FMT with a similar format that hopefully won't be a source of QRM to other ham activities, but more important, will add to our knowledge of the effects of

propagation changes on achievable accuracy and give more hams an opportunity to join in the fun.

73 de Tom, N8ZM

Oh, and please check out MVUS at www.mvus.org

The gang at W8KSE: N8UR, W8RKO, ND8I, N8ASB, W9NBS, & N8ZM. And we thank K5CM and N0AX for their support.

Charts showing results of Dec 09 FMT, by Band...

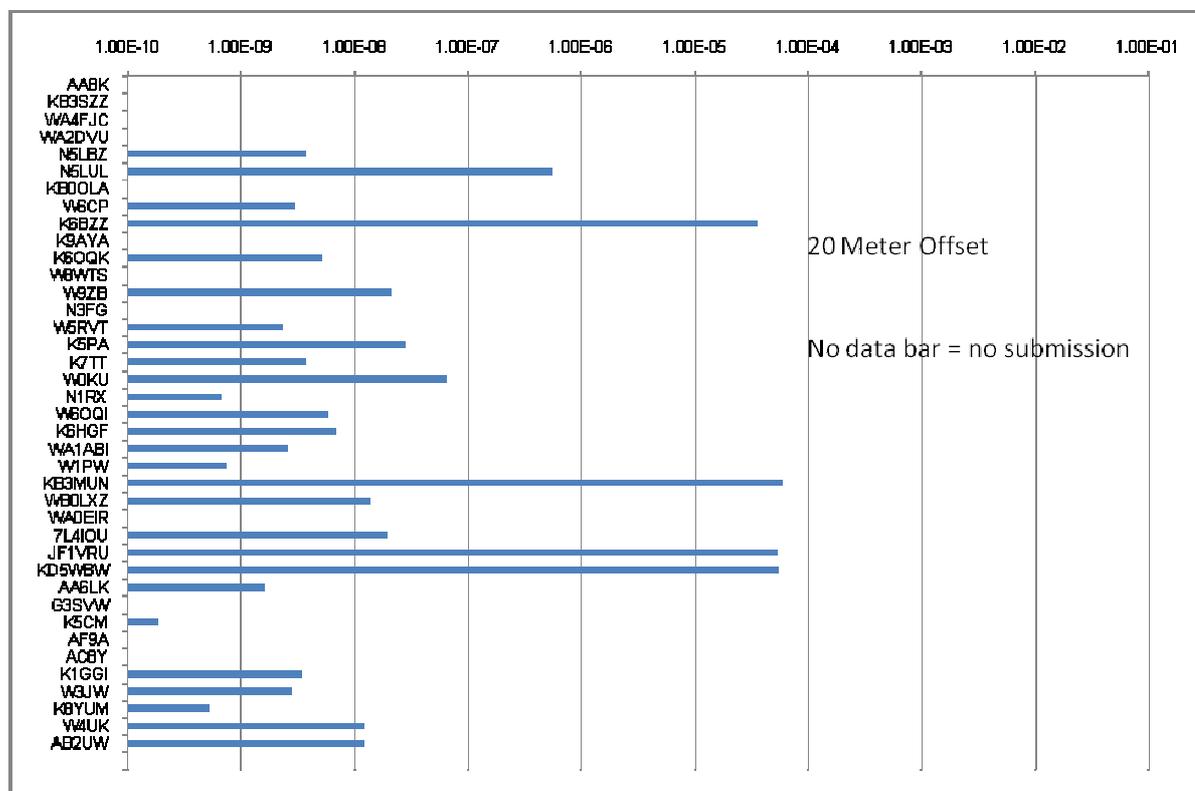
On 2m, there were only two entries, K9AYA, at 3.85×10^{-12} (.00385 ppb) offset, and W9ZB, at 3.23×10^{-7} (323 ppb) offset. Keep in mind that K9AYA was less than 25 miles from the transmitter, while W9ZB was over 100 miles away.

On 20M, winners are K5CM, K8YUM, and N1RX.

On 40M, a 3-way tie between AA6LK, K5CM, and K1GGI.

On 80M, A first place tie between K5CM and WA4FJC, with W3JW taking third.

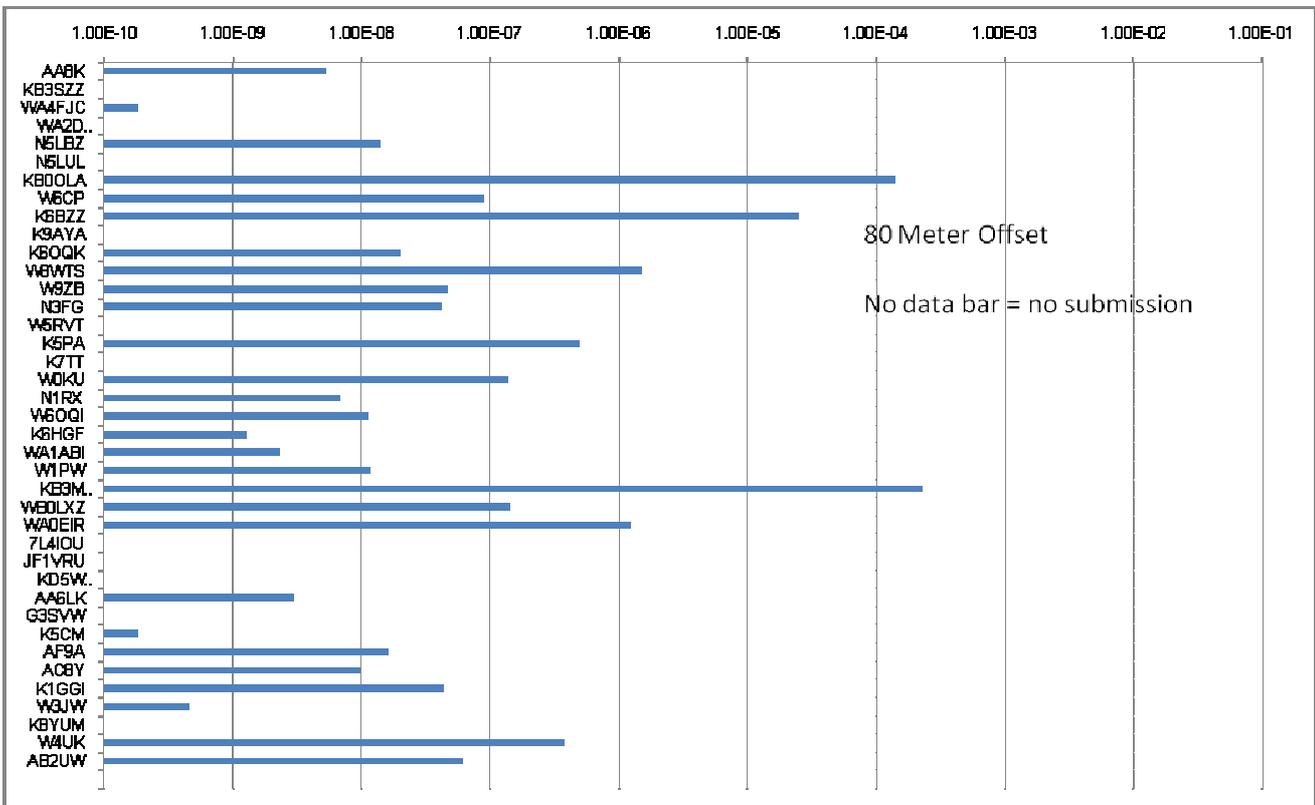
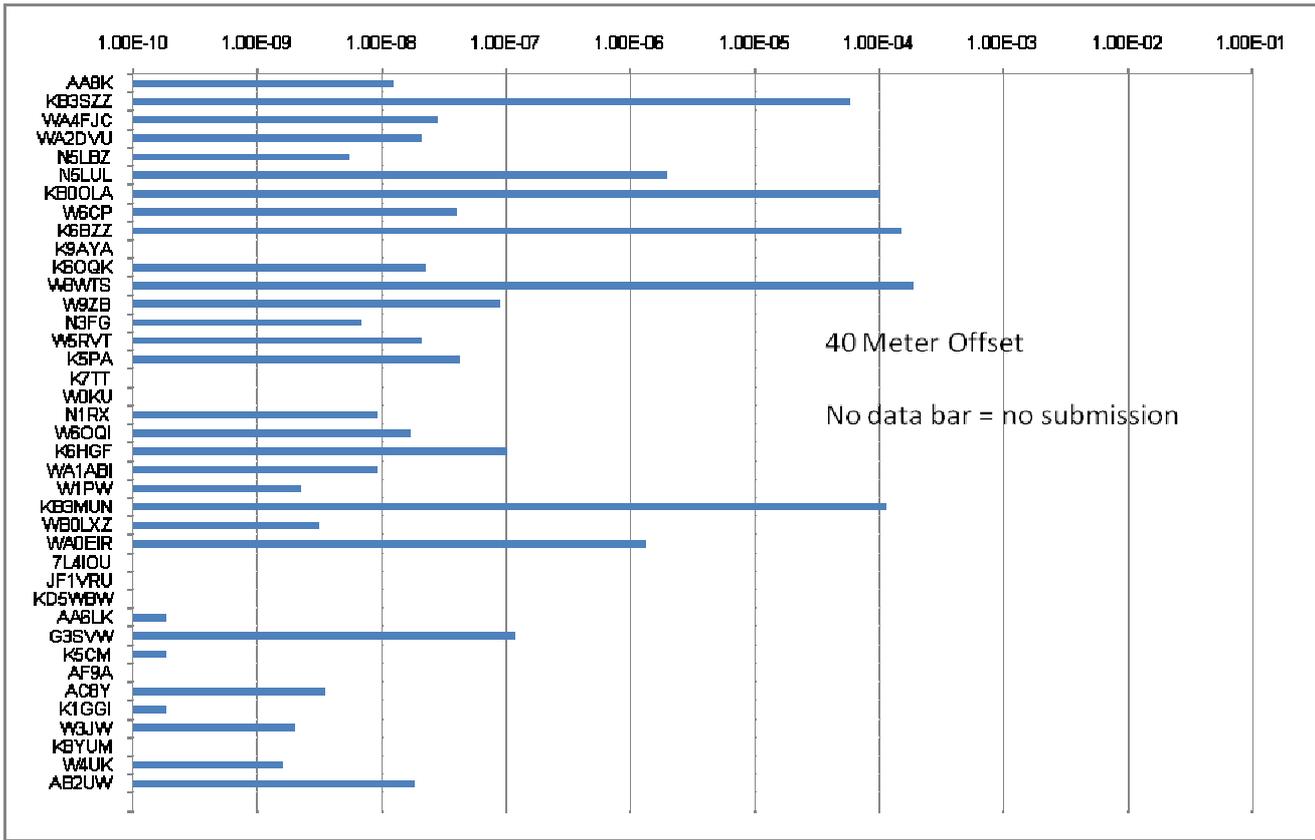
All on HF were better than 1.00E-09 (1 ppb) offset!



Additional tables

The shorter the bar the more accurate the measurement! Logarithmic scale!
Each additional segment is 10 times worse!!

For 40 and 80m are in the "web version" on pg 6a



Part Two **Meteor Scatter from JO98** (Leonids11-2009) By Rolf Niefind, DK2ZF

The next morning (Nov15) I was relieved to find out that the equipment was working just fine and the notebook had recorded the following signals:

17:12 HA6VV 180/11;
17:19 UX2SB 200/6;
19:31 OH6ZZ 360/6;
19:46 UT2UB 280/3;
20:13 ER1SA QSO w. DC9YC 260/6;
22:09 HB9DQY 80/3;
23:20 UY2QQ 60/3; OH1ND tropo;
08:18 SM2CEW 200/4.
UT2UB was heard throughout the night with CQs.

It was still raining but the final installation of the antennas on the telescope mast could not wait. Sked partners were waiting. It was helpful that I had done this many times before by myself, also I brought a 6-foot stepladder. In a little under two hours the 50 and 144 MHz antennas were mounted at 5 and 7m height. This is quite sufficient for meteor scatter. I retreated to the warmth of the motor home and fired up the amplifiers. I was thinking it might provide some extra heat, but the HLV-1500 is so efficient that very little heat is generated. The out flowing air measured only 35°C. The 4CX250B amplifier, however, generated 70°C.

I made the first call at full power. There was no drop on the power line. Good! But on my second go-around there was a loud noise coming from the plumbing unit and a sizzling noise came from the range. Oh no, I thought, I hope nothing happens to the heating electronics. Reducing the power to 500 W made the problem disappear.

Except for a few missed early skeds, all went as planned (see Table). There were only a few workable hours before the maximum. These were on the 15th of Nov from 18 to 19:45 UT. Five contacts were made on 50, respectively on 144 MHz – all in FSK441. On the 16th both bands were fine from 5 to 7 in the morning and from 17 to 21 in the evening.

There was one problem: the electronic keyer didn't work and I forgot to bring a straight key. Checking my toolbox I spotted a pair of tweezers, which I reconfigured into a key. After some experimenting and practice, the code sounded quite good!

Don't count your chickens before they are hatched. Several meteor experts had predicted that the 2009 Leonids would be out of the ordinary, which in turn made me go on this expedition. It did fall a bit short

but still, it was quite worthwhile and I certainly would not have missed it.

On the 17th of November at 9:45AM you could hear the first long bursts on 144.370 by OE3FWU and DF0MU with signals from +7 to +12 dB, longer than 10 sec. Replies, however, were unsuccessful. Until 10:05 I could hear (see) DJ9EV, DF3RL and HB9QQ. After that all was quiet. Was that it? Not quite! Activity continued until 12:35. After that there was dead silence. A good time to catch the afternoon nap!

Two hours later came a cell phone call from LY2SA (600km); he asked for a sked, he had heard me via tropo. It didn't work, not via MS, distance too short, and not via cw tropo. I heard SM5HUA via tropo, but that was it. 4 hours passed without any signals. I almost had the impression that the rx had quit working. Then a short 40msec ping! Finally, at 17:16 came a long expected very long burst of 260msec from UT6UG. And that was it!

A little disappointing, but the 12 Euro bottle of red wine was uncorked anyway. On the other hand, if there had been super meteor condx, I wouldn't have had time to drink, hi!

There was another text message from LY2SA, he really needed that grid square! So I got back on the air and finally worked him. Reports were: my signal – 9dB and his –21dB. A few more contacts followed. By 23:00 I had reached a total of 40 stations. Nothing else was heard; time to retire for the night. There was one last sked for 6 AM the next morning.

During the night the first gas bottle was empty and had to be exchanged. This required a trip outside. To my big surprise I did find a clear sky with the stars twinkling overhead. Would I get to see the Swedish November sun after all that rain? This explained that last night while drinking the wine it appeared that the SWR kept improving. It did improve as the rain stopped and the antennas were drying up!

At 5:40 one could hear PA5KM on 144.370 in a good burst. But as the weather improved the meteor bursts subsided. There was one last burst from DK3EE. Then a text message from DL8EBW confirmed that the peak was last night at 22 UT. Time to prepare to leave for home. Antennas were taken down and stashed away. By 10AM on the 18th of November I was ready for the 620-mile trip back home.



High Speed Meteor Scatter on 50 and 144 MHz

SM/DK2ZF in JO98

Serious Power on both bands

Laptop for Processing with FSK 441 or JT6M

The laptop is the weakest link, Rolf usually packs three of them. This time, however, the keyer went south and Rolf had to improvise and build a straight keyer with a pair of tweezers.



Antenna height is not that important for MS, but gain helps!

On his expeditions he places the 50 MHz Yagi at 16' and the 144 MHz at 22'.

The location, JO98, is about 30 miles south of Stockholm on a tongue of land jutting out into the Baltic Sea

The **Activity Table** (2 pages) is available in the "web version" of the newsletter as page 8a and 8b

JO98 always FIRST 144 MHz FSK441 50 MHz FSK441 OR JT6M depends on distance
 GSM SMS only pse + 46 73 899 93 82 see attached sheet abt FSK441 vs JT6M
 I am in the "wild" no Internet !!! tailending appreciated !

Nov.	UTC	Call	LOC	Frequenz	QSO	Mode	Remarks
15	6:30	G4IGO	IO80NW	50,225	nil	FSK441	
15	17:30	OH6UW	KP22WH	144,393	nil	JT65A/CW	
15	18:00	SP6NVN	JO81IC	144,393	C	FSK441	460/11
	19:00	SP6NVN	JO81IC	50,225	C	FSK441	500/4
	19:15	SP6GZZ	JO	50,225	CR	FSK441	1020/7
	19:30	ON4KST	JO	50,225	C	FSK441	440/4
	19_45	DJ9YE	JO43VH	50,225	CR	FSK441	580/6
15.	20:00	DJ8MS	JO64	144,393	NC	FSK441	nur ein burst
15.	20:30	PA1GYS	JO??	144,393	NC	FSK441	
	21:00	OH6UW	KP22WH	144,393	nil	FSK441	
15.	21:30	G4IGO	IO80NW	50,225	nil	FSK441	
15	22:00	DL5GAC	JN47UT	144,393	nil	FSK441	
15	22:30	G3WOS	IO91PH	50,225	nil	FSK441	
15.	23:00	DL8PM	JO30PU	50,095	nil	CW	
	23:30					FSK441	
	XXX					FSK441	
16	5:00	ON4PS	JO20KQ	50,225	C	FSK441	340/7
16.	5:30	LA4YGA	JO48E	50,225	C	FSK441	2290/7
16	6:00	OZ8ZS	JO55RT	50-225	CR	FSK441	200/6
16	6:30	G3WOS	IO91PH	50,225	nil	FSK441	
16	7:00	LA4YGA	JO48BE	144,393	C	FSK441	240/3
16	8:00	IV3NDC	JN65RV	144,393	nil	FSK441	
16	8:30	DL8PM	JO30PU	69.950/50.185	nil		
16	9:00	IV3NDC	JN65RV	144,393	nil	FSK441	
16	17:00	OZ3ZW	JO	50,225	C	FSK441	1240/6
16	17:40	SM0EZZ	JO89XG	50,225	C	Tropo	QRB 30 km
16	18:00	PA1GYS	JO	144,393	C	FSK441	1160/5
16	18:30	S57TW	JN57EX	144,393	nil	FSK441	
16	19:00	OZ8ZS	JO55RT	144,393	nil	FSK441	
16	19:30	S57TW	JN57EX	50,225	C	FSK441	
	19:45	G4IGO	IO80NW	50,225	C	FSK441	
	19:54	SP9HWY		50,225	NCR	FSK441	1320/8
16	20:00	DJ8MS	JO64	144,393	C	FSK441	700/3
	20:30	DL8PM	JO30BU	50,225	C	JT6M	3 sec burst
16	21:00	DL3YEE	JO41??	50,095	C	CW	559
16	21:30	HA5CRX	JN97KP	144,373	nil	FS441	
16	22:00	DL5GAC	JN47UT	144,393	nil	FSK441	
16	22:30	IV3NDC	JN65RV	144,393	nil	FSK441	
16	23:00	DL3YEE	JO41??	69.0950/.225	nil	FSK441	
	5:30	HA5CRX	JN97KP	144,373	nil	FSK441	
17	6:00	F6BEG	JN25JS	144,393	nil	FSK441	
17	6:30	OZ8HS	JO55RT	50,225	C	JT6M	
17	7:00	G3WOS	IO91PH	50,225	C	JT6M	
17	8:00	DK3WG	JO72GI	50,225	CR	FSK441	560/7
17	8:30	OZ6ABA	JO57DJ	50,225	CR	FSK441	in 6 min. 560/13
17	9:00	HA8CE	KN06EN	144,370	nil	FSK441	260/7 CQ 363
17	9:45	OE3FVU	JN78VE	144,370	nil	FSK441	760/4 QSX 389
17	9:45	DF0MU		144,370	hrd	FSK441	200/5 QSX 376

QSL OK
 QSL OK
 QSL OK
 QSL OK

18 QSO kpl
 100 smse bis hier
 20 qosos

17	9:55	DF3RL		144,370	hrd	FSK441			
17	10:13	DJ9EV	JN????	144,370	CR	FSK441	260/10	21	qsos
17	10:33	DJ5BV	JO30KI	144,370	CR	FSK441	160/7	22.	
17	10:58	HA4XG	JN96IV	144,370	C	FSK441	180/8	23.	
17	11:20	DK2PH		144,370	CR	FSK441		24.	
17	10:50	OK1UGA		144,370	NCR	FSK441			
17	10:50	DK5OX		144,370	hrd	FSK441			
17	11:46	OK1UGA	JO80DD	144,370	CR	FSK441	220/10	25.	
17	11:50	DL8AKR	JO51	144,370	hrd	FSK441			
17	11:50	DL4EBV		144,370	hrd	FSK441			
17		PA3ECU	JO32CF	144,370	NCR	FSK441			
17	11:59	DL8AH		144,370	hrd	FSK441	CQ		
17	12:19	YU1IO	KN04IQ	144,370	CR	FSK441	340/9	26.	
17	12:35	S54T	JN57EW	144,370	CR	FSK441	340/8	27.	
17	14:35	LY2SA	KO14LL	144,393	NCR	CW/FSK441	559 rcvd		
17	15:35	UA3EKX		144,370	NCR	FSK441	240/3		
17	16:30	UT6UG	KO50EI	144,393	C	FSK441	260/8	28.	QSL OK
17	17:00	RZ4HF	LO43TJ	144,393	nil	FSK441			
17	17:20	UX5UL	KO50FL	144,393	hrd	FSK441	480/4		
17	17:30	HA5CRX	JN97KP	144,363	NC	FSK441	80/4		
17	18:00	RX1AS	KO59FX	144,370	hrd	FSK441	220/5		
17	20:15	LY2SA		144,395	C	JT65B	21 dB -9dB in LY !	29.	
17	20:40	ON4KHG	JO10XO	144,393	C	FSK441	180/9	30.	
17	21:00	F5JNX	JN37PV	144,393	nil	FSK441			142 smse noch 120
17	21:20	OK2POI		144,393	C	FSK441	440/11	31.	im Handl
17	21:37	PA3ECU	JO32CF	144,393	C	FSK441		32.	
17		PE9DX	JO33MD	144,393	NC	FSK441			
17	21:45	DL7FF	JO62TJ	144,393	C	FSK441	1020/12	33.	
17		PA4PS		144,393	hrd	FSK441			
17		PA2CHR		144,393	hrd	FSK441			
17	22:01	DD3SP	JO72EN	144,393	C	FSK441	160/9	34.	
17		DH6JL		144,393	hrd	FSK441			
17	22:05	PA5MS	JO21QJ	144,393	C	FSK441	180/7	35.	QSL OK
17	22:10	PE9DX	JO33MD	144,393	C	FSK441	120/10	36.	
17		PA3COB	JO32MF	144,393	hrd	FSK441			
17	22:29	PA5KM	JO11WL	144,393	C	FSK441	360/6	37.	
17	22:37	DK8ZJ	JO54AG	144,393	C	FSK441	300/6	38.	
17		DK5SO		144,393	hrd	FSK441			
17	22:39	PA3COB	JO32MF	144,393	C	FSK441	120/7	39.	
17	22:46	DK1CO	JO63SX	144,393	C	FSK441	120/10	40.	QSL OK
17	22:48	DH2OAA	JO42TU	144,393	hrd	FSK441	140/10		
17		OK2BRD	JN99ET	144,393	NC	FSK441	180/7		
17		DH2OAA	JO42TU	144,393	NC	FSK441	140/4		
17	23:00	DK5SO		144,393	NC	FSK441	100/9		
17	23:00	DF5NK		144,393	NC	FSK441	100/10		
17	23:12	DK5YA	JN49NX	144,393	NC	FSK441	260/11		
17	23:15	S57TW	JN75EX	144,393	NC	FSK441	300/12		
18	05:00	PA5KM	JO11WL	144,370	hrd	FSK441	CQ 160/6		

January 2010 VHF Rover Report. By NE8i/r

Drove 487 miles. 16 hours operating time. Activated 6 grids. EN64, 72, 73, 74, 75, 83. 55 Q's. Claimed score 4,482. 50M through 24 GHz. Saturday: Started the contest in EN83. 6m was full of meteor scatter all weekend. Murphy, was alive and well! Had too much stuff just die and not work for no apparent reason. Conditions were poor except for meteor and rain scatter. Had K8DOG/R, stop by, knock on my window, and ask if I was ignoring him? Turns out his IC706 quit transmitting for some unknown reason. Played with it for a while. Nothing doing. Of course, it started working back home! So Murphy was really active this contest. Sunday, Started in EN75, E of Leeland Mi. Heavy rain for most of the morning. Heard lots of rain scatter, on bands 1296 through 24 GHz. Most notably K8MD and K2YAZ. Problem on my end, was QRP. Contests are too short for QRP. On 10 GHz with K2YAZ, we tried a few things, using my small station, with 15dB horn. I found his signal in various places and directions in the sky, often stronger than direct. He was really lighting up the clouds. This changed, with the changes in the rain storm. With rain and snow scatter, and antenna elevation, you can get over hills.

Biggest things I noted, besides **running QRP is rough**. Need a separate driver and operator. Hard enough to drive and make contacts, and keep a paper log. Impossible to keep a computer log and operate, and drive. Once the "game" started Sunday afternoon, the activity just dissapeared. Gave up. I was not going to just wait the additional 3 or 4 hours. The 487 miles was rough on the antennas. Going to have to rebuild them, fix them, again. Strategy of late, is to announce a rover frequency and itinery. Try for about 1-2 hours in each grid. One 4-grid corners Saturday. After a full night sleep, 4 to 6 grids on Sunday. Most contacts, have been along the Lake Michigan coast line, across the Lake. PS, CW works great on rain and snow scatter. SSB is just about a lost cause. If the signals are really strong, FM works.

Reminder: **Microwave Activity Days**. First Saturday of the month. Sunrise to Noonish. Meet on 144.260 USB talk microwaves, and move up >902 MHz. Also, If Saturday does not work. Monday Evenings. Meet on 432.120 USB and move up. We make Microwave Activity happen.

Tropo Opening in Southern Michigan

1/15 through 1/17/2010.

From Russ, KB8U

I was alerted to the opening when I looked at my TV reception web page: <http://kb8u.ham-radio-op.net/TV2> and was surprised to see some Iowa TV stations coming in. I heard the opening started Friday morning but I hadn't checked the radio or Internet for any openings until the evening. The attached screen shot shows the TV stations received over the opening. The TV antenna was pointed west and was not moved for the duration. The opening extended to the east, too, but I concentrated on DX to the west and southwest.

Highlights were N0IRS in EM29 on 1296, WB0YWW in EN22 on 432, WZ1V in FN31 on 1296, and KA9UVY in EM58 on 1296. It was also nice to have 'arm-chair copy' and rag-chew with some of the ops who are usually weak and just give the usual contest exchange. At times, signals were extremely strong on 432.

It was a nice start for 2010, let's hope this year gives us above average tropo. The last few years seem to have been below average.

For HSMS/WSJT Newbies

What's the difference is between FSK441 and JT6M, and when each mode should be used in preference to the other.

First, some history and a little technical explanation.

FSK441 was developed as a mode expressly optimized for meteor-scatter propagation. It is capable of decoding an entire message in considerably less than 1 second. FSK441, like all WSJT modes, is AFSK, or audio frequency-shift keying. Your sound card creates four audio tones in various sequences to encode the alphabet, numerals, and a few special characters.

FSK441 is not a "smart" protocol, meaning that it does not analyze data patterns to determine message contents (as does JT65), nor does it create "most likely" message contents by averaging multiple decodes of the message string (as do both JT65 and JT6M). What FSK441 decodes, character by character, is what you see in the decode window. It is a very MANUAL mode! And to get the best decoding performance out of it, more operator smarts are arguably required than for any of the other WSJT modes. (Advanced use of the FSK441 tools in WSJT is beyond the scope of this short article, but such a paper should be written.)

JT6M came along later. It is not a "dumb" protocol like FSK441 because it is capable of making some intelligent guesses about the content of the message being decoded. For this reason, and because it is a slower protocol and therefore requires less bandwidth than FSK441, JT6M is a more sensitive mode. On average, you can decode a more-or-less steady strength JT6M signal at better than 10 dB below the noise floor. In comparison, FSK441 requires signals at least 1 or 2 dB above the noise floor.

For this reason, a lot of hams jump to the conclusion that JT6M must be better for long-distance meteor-scatter contacts because it is "more sensitive". This conclusion is incorrect, and we'll discuss the reasons here.

As anyone knows who has had any experience with meteor-scatter work, meteor-scatter radio propagation events (variously called pings, burns, or bursts) come in all strengths and sizes, from the weak 1-dB, 100-millisecond (ms) ping up to the 20-second long,

speaker-rattling "blue whizzer" caused by a bigger than usual meteor hitting the atmosphere in exactly the right place. Now, here's the technical part:

The amount of ionization created by a meteor burning up (called the plasma density) is determined by a number of variables, including the meteor's composition, its mass, its speed, and its angle of entry. When a very high plasma density is achieved momentarily, the effective Maximum Usable Frequency (MUF) for that meteor trail is quite high, sometimes as high as 432 MHz or more. However, since this extremely high plasma density occurs only in a small portion of the meteor's ion trail and begins to weaken quickly, pings in the high VHF and UHF ranges are infrequent and quite narrow, usually less than 1 second duration. The higher in frequency you go, the more narrow and the more infrequent meteor pings are.

FSK441 was designed to decode meteor pings as brief as 150 ms duration. Therefore, under normal circumstances on 2 meters and above, FSK441 is really the only mode that will reliably provide meteor-scatter communication.

On 6 meters, however, propagation can be sustained with a lower plasma density, and meteor pings tend, **on average**, to be longer in duration, often lasting more than a second or two. JT6M requires a burn of at least a second, and more reliably two seconds, in order to encode/decode a worst-case length message (both calls plus reports). These longer pings allow the more sensitive JT6M mode to be usable for some meteor-scatter work on 6 meters.

Now, there is a catch. Here is the nexus of the problem:

Very weak pings that might seem to make the higher JT6M sensitivity advantageous **also tend to be very short**. Therefore, even if a 200-ms ping several dB below the noise floor could theoretically be decoded by JT6M (and could **not** be decoded by FSK441), **the ping is oftentimes too short** to contain a reliably decodable JT6M message. So your extra sensitivity is of little use! Pings that are **long enough** to contain full JT6M messages are also typically **more than strong enough** to be decodable by FSK441. And FSK441 will also decode comparatively weaker messages only a few hundreds of milliseconds long.

Therefore, in most cases, FSK441 is still a better performer in 6-meter meteor-scatter work than JT6M, though plenty of meteor-scatter QSOs can be made and are made every day using JT6M. It's just a matter of the percentages.

If conditions are strong and the station you are trying to work is in the "sweet spot" for meteor-scatter propagation (500-800 miles), JT6M will virtually always work just fine. If, however, you are: (1) working under poor MS conditions, or (2) you are trying to work a station at the edge of MS range, or (3) you are trying to work a station very close by via high-angle, high MUF meteors, it is better to use FSK441. Why? Because all three of these conditions tend to produce pings that are comparatively shorter in duration, and FSK441 simply works better for short pings.

JT6M, however, has a wonderful redeeming value. It is an outstanding mode for very weak signal work when signal strengths are either fairly stable or variable over a period of at least several seconds. Such signals can come from tropospheric, D-layer ionosscatter, and weak sporadic-E propagation. When F2 propagation begins to return to 6 meters in a few more years, we may find that JT6M is an outstanding mode for completing 6-meter QSOs when propagation is still too weak to support SSB or even CW communication.

In general, then:

(1) On bands above 6 meters, use FSK441 for meteor-scatter QSO attempts. JT6M will generally **not** be useful on 2 meters and above.

(2) On 6 meters, use FSK441 as your default mode for meteor-scatter QSO attempts. Use JT6M only when meteor burns are fairly long -- at least a full second. More often than not, these conditions will also produce burns that are fairly strong as well, again **on average**.

(3) Use JT6M for weak-signal QSO attempts using atmospheric propagation modes like tropo, ionosscatter, and sporadic-E.

These are not laws, merely suggestions based on observation and a little science. Exceptions to these generalizations do occur regularly on 6 meters.

Bill W5WVO--2009