

Vol. 21 No. 4

www.mvus.org

April / May 2007

April Meeting on Friday 27th May Meeting on Friday 25th

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

MVUS Sunday Net at 14:30 UT (currently 10:30 AM local time, EDT).

The net frequencies are primarily **144.280 Mc** and **28.960 Mc**.

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Upcoming Events

SVHFS Conference, Atlanta, GA April 27 & 28, 2007, see page 9

Hamvention 18/19/20 May, 2007 Meet with friends at the MVUS Booth, 332c Forum Saturday 13:45 – 16:45, details on back page

Central States Conference: July 26-29, Omni Hotel, San Antonio, Tx www.csvhfs.org

Microwave Update: 18/19/20 Oct. **The Inn at Valley Forge** (nr Philadelphia) \$ 92.00
1-866-795-1995 (Mention Microwave Update) More Info **W2PED:** Pdrexler@hotmail.com

Re: Your MVUS Membership.

If your label indicates your membership expired some time ago your payment will be applied only from this year (2007) on. It's \$ 10 per year for the paper newsletter and \$5 for the e-mail newsletter. Any extra donation will be appreciated and put to good use. Mail your info and check (see back page for a form) to Gerd Schrick, WB8IFM, Treasurer, 4741 Harlou Dr, Dayton Oh. 45432-1618. Questions? e-mail WB8IFM@AMSAT.ORG or (937) 253-3993

DE N8ZM

Now that it is mid-April, the slider on the MVUS web site that winter is finally 'loosing' its grip might be coming true. I sure hope so, as there are some antenna projects (mine and for others) that need to get started. One of those is actually pretty close to completion, and it is our 1296 beacon antenna. Mike Murphy, KA8ABR, has built a very rugged assembly that should last as long as the tower it will be on. Mike is still working out the final tuning, but I expect it to be ready to go shortly. Fortunately, there appears to have been a delay in the tower climbers scheduling, but only just enough to give us time to finish up some design refinements. So I am hopeful that we will soon have a radiator in the air!

Also on the subject of antennas, I was at Hara Arena the other day and took the opportunity to check out the situation for the beacons we put up for Hamvention. The tower sections that Gerd donated have been installed, although the bottom section has not been changed. Also, Mr. Wampler, the owner, has agreed to install a GFI outlet for us near the base of the tower so we won't need to run an extension cord out the window anymore. He asked that we contact him around the end of April to work out the details (and very likely to remind him to get it done).

As for Hamvention, remember to stop by the MVUS booth and say hi. And if you can spare a couple of hours to help staff the booth and give the regulars a break, please do so. And feel free to tell your friends about us and use the MVUS booth as a landmark and meeting place during the show. It is always a friendly place to see fellow VHFers.

When I read Anom Prop each month, I am impressed by the quality and usefulness of the articles (well, usually not the editorials) that it contains. Certainly Gerd plays the major role in getting people to do the writing, but you guys who have done the research and construction are the ones who make the newsletter and the club thrive. One of the things we do best in MVUS is share our knowledge and experience, and Anom Prop is the primary vehicle for doing that, especially for the folks who can't make the meetings. So please keep those manuscripts coming. I learn something new every month, and I hope you do too.

Every so often, I must remind all of you to make sure your MVUS dues are paid up. Our dues must be some of the lowest for any club around, and they basically defray our annual operating costs, like printing and postage, filing fees to the State of Ohio to maintain our existence as an Ohio corporation, stuff like that. Gerd does an exceptional job of keeping our costs down, and we haven't really had any money raising projects lately, so we pretty much live on the income from dues. Steve Coy, K8UD, provides our web presence at no charge as well. So please help support our activities, and yours.

See you at the meeting and at the Hamvention, Tom, N8ZM.

For Sale:

1/2"-50 Ohm Hardline, RG-331/U Times Wire & Cable. Like new. Smooth outer shield, with black jacket; 45 cents/ft; \$65 for 160 ft. length (have 3). Add \$10 per connector (mate with PL259 or type N). **Heavy Duty Rotor Wilson WR-1000**. Weighs 65 lbs. (Taitwister T2X is 28 lbs). Have two: used one \$500; new one \$550. Prop-Pitch motor for rotor; will turn your house! Large size; weighs 83 lbs.; \$350. **Free** – 20 years of QST and 73 magazines. Much more.

Call or email Joe, WA8OGS @ 513-385-4198 or burkej@one.net

2006 Microwave Update Proceedings

We still have a bunch, a copy can be yours for \$ 16 postage paid. Send check to:
Gerd Schrick, WB8IFM, 4741 Harlou Dr, Dayton, OH 45432-1618

This and That 4/5-07

Pre-Damaged Car. “I actually think all cars should COME pre-damaged. If the side of your car looked like it had been in a hailstorm would you care if someone dinged your car in a parking lot, or if your kid’s bicycle scratched the pain? Id would be very liberating.”
[Ray, Car Talk]

Looking Up Facts ...on the Internet, I find myself browsing in some fascinating detour that has nothing to do with what I am looking for.
[Herbert Keppler, Pop Photo]

Lotto. “I don’t know what I’ll do if I win, it’s too much money to think about!”
[one lotto player]

Busy Signal. When you get a busy signal these days it is not the teenager in the family but it’s grand dad surfing the internet with the good old “dial up”. The kid’s excuse for not using the phone, “There is a chance that you’ll have to talk to a parent.” On school buses, instead of talking to the kid next to you, text messaging (with the cellphone) is now used to communicate with a kid a few rows away
[Ed + Mary Maccarty]

Engineer. You know you’re an engineer if you stare at orange juice container because it says “concentrate”.
[Bosch Rexroth]

Call stays in Family. I was licensed in 1970 as WN8GXB then was WB8GXB as I upgraded. With dad’s passing last year I decided to apply for his call. Dad received his Technician license in the mid 50’s. So W8RKO has been in the family for approximately 52 years. I now have some work to do replacing the ham license plates, updating the web site, and configuring the ARRL email alias for the new call.
[Mike Suhar, WB8GXB, oops, W8RKO]

Making a Mistake You get what you pay for! Now, will the guy that has not made a mistake please raise his hand. Now the ones without your hands in the air, please feel free to try walking on DEEP water.
[Gene Hawkins. KA5CNT]

Blank Sun. The sunspot number has been zero for eight consecutive days. This may seem like a long time, but the sun can go much longer without sunspots. For instance, during the previous solar minimum in 1996, the sun was once blank for 37 consecutive days between Sept. 13th and Oct. 19th of that year. How long will the current "blank" last? Stay tuned.
[Space WX 4-11-07]

High Tech “Lederhose.” It has a free speech mechanism for mobile phone and an MP3 Player with 512 megabyte of memory, which can be controlled via a textile keyboard on your thigh. The microphone is integrated into the shoulder strap of the Lederhose.
[CeBIT in Hannover (Germany) 4-19-07]

Carl Friedrich Gauss. Described as the mathematical Mozart, showed his talent to his teacher as a boy: “This was the hardest mathematical textbook in German. Nobody could study it in a day, and most certainly not an eight-year-old with a running nose”. But after half an hour of questioning the teacher turns pale in recognition of the boy’s genius...
[Measuring the World, Daniel Kehlman]

Radiotrons. Radio Tubes are a lot like you (they get tired). If you haven’t changed them for a year or more, iy will pay you – in the form of better reception, better tone, better volume – to replace tired tubes with a new set of RCA Radiotrons.
[From a RCA ad in 1938]

Readrite. Pocket Battery Meters. Noted for their accuracy, durability, and permanency. A written gurantee for ONE YEAR supplied with each meter. Ammeters, \$2.50, Voltmeters, \$3.00, Volt-Ammeters, 3.50 and \$ 4.00. Write for circular and discount.
[Read-Rite Meter Works, Bluffton, Ohio, 1938]

Hamvention Beacon

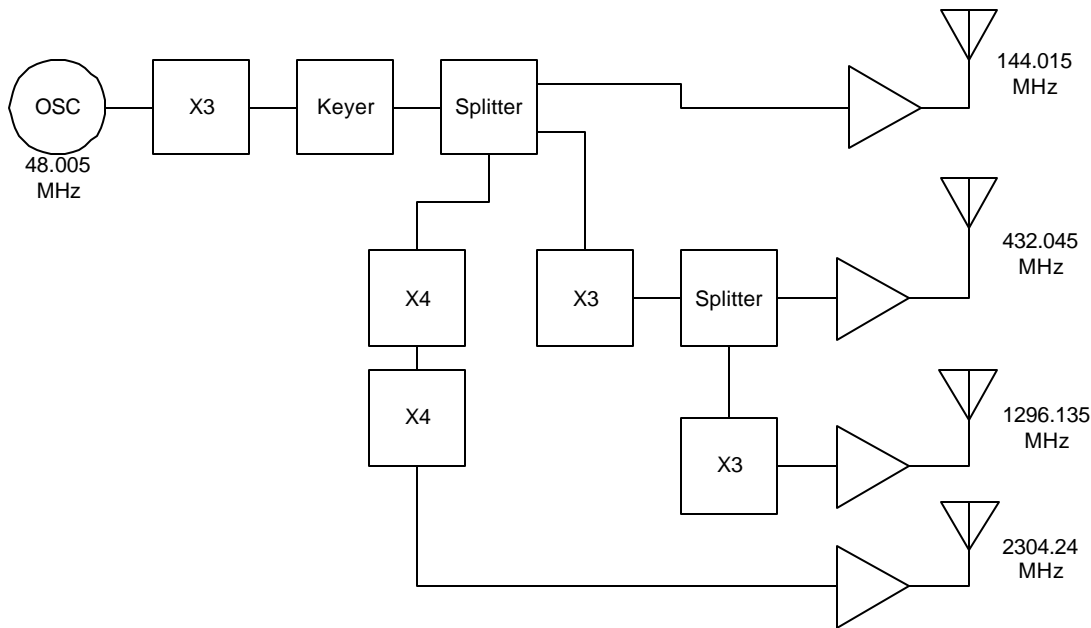
By Mike Suhar, W8RKO*

I am re-building the beacons I had at Hamvention last year and adding a couple of frequencies. The new package will be smaller and easier on the installation crew. The beacon is nothing more than an oscillator that is multiplied a number of times to generate frequencies of interest. Fortunately many of our bands are harmonically related. A simple design can be created using inexpensive and easy to use MMIC amplifiers. The conceptual idea of the beacon is shown in the block diagram. The diagram does not indicate the actual number of amplifiers and filters.

The main oscillator runs at 48.005 MHz. This oscillator is an oven design to stabilize the frequency. Later I may replace this with a GPS stabilized oscillator. That will be design improvement goal for next year. Multiply the oscillator by 3 and you have 144.015 MHz. Using a splitter one side will drive some additional amplification, a filter, and then passed to the antenna. The other side of the splitter will be multiplied by 3 again for 432.045 MHz. As before split that off and spill some out into the air for the UHF beacon. Multiply again by 3 once more and you have 1296.135 MHz. Going back to 144.015 and multiplying by 16 provides 2304.24 MHz.

Power levels for 2meters and UHF will be low at approximately +17DBm (50 mW). For 1296 and 2304 the amplifiers from last year's beacon will be used. If I recall they ran around 10 watts. Antennas will be simple dipoles.

I am a little behind on the construction but I hope to have the beacon operational in time to be installed on the roof at Hara. The beacon will run under the club's call sign: W8KSE.



* Mike, previously WB8GXB, applied and got the new call W8RKO, which was his dad's call, now a SK.

SDR-14 Spectrum-Capturing Device - First Impressions

By Rod Owen, WG9F

When I took it out of the shipping carton, I thought how small and light it was, virtually nothing to it. Someone would have to be slightly crazy to drop \$1120 on this little piece of fluff. (To those who already have, no offense is meant here; I am slightly crazy myself, and always have been, and most of my friends are crazy, as far as that goes). But this really is a **neat little gadget**.

My Ham Background

I am a traditional old radioman. I have been building and operating HF radios for a long time. I was first licensed in 1966 at age 15, but I had already been building vacuum tube radios for more than three years at that time, and had even been known to allow my dummy load (called **Artificial Aerial** back then) to accidentally leak RF, and converse with pals in the nearby village, prior to obtaining my ham license. I am certainly not averse to using modern technology, but up until yesterday I had only considered a home computer as an RFI source and a nuisance in the radio world. I certainly would not dream of having one in my shack.

A fellow radio enthusiast who has been a friend for many years, and with whom I share many electronic interests, lives in England. He recently asked me to purchase an SDR-14 (Software Defined Radio) from RF Space in Atlanta, GA, and ship it to him. He encouraged me to try it out before I sent it on to him.

Last Thursday, after work, I took the SDR-14 and went with Mike, KA8ABR, to Jim's, N8ECI, shack. Jim is already well into radio decoding and band monitoring with software, and has been playing with this stuff for a while. He has SDR (the method, not the brand) himself, for both RX and TX, and writes his own code. He had the SDR-14 running within about 10 minutes of us showing up at his QTH. Playing with it for almost 2 hours, I actually had quite a lot of fun with it.

First we applied a carrier at 14.038 Mc directly to the input from an HP signal generator. Starting at -120 dBm gradually increasing the signal level, we could detect the carrier at a bit less than -90dBm on the waterfall display.

So far so good. Now for the acid test! We plugged a real antenna into the device. Jim's main HF antenna is a 200 ft dipole center-fed with ladder line. We used one side of this (in essence a 140' long wire), plugged it directly into the center pin of the SDR-14's 0.1 - 30 Mc input jack. Still tuned to 14.038 Mc center frequency, the entire width of the display just about whited out. The red overload light (labeled "clp" for "clip") was on almost continually, just blinking off occasionally. There is no front end tuning in this thing, the problem is, it is hearing everything from car batteries up to UHF (the thin "manual" says that it is good to 300 Mc, with aliasing above 30 Mc of course), and the sum of all the signal levels from high powered broadcast and service and business band signals will just annihilate the front end. We tried adding attenuation using the built-in attenuator, which helped somewhat, but that killed all but the strongest signals as well, at the low end of the 20-meter band where we were parked. So we decided next to take a look at WWV on 10.000 Mc, as that is quite a strong reference signal. We could see it, but we still had to fiddle with the attenuator to bring it out of the overload chaos. At this point we took some photos, so the waterfall that you see in the photo is not the best that we eventually got.

Front-End Filtering

I decided that we should try some front-end selectivity, so Jim put his antenna tuner in the line. We immediately noticed significant improvement, and we eventually got really good displays. The photos were taken before we got the best displays, so the SDR-14 actually works better than what you see in the photo.

So, anyone who uses the SDR-14 on HF will really need to insert at least an antenna tuner between the antenna and the SDR-14. I think that it would benefit from a multi-stage band-pass filter between the antenna and the input. A tunable filter with several stages would be even better. This would have to be homebrewed, but would not be difficult to make. If you have an old 3 or 4 gang tuning condenser, as used in old medium-wave broadcast receivers, it would be easy to make a tuned input network consisting of 3 or 4 tuned circuits connected with very low value coupling capacitors (like 2 pF) to achieve high-Q, hence good selectivity. You would put the input and output on to taps low down on the input and output coils, or just wind a 1 or 2 turn coupling loop around the base of the input and output coils. In this way, it will be possible to cover 1-30 Mc with just three sets of coils. At VHF and UHF one could use a 3 or 4 stage fix-tuned band pass filter. These are easy to make at V/UHF. They can be made on a small piece of PC board.

The tuner that we were using has only one tuned stage, (like all transmatches) so the selectivity is not that great, but it made a big difference to the SDR-14 performance.

After we got the hang of tuning the tuner (note: we are all used to doing this by minimizing reflected power, see the meter on the front panel in the attached photo. It is obviously not possible to do this in receive-only !!), we could actually get quite good displays on the waterfall, searching for weak signals in the ham bands.

We played with some of the other display modes. I personally like the display where it is possible to have the typical spectrum analyzer "green trace" along the top with the waterfall below it.

Long Delay

One thing that is strange (though I do realize how this thing works) is that the audio continues to play for almost a second after you pull out the antenna plug. This is most disconcerting!! This means that you have to take it fairly slowly when tuning the antenna tuner for maximum signal. The depiction of an S-meter isn't too helpful in tuning the tuner unless the signal that you are looking for is strong. I think that the S-meter is showing the strength of the sum of all signals and noise in the passband, not just the signal that you are listening to (i.e. your center frequency).

Gadget as IF

Jim has a little 3-port mixer that is good up to UHF (like an SBL-1 or MCL-1 packaged in a box with three co-ax connectors, if you are familiar with those devices). Using the HP signal generator as a local oscillator, and tuning the SDR-14 to 15 Mc as an IF, we tried connecting VHF and UHF antennas to the mixer input port, with the SDR-14 connected to the output port. We were able to see and hear signals on the VHF and UHF ham bands, and also VHF and UHF business/service bands, and VHF and UHF TV signals. We had a lot of fun over the course of less than a couple of hours. This was somewhat old-hat to Jim, but he was enjoying watching my reactions, as an old "steam-radio" man. He let me do all the driving, with him just giving instructions. He would occasionally throw in comments like "How would you do that on your R-390 Rod ?" !! I like the way that you can tune up and down the band by using the scrolling wheel on the mouse, by pointing the cursor at the 10 or 100 cycle digit.

During the approximately 90 minutes that we were using the SDR-14, Win-doze crashed once and we had to re-start the whole thing. We were not running any other applications on the PC during the time that we were running the SDR-14. Fortunately, we were not copying latitude and longitude from any sinking ship at the time.

Use in Microwave Work

I think that the SDR-14 would make a great IF for a microwave down converter, with appropriate filtering. It is possible to watch a 190 kc wide slice of spectrum, and that would be great for searching around your own operating frequency on the higher microwave bands. I know that the guys operating 10 gigs have sometimes had difficulty "finding" each other, even when the nominal operating frequency is known.

Going back to the delay, it was really strange when we were experimenting on VHF with the mixer and signal generator. We sent Mike to the far end of the house with a 2-meter radio set to low power, and with a dummy load plugged in. He was speaking to us on the radio and we could hear his voice in the distance and also hear it coming out of the PC connected to the SDR-14, except that there was almost a 1 second delay on the radio signal. It sounded weird. That is like being more than half way to the moon in radio terms. As a digression, when Mike and I talk on 10 meters on Sunday mornings, we have sometimes had strong round-the-world propagation that mixes with the direct signal (Mike is 78 air miles from me). That is about a 1/7 th of a second delay, and it makes it very difficult to copy what an OM is actually saying.

Conclusion

I would like to have one of these, but I couldn't bear to spend anything like \$1120 on one. I hope that the price will eventually come down significantly, or that other companies will make cheaper versions. After all, it's only about a dozen chips, a small circuit board, and a cheap project box.

A further observation: There is virtually no protection built into the front end. There is only the attenuator, which you can switch out completely, then there is no protection !! If I was using an SDR-14 on an HF antenna I would place a couple of back-to back parallel signal diodes (1N914 or similar) across the input. This should not degrade the intermod

performance, as the diodes would not get anywhere near to conduction if there was reasonable filtering between the antenna and the RX.

The power cube (12V 1 A) provided needs reverse voltage protection, that would just require a 1N5400 diode across the output Current drain is not given, but probably less than 500 mA.

The “manual” provided doesn’t tell you much at all, and contains errors and ambiguities. It is also supplied with a CD that contains operating software and fairly good descriptions of the device and its modes of operation. Source code is contained on the CD with explanations that will supposedly allow an experimenter to write his own operating code. There is a brief description on the Web:



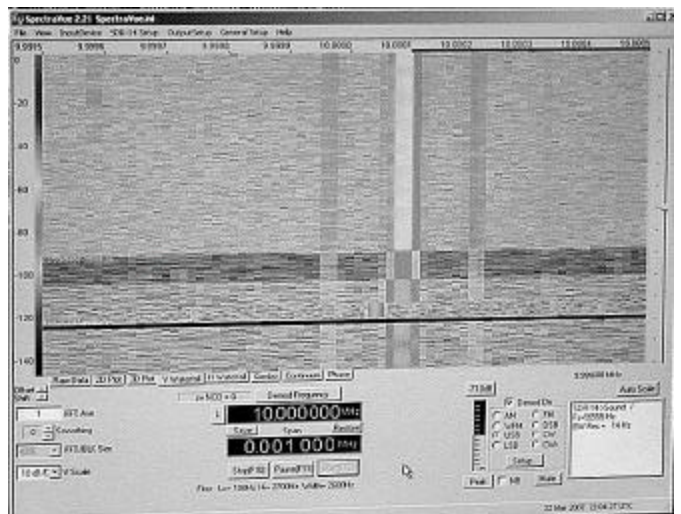
SDR-14 and Antenna Tuner as Preselector



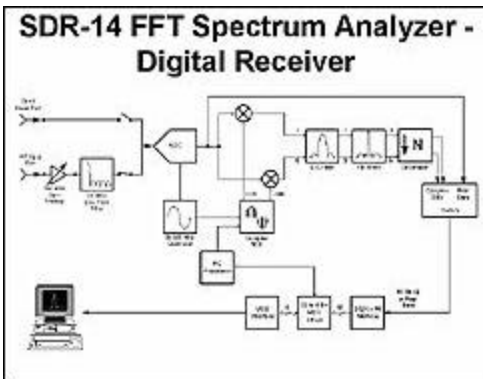
Test Equipment and Work Bench of Jim, N8ECI



From the Web



SDR-14 Display



Description from the Web:

The **SDR-14™** is a 14-bit (42 dB, Ed) software defined radio receiver. It offers a broad range of spectrum analyzer and demodulation capabilities. The hardware samples the whole 0-30 MHz band using a sampling rate of 66.667 MHz. The digital data from the ADC is processed into I and Q format using a direct digital converter (DDC). The I and Q data is then sent to the PC for processing using a USB 2.0 interface. All of the demod and spectral functions are done on the PC side.



From the Web

11th Annual SVHFS Conference, Atlanta, GA April 27 & 28, 2007 (Friday & Saturday)

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

HOTEL INFO for 2007 Conference: Marriott Atlanta Century Center 2000 Century Boulevard NE
Atlanta, GA 30345 Direct telephone# 404-325-0000 (call this number and ask for our group rate)
Fax # 404-325-4920 <http://marriott.com/property/propertypage/ATLNE> Group room rate \$109

Program Schedule

Friday, April 27, 2007

8:00 - 4:30 Registration

8:00 - 11:45 Antenna Gain and Noise Figure Measurement

11:45 - 1:00 Luncheon - ARRL Second Vice President Rick Roderick, K5UR

1:00 - 9:00 Vendor Product Displays

1:00 - 1:15 Welcome - SVHFS Conference Chairman Robin Cutshaw, AA4RC

1:15 - 1:45 Real Power on 2.3 GHz - Steve Kostro, N2CEI

1:45 - 2:15 Directly Synthesized 47 GHz Local Oscillator - Garry Hess, K3SIW

2:15 - 2:45 Some Notes on Drilling and Tapping - Chuck Hoover, K0VXM

2:45 - 3:00 Break

3:00 - 3:45 Some Ideas for Tower Trailers - Bob Lear, W4ZST

3:45 - 4:30 Noise and Noise Figure/Time & Frequency Standards – Charles Osborne, K4CSO

4:30 - 4:45 Break

4:45 - 5:30 SVHFS Business Meeting - SVHFS President Robin Cutshaw, AA4RC

5:30 - 7:00 Dinner (on your own)

7:00 - 9:00 Flea Market

9:00 - 11:00 SVHFS Board of Directors and Officers Meeting

Saturday, April 28, 2007

8:00 - 1:00 Registration

8:00 - 4:00 Vendor Product Displays

8:00 - 8:15 Welcome - SVHFS Conference Chairman Robin Cutshaw, AA4RC

8:15 - 8:45 VHF Digital Voice Transceiver - Moe Wheatley, AE4JY

8:45 - 9:30 A Software Defined Rover - Army Curtis, AE5P

9:30 - 10:00 A PVC Antenna Mount for Big Rovers - Marshall Williams, K5QE

10:00 - 10:15 Break

10:15 - 11:00 Efficient Circular Polarized 13 cm Feedhorns in Low f/D Prime Focus Parabolic Reflectors -
Tommy Henderson, WD5AGO

11:00 - 11:45 Deep Space Reception - Paul Marsh, M0EYT

11:45 - 1:00 Lunch (on your own)

1:00 - 1:45 Commanding the AO-51 Satellite via UHF/VHF Links – Gould Smith, WA4SXM

1:45 - 2:30 AMSAT and the Eagle Satellite - Rick Hambly, W2GPS

2:30 - 2:45 Break

2:45 - 3:15 Are You Wired for 220? - Ben Lowe, K4QF

3:15 - 3:45 Wire-Grid Polarizers: The Key to a Better Antenna – Philip Gebhardt, VE3ACK

3:45 - 4:15 Low Cost Bi-Directional VHF/UHF Gain Antennas - Bill Fisher, W4GRW; Ron Bailey, AA4S

4:15 - 4:30 Break

4:30 - 5:30 SVHFS Auction

6:00 - 7:00 Open Bar/Reception

7:00 - 10:00 Banquet - Editor, CQ VHF Magazine and VHF Editor, CQ Magazine Joe Lynch, N6CL

Hamvention 2007, May 18/19/20
Stop at our booth # 332c, talk to friends take a break

VHF/UHF/Microwave Forum
Saturday, May 19, 2007 1345-1645 EDT, Forum Room 2

Moderator: Michael Schulsinger, N8QHV

Presentations:

Gerd Schrick, WB8IFM; "Earthbound Microwave Transponder."

Kent Britain, WA5VJB; "Using Big Antennas."

Dave Sublette; K4TO; "Getting Started in VHF and Above."

Palle Preben-Hansen, OZ1RH; "Troposcatter Inside & Out – 700 km QSO Anytime."

John Ackermann, N8UR; "Oscillator Phase Noise."

The Midwest VHF / UHF Society, Inc. (MVUS) **Membership Application**

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MVUS Membership (\$10 mail, \$5 e-mail bulletin), paid \$.- for years starting

Gerd Schrick, WB8IFM, Treasurer

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