ATCO NEWSLETTER

VOLUME 18 NUMBER 2 **April 2001**

The ATCO newsletter is the official publication of a group of amateur television operators known as AMATEUR TELEVISION IN CENTRAL OHIO Group Inc." and is published quarterly (January, April, July, and October)

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ATCO HAM IN THE SPOTLIGHT

This time we feature Stan Diggs, AA8XA to the ranks of the ATCO Newsletter Ham in the Spotlight. Stan has been active in ATV for a number of years but has the unfortunate situation of a home in an extremely low elevation location. This makes the repeater even more valuable and because of that, he is able to communicate with many of us. I saw the repeater received at his location as a P5 signal on 427 MHz. Now if Stan would get a receiver for 1250 MHz, I'm sure that full duplex video would become even more exciting. He said he had an old satellite LMB converter in the attic collecting dust so he just might give it a try! All he needs is a 1250 MHz antenna. However, looking at his antenna farm outside, it's going to be a challenge to find room to mount it. We'll be watching, Stan.

ACTIVITIES ... from my “workbench”

OK folks, here we go again! Yes, I know that the weather is starting to warm up a bit now but the yard and home projects are making me feel a little like the illustration at the left. Also I’ve noticed that there are fewer participants in the Tuesday night net. Lately we have been averaging 13 to 15 people each time (with a maximum of 21 one night) but as of late, it’s been averaging 6-8 people. It looks like we need to spice it up a bit and stir more interest. Any ideas? More on that one later.

Now lets turn to construction issues. Well, I admit, I’ve been a little lax with this end of it also. The most important item was the repair of the 446.350 link transmitter output. I didn’t realize how much it was used until it didn’t work. It became intermittent sometime late last year and on a number of occasions while Dale was at the repeater site, he tried to find the problem. Murphy must have been there too for each of at least three times he was there, it worked perfectly. Then it would become intermittent after he left. He would say, “you can’t fix something that isn’t broke!” Finally, when I was there last, I smacked the transmitter unit and it quit. When I smacked it again in a different place, it started working. It was repeatable so I disassembled the 70 cm transmitter and checked it out. A loose connector was found and when reseated, the problem disappeared. Horray! So now the link is back in normal operation. However, I want to replace th radio unit with something better. A GE Master II driver unit was suggested with a brick to follow it for about 5-8 watts. Sounds good to me for the 1.5 watt unit there now could be a little stronger. I’ve got the brick if someone can find me a Master II driver board.

Another item on the list for repair (replacement) is the 70 cm transmitter. The Mirage D1010 is really a #@**# unit when it comes to signal reproduction quality and any attempt to improve the signal in the lower level stages is destroyed when it passes through the poor linearity of the Mirage. Don’t get me wrong here, the Mirage is great for individual use but doesn’t work well in repeater service. We’re trying to keep the signal quality up and minimize power dissipation within the cabinet and generating lots of spurious signals only to filter it out with interdigital filters after the power amplifier is NOT the way to do it. We must filter the low signal levels and then amplify a clean signal. Therefore I got a cable modulator that has internal saw filters and a clean output signal. Then I passed it through a linear brick running well below its ratings to get about 8-10 watts of RF. Finally I’ve been able to purchase a commercial television solid state driver module rated for 100 watts output. That should do it! More details after I get it up and running but so far, it looks real good. That should improve our signal at least ½ to 1 full P unit.

Next on the list is what to do with the 2.4 GHz receiver. It’s definitely a problem since the wireless Ethernet stuff started to move in on that frequency. Tests during the winter showed much commercial activity in the entire band, at least in the downtown area. It seems at this time that the only way we are going to escape the interference is …I know it’s hard to say …but move. Sometimes it’s too hard to fight them and it’s only going to get worse with the advances in 2.4 GHz spread spectrum devices. Perhaps the only way to salvage the band is to locate the receiver somewhere outside the downtown area and link it back via 128 MHz. At this time the 1280 MHz band is the only one not plagued with other commercial interference. Does anyone know of a potential 2.4 GHz receive site?

Last but not least, severe interference is showing up on the 915 MHz band. Recently when we wanted to monitor the Channel 4 radar, it was almost impossible because of intermittent bursts of commercial data packets. The source is unknown at this time. It’s not there all the time but is becoming more and more frequent. At this time, the only service we have on 915 is the radar so I’m considering converting the 915 MHz radar transmitter at Channel 4 to a 1280 MHz unit. I know the frequency will be shared with the rest of us transmitting on 1280 but I don’t know why we just can’t refrain from using that input when severe weather is present and the radar is in use. Comments invited.

That’s all I’ve got this time around. More next time! Don’t forget the Fall Event on May 6th and Dayton on May 18-20. Details are later in this issue.
…WA8RMC

WEB CAMERAS

The following article appeared in EDTN Magazine's on-line twice weekly Electronics bulletins in the Circuit Cellar section. It presents a variety of video cameras for web access but most are also useable for ATV also. Although not tested for ATV video use, the vast list is interesting and illustrates what to look for when selecting a video camera. I believe most of these cameras are very reasonably priced but may not have NTSC video output capabilities. However, if the camera has only digital video to the computer, it may be of use with a capture board to combine video and graphics. Let me know if anyone uses one of these for ATV use.

Different Kinds of Web Video Cameras by Rick Prescott

There's a lot of choices out there if you're interested in buying a web video camera, and more become available each day. Generally, there are three different kinds of video cameras you can hook up to your computer and use:

• Netcams—These are what most people use, and they are the best choice for just about everyone. They're relatively inexpensive (between $100 for the basics and $150 for top-of-the-line). They're also easy to set up and use, and usually come with an assortment of software. They're small, fitting nicely on your desk. One drawback to these cameras is that their video quality isn't nearly as high as digital video cameras. They can be used only when they're attached to your computer, and you can't take them with you to record video away from your computer.

• Digital video cameras (DV cameras)—These are in many ways just like regular video cameras that record by using film, but instead of recording on film, they record onto what's in essence a hard disk. You can transfer that recording to your computer and send it as video mail. And, you also can hook up DV cameras to your computer and use them for videoconferencing. DV cameras offer exceptionally high quality. Of course, they also cost an exceptional amount of money. DV cameras can easily cost $1,000 and professional-level models can set you back $10,000 or more.

• Normal video cameras with a video capture board—You can use a normal video camera with a special piece of hardware known as a video capture board and have a PC video camera. You are able to send either recorded video or live video to a PC, so they're great for creating video mail and for videoconferencing as well. A video capture board will set you back $150 or more. Keep in mind that setting up and using these boards can be problematic, and you might have to spend a whole lot of time doing troubleshooting. There is also a chance that the existing video card in your computer has this capability already. Look for special video inputs and outputs on the back of your computer, and check your documentation to see if you have this capability already.

Netcams Can Double as Digital Cameras
Netcams can do more than play or record video—they also can do double-duty as a digital camera. You can take snapshots with them and most include a button you can push to do that. The picture quality won't be as high as when you use a digital camera, and you can only take snapshots when the camera is attached to a computer. Still, they're great in a pinch when you need a quick picture taken.

Interfacing the Camera with a Computer
Because of their balance between price, video quality, and ease of setup and use, Netcams are the best choice for most people. There are a whole lot of specs and features to consider before deciding which Netcam to buy. Before looking at anything else, you have to decide how you want to connect your Netcam to your computer. Netcams can connect to your computer via three basic methods: the Universal Serial Bus (USB) port, a special card connected inside your computer, or a standard parallel or serial port. There are pros and cons to each method. Here's how to decide which to buy:

• USB Netcams—USB Netcams are by far the easiest Netcams to set up. That's because the USB port and USB hardware has been specifically designed for ease of setup. There's no opening up your computer, and no installation woes. The USB port can send and receive data at higher rates than your parallel and serial ports, so USB Netcams tend to show video at a higher quality than cameras that attach via the parallel and serial ports. But, they tend to show video at a lower quality than Netcams that plug into an add-in board on your computer. For most, a USB camera is the way to go. Of course, to use one, you'll need to have a USB port on your computer. Most computers manufactured in the past few years have USB port.

• Netcams that connect to an add-in card on your computer—To use these kinds of Netcams, you'll have to open up your computer, install a special card inside it, close your computer back up, and then install software. If you're not familiar with hardware, this can be difficult to do. These Netcams tend to be more expensive than USB Netcams , at least in part because they require more hardware (you're buying an add-in card as well as a Netcam). Generally, the cards can transfer data faster than USB ports, so these types of Netcams display video at a higher quality than USB Netcams.

• Netcams that connect to the serial or parallel port of your PC—These types of Netcams used to be more common than they are today. Mostly they've been replaced with USB port Netcams, but they're still around. Although they're easier to set up than Netcams that connect to a card in your PC, they're harder to set up than USB Netcams. Because serial and parallel connections are slower than a USB connection, the quality of their video isn't as good as a USB connection. Only consider buying one of these if you don't have a USB port and don't want the bother of opening your computer to add a card.

Features to be Aware of

So, you've made your basic decision about what basic kind of Netcam to buy. Now it's time to get down to business; time to see what kind of specs and features your camera should have. Here's what you should know before you buy:

• What's the frame rate?—Frame rate refers to how many frames of motion the camera captures per second. In the acronym-crazy world of computing, it's often shortened to fps (frames per second). The higher the frame rate, the better. Generally, the more expensive the camera, the higher the frame rate. Don't settle for a frame rate of less than 25 fps, and preferably 30 fps or higher to 60 fps and beyond.

• What are the maximum colors it can display?—Again, more is better. Look for a Netcam that can display what's called 24-bit color or what might be called 16.7 million colors. That's a whole lot of colors!

• What's the maximum resolution?—Netcams display as a small frame inside a window on your computer. The resolution refers to the size of the frame—the more the resolution, the bigger the frame. Bigger is better in this case. Try to get a camera that can display at 320 × 240 pixels or, preferably, better (640 × 480). Keep in mind, though, that at 640 × 480 resolution, the image will have a lot of "lag" to it. It'll appear slow and out of synch with your voice. You'll mainly use that resolution for using the Netcam to take still pictures.

• What's the focal range?—You'd like a camera that can focus close up as well as far away. Some Netcams can focus on objects within an inch of them; others can only focus on objects four inches or more away. The wider the range, the better.

• Does it automatically adjust to changes in the light?—Especially in offices or rooms such as studies, where you most likely have your computer, the light can be variable. You want a camera that automatically adjusts well to changes in lighting, and because you'll be using it indoors, you'll want one that displays well in indoor light.

• What kinds of controls does it have?—Mainly when you use a Netcam, you won't be touching the camera; you'll control most of what it does through software. But, there are still some important controls you want it to have. You should be able to easily move the camera from side to side and up and down so that you can position it for the best pictures. And, you want as long a cord as possible that attaches the camera to your computer to give you the maximum amount of room for moving the camera and fiddling with it. There is often a focus control as well. Some cameras include a contrast control, although, many of them automatically adjust the contrast and don't require that control.

• What kind of software comes with it?—Any Netcam you buy will come with a variety of software that can be used for videoconferencing and such. Look for a camera with as wide a range of software as possible. You'll want software that can capture video so you can send video mail, and you'd also like software that enables you to capture single images as well, so that you can use your Netcam as a digital camera. If you're planning to hook your Netcam to a web site, you want Webcam software to do that. Popular ones are NetSpy and Webcam32. Pretty much any Netcam you buy should come with videoconferencing software. If not, Microsoft's NetMeeting videoconferencing software is free and can be downloaded from Microsoft's web site.

• If You Don't Have a High-Speed Connection—If you're connecting to the Internet via a 56-KB or slower modem, you don't need to think about frame rates or otherwise worry about the quality of your camera when buying. At that slow of a speed, the quality of your video won't be good, so one camera will do just as well as another. If you're connecting to the Internet this way, consider buying only for ease of setup and what kind of software is bundled with the camera.

3Com Corporation HomeConnect™ PC Digital WebCam

Axis Pyro 1394 Web Cam

ADS 1394 Web Cam

Creative Video Blaster WebCam III - USB

Video Blaster WebCam GO USB 4MB LCD

D-Link Systems DSB-C100 USB Camera

USB WebCam 30FPS Desktop

Digital Camera/WebCam Digital Video

64-Million Color Digital Video Cam 8MB USB 1024X768 98/WME/W2K

Eastman Kodak: DVC 325 - Digital video camera

EZ200 640X480 Digital Camera USB

DVC323 Digital Video Camera

Hawking Technology UC300 USB PC Camera Kit

Pocket Cam Dual Mode DIG Camera PC P&P WIN98 HOT SWAP 352X288 RESOL

Intel Corp: Intel Pocket PC Camera

Deluxe PC Camera

Easy PC Camera

Pro PC Camera

ME2CAM Digital Camera

Kensington VIDEOCAM USB PC/MAC

Logitech Inc QuickCam Home - USB 352 × 288 4.9 × 4.0 Inch Window

QUICKCAM VC Parallel PC Video

QUICKCAM WEB USB PC Video Camera with Microphone Notebook

QUICKCAM EXPRESS USB

QUICKCAM PRO PC PARALLEL

Philips PC Digital Video Camera USB

Sony DCR-TRV310 Digital Camcorder

INTRODUCING AMATEUR TELEVISION!

The following is half of the article I did for the ARRL Operator Manual last year. I will make extra copies of this Newsletter to be available at the Dayton Hamvention ATNA/DARA booth this year so I'm reproducing it here in the hopes that new potential ATVers will see it and become interested in ATV. Besides, the information is of interest to the seasoned ATVers also. The second half of the article deals with building the ATV station and will be in the next ATCO Newsletter. Enjoy!…WA8RMC

I. What's it all about?

Let's assume you are acquainted with the hobby of amateur radio. (Amateur radio operators or "Hams" communicating via radio). Then a possible natural extension to radio communication could be television communication. Sound interesting?

If you're skeptical, you may ask "What practical use does Amateur Television (ATV) have and why would I ever want to do it?" Well then, why communicate via Ham radio when you can simply call the person on the phone? It doesn't *have* to be practical, but it is indeed practical, and fun to boot! But if you need justification, show home movies to fellow ATV'ers without leaving home. Maybe, if you were interested in public safety/emergency communications, you'd transmit security video of local events such as parades, marathons, airport disaster drills, etc. Or, maybe you would just like to see how many video contacts you could make.

As it turns out, there are many thousands of Ham radio operators in the USA that have ventured beyond "talking" and decided to try the transmission and reception of pictures on the Ham bands via slow scan (SSTV), facsimile (FAX) and other experimental digital forms. But here, let's concentrate on what is called Fast Scan Amateur Television (FSATV) or simply ATV for short where at least 5000 Hams find enjoyment. This transmission mode, in theory, is exactly like the television broadcasters have been doing for over 50 years. However, much simpler equipment is used. You may, at first, think ATV is overly complex and expensive but it is quite the contrary on both counts. Yes, the method of transmission/reception is rather complex if you examine the details, but it is easier (and cheaper) to accomplish than FAX or SSTV mainly because of commercially available equipment for other purposes. If you choose to pursue FAX or SSTV, you'll find that communication via great distances IS an advantage, but surplus equipment is generally not available. However, for ATV, you probably already own 2/3 of the main components in a beginner's station, namely, the receiver and camera. Your standard cable ready television will work as a receiver without modification of any kind and the required camera is the same camcorder that you use to record your vacation memories. For SSTV, the camcorder video output must be converted to a slow scan rate via a special converter to transmit but for ATV, the video output can drive an ATV transmitter directly. OK, how about the ATV transmitter? Well, this is the hardest part because usually there are no ATV transmitters in use for other purposes (well, not quite). More about that later.

Admittedly, there is one down side. ATV requires a large bandwidth signal to be able to reproduce the picture with sufficient detail. Therefore, among other factors, the communication distance is typically no greater than an average local commercial broadcast signal in your area. It is important to know this now so you don't create an ATV station with hopes of regularly communicating thousands of miles. But even with the limited range of 50 miles or less, there's a lot of fun and satisfaction to be had. Then, when the band becomes enhanced and that 100-500 mile "DX" rolls in, the excitement becomes more intense.

The most popular ATV band, by far, is 70 cm (420-450 MHz) where 439.25 MHz (cable channel 60) sees the most activity. You can monitor this frequency with a cable ready TV set connected to an outside UHF antenna to check for general local activity but it's best if you can locate someone in your area that will transmit an ATV picture to you first. The 910-920 MHz, 1250-1280 MHz or 2410-2450 MHz portions of these bands are also in use in many areas, but reception is slightly more involved. A detailed description will follow.

Hams don't use the same high power levels nor have the same antenna heights that the broadcasters use. Therefore we must use creativity to help make up some of the difference. While the broadcasters use hundreds of thousands of watts of power and antennas a thousand feet or so above ground, a typical ATV station use less than 50 watts with antenna heights less than 50 feet. However, while broadcasters use omni-directional antennas with less than 10dB gain, Hams can build directional antennas with more than 16 dB gain (at each end). This, combined with the fact that they are usually willing to be satisfied with less than a snow free signal most of the time, makes 2-way communication possible. In fact, it is surprising how well the communication link can be, given the overall circumstances. But let's be honest here. If it were not for the challenge to achieve a good 2-way communication link, it wouldn't be nearly as much fun. Without doubt this is the challenge that motivates most of us.

ATV HISTORY

ATV generally appeals to Hams more interested in the technical portion of the hobby. Therefore, many have little concern with contests but lean toward building, modifying and working on equipment. Initially, if you didn't build it, you weren't successful in ATV because there was very little affordable and readily available commercial equipment. Today, that's changed dramatically so more and more "non technical" people are entering this fascinating hobby and learning to be quite technical as they progress.

ATV in the 50's had very few people experimenting with amateur television. Those that did were TV broadcast engineers who had knowledge, equipment and component access to get started.

In the 60's there was very little commercial equipment available. Most of the experienced ATVers were busy converting the transmitter portion of taxicab UHF radios trying to squeeze those extra few milliwatts out of a 2C39 or 5894 tube. They got, if they were lucky, a few watts of RF. Feedlines were lossy, so if a watt was delivered to the antenna, that was good. On the receiving side, the situation was even more difficult. The only way to use commercially available stuff was to modify (retune) a UHF tube type tuner enough to get it to cover 439 MHz. Bell Telephone had a special "low noise" tube known as a 416B that could be used for a receiving preamp if one of these could be found. If located, you then had to search for a machinist willing to fabricate a socket and housing for the circuitry. Transmitters and receivers were difficult enough but the real stumbling block was the camera. Black/white vidicon cameras were available but generally not on the surplus market so the cheapest way to generate video was with a photo multiplier tube using a TV raster as the scanning device (another story). This method just produced still pictures.

The 70's introduced those tiny little solid state devices called transistors and a new era of experimentation began. Many types of low noise devices became available, but not necessarily affordable for all. Numerous ATV articles appeared in Ham magazines for both transmitting and receiving. Black and white vidicon cameras were now becoming more available.

The 80's and early 90's were quite transitional, as more and more modifiable commercial units became available. When this happened, more Hams got involved because it no longer required an engineer to make things work.

As we enter the next century, individual transistors of earlier times are reduced dramatically in size, combined into entire circuits on a single integrated circuit (IC) and packaged into complete radios. Even more dramatic is the cost reduction. A complete radio circuit is cheaper now than a single transistor was in the 70's. As a result, low cost, high efficiency circuitry for ATV without modification is available to everyone. Those expensive color camcorders of the 80's and early 90's are now available at hamfests for $25.00 or less, putting the cost of this hobby well below many others!

Twenty years ago, no one even dreamed this could happen. So what's next? Have we approached the limit? No, we're still on a nearly vertical learning curve with many more exciting things yet to come. Total digital processes are now emerging, so get involved and join the excitement of the adventures of amateur television.

HOW TO GET STARTED

By this time, you probably possess a moderate interest in this hobby. Obviously, somewhere along the line you must get started. But, what comes first? Well, that depends. Many factors influence where you go from here so no one can tell you exactly how to go about it. Instead, the best way is to outline the information resources available so you can choose the best avenue. After all, the best help is to know where to find them and you'll learn a lot along the way. Here are some places to start for details.

1. **The Internet**. This is a wonderful resource of activity because many ATV clubs post activity details on their Internet homepage. Area activity as well as frequencies used provides details of where and when to look for signals. Some of the most active web sites are as follows:

   http://:psycho.psy.ohio-state.edu/atco - Columbus, Ohio ATCO group
   http://www.smart.net/~brats - Baltimore, Maryland BRATS Group
   http://www.stevens.com - Houston, Texas HATS Group
   http://www.icircuits.com/dats - Detroit, Michigan DATS Group
   http://qsl.net/atn - Southern California ATN Group

2. **Hamfests**. Check QST magazine or visit the ARRL web directory http://www.arrl.org/hamfests for a list of hamfests or Ham conventions in your area. Most of the larger hamfests post signs about ATV activity and have ATV forums.

3. **ARRL Repeater Directory**. Check this directory for ATV repeater listings.

4. **Local Ham Store**. Ask about ATV activity in the area. Most ATVers are well known in these places so a list of individual Hams involved in ATV can be compiled. Contact these individuals. Most active ATVers will bend over backward to help newcomers and frequently invite potential ATVers to their hamshack to see firsthand what it is all about.

5. **Mail Order ATV Dealers.** Many are willing to share information to where their equipment is sold. If you are interested in a given manufacture's equipment, ask them about it and who owns that item in your area. Most will comply. No equipment endorsement is made but a few of the larger original equipment ATV dealers that have been in business for a number of years are:

PC Electronics - Transmitters, receivers, preamps (http://www.hamtv.com)
Downeast Microwave - Transmitters, converters, preamps (http://downeastmicrowave.com)
Directive Systems - Antennas (http://www.directivesystems.com)
M² - Antennas (http://www.m2inc.com)
Wyman Research - Transmitters, receivers (http://www.svs.net/wyman)
DCI - Filters (http://www.dci.com)

6. **Ham Magazines**. QST regularly publishes ATV related articles and carries ads for ATV dealers. ATVQ magazine is the only one dedicated solely to amateur television. Check http://www.atvq.com for details. The ARRL Radio Amateurs Handbook ATV section also contains good reference information.

That should be enough to keep you busy for awhile. But sooner or later, a transition from planning to implementation must be made. So, a recommendation is in order at this point. Start by **receiving** an ATV signal. After all, if you own a cable ready TV set and an outside UHF antenna with rotation capabilities, you're ready for action. Tune in and enjoy. The rest will follow in the order you prefer.

LICENSING, LIMITS, RESTRICTIONS . . . Don't think too big!

ATV can be used by any Ham with a Technician class license or higher on any Ham band 420 MHz and above. Some regional limitations exist for frequency and power levels in parts of the United States, so check the ARRL Repeater Directory or local sources before operating. Activity frequency concentrations differ in different parts of the USA, but generally most ATV activity can be found in the 420-440 MHz portion of the 70 CM band. ATV repeaters usually transmit on 421, 426 or 427 MHz (a few transmit on 439 MHz and receive on 421, 426 or 427 MHz) and receive on 434 or 439 MHz (cable channel 59 or 60). If you prefer simplex operation, 439.25 MHz is the most popular transmit and receive frequency.

The only formal FCC imposed frequency restriction is that no operation is allowed outside the allocated Ham bands. That includes sideband energy, so it is important to know that television requires a large bandwidth and if not adequately suppressed with various filters, they may extend beyond the band limits. Insufficient space is available here to define and detail the specifics of the various modulation types, so be sure you know the details of your signal before an operating frequency is selected. For example, many ATV repeaters transmit on 421.25 MHz. The lower band limit here is 420.0 MHz so special filtering of the sound/color subcarrier is required to prevent the signal from extending below the 420 MHz limits. (The government personnel operating in the 400-420 MHz segment are generally not interference tolerant!).

Although the full legal limit of 1,500 watts peak is allowed on any of these bands, (check for some local exceptions), very few operators exceed about 50 watts of average power. It is quickly learned that the complexity, technical expertise, mechanical ability and cost all go up exponentially past this point so don't get carried away. There's plenty of time to dream later!

Other than the FCC imposed restrictions, the remaining allocations are mostly by "gentleman's agreement" or "locally agreed to" band plans. If the local frequency coordinators have assigned a repeater frequency within a given ATV bandpass to someone else, it must be honored but not FCC mandated. The FCC does not control interference from Ham to Ham within the allocated band so it is left to the Hams involved to work it out. Cooperation is necessary. As the operating frequency is increased to the higher Ham bands, i.e. 902-928, 1240-1300, 2390-2450, interference becomes less of a problem because of directivity, activity and losses, so if it becomes too crowded in your area, serious consideration should be given to one or more of these higher bands. One last note on the interference issue - ATV is a wide band signal with energy dispersion that decreases rapidly as it departs from center carrier. The ATV receiver must tune this entire bandwidth so it will see all signals within its band pass. Therefore, a foreign narrow band signal is much more likely to interfere with an ATV signal than the other way around, so be understanding. We must all share.

SIGNAL DETAILS . . . A Broadcast Standard Comparison

At this point, we need a brief description of the type of signals we are dealing with for ATV. Don't worry, this won't be a drawn out theory session. At this point, it shouldn't be, but a little more about this general subject should be known. Here goes.

The description is broken into two parts, as there are two basic transmission modes in common use. The first mode is called **vestigial sideband** and is a form of amplitude modulation. This is most common and used by all broadcast TV stations. Basically, it is amplitude modulation where the carrier magnitude is changed corresponding to picture content. An all white screen will generate a *minimum* RF signal (It's not good to turn it off completely) and an all black screen is a *maximum* RF signal. Therefore, if you are transmitting a signal and put your hand over the lens, the average power level will be greater than if you display a bright scene. The amplitude modulated RF

signal will have two sidebands, an upper and lower with the carrier frequency in the middle because the modulation process produces the sum and difference of the carrier frequency and video. In theory, only one of these two sidebands is needed for complete picture reconstruction because each is identical. In broadcasting, the lower sideband is *partially* eliminated to conserve spectrum space (vestigial sideband) but it's needed to preserve the proper sync pulse risetimes and low frequency video components. But if it wasn't partially suppressed, the TV receiver throws it away, so if we don't eliminate the lower sideband in our ATV transmitter, the receiver won't know the difference. Since the sideband suppression process tends to be complex and expensive, ATV transmitters rarely do it. So much for the "theory", so here are a few **observed** characteristics of an amplitude modulated signal. First, this type of signal's presence can be detected with relatively low transmitted power levels (compared to FM modulation discussed later) but it takes a very strong signal to get a snow free picture. If you receive a signal that is just discernable (sync bars are visible but the content is not recognizable) and the power level at the transmitter end is 0.1 watt (100 milliwatts), the transmitted signal must be boosted by 30 dB or to roughly 100 watts to obtain a snow free signal with all other factors unchanged. Likewise, the received signal can be improved by using better coax, better antenna or more sensitive receiver. However, the transmitted signal is simple to create (if you don't do it like the broadcasters) and easy to receive on the 70 CM (420-450) band mainly because it allows the use of a standard TV receiver for reception without modification of any kind.

The second mode is **FM** or Frequency Modulation that is employed with almost all satellite systems. If you watch satellite TV (either 4 GHz "C" band or the newer 11/12 GHz "Ku" band systems) the signal is first downconverted to a lower frequency and then FM detected from a 70 MHz intermediate frequency. The resulting video is either fed directly to an ATV video input or upconverted to TV channel 2 or 3 and re-transmitted as an AM signal to your TV set. Because of this, there are a number of commercially available converters that can be used for ATV. As discussed earlier, a weak AM signal can be easily detected. It is not so with FM. As the FM signal strength is increased, nothing is seen until the limiter circuit in the receiver "sees" a significant signal. Once that limiter threshold is achieved, from the point of signal recognition to snow free is, in many cases, only 6-8 dB or so. As in the earlier example, instead of 100 milliwatts producing the barely recognizable signal, 25 watts would be needed if 100 watts produced a snow free picture. In practice, the comparison may or may not be quite as dramatic, but… well, hopefully you get the point. There are many variables involved, so true comparisons are difficult. On the up side, an FM signal tends to produce a higher resolution picture (however, it's mainly limited by the monitor used) and is less subject to fading (it has a higher fade margin above the snow free point) than the AM counterpart. Also, since noise is fundamentally AM, the FM detection process cancels some of it for better noise rejection. (Have you noticed the static crashes on your AM radio but not FM?)

So you see, there's "no free lunch". Each system has its advantages and disadvantages. You're welcome to experiment and determine for yourself, but that's much later. Because of increased available bandwidths, FM systems dominate the 2.4 GHz and higher bands, 900 and 1200 bands are mixed and 420 MHz is the only one where AM enjoys exclusive use. A case in point . . . the ATCO (Amateur Television in Central Ohio) ATV group originally used 920 MHz with AM modulation for a repeater link located in the metropolitan area plagued with intermodulation problems from nearby TV broadcast and FM commercial radios. It suffered from fading, herringbone bars in the picture and frequent noise bursts. The link was changed to FM and the improvement was miraculous, even though the power levels remained about the same! However, if power levels were reduced, there would have been a point where AM could have been recognized and FM wouldn't. The rule of thumb is if you've got power to spare, willing to spend more money for increased complexity and want a better quality picture . . . use FM.

OK, we talked about signal levels but haven't discussed the way it's most commonly reported. When you watch an ATVer's picture, you would like to tell the sender conveniently how well it is being received. You could say, "Your picture is 20% snow", etc. But that terminology is very vague and wordy. The only exceptions are "I can't see it at all" or " You're perfectly snow free" which, we all understand very well. It's analogous to the digital 1's or 0's indicating "On" or "Off" but it's the "shades of gray" that become a bit more arbitrary. To solve this the "P" system was developed for AM signal reception. It goes like this. "P" stands for picture level and is broken into six levels from P0 to P5. A signal received as P0 is recognizable to its existence only. No detail is discernable and usually only sync bars can be seen in the snow. Experience has demonstrated that the minimum recognizable signal *change* is about 3db (2:1 power change) so 6 dB/step is easily recognized and represents sufficient precision. The numbers continue in 6 dB steps to P5, which is a snow free signal and 30 dB greater than P0. Beyond that, we tend to be complementary to the sender, such as, "P5 plus", "broadcast quality", etc. Everyone likes complements and ATVers are no exception so if you like what you see, tell the sender about it. However, try not overdoing it. P-unit reporting is universal across the USA and in other countries as well. (Remember the P-unit reporting system is accurate only for AM modulation because of the near linear levels. P-unit reporting of FM signals can be used as long as it's understood that it will not be 6 dB/P unit because of the non-linear nature of the receiver detection system). For a visual representation of what the AM signal for each P-unit level looks like, visit the ATCO web site. It is located at http://psycho.psy.ohio-state.edu/atco.

In the next issue I'll describe ways to "build The Station". Stay tuned.
…WA8RMC

HDTV COMMENTS…another person's opinion.

It's certainly true that DHTV does not seem to be ready for amateur prime time. The continued very high cost of state of the art encoders makes any real experimentation just that - experimentation that might or might not lead to some deployable form of DHTV.

I still believe there is reason to pursue this in amateur circles. There are those who believe that fast scan ATV must not give up anything to quality if DHTV is adopted. I believe you have to give something to get something. The thing we would all like to get is more space to play with ATV. Right now, there is a whole bunch (a Texas measurement) of pressure on the spectrum we use for ATV. I, for one, would like more channels to play with. Since our only option to getting more channels today is to move up in frequency (and we're already using everything up to 2.4 ghz. - so that means UP from there) I would welcome a digital option that might let us carve up one of those 6 mhz. VSB channels into two or three digital channels. Would I settle for the equivalent of a 128 kbps video conference? No way. But would I accept some limited pixelation to get those additional channels? Show me - I'd love to have that choice.

There are a number of different ATV users in the hobby. There are those who love chasing ATV DX - for them, VSB AM is perfect (using big, black, block letters). There are those who like to use a local repeater and send high quality pictures to each other. There are those using ATV for public service work. DHTV can fit into some of these areas and provide some benefits.

I would welcome suggestions about available hardware that might be used. Demodulation is pretty easy right now. It's the ability to encode and generate the stream that is the problem. HATS (Houston Amateur Television Society, Inc.) continues to look for fertile area to do work. We have a small amount of money to invest in the development of DHTV. If a piece of dedicated user hardware needed to be constructed to make it fly, HATS would consider the possibility.

My personal goal has been to be able to generate a "nearly" perfect fast scan quality picture with an occupied bandwidth of 2 MHz. And, before you say that is not possible, we are already doing stuff we thought impossible just a few years back. It's just a matter of getting access to the technology that is already out there on the leading edge. Imagine what that would do for you on the 70 cm band.

DHTV has been moving very slow - but then the visionaries who started this list were way ahead of their time. We can do it, we need to do it, and we will do it. Who will bring the idea that makes it happen forward?
…Ed Manuel, N5EM, Houston Amateur Television Society, Inc**.,** n5em@amsat.org

VIDEO SURVEILLANCE ILLEGAL EQUIPMENT…W6ORG speaks out.

ATVers: If you are as concerned as I am about the growing number of manufacturers and dealers selling unlicensed and non-FCC compliant video surveillance and digital transmitters on frequencies in our ham bands for use by anyone, the FCC now has an email address that you can report these people to - see below. More and more these transmitters show up in Electronic Hobby, Security, TV and Movie production magazines, and on the Internet. If they are not stopped, our bands could be taken over by them and instead of enjoying our hobby we would either have to put up with the interference or waste a lot of time trying to find the transmitter and talking the user out of transmitting. Here in the LA area we occasionally get surveillance video transmitters opening up our repeaters or causing interference to other modes. Last time it took the FCC about 6 months to find them and shut them down. It would be better to stop this at the source. Most illegal users are fooled into thinking what they are doing is license free by the sellers.
…Tom W6ORG

The FCC offers this advice,
The Federal Communications Commission receives hundreds of complaints about alleged illegal equipment being offered for sale on the Internet or in publications. The Commission is monitoring this situation carefully and request your assistance. If you have information about illegal or uncertified equipment being offered for sale, the FCC will need the following information:

* An original advertisement or web address where the illegal equipment is being advertised or offered for sale.
* If it is a web-auction we will need the name of the auction site, the exact item number, and auction opening and closing dates.
* Name and address of the individual or business offering the item(s) for sale.
* Consumer's name / telephone number if follow-up is necessary. Consumer information can remain anonymous, if requested.
* Specifically, WHY you think the equipment is not in compliance with FCC rules.
* Number of pieces or types of equipment about which the allegations are being made (one piece, 5 pieces, # of models etc.).

Information can be e-mailed to FCCINFO@fcc.gov or mailed to:

Federal Communications Commission
Consumer Information Bureau
Consumer Complaints
445 12th Street SW
Washington, DC 20554

2.4 GHz HAM INTERFERENCE…FCC queries wireless net provider

The FCC has asked a wireless Internet system provider what it intends to do to eliminate interference to Amateur Radio operations in the Dallas, Texas area. The FCC wrote Darwin Networks Inc on February 8, 2001, regarding complaints of harmful interference to Amateur TV on 2.4 GHz that's said to be a result of the company's deployment of Part 15 devices in an apartment complex.

The FCC said Darwin Networks' Part 15 devices at the Post Townlake Village property in Dallas apparently were installed in the apartment complex to provide Internet service using wireless 2.4 GHz nodes from Cisco Inc.

In the letter, FCC Special Counsel for Amateur Radio Enforcement Riley Hollingsworth noted that operators of Part 15 devices are required to cease operation should harmful interference occur to authorized (ie, licensed) spectrum users. "Darwin Networks is obligated under Commission rules to locate the source of interference caused by its equipment and make necessary corrections within a reasonable time," he said.

According to Hollingsworth, Darwin had written the unidentified complainant stating that its devices were operating under Part 18 Industrial, Scientific and Medical rules, which would not obligate the company to resolve amateur complaints. But Hollingsworth said it appears that Darwin is not operating Part 18 ISM devices but Part 15 devices that are not covered by the same sort of exception. Hollingsworth gave Darwin Networks 10 days to reply.
…From the ARRL newsletter Vol 20 #7 February 16, 2001

ARRL URGES FCC TO NIX PART 15 PETITION AFFECTING 420-450 MHz

The ARRL is urging the FCC to deny or dismiss a petition that seeks to boost the field strength and duty cycle of RF identification systems deployed as unlicensed Part 15 devices in the 420-450 MHz band. The League filed comments March 1 in a petition filed by SAVI Technology Inc.

The petition, designated RM-10051, asks the FCC to change certain Part 15 rules affecting unlicensed, periodic, intentional radiators. SAVI, which markets radiolocation and wireless inventory control products, says it needs the rules changes to satisfy customer demand for increased RFID system capabilities.

The ARRL argues that the field strengths and duty cycles SAVI proposes for its RFID tags "are completely unreasonable and would undoubtedly seriously disrupt amateur communications in one of the most popular of the Amateur Service allocations."

The ARRL characterized SAVI's petition as another in a long series in which manufacturers of unlicensed RF devices seek to liberalize rules regarding permitted field strengths for such devices in bands allocated to the Amateur Service. The League said SAVI obviously did not have interference avoidance in mind when it chose the 420-450 MHz band. "It is among the worst choices SAVI could have made from that perspective," the ARRL said. The League suggested that SAVI would be better off deploying the devices in the 902-928 MHz band.

The ARRL said SAVI not only has failed to show that its unlicensed devices could operate at the requested field strengths and duty cycles on an itinerant basis without unduly risking harmful interference to amateurs, it hasn't shown why it needs such extremely high field strengths to communicate over paths of 100 meters.

The ARRL said its limited anecdotal studies of noise levels from unlicensed devices in certain metro areas indicate that manmade RF noise "is substantially increasing." The League warned the FCC to "be extremely careful in evaluating rulemaking petitions proposing substantial departures from present Part 15 rules."

For more information on Part 15 devices, visit the ARRL Web page, http://www.arrl.org/tis/info/part15.html.
…From the ARRL newsletter 3/9/01 volume 20 number 10

EXPERIMENTAL TV IN L.A. COUNTY…the final chapter?

FCC Denies LA County 2.4 GHz Application, Cancels Experimental Grant to City. Following objections from the ARRL, AMSAT and others, the FCC has turned down an application from Los Angeles County, California, for an experimental license permitting airborne microwave TV downlinks (TVDL) in the 2402-2448 MHz range. The FCC also canceled an experimental license grant to the City of Los Angeles to operate an identical TV downlink system in same band.

Amateurs have a primary domestic allocation at 2402-2417 MHz and a secondary allocation in the rest of the affected band.

"Experimental licenses are not substitutes for regular radio communication service licenses," said Charles Iseman, deputy chief of the Electromagnetic Compatibility Division in the FCC's Office of Engineering and Technology. OET issues all experimental licenses.

The ARRL, AMSAT and the Amateur Television Network had asked the FCC to deny the County's application. ARRL members Art McBride, KC6UQH, and Thomas O'Hara, W6ORG, also filed informal objections. The League, AMSAT and ATN also had objected to the City's experimental grant. The FCC gave the City until December 1 to terminate its operation but reserved the right to accelerate the cancellation date if interference occurs.

The LA County proposal, filed in August 1999, sought FCC authorization to develop a TVDL system on four 2.4 GHz channels for deployment aboard sheriff's and fire department airborne units. The FCC granted the City's WB2XEN experimental license based on a similar submittal.

In protesting the County's plan, the ARRL called the application a "foot in the door" toward gaining a permanent berth in the 2.4 GHz band. The County and the City already are authorized to operate TVDL systems under Part 90 rules in the 2.450-2.483.5 GHz band, but both told the FCC that they had experienced coordination and interference problems and sought the experimental TVDL authorization as a result.

In light of the denial and the cancellation, the FCC did not address potential interference issues raised by the objectors.
… ARRL Bulletin 10 ARLB010 From ARRL Headquarters Newington CT March 15, 2001

NEWS FROM OTHER ATV GROUPS…What are they up to?

From time to time I am able to contact other ATV groups to see what they're doing in the line of ATV. When I do, I'll pass the information on to you. Likewise, I make this Newsletter information available to these clubs so we can reciprocate. Hopefully in the future, we will all be able to report on a regular basis. WA8RMC.

Kansas City ATV group (KCATV)

Our club for years had a fiber optic feed from the cable TV people and lost it a few years back. We also had space shuttle video from one ham that had a downlink signal and the trees have dropped his signal so he quit putting it on. Since then it seemed like activity in the club went down, so we needed to do something to jump start the club again. I contacted one of the local TV stations to see if we could obtain a feed from their local radar. They said yes and we set forth to build a system to transmit from their studios. Their studio was down in a hole and 900 MHz just doesn't work and I am building up a 1.2 gig FM ATV repeater so that was out also to make a link from. We decided to try the Wavecom sr. to do a two site hop. The first hop was 1.6 miles and the second was 2.8 miles. We repackaged the wavecom sr. with the added boards from P.C.Electronics and got a whopping 100 MW out. We purchased the conifer dishes (24 db) and tested at 2.8 miles and it was perfect then went to 6.96 miles and the same thing perfect signals and super audio. I have the first site transmitter up and running and we have one ham that goes out at net night and retransmits the live radar video to show what we will have soon. I hope to finish the rest of the installs soon. Our club might have a possibility of getting a space shuttle down link from the cable TV people as they have a big dish that is not being used. So things are looking up for our sleepy club. Our club has a web page at http://kcatv.org/ Our club has a net night Sunday at 8:00 and has a live web cam at http://pages.prodigy.net/dsudduth/wcam.htm This web cam is made possible by kb0znp. We have a few club members that live on the fringe and they just watch the web cam in poorer conditions. I am starting to build up 1.2 gig repeater as we have found a nice site (200 footer 1 commercial and 1 amateur repeater on vhf) and had some donations of some 1 5/8 hard-line. That seems to be about it as I have a few building projects going on and hope to write them up for ATVQ soon. 73's for now and hope to see you some day (439.250 P5). P.S. I will be launching a balloon with ATV on 439.250 on June 30 from Mahattan Kansas so stay tuned for details.
…Mike kd0fw
Kansas City ATV Society

Houston ATV Society (HATS)

We have spent much of the last 12 months trying to recover from the loss of our repeater site. This unexpected, short notice event last February put us in an awkward situation. It meant the loss of the main 70 cm. and 1.2 GHz outputs. So, we then began a search for options. One option that presented itself was a very compact 2.4 GHz AM transmitter (ex MMDS) that we could "shoehorn" into another location we had limited access to. Since this was both a new mode and band, the club bought a box full of Conifer downconverters and modified them. We then gave them out at the club meetings to all paid members as a "freebie". This allowed us to get back on the air late last year with our regular 1.2 GHz FM input and a 2.4 GHz output. While the 2.4 GHz AM output is not as easy to deal with as the 70 cm. it allows the club members to have something ATV to experiment with. It has been successful enough that we were able to do our annual public service event, the Houston Marathon. In parallel we have been refitting all the 70 cm gear into a nice, neat, new half-rack that we can install on another site and link to the 2.4 GHz unit with a 915-ish link. That will then give us 1.2 GHz FM in and parallel 2.4 GHz AM and 70 cm AM out. Future improvements will add a second 1.2 GHz FM input and "de-linking" capability so that the two sites can
operate in parallel or separately. Also we are working to increase the 2.4 GHz output by reducing feedline losses and adding a Power Amplifier. Further in the future is a 2.4 GHz FM output.

Our main "opportunities" are in trying to get the repeater controller reconfigured and debugged to increase reliability. Also, finding new sites are important.
…Ron, AG5RS Houston Amateur TV Society

ATV FROM CABLE TV MODULATORS…Watch for these at Dayton!

Commercial cable TV modulators are becoming readily available at Hamfests and make excellent ATV transmitters. Use an agile modulator with at least +10dBM output (10mW) and drive a **linear** brick to output about 10 watts of high quality ATV video. This is exactly the approach I'm taking with my latest 427 MHz improvement to the ATCO repeater. I've tested the combination to find that it works great. One word of caution if you think about building this arrangement for ATCO repeater use. The modulator outputs a very good vestigial sideband signal with upper sideband energy only. Since the ATCO 439.25 input is lower sideband, it won't be received there but will be excellent for operator to operator ATV contacts. (the reason other ATV transmitters work on lower sideband is the fact that they don't have vistigial sideband filters and transmit **both** upper and lower sidebands. Tom O"Hara describes how he has tested his amplifier with a modulator and is well worth reading. I've seen modulators at Hamfests go for $50-100 so that's cheaper than you can get most ATV transmitters. It's worth looking into and putting one on your Dayton list!
…WA8RMC

Tom writes,
"I occasionally get asked about driving the 20 watt PA5 amp module by a cable TV modulator. While testing a PA5 out for an order today that was going to be driven by a ham with a cable TV modulator, out of curiousity, I checked what actual input power is to get up to 10 watts which is still within the reasonable linear gain portion of the curve for the brick. I was surprised to find that it only required 10 milliwatts to get 10.5 watts out at 439.25 MHz. This means that the head end cable TV modulators that can give +60 dBmv power output (equivalent to about 13 mw into 50 ohms) can drive the 20 Watt PA5 directly. Not all cable TV modulators give this much power level but you can add an amplifier between the TV modulator and amp to get to this level like one of the MMIC's from MiniCircuit Lab, etc. Before you consider going the route, check to see what the output power rating is of the cable TV modulator you have. Don't be concerned about 50 ohms vs 75 ohms, the mismatch loss is not worth considering and the actual impedance of the cable TV modulator and the PA5 are probably not exactly 75 or 50 ohms resistive at any given frequency anyway. At the 10 watts out on 439.25 MHz, the current draw was 3 amps at 13.8 Vdc.
The gain does drop a little as you go down in frequency in the band - the PA5 got 8 watts out at 421.25 MHz with the 10 mw drive."
…Tom O'Hara W6ORG, P. C. Electronics , www.hamtv.com

HAMFEST CALENDAR

This section is reserved for upcoming hamfests for as far in advance as we know about them. They are limited to Ohio and vicinity easily accessible in one day. Anyone aware of an event incorrectly or not listed here, notify me so it can be corrected. I maintain some fliers that compile this list so for additional info Email me at towslee@ee.net. This list will be amended, as further information becomes available.

21 Apr 2001 + Jackson County ARC Contact: Edgar Dempsey, KD8XL 110 Morton Street Jackson, OH 45640-1335 Phone: 740-286-3239 Email: kd8xl@ohiohills.com
29 Apr 2001 + Athens County ARA Contact: Drew McDaniel, W8MHV 61 Briarwood Drive Athens, OH 45701 Phone: 740-592-2106 Email: dmcdaniel1@ohiou.edu Athens, OH
29 Apr 2001 + Twenty Over Nine Radio Club Contact: Don Stoddard, N8LNE 55 South Whitney Avenue Youngstown, OH 44509 Phone: 330-793-7072 Email: N8LNE1@juno.com Canfield, OH
18-20 May 2001 Dayton Hamvention Dayton ARA http://www.hamvention.org/ Contact: Jim Graver, KB8PSO Phone: 937-276-6930 Fax: 937-276-6934 Email: info@hamvention.org Dayton, OH
10 Jun 2001 + Goodyear ARC Contact: Rich Kuster, N8ZDQ 1341 Whippoorwill Trail Stow, OH 44224-2327 Phone: 330-796-3951 Email: rich.kuster@goodyear.com Suffield (Akron), OH
16 Jun 2001 + Milford ARC Contact: Chris Reinfelder, KB8SNH 3691 Charter Oak Amelia, OH 45102 Phone: 513-753-5066 Email: kb8snh@cs.com Milford, OH
8 Jul 2001 + Wood County ARC http://wcarc.bgsu.edu/flyer.html Contact: Bob Boughton, N1RB PO Box 534 Bowling Green, OH 43402 Phone: 419-354-1811 Email: hamfest@wcarc.bgsu.edu Bowling Green, OH
21 Jul 2001 + Northern Ohio ARS http://apk.net/noars/noarsfe.htm Contact: John Schaaf, K8JWS 6264 West River Road South Elyria, OH 44035 Phone: 216-696-5709 Email: k8jws@arrl.net Wellington, OH
29 Jul 2001 + Portage ARC http://parc.portage.oh.us Contact: Joanne Solak, KJ3O 9971 Diagonal Road Mantua, OH 44255 Phone: 330-274-8240 Email: ljsolak@apk.net Randolph, OH
4 Aug 2001 + Voice of Aladdin ARC Contact: James Morton, KB8KPJ 6070 Northgap Drive Columbus, OH 43229-1945 Phone: 614-846-7790 Email: kb8kpj@cs.com Columbus, OH

DAYTON HAMVENTION IS COMING!…don't miss the Friday night gathering

Mark your calendar for May 18, 19, 20 this year so you won't miss the Dayton Hamvention. All indications point toward a record year. (And I predict that there will be NO rain!) If you plan to go to the Hamvention, don't miss the Friday Night gathering at the West Carrolton Lions Club from about 7:00PM till 10:30 PM. I'm the "prize" chairman this year (No, that doesn't mean I'm a great gut!) and the collection of prizes is great. So far, I've collected about 12 prizes so with about 100 attendees you do the math and figure out your chances. I usually don't publish the prize list before hand but I will say at that ATV Research is donating **two color video cameras** so that in itself is reason to come! There are a number of speakers lined up and I publish the list on the ATCO web page so if you're curious, check http://psycho.psy.ohio-state.edu/atco for the latest details. Free refreshments will be served during two intermissions. Also, if you have anything that you've built and would like to share with others, bring it and we'll check it out during the intermissions. Below is a map of how to get there and if you get lost, we'll monitor 144.34 MHz and 147.45 MHz.

ATV PARTY MEETING FRIDAY MAY 18TH 2001

7PM AT THE
WEST CARROLLTON LIONS CLUB
435 EAST MAIN STREET
WEST CARROLLTON, OHIO
Sponsored by ATNA

DIRECTIONS

From Dayton head south on I-75, take exit #47 West Carrollton. Stay in right hand lane, pass football field and Jr High, at traffic light turn right onto Cedar go one block and turn right onto E Main. The Lions Club is the last building on the left (Grey)

From Cincinnati,Ohio take I-75 to exit #44 Miamisbur-Centerville Stay in middle turn lane and turn left onto SR #725. At Alex Rd turn right After crossing RR tracks go to 2nd Trafic light and turn left onto Central Ave. Get in right hand lane, pass football field and the Jr High, at Traffic light turn right onto Cedar go one block and turn right onto East Main. The Lions Club is the last building on the left (Grey)

NEW MEMBERS

Let’s welcome the new members to our group! If any of you know anyone who might be interested, let one of us know so we can flood him or her with information. New members are the lifeblood of our group. It's important that we actively recruit new faces aggressively.

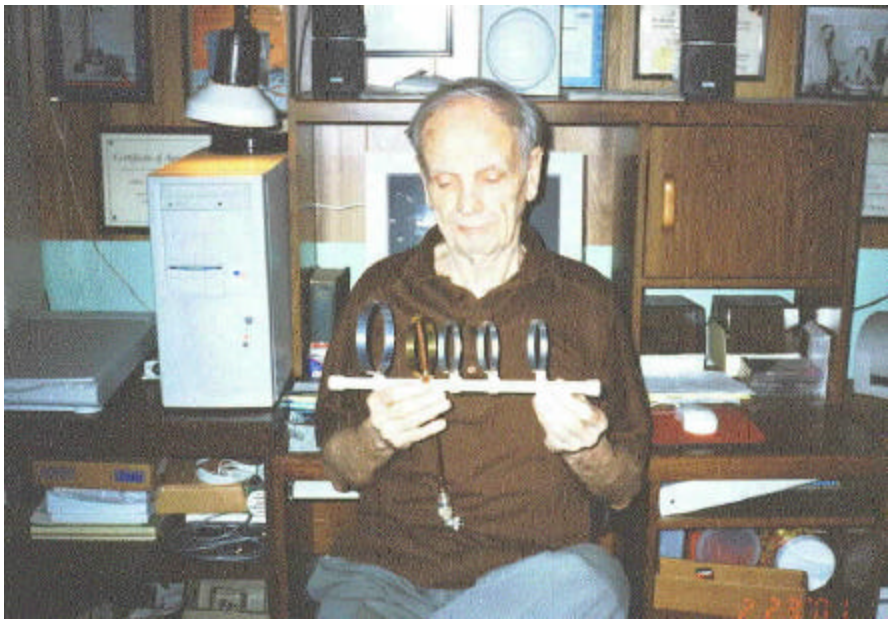
W2WIA, Ed Kuligowski & KA2EVC son John, Massapequa, Ny
W8RQI, Ray Zeh, Toledo, Ohio

…Art WA8RMC

LOOK WHO WE FOUND PLAYING WITH ANTENNAS?

I believe it’s our long time ATV enthusiast, Bill Parker, W8DMR.

In this photo, Bill has just finished construction of a 1250 MHz loop antenna he plans to use with his field strength meter. I know it’s hard to see in the photo, but the boom is made of CPVC plastic pipe. Simple, huh? It’s not going to break any gain records but it’s not intended to…the primary purpose is portability when doing field strength tests. Maybe if we coax Bill, he’ll share the design data. Watch out Ted (N8KQN), Bill is moving in on your antenna building territory!
…WA8RMC



IT'S ATCO SPRING EVENT TIME

Once again we will get together have lunch, pass out door prizes and discuss our ATV experiences since the Fall Event last year. Since we have swapped places with the Dayton Hamvention, we can discuss our plans for that event. Come one, come all. Let's see if we can break an attendance record this year. Check out the "poster" on the next page for details. See you there!
…Art WA8RMC

ATCO

2001 SPRING EVENT

1:00 PM - SUNDAY

MAY 06, 2001

ABB PROCESS AUTOMATION

(ACCURAY)

*** SHELTERHOUSE ***

650 ACKERMAN ROAD

FOR MORE DETAILS, CONTACT

RICK - WA3DTO 877-0652

Or ART – WA8RMC 891-9273

LUNCH PROVIDED - DOOR PRIZES -
BRING A FRIEND AND MEET OLD FRIENDS

SHOW AND TELL

DIRECTIONS TO THE ATCO EVENT

From I-70 either EAST or WEST Bound:

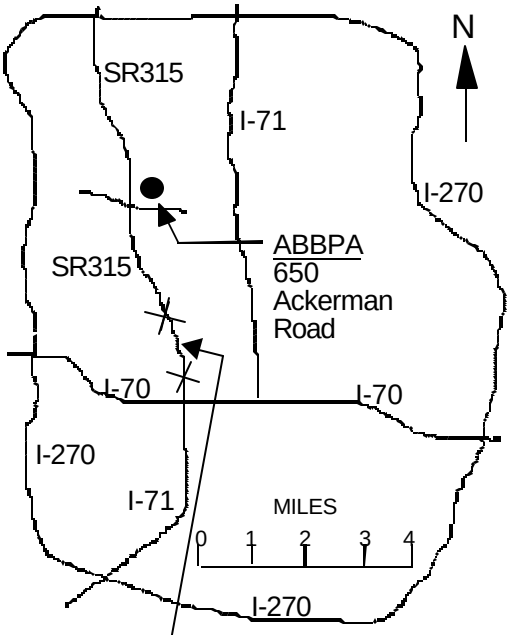
Take I-70 to the SR-315 exit. Travel SR-315 north about 4 miles to Ackerman road. Turn east on Ackerman about 200 yards to first driveway on left. (SR 315 is now **OPEN** between I-70 and Ackerman road)

From I-71 traveling NORTH bound toward Columbus:

While traveling north on I-71, exit onto SR 315 north. Travel on SR 315 about 4 miles to Ackerman road. Turn east on Ackerman about 200 yards to first driveway on left. (SR 315 is now **OPEN** between I-70 and Ackerman road)

From I-71 traveling SOUTH bound toward Columbus:

(DIRECTIONS IF YOU'RE "NORTH" OF I-270).
Take I-71 SOUTH to I-270 Bypass Loop & head WEST on I-270 to SR 315. Take SR 315 south about 5 miles to Ackerman road. Turn east on Ackerman (under SR 315) about 200 yards to first driveway on left.



ATV EQUIPMENT SUPPLIERS… Find your ATV stuff here!

Below is a list of manufacturers of ATV equipment that I have found. There is no endorsement of any of the manufacturers listed below so buyers beware. If I or anyone else that I know of has had any trouble with a manufacturer, it won't be listed. As I get more info, I'll add manufacturers. Likewise, if I hear of any trouble, it'll be removed. Good luck and keep me advised. List verified 6/1/00.
…Art WA8RMC

Michael Kohlstadt, KD6UJS has a limited supply of used but working Pacific Monolithics 2.4 ghz downconverters and power supplies which will work fine for the repeater.
Phone: 408-926-0430.

Downeast Microwave
Antennas, Power Amplifiers, Deluxe Downconverters, microwave parts.
954 Rt. 519 Frenchtown, NJ 08825
Phone: 908-996-3584
Fax: 908-996-3702

Hamtronics Inc
Ham receivers, transmitters
Antennas, Preamps
http://www.hamtronics.com

M²
Antennas
7560 N. Del Mar Ave.
Fresno, Ca 93711
Phone: 209-432-8873
http://www.m2inc.com

CCI Communications Concepts, Inc.
508 Millstone Drive
Beavercreek, OH 45434-5840
(937)426-8600 Voice
(937)429-3811 Fax
Email: cci.dayton@pobox.com
http://www.communications-concepts.com ATV Equipment

ATV Quarterly (ATVQ)
ATV magazine publisher
5931 Alma Drive
Rockford, Il. 61108
Phone 815-398-2683
FAX 815-398-2688
Email: atvq@hampubs.com

PC Electronics
ATV Transmitters, Receivers
Manufacturer/Reseller
2522 Paxson Ln.
Arcadia, CA 91007-8537
Phone: 626-447-4565
Fax: 626-447-0489
tom@hamtv.com
www.hamtv.com

Black Box
1000 Park Drive
Lawrence, PA 15055-1018
(800)552-6816 Voice
(800)321-0746 Fax
Email: info@blackbox.com
http://www.blackbox.com
Electronic Connections

SHF Microwave Parts Company
10GHz Gunn oscillators and Antennas
7102 W. 500 S.
LA PORTE, INDIANA, 46350
Fax: 219-785-4552

Allied Electronics
7410 Pebble Drive
Fort Worth, TX 76118
(800)433-5700
http://www.allied.avnet.com
Electronic Parts House

GEKCO Inc
TV test signal circuit boards
PO Box 642
Issaquah, Wa 98027-0642
Phone: 425-392-0638
Email: sales@gekco.com
www.gekco.com

Cable X-Perts
416 Diens Drive
Wheeling, IL 60090
800-828-3340 Voice 847-520-3444 Fax
http://www.cablexperts.com
Wire and Cable

DCI Communications
Interdigital filters and cavities
Box 293, 29 Hummingbird Bay
White City, SK, Canada S0G5B0
Phone: 306-781-4451
http://www.dci.ca/

ATV Research Inc.
TV cameras & related parts
1301 Broadway PO Box 620
Dakota City, NE 68731-0620
Phone: 402-987-3771
Homepage: www.atvresearch.com
Email: atc@pionet.net

E. H. Yost & Company
2211-D Parview Road
Middleton, WI 53562
(608)831-3443 Voice
(608)831-1082 Fax
Email: ehyost@midplains.net
Battries

Phillips-Tech Electronics MMDS, ITFS downconverters and antenna systems
P.O. Box 8533
Scottsdale, AZ 85252
Phone: 602-947-7700
Fax: 602-947-7799

MCM Electronics
650 Congress Park Drive
Centerville, OH 45459
(800)543-4330 Voice
(800)765-6960 Fax
http://www.mcmelectronics.com

Jameco Electronic Components
1355 Shoreway Road
Belmont, CA 94002-4100
(800)831-4242 Voice
Email: infor@jameco.com
http://www.jameco.com
Electronic Parts

Fair Radio Sales
1016 E. Eureka P.O. Box 1105
Lima, OH 45802
(419)227-6573 Voice
(419)227-1313 Fax
Email: fairadio@wcoil.com
http://www.fairradio.com
Electronic Surplus Equipment

Directive Systems
RR#1 Box 282 Dixon Road
Lebanon, ME 04027
(207)658-7758 Voice
(207)658-4337 Fax
Antennas
http://www.directivesystems.com/

Mouser Electronics
958 North Main Street
Mansfield, TX 76063-4827
(800)346-6873 Voice
(817)483-0931 Fax
Email: sales@mouser.com
http://www.mouser.com
Electronics Parts House

Hosfelt Electronics Inc.
2700 Sunset Boulevard
Steubenville, OH 43952-1158
(800)524-6464 Voice
(800)524-5414 Fax

Pauldon Associates
210 Utica Street
Tonawanda, NY 14150
(716)692-5451 Voice
ATV Receivers and Transmitters

Universal Radio Inc
6830 Americana Parkway
Reynoldsburg, Ohio 43068
614-866-4267
http://www.universal-radio.com

Spectrum International
J-Beams, KVG, Micromodules,VSB
John Beanland
Phone:978-263-2145.
Email: Spectrum@ma.ultranet.com
filters

The Wireman, Inc.
261 Pittman Road
Landrum, SC 29356
(800)727-9473
(864)895-4195
Wire and Cable

Webster Communications, Inc.
115 Bellarmine
Rochester, MI 48309
(800)521-2333 Voice
(810)375-0121 Fax
Electronic Parts

Wyman Research Inc.
8339 S 850 W
Waldron, In 46182-9608
765-525-6452
http://www.svs.net/wyman
wyman@svs.net
SSTV equipt.

INTERNET ATV HOME PAGES (list verified 01/15/01)

If you have access to the INTERNET, you may be interested to know of some of the HAM related information that is available. Most addresses listed below are case sensitive, so type exactly as shown. (For comments or additional listings contact me at towslee@ee.net).
Note: The listings below without URL's have disappeared! If any of you know otherwise, let me know.

Domestic homepages

http://psycho.psy.ohio-state.edu/atco	Ohio, Columbus, homepage (ATCO)
http://www.radio-amateurs.com	Ohio, Dayton ATV group (DARA)
http://users.erinet.com/38141/atv.htm	Ohio, Xenia KB8GRJ
http://www.angelfire.com/al/gcats/	Alabama - Gulf Coast Amateur Television Society
http://www.hayden.edu/Guests/AATV	Arizona, Phoenix Amateurs (AATV) Carl Hayden High School
http://www.qsl.net/aatv/	Arizona, Pheonix Amateurs(AATV)
http://www.citynight.com/atv	California, San Francisco ATV
http://www.qsl.net/atn	California, Amateur Television Network in Central / Southern
http://home.tampabay.rr.com/k4lk/	Florida,Tampa Bay Amateur Television Society (TBATS)
?	Florida, Emerald Coast Amateur Television Society (ECATS)
http://www.qsl.net/scats/	Florida, Melborn Space Coast Amateur TV Society (SCATS)
http://www.bsrg.org/aatn/aatn1.html	Georgia, Atlanta ATV
http://members.tripod.com/silatvg	Illinois, Southern, Amateur Television group
http://www.ussc.com/~uarc/utah_atv/id_atv1.html	Idaho ATV
http://www.qsl.net/k4kjq/atv/BATS.htm	Kentucky, Lexington Bluegrass ATV Society (BATS)
http://www.kcatv.org/	Kansas, Kansas City Amateur TV Group (KCATVG)
http://www.bratsatv.org	Maryland, Baltimore Radio Amateur Television Soc. (BRATS)
http://www.icircuits.com/dats	Michigan, Detroit Amateur Television System (DATS)
http://come.to/amateurtv.mn	Minnesota Fast Scan Amateur Television (MNFAT)
http://www.intecnet.net/vidking/	Missouri, St Louis Amateur Television
http://www.qsl.net/kd2bd/atv.html.	New Jersey, Brookdale ARC in Lincroft
http://no3y.com/	New Mexico, Farmingham
http://www.ipass.net/~teara/menu3.html	North Carolina, Triangle Radio Club (TEARA)
http://www.lloydio.com/oatva.html	Oregon, Portland ATV (OATVA)
http://www.jones-clan.com/amateur_radio/klamath_amateur_television.htm	Oregon, Southern Oregon ATV
http://www.nettekservices.com/ATV/	Pennsylvania, Pittsburg Amateur Television
http://members.bellatlantic.net/~theojkat	Pennsylvania, Phila. Area ATV
http://www.geocities.com/Hollywood/5842	Tennessee, East ATV
http://www.hats.stevens.com.	Texas, Houston ATV (HATS)
http://www.wacoatv.org	Texas, WACO Amateur TV Society (WATS)
http://www.hamtv.org/	Texas, North Texas ATV
http://www.ussc.com/~uarc/utah_atv/utah_atv.html	Utah ATV
http://www.qsl.net/w7twu	Washington, Western Washington Television Soc. (WWATS)
http://www.shopstop.net/bats/	Wisconsin, Badgerland Amateur Television Society (BATS)

Foreign homepages

http://www.batc.org.uk/index.htm	British ATV club (BATC)
http://www.sfn.saskatoon.sk.ca/recreation/hamburg/hamatv.html	Saskatoon, Canada ATV
http://www.gpfn.sk.ca/hobbies/rara/atv3.html	Regina, Canada ATV
http://www.inside.co.uk/scart.htm	UK, Great Britain ATV (SCART)
http://www.cmo.ch/swissatv	Swiss ATV
http://www.rhein-land.com/atv	German ATV in "Niederrhein" area
http://www.arcadeshop.demon.co.uk/atv/	UK, G8XEU ATV homepage
http://lea.hamradio.si/~s51kq/	Slovenia ATV
http://www.burnabyradio.com/ve7rtv/	British Columbia, Canada VE7RTV repeater
http://www.qsl.net/zl1qf/atvug/ATVusers.html	Auckland, New Zealand ATV
http://www.cq-tv.com	British ATV Club and CQ-TV Magazine

INTERNET MISCELLANOUS HAM RELATED HOME PAGES

(list verified 01/15/01)

The following addresses are helpful in searching for many different Ham Radio items on the INTERNET.

http://www.hampubs.com/	ATVQ Magazine home page. ATV equipment & article references.
http://www.hamtv.com	PC Electronics Inc. Lots of proven ATV equipment for sale.
http://downeastmicrowave.com	Down East Microwave Inc. Lots of uhf/microwave parts & modules.
http://www.arrl.org/hamfests.html	Current yearly hamfest directory.
http://amsat.org	AMSAT satellite directory/home page.
http://www.arrl.org	ARRL home page
http://www.arrl.org/fcc/fcclook.php3	ARRL/FCC revised CALLSIGN database. Search call sign or name.
http://hamradio-online.com	Ham Radio Online "newsletter" Lot of Ham related info.
http://www.qsl.net/atna/	ATNA homepage
http://www.ham-links.org	Ham Radio collection database
http://fly.hiwaay.net/~bbrown/index.htm	Tennessee Valley Balloon launch info (Bill Brown WB8ELK)
http://www.ipass.net/~teara/atv4.html	Arizona ATV 2.4Ghz Wavecom page (Wavecom mod. info)
	Space Shuttle Launch Info Service & Ham TV System (LISATS)
http://www.svs.net/wyman/	Wyman Research Inc. W9NTP Don Miller ATV equipment
http://www.m2inc.com/	M2 Antenna Systems Inc.
http://www.dci.ca/amateur_radio.htm	DCI Digital Communications Inc. Bandpass filters
http://scott-inc.com/wb9neq.htm	Kentucky, Airborn ATV from WB9NEQ in Bowling Green
http://www.icircuits.com/	Intuitive Circuits Inc
http://www.qsl.net/kd4dla/ATV.html	KD4DLA ATV web page index
http://www.severe-weather.org	Columbus, Ohio severe weather net at Columbus airport
http://www.mods.dk	Ham radio modification lists.
http://gullfoss.fcc.gov:8080/cgi-bin/ws.exe/beta/genmen/frequency.hts	look up any frequency on the FCC data base.
http://www.fcc.gov/wtb/	Starting point from which all radio license holders can be found
http://www.geocities.com/richcam1/Museum008.htm	Lab Guy Antique TV camera listing

ATV LISTSERVER … check here for the latesr ATV news!

For those of you that don't know about the internet ATV listserver, here are the latest details about what's going on there!

The Tallahassee listserver is an internet site where ATV news from individuals from around the world may post questions and comments about ATV. Answers to questions may be either addressed to the entire group that monitors it or directly to the individual asking the question. It is open to all but please keep it to subject matter relating to ATV. It's great for those just starting in ATV or if you have something to sell or want to buy, ask here. It's fun and quite informative.

To subscribe to the listserver, send an Email message to *majordomo@www.kd4moj.org* and in the body of the Email type: **subscribe atv**
To unsubscribe, send a message as above but in the body of the Email, type: **unsubscribe atv**
To send an Email message to the group, address it to *atv@kd4moj.org* and type your comments in the body. Please fill in the subject also.
If you have problems, send a message to *kd4moj@kd4moj.org* and they will respond with help.

ATCO REPEATER TECHNICAL DATA SUMMARY

Location: Downtown Columbus, Ohio
Coordinates: 82 degrees 59 minutes 53 seconds (longitude) 39 degrees 57 minutes 45 seconds (latitude)
Elevation: 630 feet above average street level (1460 feet above sea level)

Transmitters: 427.25 MHz AM modulation, 1250 MHz FM modulation and 2433 MHz FM modulation.
Interdigital filters in output line of 427.25, 1250 & 2433 transmitters
Output Power - 427.25 MHz:40 watts average 80 watts sync tip
1250 MHz: 50 watts continuous
2433 MHz: 15 watts continuous
Link transmitter - 446.350 MHz 1 watt NBFM 5 kHz audio

Identification: 427, 1250 & 2433 xmtrs. Video identify every 10 minutes showing ATCO & W8RUT on four different screens.

Transmit antennas: 427.25 MHz - Dual slot horizontally polarized 7 dBd gain major lobe west
1250 MHz - Diamond vertically polarized 12 dBd gain omni
2433 MHz - Comet Model GP24 vertically polarized 12 dBd gain omni

Receivers: 147.45 MHz for F1 audio input control of touch tones
439.25 MHz for A5 video input with FM subcarrier audio (**lower sideband**)
915 MHz for F5 video link data from remote sites
1280 MHz for F5 video input
2398 MHz for F5 video input

Receive antennas:147.45 MHz - Vert. polar. Hi Gain 12 dBd dual band (also used for 446.350 MHz output)
439.25 MHz - Horiz. polar. dual slot 8 dBd gain major lobe west
915 MHz - DB Products vertically polarized 10 dBd gain omni
1280 MHz - Diamond vertically polarized 12 dBd gain omni
2398 MHz - Comet Model GP24 vertically polarized 12 dBd gain omni

Input control: Touch Tone Result (if third digit is * function turns ON, if it is # function turns OFF)
00# turn transmitters **off** (exit manual mode and return to auto scan mode)
00* turn transmitters **on** (enter manual mode - keeps transmitters on till 00# sequence is pressed)

Manual mode functions:	00* then 1	Ch. 1	Select 439.25 receiver - manual mode (hit 00* then 1 to view 439.25 signal only)
	00* then 2	Ch. 2	Select 915 receiver - manual mode
	00* then 3	Ch. 3	Select 1280 receiver - manual mode
	00* then 4	Ch. 4	Select 2411 receiver - manual mode
	00* then 5	Ch. 5	Select video ID - manual mode (the 4 identification screens)
	01* or 01#		Channel 1 439.25 MHz scan enable (hit 01* to scan this receive channel & 01# to disable it)
	02* or 01#		Channel 2 915 MHz scan enable
	03* or 01#		Channel 3 1280 MHz scan enable
	04* or 01#		Channel 4 2411 MHz & camera video scan enable
	A1* or A1#		Manual mode select of 439.25 receiver audio
	A2* or A2#		Manual mode select of 915 receiver audio
	A3* or A3#		Manual mode select of 1280 receiver audio
	A4* or A4#		Manual mode select of 2411 receiver audio
	C0* or C0#		Beacon mode – transmit ID for twenty seconds every ten minutes
	C1* or C1#		427.25 transmitter power output select (C1* = 40W output power or C1# = 1.5W output)
	C2* or C2#		2433 transmitter for on/off. (C2* enables transmitter and C2# disables it)

Auto scan mode functions:	001	2411 receiver (normal mode - returns to auto scan)
	002	Roof camera (select 001 when finished viewing camera so repeater will shut down)
	003	Equipt. room camera (select 001 when finished viewing camera so repeater will shut down**)**

NOTE: We will change the controller sometime soon with a corresponding change to the above control codes. Stay tuned to the Tuesday night Net on 147.45 MHz for further details.

ATCO MEMBERS AS OF 15 April 2001

Call	Name	Address	City	St	Zip	Phone	URL
AA8XA	Stan Diggs	2825 Southridge Dr	Columbus	Oh	43224-3011		sdiggs4590@aol.com
K8AEH	Wilbur Wollerman	672 Rosehill Road	Reynoldsburg	Oh	43068	614-866-1399	wilbur.w@juno.com
KC3AM	David Stepnowski	735 Birchtree Lane	Claymont	De	19703-1604		kc3am@aol.com
KC8ASD	Bud Nichols	3200 Walker Rd	Hilliard	Oh	43026	614-876-6135	
W8FZ	Fred Stutske	8737 Ashford Lane	Pickerington	Oh	43147		kc8bni@amsat.org
WB8CJW	Dale Elshoff	8904 Winoak Pl	Powell	Oh	43065	210-0551	delshoff@columbus.rr.com
WA8DNI	John Busic	2700 Bixby Road	Groveport	Oh	43125	491-8198	jbusic@copper.net
K8DW	Dave Wagner	2045 Maginnis Rd	Oregon	Oh	42616	419-691-1625	
WA3DTO	Rick White	5314 Grosbeak Glen	Orient	Oh	43146	877-0652	wa3dto@aol.com
WB8DZW	Roger McEldowney	5420 Madison St	Hilliard	Oh	43026	876-6033	wb8dzw@aol.com
W8EHW	Foster Warren	PO Box #32	No. Hampton	Oh	45349		
KS4GL	John Barnes	216 Hillsboro Ave	Lexington	Ky	40511	606-253-1178	jrbarnes@iglou.com
KB8GUE	Ron Piatt	PO Box 200	Leesburg	Oh	45135		yonkb8gue@webtv.net
KA8HAK	Jim Reese	1106 Tonawanda Ave	Akron	Oh	44305		
WA8HFK,KC8HIP	Frank, Pat Amore	3630 Dayspring Dr	Hilliard	Oh	43026	777-4621	
W3HMS	John Jaminet	912 Roberts St	Mechanicsburg	Pa	17055-3451		w3hms@aol.com
W8JND	Richard Knowles	573 Plaza Drive	Circleville	Oh	43113	477-8132	
K8KDR,KC8NKB	Matt & Nancy Gilbert	5167 Drumcliff Ct.	Columbus	Oh	43221-5207	771-7259	mjgilbert@wcom.net
N8KQN	Ted Post	1267 Richter Rd	Columbus	Oh	43223	276-1820	n8kqn@juno.com
WA8KQQ	Dale Waymire	225 Riffle Ave	Greenville	Oh	45331	513-548-2492	walkingcross@mail.bright.net
N3KYR	Harry DeVerter Jr	303 Shultz Road	Lancaster	Pa	17603-9563		hdeverter@redrose.net
KC8LOW	Bob Harmon	831 McDonell Dr	Gahanna	Oh	43230	478-2193	kc8low@netscape.net
N8LRG	Phillip Humphries	3226 Deerpath Drive	Grove City	Oh	43123	614-871-0751	phumphries@iwaynet.net
WB2LTS	Manny Diaz	8 Pearl Ave	Huntsville	Ny	11742-1711		wb2lts@worldnet.att.net
KC8LZC	Tom Walter	9176 Axe Handle Rd	Milford Center	Oh	43045	937-349-6645	
W8MA(ex wa8tte)	Phil Morrison	154 Llewellyn Ave	Westerville	Oh	43081		
KA8MID	Bill Dean	2630 Green Ridge Rd	Peebles	Oh	45660		ka8mid@qsl.net
N8NT	Bob Tournoux	3569 Oarlock Ct	Hilliard	Oh	43026	876-2127	rtournou@columbus.rr.com
WD8OBT,KB8ESR	Tom Camm & sons	1634 Dundee Court	Columbus	Oh	43227	860-9807	
N8OCQ	Robert Hodge	PO Box 23473	Columbus	Oh	43223	875-7067	
N8OPB	Chris Huhn	146 South Hague Ave	Columbus	Oh	43204	279-7577	
W6ORG,WB6YSS	Tom & Maryann O'Hara	2522 Paxson Lane	Arcadia	Ca	91007-8537	626-447-4565	tom@hamtv.com
W2OTA,WA2DTZ	Michael Chirillo	942 Bruce Drive	Wantagh	Ny	11793	516-785-8045	
WB8OTH	Perry Yantis	1850 Lisle Ave	Obetz	Oh	43207	491-1498	pyantis@compuserve.com
KE8PN	James Easley	1507 Michigan Ave	Columbus	Oh	43201	421-1492	jeasly@freenet.columbus.oh.us
W8PGP,WD8BGG	Richard, Roger Burggraf	5701 Winchester So. Rd	Stoutsville	Oh	43154	474-3884	
NZ8R	Greg Radcliff	3311Kristen Ct	Columbus	Oh	43231		
WA8RMC	Art Towslee	180 Fairdale Ave	Westerville	Oh	43081	891-9273	towslee@ee.net
W8RRF	Paul Zangmeister	10365 Salem Church Rd	Canal Winchester	Oh	43110		w8rrf@copper.net
W8RRJ	John Hull	580 E. Walnut St.	Westerville	Oh	43081	882-6527	
W8RUT,N8KCB	Ken & Chris Morris	3181 Gerbert Rd	Columbus	Oh	43224	261-8583	wa8rut@aol.com
W8RVH	Richard Goode	9391 Ballentine Rd	New Carlisle	Oh	45334	937-964-1185	w8rvh@glasscity.net
W8RQI	Ray Zeh	2263 Heysler Rd	Toledo	Oh	43617		zehrw@glasscity.net
KB8RVI	David Jenkins	1941 Red Forest Lane	Galloway	Oh	43119	614-878-0575	kb8rvi@hotmail.com
W8RXX	John Perone	3477 Africa Road	Galena	Oh	43021	740-548-7707	
WA8SAR	Gary Obee	3691 Chamberlain	Lambertville	Mi	48144		
N8SFC	Larry Campbell		Galloway	Oh	43119		
W8SJV	John Beal & family	2899 Castlebrook Ave	Columbus	Oh	43026	876-9412	johnbeal@columbus.rr.com
W3SST	John Shaffer	2596 Church Road	York	Pa	17404		w3sst@juno.com
W8STB	John Hey & family	894 Cherry Blossom Dr	West Carrolton	Oh	45449	937-859-5295	heyjo@netzero.net
K8STV	Jim Carpenter	823 Quailwood Dr	Mason	Oh	45040		
N8TCB	Bill Smith	657 Redford Ave	Columbus	Oh	43207	491-0709	n8tcb@columbus.rr.com
KB8TRP,KB8TCF	Tom, Ed Flanagan	1751 N. Eastfield Dr	Columbus	Oh	43223	272-5784	ed@fastpc1.com
W8TZ	Ross Hatfield	47 Wildflower Lane	Chillicothe	Oh	45601	740-774-2777	w8tz@qsl.net
KB8UGH	Steve Caruso	6463Blacks Rd SW	Pataskala	Oh	43062-7756	740-927-1196	mixter.1@osu.edu
WB8URI	William Heiden	5898 Township Rd #103	Mount Gilead	Oh	43338	419-947-1121	
KB8UU	Bill Rose	9250 Roberts Road	West Jefferson	Oh	43162	879-7482	
WA8UZP	James R. Reed	818 Northwest Blvd	Columbus	Oh	43212	297-1328	wa8uzp@qsl.net
K7VE	John Hays	P.O. Box 95473	South Jordan	Ut	84095-0473		jhays@hays.org
WB8VJD	Rick Morris	203 Merton Street	Holland	Oh	43528		wb8vjd@glasscity.net
KB8VUQ	Jack Wolff	2682 Hiawatha Ave	Columbus	Oh	43212	263-3092	
W2WIA,KA2EVC	Ed & John Kuligowski	63 Connecticut Ave	Massapequa	Ny	11758	516-541-3172	w2wia@netscape.net
N8WLT	James Neymeyer	2879 East Moreland Dr	Columbus	Oh	43209	237-2331	
KB8WBK	David Hunter	45 Sheppard Dr	Pataskala	Oh	43062	740-927-3883	hiramhunter@aol.com
KB8YMN	Mark Griggs	2160 Autumn Place	Columbus	Oh	43223	272-8266	mmgriggs@aol.com
KB8YMQ	Jay Caldwell	4740 Timmons Dr	Plain City	Oh	43064		
N8YZ	Dave Tkach	2063 Torchwood Loop S	Columbus	Oh	43229	882-0771	tkach@copper.net
KB8ZLB	Dave Kibler	243 Dwyer Rd	Greenfield	Oh	45123	937-981-4007	k154@bright.net
KA8ZNY,N8OOY	Tom & Cheryl Taft	386 Cherry Street	Groveport	Oh	43125	836-3519	ka8zny@copper.net

ATCO MEMBERSHIP INFORMATION

Membership in ATCO (Amateur Television in Central Ohio) is open to any licensed radio amateur who has an interest in amateur television. The annual dues are $10.00 per person payable on January 1 of each year. Additional members within an immediate family and at the same address are included at no extra cost.

ATCO publishes this newsletter quarterly in January, April, July, and October. It is sent to each member without additional cost.

The membership period is from January 1ST to December 31ST. New Members will receive all ATCO newsletters published during the current year prior to the date they join ATCO. For example, a new member joining in June will receive the January and April issues in addition to the July and October issues. Your support of ATCO is welcomed and encouraged.

ATCO CLUB OFFICERS

President: Art Towslee WA8RMC
V. President: Ken Morris W8RUT
Treasurer: Bob Tournoux KF8QU
Secretary: Rick White WA3DTO
Corporate trustees: Same as officers

Repeater trustees: Art Towslee WA8RMC
Ken Morris W8RUT
Dale Elshoff WB8CJW
Statutory agent: Rick White WA3DTO
Newsletter editor: Art Towslee WA8RMC

ATCO MEMBERSHIP APPLICATION

RENEWAL O NEW MEMBER O DATE _____ CALL _____

OK TO PUBLISH PHONE # IN NEWSLETTER YES O NO O HOME PHONE _____

NAME _____INTERNET Email

ADDRESS_____

ADDRESS _____

CITY _____ STATE _____ ZIP _____-_____

FCC LICENSED OPERATORS IN THE IMMEDIATE FAMILY

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COMMENTS_____

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ANNUAL DUES PAYMENT OF $10.00 ENCLOSED CHECK O MONEY ORDER O

Make check payable to ATCO or Bob Tournoux & mail to: Bob Tournoux N8NT 3569 Oarlock CT Hilliard, Ohio 43026. Or, if you prefer, you may pay dues via the Internet with your credit card. Go to www.tournoux.com/~atco and fill out the form. Payment is made through "PayPal" but you DO NOT need to join PayPal to send your dues. Simply DO NOT fill out the password details and there will be no PayPal involvement.

TUESDAY NITE NET ON 147.45 MHz SIMPLEX

Every Tuesday night @ 9:00PM WA8RMC hosts a net for the purpose of ATV topic discussion. There is no need to belong to the club to participate, only a genuine interest in ATV. All are invited. For those who check in, the general rules are as follows: Out-of-town and video check-ins have priority. A list of available check-ins is taken first then a roundtable discussion is hosted by WA8RMC. After all participants have been heard, WA8RMC will give status and news if any. Then a second round follows with periodic checks for late check-ins. We rarely chat for more than an hour so please join us if you can.

ATCO TREASURER'S REPORT - de N8NT

OPENING BALANCE (01/15/01)..... $978.18
RECEIPTS (dues)..... $170.00
OTHER INCOME (bank interest)..... $ 8.38
Repeater parts ..... $(15.00)
January Newsletter postage..... $ (35.75)
CLOSING BALANCE (01/15/01)..... $1105.81

ATCO Newsletter
c/o Art Towslee-WA8RMC
180 Fairdale Ave
Westerville, Ohio 43081

FIRST CLASS MAIL

REMEMBER...CLUB DUES ARE NEEDED.
CHECK MAILING LABEL FOR THE EXPIRATION DATE AND SEND N8NT A CHECK IF EXPIRED.
