

Vol. 19 No. 3

www.mvus.org

March, 2005

### Club Memorial Call W8KSE

10 GHz Beacon, presently off the air.

### Meetings at the Old Country Buffet !

Our **March Meeting** is on **Fri. the 25th** at 7:30 PM Topics: Tech session (see below and De N8ZM on next page), Hamvention, and "Digital TV" by Steve, K8UD.

Location: at the Old Country Buffet near SR 725 and Yankee Rd. in Centerville

#### Contents

De N8ZM.....	3
Packrats Conference.....	3
This and That.....	4
HDTV?.....	5
Digital TV Terms.....	6
Digital Video Formats, Connectors.....	7
Progressive Scan.....	8
Trip to Hardware Store.....	8
10 GHz Transverter.....	9
ATV Antennas.....	9
SVHF Conference.....	10
Hamvention VHF/UHF Forum.....	10

**\*\*SVHFS conference April 29,30\*\* See Backpage.**

### Dayton Hamvention & ARRL Expo, 20,21,22 May, 2005

*"Bringing hams together from around the world"*

See ad in the March or April QST, pg. 112.

Look up on the Internet [www.hamvention.org](http://www.hamvention.org) order your tickets there using a credit card or order by mail from Tickets, Box 1446, Dayton, OH, 45401-1446

Ticket Price this year is \$ 20.- (three days) A 3-day bus ticket is extra and cost \$ 8.

This year is the 75<sup>th</sup> anniversary of the founding of the **Dayton Amateur Radio Association (DARA)**

#### Tech Session

**Saturday 26 Mar. at Tom's place:** Directions: Take I-75 north through Dayton, past I-70 to the 2nd exit, Northwoods Boulevard. Turn left and go west until the road dead-ends into North Dixie Drive (old US-25). Turn right (north). Go about 1.7 miles, then turn right (east) on Ginghamburg road. Go about 8/10 mile to Winding Way, and turn right ( note big sign with a deer on it). Go to 2nd right, which is Wilderness Bluff. The house (# 1055), phone number is 667-5990.

De N8ZM.

Well, spring seems to finally have started to prevail over winter, although the fight isn't quite over yet. But all the signs seem to point to the more desirable outcome, so I am optimistic. This means that I can get outside soon and put up the HF vertical I bought with my Christmas money. Haven't had decent HF antennas up for years, except for an 80/40 trap dipole that is more of an inverted Vee that is too close to the ground. This vertical should be fun to play with!

At the February meeting, we talked about having **another tech session** so that folks could get things tuned up and set on frequency, do some troubleshooting, or evaluate performance. The date for that is **Saturday, April 2**, starting at 10:00 AM. It will be held at my home again; since Barb agreed once again to let me have my friends come over to play. We can measure frequency and power, impedance, input sensitivity, and take a stab at 3<sup>rd</sup>-order intercepts as well as noise figure. We'll have capability up through 10 GHz for all of these. I took a list at the last meeting, but if you weren't there, drop me an e-mail letting me know what you would like to test and the frequencies of interest. At least one fellow has asked for some help with calibrating a wattmeter, which should be an interesting project. Looking forward to a great time. Oh, and of course there will be soda and coffee available, and we'll send out for pizza for lunch, too!

We will again have a booth at the Hamvention, but as always, it is too early to know where it will be located. Gerd will again be pretty busy with tickets at the show, so anyone who can help with setting up on Thursday will be a hero! And as always, some folks to staff the booth during the weekend are needed. It isn't tough work, and the pay scale is decent. I have arranged again with HARA for us to be able to put the 10 GHz beacon, or some other device at the discretion of the person doing the work, on the roof of the building. Most of you recall we had the 10 GHz beacon there last year, and there were several reports of contacts facilitated by its presence. If anyone has an idea for this year, or if we just want to do the same thing, please get in touch with me so I can work with you on the arrangements and liaison to the arena folks.

On a slightly different tack this month, there are articles dealing with digital TV, in particular there is an article by Steve Coy, K8UD, about an affordable set-top box that might be your intro into this upcoming new field of HDTV and **SDTV (Standard Digital TV)** that is quite interesting. Come to the meeting on the 25<sup>th</sup> to talk more with Steve about it.

See you soon! Tom, N8ZM.

## **There will be a Packrats Conference this Year!!!**

The Mt Airy VHF Radio Club, "the Packrats" will again be hosting the Mid-Atlantic VHF Conference starting Fri eve, Sept 23rd with hospitality and registration, Conference on Sat, Sept 24, Banquet Sat eve and Hamarama (radio fleamarket) at the Grange on Sun 9/25. Please mark you calendars to save the date. Watch for announcement soon on details and for submission of papers.

73, Rick, K1DS, Packrat President and Jim, WA3EHD, Conference Chairman

## This and That. 3-05

- **TV.** “Television is the literature of the illiterate, the culture of the lowborn, the wealth of the poor, the privilege of the underprivileged, the exclusive club of the excluded masses; television is the goose that lays scrambled eggs. And it is futile, probably fatal, to beat it for not laying caviar. Anyway, more people like scrambled eggs than caviar.” [Lee Loevinger]
- **HDTV.** Does it turn you on or off? In any case, you ought to be looking what digital video and compression is doing for the TV of the future. It’s actually here already. Read Steve, K8UD’s report in this issue! [Gerd, WB8IFM]
- **How Much Light?** The announcement reads: “T1-3/4 white LED generates 5,000 mcd.” That is five-thousand milli candela! Why not say 5 cd (cd =candela=candles). See, that doesn’t sound like much but it would be easier to grasp. [Gerd, WB8IFM]
- **Harry Potter Magic.** Kids today are watching more fantasy and science fiction, which leads them away from real science and engineering. There is no point in trying to figure out magic. The need is to learn math, or how to read or write, or how to think logically. There is *power* in knowing how something works. You can change it, improve it; bend it to your will. [In letter to EP, Sep 04]
- **Manager.** Managers can sit –for hours at a time if they want--but it’s their job to see that no one else ever does, even when there is nothing to do, and this is why for servers, slow times can be as exhausting as rushes. You start dragging out each little chore because if the manager on duty catches you in an idle moment he will give you something far nastier to do. [Barbara Ehrenreich]
- **Water, Water.** Everyone in yuppie -land –airports, for example - looks like a nursing baby these days, inseparable from their plastic bottles of water. [Barbara Ehrenreich]
- **Sunny Italy.** “The state cannot prevent exceptional snowfalls, even if Italy is the country of the sun and people think they have the right to have the snow melted immediately by the authorities.” [Pietro Lunardy, Transport Minister]
- **Gobbledygook.** “Be short and say what you are talking about. Stop *pointing up* programs. No more *finalizing, effectuating* or *dynamics*. Anyone using the words *activation* or *implementation* will be shot”. [Maury Maverick]
- **Elevator Talk.** Early on, I learned not to discuss sensitive matters while riding elevators. Everyone listens while pretending not to. [William J. Dean]
- **Read the Manuals.** You’re busy, and this is an imposition. But without at least a basic understanding of the gadgets you own, you’re at the risk of being *owned by your gadgets*. [Bill Husted]
- **On/Off Button.** In a *perfect world*, all you should need to know is the location of the on/off button. [Bill Husted]
- **Arithmetic.** Came across this ad: “World’s Only 15 Minute Rechargeable System” by RayOvac. The picture shows four 2000 mAh AA NiMH in the “system.” Now lets figure: For a full charge they require a minimum of 2 A for one hour or 8 A in 15 minutes. That makes 32 A for four of these. At approximately 1.5 V this requires a power supply of 50 to 60 Watts depending on the efficiency. I guess it could be done! [Gerd, WB8IFM]

## HDTV, the time has come, or not

By Steve, K8UD

Actually, this article is more about OTA (over the air) **Digital TV Reception**. Lets go back in time, back in the 60's when UHF was just being introduced. No one could pick up the new broadcast stations without buying a new TV or getting one of those Blonder-Tongue UHF Converters. It was a bit messy hooking up the converter, setting the VHF output channel to 3 or 4 and carefully tune in the new station (Channel 22 or 16 in Dayton). When someone walked over the floor, the signal would disappear. Frustrating, but it worked and it was the most preferred method for those individuals to receive the new stations, and it was relatively cheap.

Here comes HDTV, the new buzzword. Improve your viewing pleasure with the newest technology available. Most of us really don't care about "high definition." No one wants to see the pimples on the movie stars, so there hasn't been a big push to run out and buy the latest HDTV. Then there are all these abysmal programs. Spend more money and do you really get back anything desirable in return? There is an alternate solution, get a digital TV set-top box. These are inexpensive receivers designed to receive and decode all over the air digital TV signals including HDTV. All the TV Stations are now broadcasting in the new digital format. The regular analog signals are all converted and are available in digital. Most are not HDTV, but standard digital.

There are benefits of going digital: "No Ghosts" or "reflections" or any kind of fluctuation, and the sound is also much better. Because of the compression algorithms, the bandwidth is much smaller, more signals fit in the same bandwidth. Currently channels 2, 7, and 22 are broadcasting both HDTV and standard TV. Channel 16 has improved its transmission by offering a selection of up to 6 different signals (programs) They are currently offering 2 standard channels, another one channel for kids, one for Ohio, and yet another channel called "again", so in essences, they have up to 6 channels allocated. They usually don't run all 6 at a time, but do run 4 most all the time.

Wow, I hope the other TV stations start to pick up on this idea. Cable TV has been too expensive and I don't watch enough TV to justify it, however, when I want to watch the news or a special event (yes, March Madness) I like to watch it crystal clear. The quality is just like a DVD or cable TV without the cost. Well a one time charge for the receiver. I did some research and found that they start at around \$100. This is for some of the earlier HDTV receivers. You can go to Best Buy or Circuit City and they start around \$250.00. I found an outlet that was selling refurbs for \$170, so I took a chance and bought one. Gerd (WB8IFM) was so impressed with the quality; he went ahead and bought one too.

Antennas? Well for all the Dayton stations, rabbit ears work just fine. Something to keep in mind, these new stations are in **the UHF band**, so if you want to pull in distant stations, like Cincinnati or Columbus, you will need a high gain UHF antenna. The receiver needs a decent signal (4 out of 5 bars on the build in s-meter) to decode the broadcast. If you have a weak signal, there will be some pixeling or tileing going on, and if it gets below 3 out of 5 bars, you might loose the signal completely.

In conclusion, I recommend Digital TV over the old Analog TV anytime. The output of the set-top box can be connected to virtually any TV, Computer Monitor, and yes, a new HDTV Monitor or TV. So try this before investing in a \$2000 or \$3000 HDTV TV. Happy viewing!

## **Digital TV Terms**

(From various sources)

**Intro.** A major use of DTV can be to carry more channels on the same amount of bandwidth. Another can be high-definition programming. The digital signal eliminates common artifacts from analog broadcasting, such as ghostly and snowy images, static noises in audio; although it can replace them with new MPEG compression artifacts, such as "blocking" artifacts, when transmitted with too low data rate, and may entirely fail to work in situations where analog television would have produced an impaired but watchable picture. Depending on the sophistication of the error correction, DTV may either work perfectly or not work at all.

### **Set-top Box STB (also: Decoder, Receiver, Tuner)**

A unit similar to the UHF tuner from long ago and to-day's cable boxes, which is capable of receiving and decoding DTV broadcasts. A DTV 'Certified' STB can receive all (18) ATSC DTV formats, (including HDTV) and provide a displayable picture.

### **Bandwidth**

A range of frequencies used to transmit information such as picture and sound. For TV broadcasters, the FCC has allocated **6Mhz for each channel**. For DTV, the maximum bit rate possible within the bandwidth is **19.4 Mbps**, which is one HDTV channel. SDTV has a lower bit rate, therefore the bandwidth can accommodate more than one channel.

### **Compression**

A method of electronically reducing the number of bits required to store or transmit data within a specified time or space. The video industry uses several types of compression methods but the method adopted for DTV is called "**MPEG2.**" Four full-range channels of programming and data can be compressed into the same space required by a single analog channel.

### **High Definition Television (HDTV)**

The generally agreed upon definition of HDTV is approximately twice the vertical and horizontal picture resolution of today's NTSC TV, which essentially makes the picture twice as sharp. HDTV also has a screen ratio of 16:9 as compared with most of today's TV screens, which have a screen ratio of 4:3. HDTV offers reduced motion artifacts (i.e. ghosting, dot crawl), and offers 5 independent channels of CD-quality stereo surround sound, (also referred to as AC-3).

### **Standard Definition Television (SDTV)**

SDTV refers to **DIGITAL** transmissions with 480-line resolution, either interlaced or progressive scanned formats. SDTV offers significant improvement over today's conventional NTSC picture resolution, similar to comparing DVD quality to VHS, primarily because the digital transmission eliminates snow and ghosts, common with the current NTSC analog format. However, SDTV does not come close to HDTV in both visual and audio quality.

**Signal Strength and Quality.** Whereas the HDTV signal required is about the same as for traditional TV, the standard digital TV, however, requires less signal. Once the DTV signal level exceeds the threshold level, the digital video and audio data is decoded and yields the same quality as the original encoded for broadcast. This is the big advantage for DTV over analog TV – there is no noise, ghosting, static, or scratchy audio. Additionally text messages as related to programming can ride along on the same signal.

# Digital Video Arrives ... New Formats and Connectors

By Electus Distribution Co.

With the development of improved home video equipment in the last few years (especially on the digital front), there has been a confusing expansion in the variety of video formats you are likely to come across especially with DVD players, Camcorders, laserdisc players and so on. Here is a rundown on the common formats, what they are used for and how they relate to each other.

## Composite video

Composite video is the familiar type of single cable video that has been used for many years with home VCRs (both VHS and Beta), camcorders (VHS and Video8), laserdisc players, video CD players, security cameras and so on. This type of video is passed from one piece of equipment to another using a single coaxial or shielded cable, fitted with the familiar RCA or phono plugs (often color coded yellow).

As the name suggests, composite video has all of the signal components needed to produce a TV image, combined together into a single composite signal. This means that the luminance (B&W detail) information, chrominance (color) information and sync pulses are all combined. Because it is everything in one, composite video is very convenient as a way to transport video information. However because all of the components are lumped in together, it is possible for them to interact with each other. This can result in various kinds of picture defect: color smear (colors running outside the boundaries of their correct picture areas), dot crawl or Moire (moving colored interference patterns in fine picture detail) and so on.

## S-video

To try and avoid the picture degradation that can occur with composite video, makers of high-end VCRs, S-VHS and Video Super-8 camcorders and laserdisc players started providing them with a different type of video output and input format. In this S-video format (sometimes called S-VHS), the chrominance information is kept separate from the luminance and sync information, to reduce the possibility of interaction. S-video signals are transferred via twin coaxial or shielded cables, which are usually fitted with miniature 4-pin DIN plugs. Sometimes they are fitted with two RCA-type plugs, though, marked Y (for luminance plus sync) and C (for chrominance). Most video equipment fitted with S-video connectors is also provided with standard composite video connectors, as a fall back option. However, if you are using two pieces of equipment, which are both able to handle S-video, it is generally better to use their S-video connectors (with a suitable cable), as this will almost always give better picture quality. This applies particularly with VCRs and camcorders, where the video is actually recorded on tape as separate luminance and chrominance signals. It is less true with laserdisc players, where the video is in fact recorded on the laserdiscs in composite format. However where a laserdisc player is provided with an S-video output, this will often still give better results than if you use the composite video output because of the player's more sophisticated Y-C separation circuitry.

## Component video

The advent of movies on DVD (digital versatile disc) brought the possibility of delivering even higher image quality. As you are probably aware both the images and sound are recorded on DVDs in compressed digital format, which allows both to be recorded in very high quality. In the case of the images, the original video is separated into component video form before being digitized and subjected to MPEG2 compression. What is component video? It is simply video where the components are separated to an even greater extent than with S-video, so there is even less chance of them interfering with one another. Instead of simply separating the luminance/sync (Y) and the chrominance (C) information, with component video the chrominance information is further separated into its own two components: the B-Y (blue minus luminance, also called Cb or Pb) and R-Y (red minus luminance, also called Cr or Pr).

## Interlaced vs. Progressive Scanning

(Canadian DigitalTV)

The next big picture TV that you own will likely be digital and will be able to accept a variety of types of television signals. Depending on how deeply you get into the technology, you will begin seeing designations like 480p, 720p, and 1080i. The numeric part, 480, 720, 1080, indicates the number of lines of information that are being used to create the picture. The alpha part indicates whether the picture is being created using **interlace** or **progressive** scanning.

Each frame of video we see on a traditional TV is made up of 525 lines (well, 480 really, but that's another story), but we don't see all the lines at once. Instead, interlace scanning "paints" the picture by first placing the odd numbered lines on the screen (1, 3, 5, etc) and then goes back and places the even numbered lines on the screen (2, 4, 6, etc.).

There is another way. Instead of creating a picture using odd and even lines, progressive scan TVs put the lines of information on the screen in order, with no gaps. Instead of 1, 3, 5 and so on, the picture is painted in order: 1, 2, 3, and so on. You've seen this method used before; in fact you're probably seeing it right now. That's right, **most computer monitors use progressive scanning**. Ever wonder why pictures on computer monitors look so good? Progressive scanning is one of the biggest reasons. And on a new digital progressive scan TV you'll see **twice as many lines in the same amount of time** as a conventional interlaced TV.

## A Trip to the Hardware Store.

By Gerd, WB8IFM

Have you looked around recently what is available on the hardware front to help you build antennas? These days you would head for one of the "big box" stores like Lowe's or Home Depot. I had some time on my hand (waiting for the copies of Anomalous Prop to run) and there was a Lowe's next door. I was amazed, what is available there, although, when you look closer, there are umpteen very similar items of what is presently in fashion and very little of what you are looking for.

Anyway, for wires there is a great selection of solid and stranded insulated copper wire just right for wire antennas. BTW, they had a monster machine with 12 rungs for three ea large cable drums or lot smaller drums. The rungs were rotated like a Ferris wheel, except it wasn't going in a circle but just straight up and down. Telling one of the employees how impressed I was, he remarked: "Yea, this thing costs a 100k."

As for guy wires, there were steel cables coated and uncoated, the coat being from tough plastic, no idea how durable in bad weather this would be. I would prefer the zinc-coated wire, but that wasn't offered. There was a great selection of ropes, and leading right to the clothesline section. I was surprised to see all the plastic hooks, pulleys etc. Most looked quite sturdy and suitable for long-term wire antenna installation. There were also "super stakes" (that looked like they could support a lot more than a family tent); these might come in handy for field day.

Another area with plenty of variety is the plastic pipe section. That comes in handy when you look for insulated support for beams with cross polarization as used for communication over satellites.

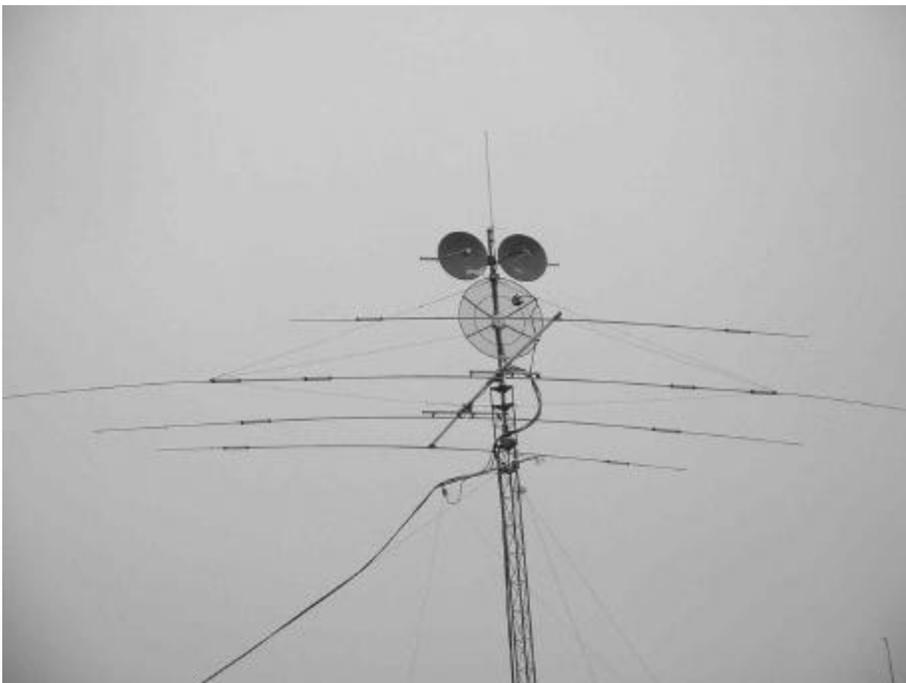
Unfortunately, time ran out to look at metal tubing and profiles, but there ought to be a fine selection for VHF/UHF and microwave antennas.

I'd dare say, the experimenter of today sure has wider choices in picking parts and material than we had 20 to 30 years ago.

## DB6NT-10 GHz Transverter



This x-band transverter was built for the 60 ft. dish at the AMSAT DL Bochum site to be used for EME and Tropo. The purpose is to get ready for the Mars mission and other deep space endeavors. The amplifier puts out 50 Watts on 10 GHz. The receiver has a noise figure of .65dB and the 144 Mhz input power required is 3 W



### DF7NH heavily into ATV

The HF beam has 3 ele effective on 10-15-20m, one element on 40m, and one trap element for the WARC bands.

One of the 2ft dishes is for 6cm ATV transmit, the other is for 3cm ATV receive.

The 4 ft perforated dish is for 23 and 13 cm ATV Tx/Rx. On top is a four ft collinear vertical for 2m and 70 cm.

The hf beam is at a height of 60 ft.