

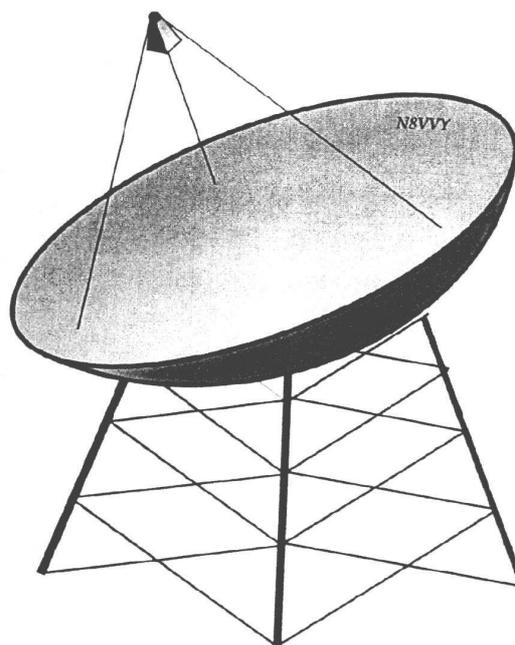
ANOMALOUS PROPAGATION

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

Editors:

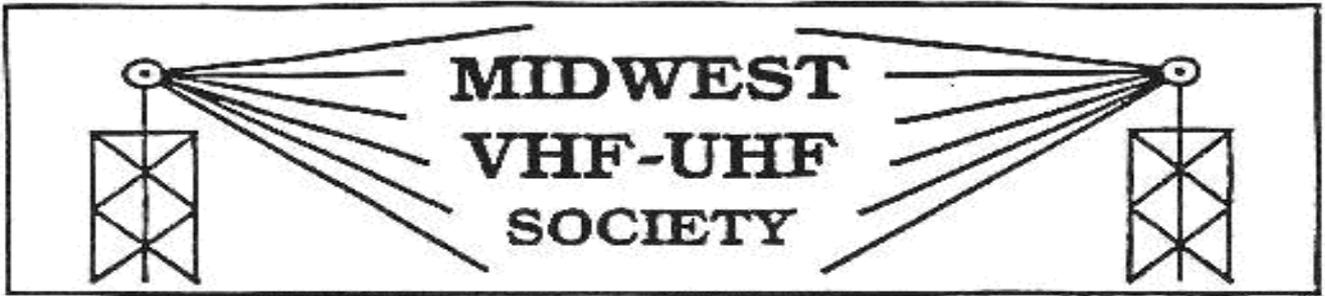
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Annual Society membership is \$ 12.00. Please
make checks payable to Gerd Schrick



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www.mvus.org

April/May 2010

**No April Meeting --- SE Conference 24/25 Apr Morehead, Ky
May Meeting Fri 21st (7PM)**

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

**MVUS Sunday Net at 13:30 UT (currently 9:30 AM local time, DST).
The net frequencies are primarily 144.280 Mc and 28.960 Mc.**

Contents

De N8ZM.....	3
This and That.....	4
Solar Roof.....	5
Cheap BNC Cable.....	7
Distribution Amplifiers.....	7
W8RKO, Mike.....	8
SE Conference Lineup.....	9
Hamvention Info.....	10

Upcoming Events:

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

Hamvention 14/15/16 May

Club News

Dues will go up in May to \$12

De N8ZM (4-10)

As many of us will be attending the Southeast VHF Conference in Morehead, KY at the time of our April meeting, I'll leave it up to the stay-at-homes to decide whether to convene in our absence. Of course, any important decisions made regarding MVUS will be declared immediately null and void as soon as we return. Unless such decisions involve pizza or other edibles.

While I am on the subject of the SEVHF Conference, Gerd asked me for a schedule of presentations to publish here, but as of this writing, I have not received one from the program organizer. If I get it in time, I'll get it into this issue, or on the MVUS web site.

A new feature at Hamvention this year will be the Discover Homebrew demo area, in the North Hall. MVUS has agreed to provide folks to facilitate and monitor the activities for the weekend. To make this task easier, we have agreed to move our booth to space **NH 202**, which is now a corner space. As we appreciate that this new location may make it harder for our loyal members and visitors to find us, and that the homebrew area may only be a onetime event, we have agreement from the Hamvention folks to allow us to place a sign in our old space to direct folks to our new location. Also, I have it in writing that we can move back to our old spot in 2011 if this location does not work out for any reason. One advantage to the North Hall spot is that we will be close to an outside wall so that we will have access to antennas, both for the demo area, and for our use. Depending on what we are able to borrow, we should have at least HF capabilities, and possibly VHF/UHF as well. And there will be 120VAC power available, too.

By the way, the **Discover Homebrew** demo area is open to everyone, so if YOU have something you would like to show off, BRING IT! The demo area will operate on an open schedule basis, meaning that you can be there when you want for as long as you want. We will have a sign-in sheet where you can record your contact info and anything else you would like. We want to help people find you if they have questions or missed your demo. Of course, all of that is optional, although we would at least like you to record the when you were there, and a brief description of your project. For those with a lot of ambition, we will provide space for you to leave **handouts** about your creation.

Please be courteous to the vendors who have paid for their inside booths or flea market spaces to be able to sell their wares, and do not conduct any sales from the demo area. However, if you have commercial plans for your project, go ahead and talk about them.

A reminder also that MVUS is providing support to Bill Brown, WB8ELK, for his balloon launch on Friday afternoon at about 2:30, immediately following his forum.

The launch will take place from the HARA grounds, with the exact location to be determine based on the prevailing winds and safety considerations.

We will need several people to help with moving the launch hardware to the 'pad', and monitoring the signals from the balloon. We hope to attract some media coverage as well. Please let me know if you would like to be involved with this fun event!

See you at the MVUS Booth, **NH-202!** de Tom, N8ZM.

This and That 4-10

- **Standby Power**, also called vampire or phantom power, is the electricity consumed by electronic equipment when it's switched off or in standby mode. The typical power loss per equipment is low, from 1 to 25 W. But when it's multiplied by the billions of devices in homes and businesses, standby losses represent a significant fraction of total world electricity use.
[Sam Davis, Electronic Design Mag.]
- **Cellphone.** It seems like my whole life is now in my cellphone. There is my address book, my newspaper, my Internet connection, my music collection, a map, a video game, and, oh, yeah, a phone.
[Craig Ferguson]
- **Video Software ...** So far the only software that I have found with that capability is a fancy ripper/editor combination called "TMPGEnc 4.0 XPress Trial Version". Unfortunately the license for the software is \$100. It seems very powerful and might actually be reasonably easy to use *if the help function was more helpful*.
[Ben Barnett]
- **Your Brain.** "Don't people realize how dangerous tampering with your brain is? ... Nobody touches my brain, and nobody decides where I look but me."
[Controls engineer Bruce Kerner, in EDN's Feedback Loop]
- **Near Sighted.** In the 1970s 25% of Americans were nearsighted. That number has grown since to 42%. An increase in jobs, that require "close work" such as constant computer usage, may be one of the causes, according to a study by the National Eye Institute.
[Kim Margolis, DDN]
- **No Real Job.** I'd be forced to find a real job were it not for hackers, viruses, spam and spyware. Without all that stuff, using a computer would be easy. All you'd need to know would be the location of the on/off button. The computer is pretty much used as an appliance these days, **but** it's different from most. You won't find magazines and columns devoted to advice on using your microwave oven, for instance. Nor do you need them.
[Bill Husted, Technobuddy]
- **Ham Radio.** "At a ham radio convention near St. Louis, the crowd swapping antenna parts and other equipment is mostly male and mostly over 50. But the hobby has attracted 15-year-old Jonathan Dunn. He says Facebook and texting are fun, but making friends using a \$200 radio **that doesn't come with monthly fees** is more rewarding.
[Matt Sepic, National Public Radio]
- **Grandfather Clock.** During an interview of Barack Obama David Remnick, the editor of the New Yorker, noticed the loud ticking of the grandfather clock in the room. Something you do not hear often these days of electronic everything. "An unnervingly loud reminder to the occupant that his stay is brief," Remnick writes. "In the end, life is more like a journey than a destination, since no destination is ever really permanent. The president is a patient man because journeys require patience—this helps explain his understated doggedness, a doggedness that is likely to stand him in pretty good stead as the clock ticks."
[From an Editorial in Newsweek, 12 April, 2010 by Jon Meacham]
- **Space Standards.** If the same standards of safety were applied to automobile driving that some would apply to space programs, most of us would never be allowed out of our driveways.
[Tim Braithwaite, AP 8-03]
- **National Weather Info.** This is the coolest thing! Just move your cursor around the map, and see what the current temperatures and weather conditions are in cities all over the country.
<http://www.wrh.noaa.gov/zoa/mwmap3.php?map=usa> [Passed along by Lloyd, NE8i]

Sunlight. The 89 PetaWatts (10^{15}) of sunlight reaching the Earth's surface is plentiful - almost 6,000 times more than the 15 TeraWatts (10^{12}) of the average electrical power consumed by humans. Additionally, solar electric generation has the highest power density, a global mean of 170 W/m^2 , among renewable energies. [Wikipedia]

Solar Roof

By Gerd, WB8IFM

Siegfried **Ottner**, known to me as Sigi, DL1NAL, has always been at the fore front of technology. He lives in the hometown of my xyl and is the manager of a medium size yarn dye plant. This plant is very modern computers control almost everything. A recent acquisition impressed in particular is a completely automated yarn dying machine. Many small spools can be individually dyed thus producing samples with reproducible colors. In essence you can sit there at the computer and mix the colors of your choice for the individual spools, which subsequently get dipped into their own little kettle, heated, dyed, then dried.

To move around the factory quickly he uses a segway, which he let me try the last time I visited.

Last year he had solar panels installed for his house. He placed them on the Southside of his slanted tile roof. This 10 kW installation is working out so well that the installer is running a special for the small town of Wunsiedel, population 10,000. He offers a 4 kW installation ready and connected to the power grid, including the legal paper work with the power company for 100 houses that have suitable south facing slanted tile roofs.

In Germany this activity is regulated and supported by the government. The price for this 4kW array is set at 13,312 Euros roughly \$18,124 which converts to \$4.53 per watt, a good price.

Of course, Sigi has the latest in monitoring devices and the following pictures with their captions will tell the story. You may also follow the "kW production" on the Internet. Click on http://ottner.dyndns.org/index_pc.html. There you can follow the kilowatthours accumulate and the money that is paid by the power company. As a side effect you can see how much sunshine Wunsiedel got on any particular day.

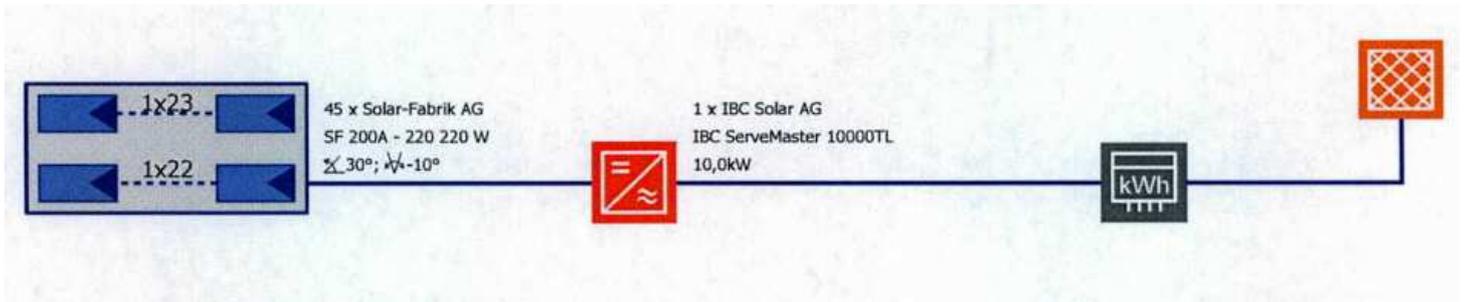


Installing the solar panels, summer of 2009 The panels are $1.667 \times .998 \text{ m}^2$ x 5cm thick and weigh 24 kg. Power generated is $220\text{W} \pm 2.5\text{W}$ (ea)



The Completed Installation -- total area is 75 m^2 there are two strings with 22 resp. 23 panels , generating optimally a total of 10 kW. This number referred to as 10 kWp. (p for peak)

More Charts from the Ottner Solar Roof

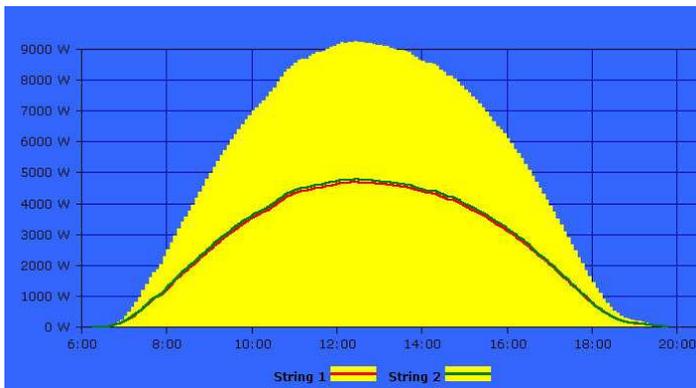


Two Strings of Panels

Converter DC to three phase AC

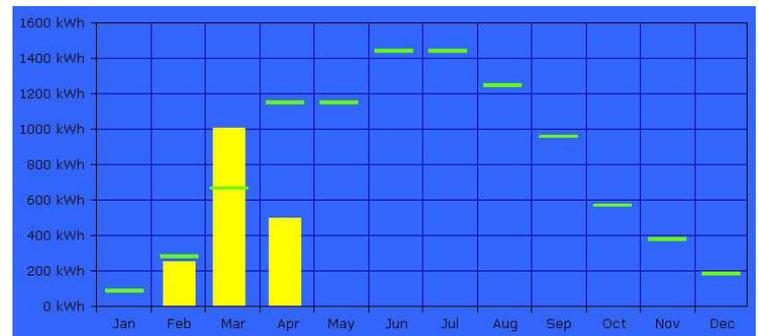
Monitoring Meter

Power Grid

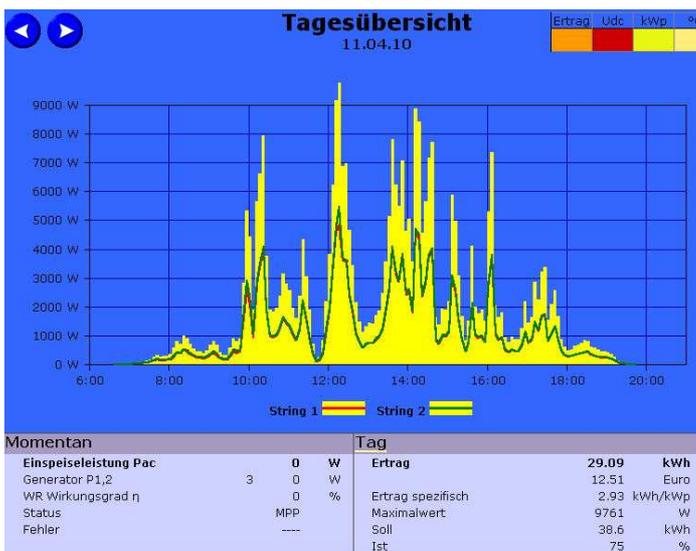


A perfect day! Sunshine from dawn to dusk. Both strings (red and green lines almost producing the same amount of energy) The yellow area is the energy produced on that day (in March 2010)
The amount produced: **70 kWh !**

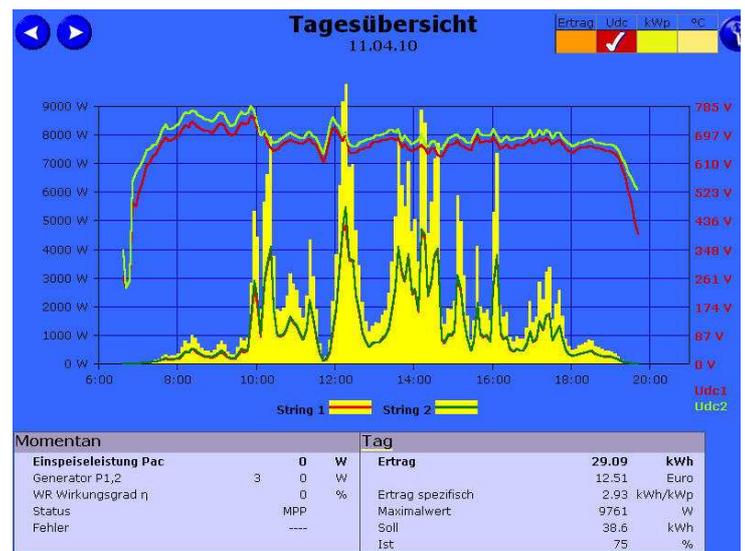
In the black and white print of the newsletter the "yellow" shows up as light gray



Electricity production for 2010. Predicted, the green bars. Delivered amounts (in yellow) for February, March and part of April. There is no output in January because of snow cover! This part of central Germany, located at higher elevations, is known for cold winters. Temperatures are very pleasant in the summer



A day with a mix of sunshine and clouds. You can follow the weather by the hour by looking at the amount of electricity produced (the yellow area). For that day there were **29 kWh**.



Same as on the left, but voltages from the two strings superimposed. It shows that even under clouds the cells are delivering reasonable voltage, but the current and therewith the power generated is much reduced.



Cheap BNC Cables

By Mike Suhar

Some time ago I picked up a package of 3 and 6 foot BNC cable. The cables are marked as RG-58/U and look to be well constructed with molded ends around the connectors. For the most part the cables have performed as expected but I have had situations that appeared to be caused by bad cables. The last occurred a few days ago while I was trying to measure the output of a function generator on my frequency counter. At low frequencies I could not get the counter to lock and if I did the reading was not correct. Substituting the first cable did not solve the problem. I then replaced the second cheap BNC cable with one I had made from Times LMR-240 ultraflex and good quality BNC connectors for that cable type. Problem went away. Changing out to one of the cheap cables that had never been used solved the problem also. With yet another failure of a cheap cable I decided to cut one open to see how it was manufactured.

From the photograph you can see there is minimal copper braid but an inner foil around the center dielectric. Looking into the cut-a-way connector body I found the crimp was applied metal against cable jacket. There were strands of the copper braid sandwiched between the metal connector body and the cable jacket. That was the extent of the ground connection. The foil did not touch the connector body as the inner chamber of the connector widened out past the cable jacket. I suspect the shield connection had been compromised. The bad connection could have been caused a number of factors such as the copper braid being pushed into the jacket, corrosion of the copper wires, or breakage of the wires.

Moral of the story is if you obtain cheap cables they may work fine but keep in mind they may have limited life. Don't be afraid to chuck them at first sign of trouble. I still prefer my homemade cables made from LMR-240 Ultraflex and the correct connectors for that cable type.

Distribution Amplifiers for the Ham Shack

By Dave Powis, G4HUP / ND8P

The following is an extract from the full article, to be found at <http://g4hup.com>

What is a DA?

A DA is an amplifier designed to provide multiple copies of the input via several output ports – common types give 4, 6 or even more outputs. Depending on the design it may also provide filtering, transformer isolation and gain adjustment. Some of the simplest homebuilt DA's are based around digital buffer IC's such as the 74HC04, often using several gates in parallel to meet the output drive requirements into 50 ohm loads – I will refer to these as 'digital' DA's. Analogue DA's may be based around transistors, MMIC's or video IC's – Maxim used to make some very good video amplifiers which were effectively a 'DA in a tin' – regrettably these are obsolete!

Common Applications

The most common application in the last few years has become that of providing the necessary number of 10MHz outputs from the shack reference source (GPSDO or OCXO). With the explosion in availability of good surplus sources (eg HPZ3801, Trimble Thunderbolts etc), the standard has become to use this reference to frequency lock your test equipment and any microwave and VHF transverter LO's, thus removing one of the uncontrolled variables for the equation.

However, other applications also arise, again thanks in part to new technology – in this case software defined radio (SDR). Although there are an increasing number of SDR transceivers available, there are also many Rx only models, such as the excellent Softrocks and SDR-IQ/14s etc. Many operators want to use these in parallel with traditional rigs to have the advantage of a visual output as well as the audio – this is particularly true in microwave and EME work. Here again, a DA can provide the solution.

10MHz distribution

Most of the DA's available surplus and via 'amateur' sources (see websearch) are capable of providing 10MHz distribution. They are also easy to homebrew on stripboard etc, using 74HC04's or analogue circuitry. Depending on what you are going to use it for, and the output quality of your source you may need to provide filtering and isolation too. Some issues that may need consideration for your application are:

- **OCXO Output Spectrum**
- **Analogue and 'Digital' DA's**
- **10MHz inputs**

See the article for a full discussion on these topics.

Getting it sorted

Fortunately, the answer to all of these issues can be found cheaply – old PC network cards!

Now that most motherboards have LAN capabilities built in, it's common to find boxes of old PC cards underneath the stands of some surplus traders at hamfests – a few moments digging can provide a set of useful components for a very small outlay. For examples of their use, specifications, performance and pin-outs, see the article!



W8RKO Antennas

Mike, his dog Jake



The 10 GHz portable set-up



Test Equipment Galore!



Mike relaxing at the operating Table

Mike Suhar, W8RKO, was from early on interested in radio and experimented with receiving am broadcast and TV over longer distances before he took the test to become a licensed ham. His first Ham call was WB8GXB. After his dad, also a ham, passed away and Mike upgraded his license to "extra" he was able to adopt his dad's call, W8RKO. He studied electronics and learned to apply theory to the circuits that appeared in the various ham and electronics magazines. In 1979 he obtained a degree in Electrical Engineering from the University of Dayton. Subsequently the Dayton Power and Light Company employed him in the microwave and two way radio field. After nine years and with the introduction of computers he left the power company and joined a more computer-oriented corporation. For the last 23 years he has been employed as a systems engineer by Reed Elsevier (formally Lexus Nexus) of Dayton. His main interest today is in the higher frequencies starting with VHF /UHF and up to the microwave range. He has an elaborate collection of measuring equipment and is well versed with modern pc board techniques. His antenna collection made him the obvious choice to radiate the (HF) signals for the frequency measurement test that our club has been conducting lately. He also designed and built the local oscillators for our transponder project. (presently being upgraded) and the various club beacons.

SE Conference

Presentations

Marshall Williams	K5QE	Contesting from Swamp Grid EL58
Art Towslee	WA8RMC	Digital ATV
Mike Stipick	KC4RI	SDR
Joe Trantham	WB4BPP	Cesium Beam Standards
John Ackermann	N8UR	Phase Noise @ 10 GHz
Tom Holmes	N8ZM	Setting Up HPSDR Hardware & Software
Gerd Schrick	WB8IFM	Lightning Protection
Dave Sublette	K4TO	A Virtual Tour of K4TO
Charles Osborne	K4CSO	Test Equipment for a Home Lab
Ben Lowe	K4QF	Hobby Lobby Projects for the Microwave Ham
Jeff Kruth	WA3ZKR	Novel Multiband Transverter Architecture
Jeff Kruth/MSU	"	KySAT
Steve Kostro	N2CEI	Yankee Roving, Southern Style
John Jaminet	W3HMS	23cm EME
Ott Fibel	W4WSR	Multiplexed Transverter Control
David Meier	N4MW	N4MW Beacons

Other

There will be a banquet Saturday night but there will NOT be a luncheon on Friday. The banquet speaker will be **Dr. Benjamin Malphrus** who will speak to us about the KySpace Cubesat program.

The banquet buffet is Sliced Roast Beef, Herb Baked Chicken and BBQ Pork Chops, with mixed veg., corn, Herb Seasoned Potatoes, Mixed Greens Salad, Cheesecake with assorted toppings, rolls, etc.

Hamvention 2010 Activities

VHF/UHF/Microwave Forum

Saturday, May 15, 2010 , 9:15 AM to 11 AM , Forum Room 5

Moderators: Mike Schulsinger, N8QHV and Red Dakin, W8ULC

- Richard Frey, WA2AAU AML Amplifier Update

AML Communications manufactures a wide variety of amplifiers covering frequencies from below 1 MHz to over 26 GHz, with choices of frequency, gain, power and noise figure specifications. Most can be optimized for a specified frequency of interest and optional features are available.

- Kent Britain, WA5VJB Data Antennas

Kent will go over several families of easy to build antennas aimed at Data Communications for our 900 MHz, 1290, 2400, 3400, and 5800 MHz bands.

- Sam Jewell, G4DDK/W5DDK Achieving DXCC at Microwave

" DXCC is regarded as the premier operating award in all of amateur radio. Can it be achieved on the amateur microwave bands? This talk, which was given at the 2009 RSGB Convention, provides an update on progress towards the ultimate goal".

MVUS Booth space **NH 0202**, which is a corner space

A new feature at Hamvention this year will be the **Discover Homebrew demo area**, in the North Hall. It will adjacent to our booth and MVUS has agreed to provide folks to facilitate and monitor these activities.

Balloon Launch: Bill Brown, WB8ELK, will launch a balloon on Friday afternoon at about 2:30, immediately following the forum.

The launch will take place from the HARA grounds, with the exact location to be determine based on the prevailing winds and safety considerations.

We will need several people to help with moving the launch hardware to the 'pad', and monitoring the signals from the balloon. We hope to attract some media coverage as well. Please let me know if you would like to be involved with this fun event!