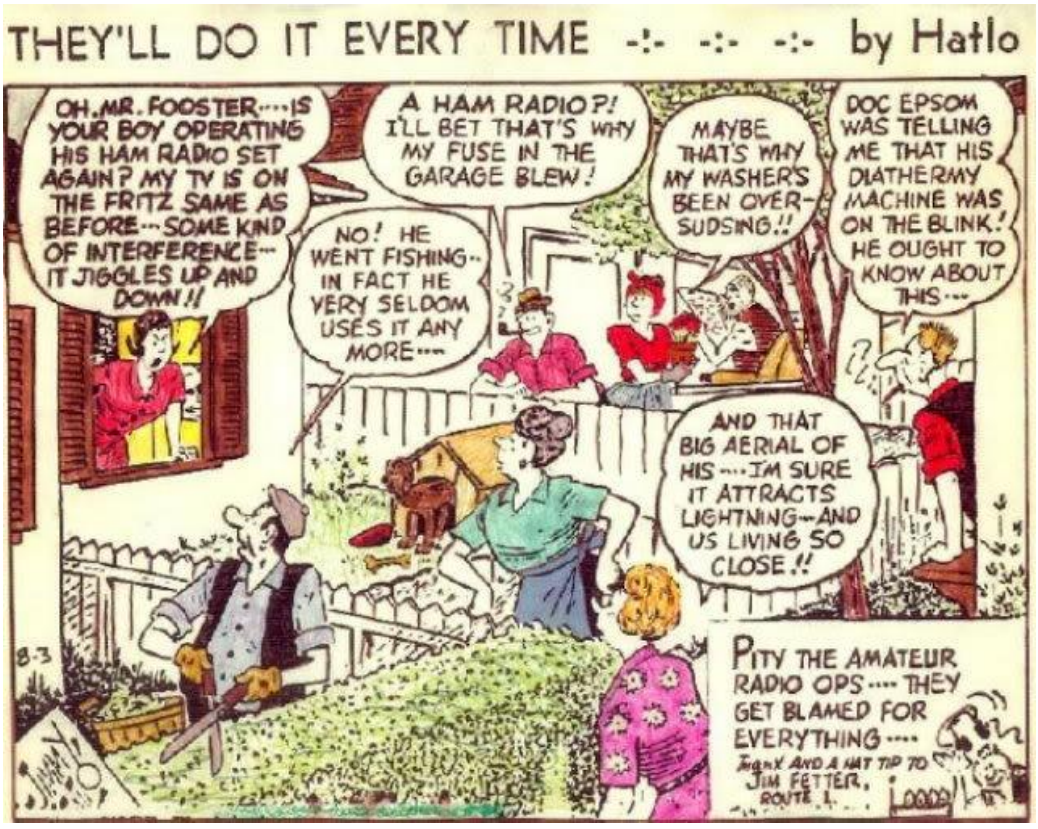
ATCO NEWSLETTER

VOLUME 34 NUMBER 4 **October 2017**

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

ATCO SPOTLIGHT TOPIC

Thanks to Beasley, K6BJH (SK) and ATVQ Magazine for allowing us to share his cartoons. For the complete book on "The Best of Beasley" go to the ATVQ Magazine web site (http://atvquarterly.com/) available for purchase.



ACTIVITIES ... from my Workbench

Well, another summer gone!!!! Again, I spend more time thinking about what needs to be done than what it would have taken to actually do it. However, I remember "the good old days" where I spent more time avoiding homework than it took to do it, and then it was done at the last possible moment. Why do we do these things?????????? Ok, now on to the better things which, incidentally, shows that we tend to do the things we like and leave the rest until it absolutely has to be done.

'Tis the time to do tower work! See… last year I let it go till it was too cold to work on it so I'm improving! I needed to oil the bearings on the telescoping tower mechanism so that's now done. While climbing up to the top, I noticed the bolt holding the emergency brake lever that keeps the tower from racing to the ground if a cable breaks, was about one thread from falling out. It was good I saw that. Next, I made a cable extension arm to keep the coax cables from rubbing the tower on the up and down trips. Upon tightening the hose clamp holding it, I lost grip of the hex nut driver causing it to go tumbling down the roof and into the rain gutter. No problem. I got the ladder when I was off the tower and went to retrieve it. It was nowhere to be found even though I saw exactly where it went. I finally found it in the least likely place, in my opinion (Murphy will disagree) in the downspout pipe! Luckily it wasn't far down there and my fingers were able to reach in and pull it out. (Murphy lost again. I think this was the second time in the last 20 years!) Well, I'm good now for another year. The tower and antennas are hopefully good till this time next year.

I'm working on creating a DVB-S tuner module assembly for sale later this year. I won't cover the details here but reserve it for the next Newsletter. I have a working breadboard model and the PCB artwork is nearly complete. When finished, it will be a complete fully assembled and tested unit with housing. Essentially it is the DVB-S/S2 close equivalent of the HiDes UT100B DVB-T USB module selling for about the same price. The difference is it is more sensitive, it covers the complete frequency range of 144 to 2450 MHz and has two completely independent inputs. It works with the free Tutioune software created by Jean Pierre. More information later.

Another improvement is made to the MESH antenna downtown Columbus at SOT. The top mounted antenna was retrofitted with a pair of bandpass filters optimized for the Channel 1 -2 frequency we are using for our MESH operation. (2397 MHz). The filters are intended to trap out the Wi-Fi frequency stuff starting at 2402MHz. This is necessary because of the extremely high amount of 2.4GHz signals in the immediate vicinity which de-senses the MESH receiver inputs. It is early yet but initial tests showing it working VERY WELL! I was not able to receive or transmit to it from my QTH 15 miles away before with my tower all the way up. Now I get 85-100% LQ signal reports. I don't think the tree leaves are a factor as not many leaves are down yet. Wait a minute…now that I think about it, the leaves MAY be contributing to the improvement after all!!!! Moisture directly affects RF attenuation at 2.4GHz. and leaves have moisture. But in the Fall, the drying leaves decrease the path attenuation so it seems reasonable that the Fall leaves will lessen the attenuation as they dry even though they haven't fallen to the ground yet. Also, the leaves REFLECT the RF too so it also seems reasonable that after they have fallen to the ground, the attenuation will be even less! Sooooo…..it may very well be that my improved reception is due in part to the antenna but the leaves probably are a contributing factor also. It's too bad I didn't take an RF reading just before swapping antennas! I need to see if others report better communication with the SOT node also.

Finally, during my routine audit of the ATCO membership and Newsletter mailing list, I have discovered a few potential errors. In the coming days, I will send out memos to the individuals that I suspect may involve those potential errors. They include expired memberships and Newsletter mailings omitted from my mailing list. I ask that anyone wishing to remain ATCO members and have not renewed their membership, please do so as soon as possible.

That's all for now guys. See you at the Fall Event October 29 or Saturday breakfast!
…WA8RMC

VERY UNUSUAL ANTENNA

Here is an unusual “disguised” antenna I saw along the highway. I saw one like this a few years ago in Florida along Interstate I-95 but this is the first one I’ve seen in Ohio. They usually do this when property owners around it complain about the negative effects it will have on their property values.

This one is in Toledo, Ohio along US 23 near Maumee. It is even more “stealth” than the one I saw in Florida. The property owners around it must have had a strong objection to the look of a “naked” cell tower but **not the hi-tension lines beside it!** Go figure!

Here’s the cell portion. On closer inspection, this may be an **actual pine tree** with cell antennas on top. What do you think?

AND NOW…. A LITTLE HUMOR

A Doctor was addressing a large audience in Tampa …
"The material we put into our stomachs is enough to have killed most of us sitting here, years ago.
Red meat is awful. Soft drinks corrode your stomach lining. Chinese food is loaded with MSG.
High fat diets can be disastrous, and none of us realize the long-term harm caused by germs in our drinking water. However, there is one thing that's the most dangerous of all and we all have eaten, or will eat it. Can anyone here tell me what food causes the most grief and suffering for years after eating it?" After several seconds of quiet, a 75-year-old man in the front row raised his hand, and softly said, "**Wedding Cake**."

Some things are just better left unsaid. I usually realize that right after I say them.

One night, an 87-year-old woman came home from Bingo to find her 92-year-old husband in bed with another woman. She became violent and ended up pushing him off the balcony of their 20th floor apartment, killing him instantly. Brought before the court on the charge of murder, she was asked if she had anything to say in her own defense. "Your Honor," she began coolly, "I figured that at 92, if he could screw, he could fly."

Behind every angry woman, stands a man who has absolutely no idea what he did wrong!

A man went to church one day and afterward he stopped to shake the preacher's hand. He said, "Preacher, I'll tell you, that was a damned fine sermon. Damned good sermon!" The preacher said, "Thank you sir, but I'd rather you didn't use profanity." The man said, "I was so damned impressed with that sermon I put five thousand dollars in the offering plate!" The preacher said, "**No shit**?"

Arguing with a woman is like reading a Software License Agreement. You have to ignore everything and click, "I agree".

Bob, a 70-year-old, extremely wealthy widower, shows up at the Country Club with a breathtakingly beautiful and very sexy 25-year-old blonde-haired woman who knocks everyone's socks off with her youthful sex appeal and charm and who hangs over Bob's arm and listens intently to his every word. His buddies at the club are all aghast. At their very first chance, they corner him and ask, "Bob, how'd you get the trophy girlfriend?" Bob replied, "Girlfriend? She's my wife!" They're knocked over, but continue to ask: "So, how'd you persuade her to marry you?" "I lied about my age," Bob replied. "What? Did you tell her you were only 50?" Bob smiled and said, "No, I told her I was 90."

Every time you talk to your wife, your mind should remember, "This conversation will be recorded for training and quality purposes".

Groups of Americans were traveling by tour bus through Switzerland. As they stopped at a cheese farm, a young guide led them through the process of cheese making, explaining that goat's milk was used. She showed the group a lovely hillside where many goats were grazing. "These," she explained, "are the older goats put out to pasture when they no longer produce." She then asked, "What do you do in America with your old goats?"
A spry old gentleman answered, "They send us on bus tours!"

CINCINNATTI IS HEARD FROM…

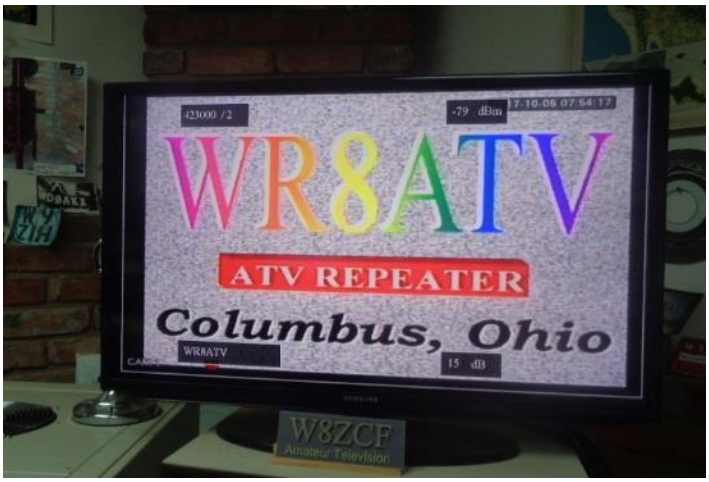
10/6/17

Hi Art,

Just wanted to let you know that your continuous 423MHz DVB-T digital pictures from ATCO were received here in Cincinnati for about 30 minutes this morning! Attached is a sample of the picture on my computer screen using the UT 100B. I was also receiving you on my AC 110 displayed on a 32-inch screen. Note: -79dbm, 15db above the noise. Keep it coming.

73,

Farrell, W8ZCF Cincinnati



LIMA HAMFEST DETAILS

The Lima Hamfest will be held October 14 2017 at the Allen Co Fairgrounds.

Also, I have 5, 88 element 420 to 450 J beams for ATV. I am keeping one for myself, one is beyond repair and, three are for sale. I have two of the remaining three antennas rebuilt and tested and a third that is complete but not assembled at this time. I will take $25 ea. for the rebuilt ones and $20 for the unassembled one. I also have some spare parts if someone should need some. If someone is interested they can call my cell phone number, 419-516-7164 (leave a message) or email me at dmmorris@bright.net. I would really like to get these antennas into the hands that could use them. Thanks.

…WB8PJZ Dave Morris

"KEN'S KORNER" – MESH ACTIVITY

Here's a new section that I hope to continue that will be dedicated to MESH activity. Everyone is encouraged to help with information and activity progress. WA8RMC

From: Robert Dixon <w8erdbob@gmail.com> Subject: Iron Man Mesh Report Date: August 1, 2017

AT HEADQUARTERS

Things started out badly. Craig W8CR was to pick me up at 5:45 am. I set the alarm clock in my cell phone for 5 am. Amazingly I woke up at 5:36 and realized the alarm had failed to go off. So, in 9 minutes (with my wife's help) I was able to dash around and get ready to go just in time for Craig's arrival. But no breakfast, forgot wallet and name tag. Fortunately, I had packed all the equipment up the night before, so Craig was able to load it quickly My mental acuity was not all it could be.

We arrived at Meek Aquatic Center and with help from our folks already there, everything was carried in. During the setup the day before, we located the best (darkest) place for the projection screen to be located, in the big main room at Meek. We discovered that the Powers That Be decided to move the screen so they could see it more easily from their table locations. Unfortunately, that placed it so the sun shined directly on the screen, and the room is very bright with big windows all around, and also second floor windows shining down. So, the screen was all washed out and it was difficult to see the remote mesh video we were showing on it. (see picture) We had also discovered the previous day that the projector provided to us by the Meek staff was not very bright, and it had low resolution. Fortunately, I brought my own better projector "just in case", and we used that. It was mounted ingeniously on 3 Styrofoam cups to get the best angle (see picture).

The crew installed the mesh access point on the roof, and Craig was forever memorialized by the picture shown in the Delaware Gazette, holding the antenna mast very heroically. The link to the EOC tower worked perfectly. Another crew installed the 2-meter antenna out on the lawn. Both cables were run thru the door, held open with a chair. The 2M signals were great, as we could hear the Marion repeater. So, we made a test transmission with the radio Donn K8AOK brought, only to learn that our audio was 100% hum. Hmmmm. Fortunately, again I had brought my own 2M radio and power supply "just in case", so we swapped power supplies and it worked perfectly.

The big meeting room is very live acoustically, so it was very noisy and we could hardly hear our radio. Many people were talking loudly, and there were other radios in operation. If we turned our radio up louder, they told us to turn it down. So, Donn made a custom audio director from a Styrofoam cup that directed our audio towards us and it worked much better (see picture). NOTE - Next year we must have a headset for the operator, but it cannot also turn off the room audio. Somebody please make that happen.

AT THE BEACH

Paul KD8UUA, Larry AC8YE and Ben W8AXE erected their camera station with a big dish pointed across the lake towards our relay station. Tim K8TAT and Grant KD8UNQ erected the relay station on the levee. We have had trouble with this link before. In the middle of the previous night, I realized that we could improve things by having Tim use the other big dish pointing towards the beach (instead of the omni as planned), and then using the smaller dish loaned by Ken W8RUT to point towards the Delaware 911 tower. That would also provide greater separation between the two antennas to reduce mutual interference. But Tim did not have another mast, so Craig took off in his car to bring him a mast and to help with the installation. He reports that driving on the levee is very treacherous, as it is narrow, and one false move could land you either in the lake or on busy Route 23. They got it all set up and that NAILED the link across the lake. So that worked well. But the link south to the Delaware tower was still marginal with about 20dB SNR. Higher antennas would help, but they are already as high as it is safe with portable antenna masts. Meek is 5 relay hops away from the beach, much more than we have ever done before, and just did not work well. Stan N8BHL at Red Cross was able to get a marginal picture, as he is fewer

hops away. Craig and Tim are talking about using a balloon next year to get the mesh node several hundred feet in the air, which would very likely fix this problem. I can make a lightweight antenna and cable.

IN THE TOWN
We planned to have 3 stations along William street at various locations, as requested by the Delaware Police Department. Mike KD8YED set his station up at Henry St, and it worked perfectly all day. I did a trace route, and found that he was connecting directly to Meek, not going thru the EOC 911 tower as we had planned, which probably helped by eliminating an extra relay point. Very strangely, while watching his video, on 3 occasions I saw a shadow cross the street in the crosswalk, without any accompanying person. Wish that had been recorded.

Unfortunately, our other two stations got stuck in traffic trying to get out of the beach to get to these new locations, so they were late in arriving. NOTE - We have to plan that better next year. Larry AC8YE got his station set up, but the signal was marginal and all we got was a still picture at Meek. This is odd, since that worked fine last year. I figured out why. Last year we used a big dish at the downtown locations, whereas this year we used the more portable omni antennas. This was my mistake. NOTE - Use big dishes and masts downtown next year, even if it seems like overkill. I also tried lowering the resolution and frame rate of the cameras, but it made no difference. AC8YE PC battery died, so he could not make adjustments at his end. KD8UUA was never able to get his station working at the 3rd location, for reasons unknown.

I am sure there is more info and pictures to be had from others who were in the field.
…Bob W8ERD

MESH QUESTIONS FROM THE GUYS OUT WEST

Here's what's going on in California. I repeat Mike's message for information here. Even though we have no plans to utilize 5GHz for Delaware/ATCO MESH operations, it's good to see what others are doing…WA8RMC

Aloha Jim and Art,
I am contacting you both because your groups utilize microwave ATV. As you are aware, the Mesh community is expanding like wildfire in the US and other countries. In the case of 2.4 GHz, we have had a good relationship with most Mesh operations moving to -channel 2 AKA 2397 MHz. ATV links at 2417.5 MHz and repeater inputs at 2441.5 MHz.

3 GHz band, in areas where there is no ATV utilization, the traditional ATV channels have been used for Mesh. In the case of 5 GHz, this is where we have had the biggest issue, we used to have six 25 MHz wide channels, the upper three 5850-5875, 5875-5900 and 5900-5910 are the channels above the Wi-Fi part of the band. ATN uses 5900-5925 as point multi-point as both an FM repeater output and point to point links. The METS group uses the center channel. I have had good conversation with the ARDEN group and most of the Mesh community has stayed off the upper channel (I had to chase one guy off our channel). The ATV community in the southwest (AZ, CA & NV) have given up the 5850-5875 MHz channel to Mesh to give them some low QRM area analog with one of the lower 5.7 GHz channels.

This has worked for about a year but now they are not wanting the lower channels, they have filled up the 5850-5875 channel and are filling up the two upper 25 MHz channels. They are now asking how far into the desert does ATN consider our 5910 usage. I think they are asking this because they want to use the entire upper end of the band. I have discussed going jointly to the local frequency coordination groups to re-visit the microwave band plans. One of the ARDEN guys said they are already working with ARRL to address the microwave bands, they may talk to the local groups after a national band plan is addressed with the ARRL.

I think it may be a good idea that the ATV community do the same or face losing our microwave ATV channels. What are you hearing in your areas? Should we have some ATV representation at the ARRL? At least for 5 GHz band, I would like to have 5900-5925 reserved specifically for ATV. Comments?
…Mike WA6SVT

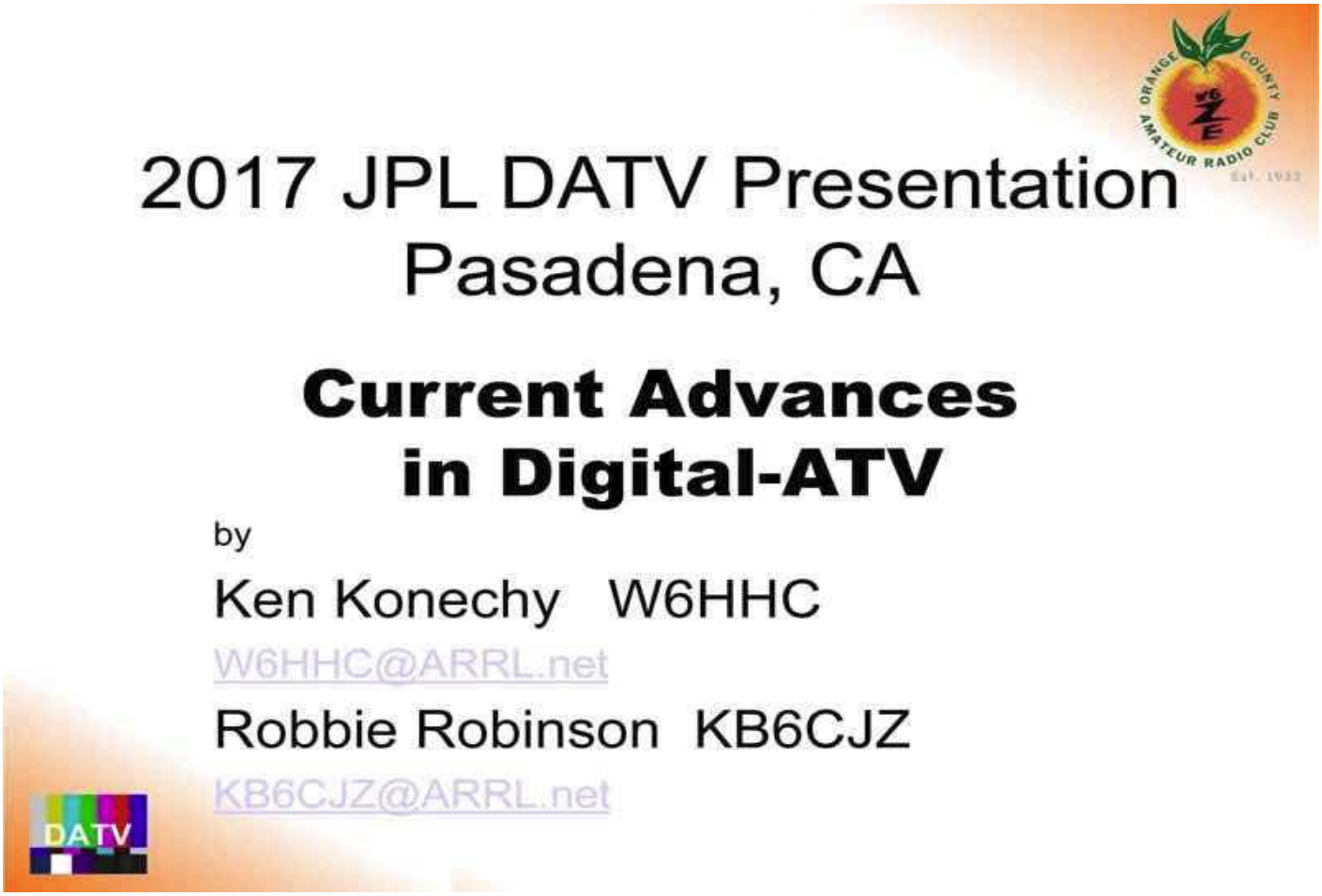
DATV PRESENTATION TO JPL PASADENA HAM CLUB

by

Ken W6HHC and Robbie KB6CJZ

RF Newsletter Orange County Amateur Radio Club www.W6ZE.org **August 2017 - RF Newsletter.**

On July 14, Robbie KB6CJZ and Ken W6HHC provided a one-hour slide show with a show and tell session about the current advances in Digital-ATV to the JPL ARC in Pasadena, CA. Can you imagine, these hams are all part of the "flight communications systems" section of JPL for space probes and Mars-landers, etc….so they really know communications. So, I really had to "be on my toes" when talking about capabilities of RF communications used by DATV. For example: they completely understand that when the antenna gain gets impacted… you could narrow the RF bandwidth (slow down the data rate) to compensate for the loss of antenna gain. So, when I talked about improved DATV S/N reception using Reduced Bandwidth DATV (RB-DATV) …every head was nodding. Josh KB3UUS of JPL explained to us that some signals are as weak as around -160 dBm and JPL sometimes reduces the RF bandwidth down to 10 KHz to receive the incoming data stream from space. Josh went on to explain that the "closer" spacecraft at Mars and Jupiter are usually around -130 to -140 dBm.



The presentation covers DATV protocols, digital modulation technologies, current exciter equipment, MiniTiouner analyzer, and useful URLs

They said they learned a lot about concepts of DVB-S and DVB-T protocols and the overview of DATV exciters (including the Portsdown Project) and MiniTioune analyzer and appreciated the list of URLs to get started in DATV. Hopefully, we stirred up some interest in DATV at JPL ARC. The presentation PowerPoint and PDF files are available for download at

Robbie and I received a two-hour private tour of the Mission Control Center room and the JPL Museum which has models of all their space vehicles (some full size). Very cool…and we did not have to elbow through any overwhelming crowds of competing visitors that occurs during a JPL Open House event.

MORSE CODE ON MARS

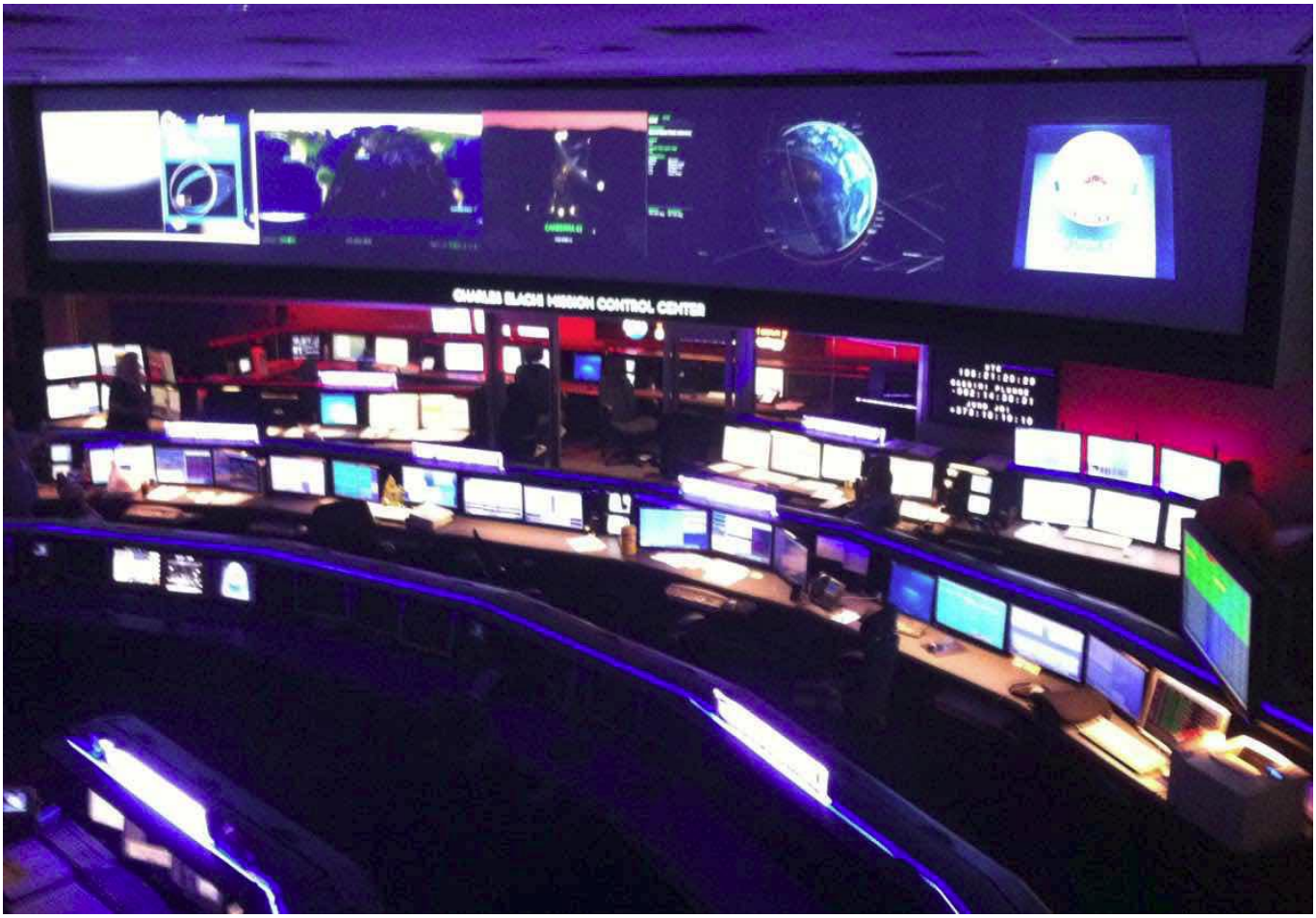
An interesting artifact that we saw was: the tires of the Mars Rovers in the museum have an imbedded Morse-code pattern with the letters "J – P – L".

The full-size Mars Rover model exhibits Morse Code for J – P – L embedded on tires

The purpose of the embedded tire patterns is to allow JPL to visually inspect the tire marks in the Martian dust with the Rover cameras and look for a mal-functioning wheel…perhaps "dragging along" instead of correctly rotating.

MISSION CONTRL CENTER

The Mission Control Center at JPL allows the Center to collect data from all of their spacecraft simultaneously if required.



The view from the visitors-gallery allows seeing all the displays at the Mission Control Center

JPL gathers data from and can send "control commands" to any of the spacecraft that are active, using radio telescopes at three locations on Earth. The clusters of radio-telescopes for the Deep Space Network are located at Goldstone, CA and Madrid, Spain and Canberra, Australia are all separated by 120 degrees of longitude so that they can be pointed to any spacecraft location at any time of the day. A NASA web URL to show the current activities of these radio telescopes can be found at:
https://eyes.nasa.gov/dsn/dsn.html

SK: Lester Broadie

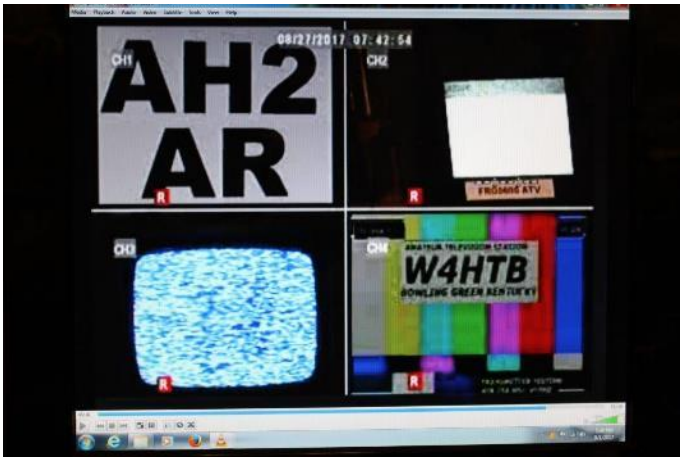
Lester Broadie, KC8EVR, passed away August 28, 2017. He was 79. He was a veteran of the US Army, longtime member of the Cub Scouts and was an active Ham radio and ATV operator. Lester always attended the Spring and Fall Events and sometimes was present at our Saturday morning breakfasts.

He will be missed by all of us.

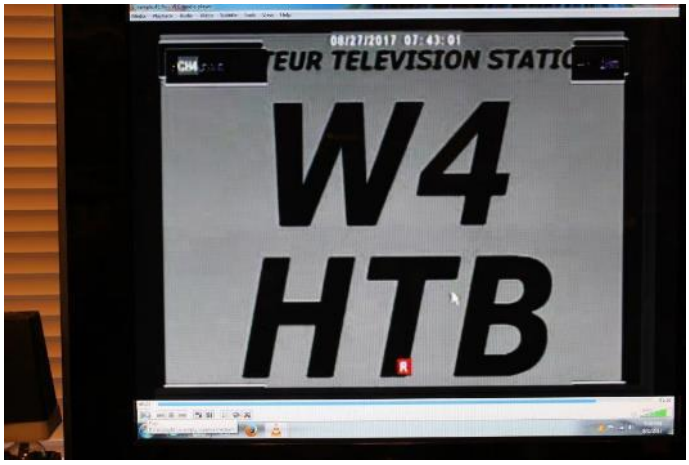
D2 AND A5 70CM ATV BAND OPENING

August 26-27 pictures of W4HTB as received at W8KHP and W8KHP as received at W4HTB. Hank very rarely sees me at all, we had a great path that day. Photos include (but are not limited to) Bowling Green, KY (W4HTB) to Dayton Ohio (W8BI Repeater), both modes (A5 and D2). All photos were taken in my Ham Shack.
…AH2AR

WB8LGA received by AH2AR in Vandalia, Ohio
A5 picture

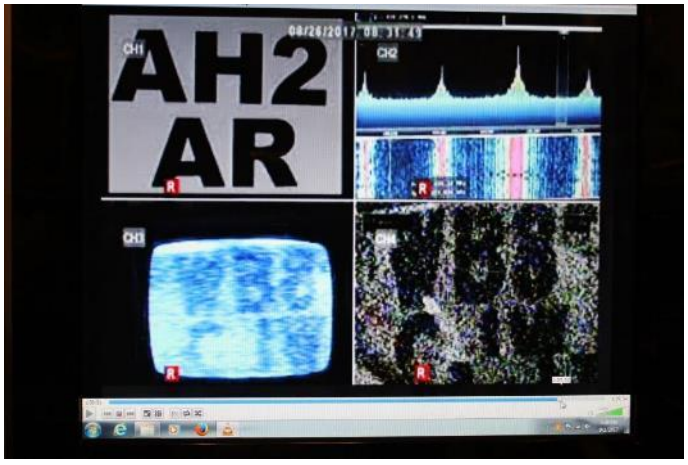


W4HTB received by DARA Repeater DVB-T

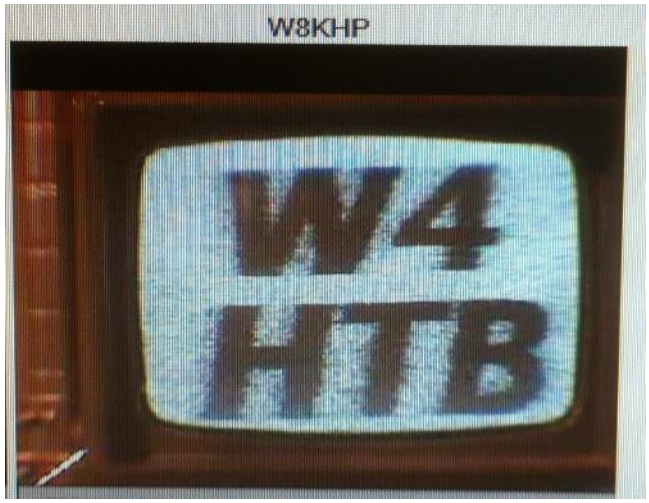


W4HTB received by DARA Repeater DVB-T

WB8LGA received by AH2AR DVB-T



WB8CJW Into DAYTON Repeater and Direct into Vandalia AH2AR



W4KHP_Dx

ARECIBO DISH SUSTAINED SERIOUS DAMAGE FROM MARIA

Articles on the *National Geographic* and Space.com websites last weekend cited Amateur Radio reports that Puerto Rico's Arecibo Observatory came through Hurricane Maria largely intact but "with some significant damage." Universities Space Research Association (USRA), which helps to operate the Observatory, said it learned via "short wave radio contact" that staff and family members sheltering at Arecibo are safe.

"The major structures, including the 300-meter telescope, are intact, though suffered some damage when the atmospheric radar line feed broke off, and falling debris from it punctured the dish in several places," USRA reported on its website. "Also, a separate 12-meter dish used as a phase reference for Very Long Baseline Interferometry was lost." Observatory officials are still assessing the damage, but Jim Breakall, WA3FET, of Penn State University, told ARRL that the 96-foot line feed antenna at 430 MHz is "historically the key piece to the observatory." It's also the antenna that he and others have used for Amateur Radio moon bounce activities from Arecibo. The Observatory is home to KP4AO.

"To hear that this 10,000-pound key piece to the Observatory fell and hit the 1,000-meter dish is just a huge shock," Breakall said last Saturday. "This antenna was connected to the 2.5 million W 430-MHz radar transmitter that was a key to ionospheric experiments. It is a great loss for sure."

Angel Vazquez, WP3R, who manages radio telescope operations at the Observatory, was one of the only radio amateurs able to pass along any information; among those he contacted was Princeton University professor and Nobel Laureate Joe Taylor, K1JT. Vazquez was using a generator that, Breakall told ARRL, was not working very well. "Many others have heard about all of this and have come to help relay messages to loved ones and friends to let people know they are okay," Breakall added.

Breakall said he's less concerned to learn that his own Amateur Radio contest station, on a hill not far from the Observatory, was destroyed by Hurricane Maria. "While this is sad for me and others, my concern is with the safety and health of many friends and the people of Puerto Rico in General," he said. This is my second home, and many of the people there I treat as my brothers and sisters."

USRA reported last weekend that the access road to the Observatory was covered with debris and impassable. Breakall told ARRL that he's worried about what might happen in the weeks and months ahead. "I just hope that desperation does not set in, and things get out of hand there," he said. "It is going to be very tough."

…From the ARRL Reports Newsletter

DATV-EXPRESS DVB-S BOARD UPDATE

Art WA8RMC reports that as of 9/27/2017 the DATV-Express boards have sold out and are **no longer available until the project team decides if we want to make another production run.** If you want a board, send a message to **support@datv-express.com** and we will put your name on the list of those Hams wanting boards. The PayPal BUY button has been removed from the PURCHASE NOW page on the DATV-Express.com web site until we decide what avenue to take.

Two new DATV products are getting ready to appear on the market. The Analog Devices ADALM-PLUTO SDR Tx/Rx may become available in the first week of January at a price of US$100 or US$150. The Lime-Micro mini-LimeSDR Tx/Rx is rumored to ship in mid-January at a price of US$140. Both of these new SDR boards will be lower priced than the DATV-Express Tx-only board (US$300). However, these are new boards and it will take some time to write bug free software. Charles G3GUO continues to clean up reported bugs and try to improve performance with the early PLUTO-Express software for the Analog Devices ADALM-PLUTO SDR board as a modulator. An early-experimental alpha-release, v1.25p4 (based on the normal DATV-Express v1.25 software), has just been posted to the **DOWNLOADS** page of the www.DATV-Express.com website. This alpha-release corrects the RB-DATV wide-spectrum "haystack" bug with DVB-S protocol reported by Brian G4EWJ on the BATC Forum. G4GUO explains the "haystack" problem was caused by "math overflow" into one of the PLUTO buffers. The v1.25p4 software also corrects some bugs that prevented the hardware-abstraction-layer from allowing the user to switch between the PLUTO modulator board and the DATV-Express modulator board.

http://www.W6ZE.org/DATV/BATC/ PLUTO-Express_v1.25p4.JPG

The PLUTO-Express software currently has a hardware selection menu to select between PLUTO board and DATV-Express board

Charles has determined that the limitation of the PLUTO Tx sample rate of around 4.2 MSymb/sec is apparently caused by limitations in the USB2 data throughput rate on the SDR board design. The Rx sampling rate can be set to 50 MSymb/sec for "waterfall" displays because the USB-induced data dropouts are not "visible" in the waterfall. Tx USB-induced video dropouts are easily apparent.

http://www.W6ZE.org/DATV/BATC/ PLUTO-Express-H.264-SR2.2M_v1.25p4.jpg

The PLUTO-Express v1.25p4 software produces a nice 2.2 MS/s DVB-S2 signal from PLUTO board for MiniTiouner analyzer

In addition, Charles created two YouTube videos that were posted by BATC from the CAT17 convention in September. The main presentation was a talk about his testing of the PLUTO SDR. A second video was the Q&A session at the end of his main presentation on PLUTO. These sessions can be watched on YouTube at **https://www.youtube.com/channel/UCUWLnUZllytlcCFd93tnBzw**

Finally, Art WA8RMC reports that the PCB layout files for the MiniTiouner-Express version of the MiniTiouneV2 board design are just about completed by Tom WB6P. The intent is to produce a smaller and assembled and tested version of the Serit NIM PCBA design at an affordable price.
…. de Ken W6HHC

CHANNEL LIST DETAIL FOR DVB-T BDAVIEWERPLUS PROGRAM

BDAViewerPlus.exe is the program for the HiDes UT-100 series receive / transmit modules and decodes DVB-T digital video with a personal computer where it is powered and communicates using a USB port. The program can be used to record the transport stream transmission received to a file using the pc for playback at some other time. To receive a station, it is necessary to initially perform a scan of the frequency and bandwidth of the signal to be received. Once it is decoded the video will be displayed and any audio in the transmission will be heard through the pc speakers.

The definition of BDA from a Google search: "The Broadcast Driver Architecture (**BDA**) is a Microsoft standard for digital video capture on Microsoft Windows operating systems. It encompasses the ATSC and DVB standards and gives developers a standardized method of accessing TV tuner devices (usually PCI, PCI-E or USB)."

When enough of the broadcast stream is successfully decoded the station information for the channel(s) is stored in the file *ChannelList.ini* in the BDAViewerPlus folder and is saved when the program is closed. This data will be loaded when the program is restarted. When performing a scan, the program can be set to find a single frequency broadcast or can search a range of frequencies by entering a start and end frequency. The stations received will be saved to the *ChannelList.ini* file. Searching a range of frequencies is the mode of operation to receive commercial television broadcast stations in Europe. However, for ham use typically only one channel is scanned at a time. The digital video broadcast – terrestrial (DVB-T) provides excellent digital communication for ham radio use.

I wanted to take advantage of the channel list for BDAViewerPlus by making my own list of frequencies I use for repeater and simplex operation. This would simplify things by not having to do a scan every time I wanted to check a different frequency. It would be a matter of editing the *ChannelList.ini* file and install the additional lines of information for the frequencies and bandwidth used for simplex or repeater operation. Simple I thought.

My list of two frequencies I tried didn't work and it was quite a long time until I figured out what was going on. In the meantime, I set up individual script shortcuts on my desktop using AutoHotKey that copied the desired channel list to the *ChannelList.ini* file then it started the BDAViewerPlus program. That was somewhat awkward because it was necessary to have a separate script for each frequency and it was necessary to shut the program down before another shortcut could be used for a different frequency.

I compared my entries to a partial list that I saw in the HiDes Quick Installation Guide and from what I could see everything looked correct. I even tried making the entries unique so there was no duplication of ServiceNames's, ONID – original network ID and other entries to see if that was causing a conflict. Nothing I tried seemed to work. I found that each channel entry column in the .ini file ended with a space character followed by a tab to the next column. Now I was seeing the first frequency entry was getting changed by the program when I exited it. Instead of "423000" for the first channel frequency in the list it would have something like "329102" with a bandwidth of 6 MHz. instead of 2 MHz.

One day I decided I was going to try again and figure this out. Since the software won't append a new scan to the existing list I thought if I would scan our local repeater on 423 MHz. along with my transmitting a signal on 439 MHz. I could use my UT-100B transmitter as a second station. I would be able to scan both 423 and 439 to the channel list then examine the results closely. When the scan completed I compared it to what I was expecting and saw no difference. The list now contained two entries. The first line was channel ID 0 for 423 MHz. and the second ID 1 for 439 MHz. I shut BDAViewerPlus down and to verify started it up again and the channel list with two stations worked fine. Now I had a good channel list for two frequencies at least.

I modified the list by removing the added channel then saved the file with just one entry back to the way it was originally then restarted BDAViewerPlus. It didn't work! This is the same entry I had that worked fine before. What's going on? Wait a minute. The file is being altered when I save it. It worked fine before editing. I took a look at the file with my hex editor then opened my good *ChannelList.ini* to see what was different. Now I could see the edited file began with hexadecimal FF and the second character was hex FE but the good file didn't have those characters at the beginning. The rest of the file appeared fine. I opened the file with Notepad and found the default encoding was set for "Unicode" when a file was saved. I tried saving the file as "UTF-8", then "unicode big endian" – they also had a starting descriptor inserted. I

thought ANSI, last choice, should work but found out that also modified the original file. With the ANSI file now saved it was about half the size it had been although there were no added ID characters at the beginning. Notepad had stripped all the 00 null characters that the file should contain when it is saved.

I always thought Notepad was a 'so called' non-formatting editor. Nope. As I found it alters the contents of the channel list file making it unusable. The BDAViewerPlus software saves *ChannelList.ini* similar to Notepad's Unicode where a 00 "null" character is inserted after every character. That makes the file double the size but has no encoding descriptor characters at the beginning of the file like Notepad wants to put in.

I installed the free Notepad++ and it worked fine and it did not add any mysterious characters or changes to the file I couldn't see. I also tried TextPad that I used years ago at work because it could also load huge files when at that time on Windows XP or maybe even Windows for Workgroups Notepad would choke on anything over 32MB. It also worked fine without cobbling the data up and selecting the ¶ symbol in the toolbar will display any formatting characters.

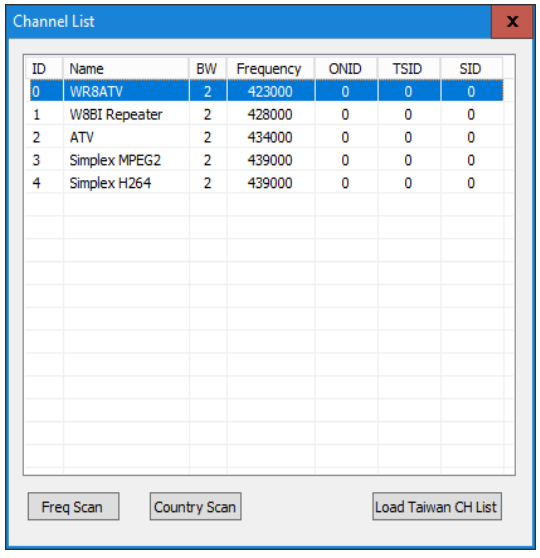
Now at last I was in business. I made a four channel list for 423, 428, 434 and 439 MHz. that works with point and click channel changes. No more scripts needed. No scanning or rescanning required – just click on the ID in the channel list or use the up/down arrows in the program. This is so much faster now for me to switch from 439 to our repeater on 423 or check if the band is "open" looking on 428 MHz. towards Dayton.

ChannelList.ini is a "text" file. The first channel below shows where a space or tab is placed that can't be seen without a special editor. All lines are copy and paste with changes to the SI/PSI data if it is known for audio, video PID's and encoding type used for audio and video.

Here a single line of ChannelList.ini is described using colors for spaces and tabs along with a symbol for the enter key. The next line in the example is the rest of the line which is actually one long continuous line. It looks strange because it is wrapped to accommodate the margins of this document.

¶ = enter, ▮ = space, ▮ = tab

Network_0:▮423000▮▮▮2¶
▮▮▮▮▮▮▮Program_0:▮WR8ATV▮423▮▮▮423▮▮▮423▮▮▮256▮▮▮257▮▮▮0▮▮▮▮▮▮H264_Video▮▮▮MPEG2_Audio▮Unknown
▮▮▮▮▮▮▮8▮▮▮▮▮▮0▮▮▮▮▮▮16▮▮▮▮▮▮17▮▮▮▮▮▮18▮▮▮▮▮▮1600▮▮▮1600▮▮▮256▮▮▮257



Later I found the ONID, TSD, SID and other SI/PSI data could be set to 0 and wasn't used or checked. I have two 439 MHz. channels set up to manually switch between the two video codec's used for simplex operation since the program doesn't automatically detect and switch the decoding mode like the HV-110 is capable of doing.

Network_0: 423000 2
Program_0: WR8ATV 0 0 0 256 257 0
H264_Video MPEG2_Audio Unknown 0
Network_1: 428000 2
Program_1: W8BI Repeater 0 0 0 1601 1602 0
H264_Video MPEG2_Audio Unknown 0
Network_2: 434000 2
Program_2: ATV 0 0 0 0 1601 1602
MPEG2_Video MPEG2_Audio Unknown 0
Network_3: 439000 2
Program_3: Simplex MPEG2 0 0 0 1601 1602 0
MPEG2_Video MPEG2_Audio Unknown 0
Program_4: Simplex H264 0 0 0 1601 1602 0
H264_Video MPEG2_Audio Unknown 0

Additional lines can be inserted as "Program_5, Program_6, etc." if different PID values are necessary or additional Network_# for more frequencies. PID's are in decimal notation here.

…Dale WB8CJW

ATCO

2017 FALL EVENT

12:30 PM Lunch/meeting

Sunday October 29, 2017

ABB PROCESS AUTOMATION

CAFETERIA

579 EXECUTIVE CAMPUS DRIVE

FOR MORE DETAILS, CONTACT

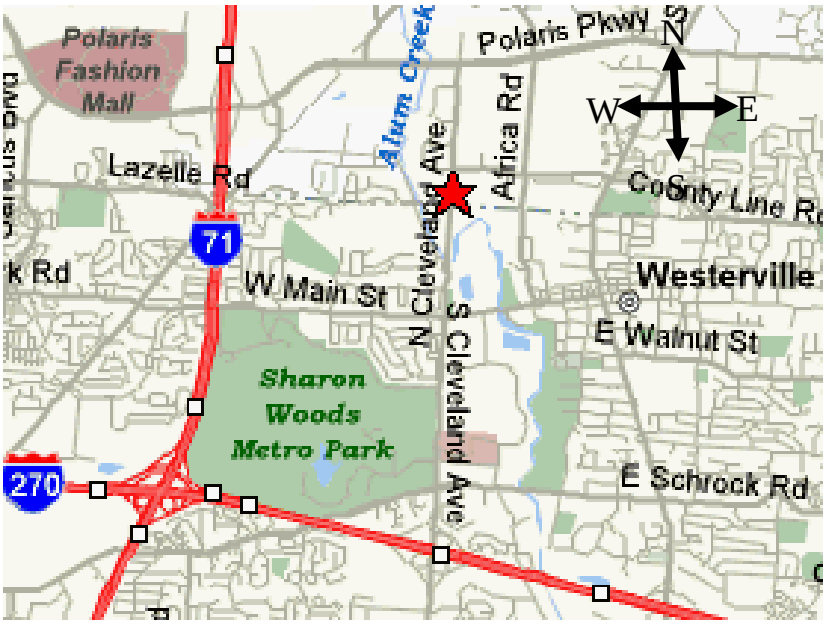
ART - WA8RMC 891-9273

LUNCH PROVIDED - DOOR PRIZES -

BRING A FRIEND AND SEE OLD BUDDIES

MINI HAMFEST - SHOW AND TELL

DIRECTIONS TO THE ATCO FALL EVENT



From I-70 WEST Bound:
Take I-270 Northbound around and turning to the west to Cleveland Ave. Exit north onto Cleveland Ave and travel north about 2 miles to Executive Campus drive. (It's the next street past Westar Crossing Street). Turn left (west) to the ABB building at the end of the street.

From I-70 EAST Bound:
Take I-270 Northbound around and turning to the east past SR 315 and past I-71. Get off on the Cleveland Ave second exit and travel north (to Westerville). Continue north on Cleveland past Schrock Road and then past Main Street. Continue north about ½ mile past Main Street to Executive Campus Drive. (It's the next street past Westar Crossing Street). Turn left (west) to the ABB building at the end of the street

From I-71 NORTH bound toward Columbus:
Drive through Columbus on I-71 to I-270 on the north side. Take I-270 east to the first exit, Cleveland Ave. Get off the Cleveland Ave second exit and travel north (to Westerville). Continue north past Schrock Road and then past Main street. Continue north about ½ mile past Main Street to Executive Campus Drive. (It's the next street past Westar Crossing Street) Turn left (west) to the ABB building at the end of the street.

From I-71 traveling SOUTH bound toward Columbus (North of I-270):
Exit the Polaris Ave exit and travel east about 1 mile to Cleveland Ave. Turn right on Cleveland Ave to Executive Campus Drive. Turn right again on Executive Campus Drive. ABB is on the right side of the street about half way around the semi-circle.

NEW MEMBER(S)

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 them with information. New members are our group's lifeblood so it's important we aggressively recruit new faces.
Ron Reynolds, N8DUK Columbus, Ohio

LOCAL HAMFEST SCHEDULE

This section is reserved for upcoming Hamfests. 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. This list will be amended, as further information becomes available. To see additional details for each Hamfest, Control Click on the blue title and the magic of the Internet will give you the details complete with a map! To search the ARRL Hamfest database for more details, CTL click ARRLWeb: Hamfest and Convention Calendar …WA8RMC.

10/15/2017 | Conneaut ARC Hamfest
Location: Conneaut, OH
Type: ARRL Hamfest
Sponsor: Conneaut Amateur Radio Club
Website: http://www.facebook.com/pg/W8BHZ/events/?ref=page_internal

10/29/2017 | Massillon ARC Hamfest
Location: Massillon, OH
Type: ARRL Hamfest
Sponsor: Massillon Amateur Radio Club
Website: http://www.w8np.org

11/04/2017 | Grant ARC Hamfest
Location: Georgetown, OH
Type: ARRL Hamfest
Sponsor: Grant Amateur Radio Club
Website: http://garcohio.net/

01/14/2018 | SCARF's 22nd Annual Hamfest
Location: Nelsonville, OH
Type: ARRL Hamfest
Sponsor: Sunday Creek Amateur Radio Federation
Website: http://www.qrz.com/db/kc8aav

02/18/2018 Mansfield Hamfest
Location: Mansfield, Ohio
Type: ARRL Hamfest
Sponsor: Mansfiels Amateur Radio Club
Website: www.arrl.org/hamfests/mansfield-mid-winter-hamfest-4

07/22/2018 | Van Wert Hamfest
Location: Van Wert, OH
Type: ARRL Hamfest
Sponsor: Van Wert Amateur Radio Club
Website: http://w8fy.org

TUESDAY NITE NET ON 147.48 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 followed by late check-in requests or comments. We usually chat for about ½ hour so please join us locally or via internet at www.BATC.tv then ATV repeaters thenWR8ATV.

ATCO TREASURER'S REPORT - de N8NT

OPENING BALANCE (07/22/17)	$	1391.88
RECEIPTS(dues)	$	110.00
State of Ohio Registration fee	$	(25.00)
Postage stamps	$	(7.00)
Donation in memory of KC8EVR	$	(25.00)
PayPal fee	$	(1.18)
CLOSING BALANCE (10/15/17)	$	1443.70

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 the average street level (1460 feet above sea level)

TV Transmitters: 423.00 MHz DVB-T, 10 W cont, FEC=7/8, Guard=1/32, Const=QPSK, FFT=2K, BW=2MHz, PMT=4095, PCR=256, Video=256, audio=257
427.25 MHz Analog VSB AM, 50 watts average 100 watts sync tip (cable channel 58)
1258 MHz 40 watts FM analog
1268 MHz DVB-S QPSK 20W continuous. SR=3.125MS, FEC=3/4, PMT=32,Video=162,Teletext=304,PCR=133,Audio=88,Service =5004)
2397 MHz Mesh Net transceiver 600mw output (channel 1 -2). ID is WR8ATV-2
10.350 GHz: 1 watt continuous analog FM
Link transmitter: 446.350 MHz: 5 watts NBFM 5 kHz audio. This input is used for control signals.

Identification: 423, 427, 1258, 1268 MHz, 10.350 GHz transmitters video ID every 10 min. with active video and information bulletin board every 30 minutes.
423 MHz digital, 1268 MHz digital & 10.350 GHz analog - Continuous transmission of ATCO & WR8ATV with no input signal present.

Transmit antennas: 423.00 MHz – 8 element Lindsay horizontally polarized 6dBd gain "omni"
427.25 MHz - Dual slot horizontally polarized 7 dBd gain "omni" major lobe east/west, 5dBd gain north/south
1258 MHz - Diamond vertically polarized 12 dBd gain omni
1268 MHz - Diamond vertically polarized 12 dBd gain omni
2397 MHz - Ubiquiti dual polarity omni 13dBi gain slot for channel 1 -2 MESH Rx/Tx operation
2397 MHz - Comet Model GP24 vertically polarized 12 dBd gain omni (Used for experimental Mesh operation)
10.350 GHz - Commercial 40 slot waveguide slot horizontally polarized 16 dBd gain omni

Receivers: 147.480 MHz - F1 audio input with touch tone control. (Input here = output on 446.350)
438.000 MHz - DVB-T QPSK, 2K BW. Receiver will auto configure for FEC's and PID's. (Input here = output on all TV transmitters)
439.250 MHz - A5 NTSC video with FM subcarrier audio, **lower sideband**. (Input here = output on all TV transmitters)
449.975 MHz - F1 audio input aux touch tone control. 131.8 Hz PL tone. (Input here = output on 446.350).
1288.00 MHz - F5 video analog NTSC. (Input here = output on all TV transmitters)
1288.00 MHz - DVB-S QPSK digital SR=4.167Msps, FEC=7/8. PIDs: PMT=133, PCR=33, Video=33, Audio=49 (Input here feeds all TV transmitters and also goes directly to 1268 MHz DVB-S digital output channel 2.)
2398.00 MHz - F5 video analog NTSC. (Input here = output on all TV transmitters) (inactive at this time because of MESH on 2397)
10.450 GHz - F5 video analog NTSC. (Input here = output on all TV transmitters)

Receive antennas: 147.480 MHz - Vert. polar. Diamond 6dBd dual band (Shared with 446.350 MHz link output transmitter)
438.00/439.250 MHz - Horizontally polarized dual slot 7 dBd gain major lobe west (Shared with 438 & 439 receivers)
1288.00 MHz - Diamond vertically polarized 12 dBd gain omni (shared with analog and DVB-S receivers)
2398.00 MHz - Comet Model GP24 vertically polarized 12 dBd gain omni (inactive at this time because of MESH on 2397)
10.450 GHz - Commercial 40 slot waveguide horizontally polarized 16 dBd gain omni

Auto mode Input control:	Touch Tone	Result (if third digit is * function turns ON, if it is # function turns OFF)
	00*	turn transmitters **on** (enter manual mode-keeps transmitters on till 00# sequence is pressed)
	00#	turn transmitters **off** (exit manual mode and return to auto scan mode)
	264	Select Channel 4 Doppler radar. (Stays on for 5 minutes) Select # to shut down before timeout.
	004	Select 10.450 GHz receiver. **(Always exit by selecting 001)**
	003	Select room camera **(Always exit by selecting 001)**
	002	Select roof camera. Select room cam first then 002 for roof cam. (**Always exit by selecting 001**)
	001	Select 2398 MHz receiver then 00# for auto scan to continue

Manual mode Functions:		
	00* then 1 for Ch. 1	Select 439.25 analog /438 digital receiver (if video present on digital, it is selected. Otherwise analog)
	00* then 2 for Ch. 2	Select 1280 digital receiver
	00* then 3 for Ch. 3	Select 1280 analog receiver
	00* then 4 for Ch. 4	Select 2398 receiver
	00* then 5 for Ch. 5	Select video ID (17 identification screens)
	01* or 01#	Channel 1 439.25 MHz scan enable (hit 01* to scan this channel & 01# to disable it)
	02* or 02#	Channel 2 1288 MHz digital receiver scan enable
	03* or 03#	Channel 3 1288 MHz analog receiver scan enable
	04* or 04#	Channel 4 2398 MHz scan enable
	A1* or A1#	Manual mode select for 439.25 receiver audio
	A2* or A2#	Manual mode select for 1288 digital receiver audio
	A3* or A3#	Manual mode select for 1288 analog receiver audio
	A4* or A4#	Manual mode select for 2398 receiver audio
	C0* or C0#	Beacon mode – transmit ID for twenty seconds every ten minutes
	C1* or C1#	C1* to turn off 438 MHz DVB-T Tx, C1# to enable it (Must be in manual mode to enable this function).
	C2* or C2#	C2* to turn off 423 MHz DVB-T Rx, C2# to enable it (Must be in manual mode to enable this function).

Note: The DVB-T Tx and Rx units can lock up when they lose video or see bad video. When this happens, power must be cycled. To do this select C1* or C2* to turn off power. A few seconds later select C1# or C2# whichever appropriate to restore power to selected unit. Wait about 15 to 30 seconds to see restored operation. (Example: To reset the DVB-T receiver enter C2*, wait a few seconds then C2#)

ATCO MEMBERS as of October 2017

Call	Name	Address	City	St	Zip	Phone
KD8ACU	Robert Vieth	3180 North Star Rd	Upper Arlington	OH	43221	614-457-9511
AH2AR	Dave Pelaez	1348 Leaf Tree Lane	Vandalia	OH	45377	937-264-9812
W8ARE	Larry Meredith III	6070 Langton Circle	Westerville	OH	43082-8964	
VK3BFG	Peter Cossins					
N9BNN	Michael Glass	6836 N. Caldwell Rd	Lebanon	IN	46052	
WB8CJW	Dale Elshoff	8904 Winoak Pl	Powell	OH	43065	614-210-0551
N8COO	C Mark Cring	2844 Sussex Place Dr.	Grove City	OH	43123	614-836-2521
N8CXI	Garry Cotter	2367 Northglen Drive	Columbus	OH	43224	
N3DC	William Thompson	6327 Kilmer St	Cheverly	MD	20785	301-772-7382
K8DMR	Ron Fredricks	8900 Stonepoint Ct	Jennison	MI	49428-8641	
W8DMR	Bill Parker	2738 Florbunda Dr	Columbus	OH	43209	
WA8DNI	John Busic	2700 Bixby Road	Groveport	OH	43125	614-491-8198
N8DUK	Ron Reynolds	2173 Noe Bixby Rd	Columbus	OH	43232-4131	
K8DW	Dave Wagner	2045 Maginnis Rd	Oregon	OH	42616	419-691-1625
WB8DZW	Roger McEldowney	5420 Madison St	Hilliard	OH	43026	614-405-1710
KB8EMD	Larry Baker	4330 Chippewa Trail	Jamestown	OH	45335-1210	
N8FRT	Tom Flanagan	6156 Jolliff St.	Galloway	OH	43119	
W8FZ	Fred Stutske	8737 Ashford Lane	Pickerington	OH	43147	
WA8HFK,KC8HIP	Frank & Pat Amore	P.O. Box 2252	Helendale	CA	92342	614-777-4621
WA8HNS	Mike Gray	5029 St Rt 41 NW	Wash. Ct House	OH	43160-8740	740-335-5133
K8KDR,KC8NKB	Matt & Nancy Gilbert	5167 Drumcliff Ct.	Columbus	OH	43221-5207	614-771-7259
W8KHP	Allen Vinegar	2043 Treetop Lane	Hebron	Ky	41048	
WA8KKN	Chuck Wood	5322 Spruce Lane	Westerville	OH	3082-9005	614-523-3494
WA8KQQ	Dale Waymire	225 Riffle Ave	Greenville	OH	45331	937-548-2492
N8LRG	Phillip Humphries	30856 Coshocton Road	Walhonding	OH	43843	614-3543744
W8MA	Phil Morrison	154 Llewellyn Ave	Westerville	OH	43081	
KA8MFD	Ross McCoy	227 S Boundary St PO Box 9	Edison	OH	43320	
KA8MID	Bill Dean	2630 Green Ridge Rd	Peebles	OH	45660	
N8NT	Bob Tournoux	3569 Oarlock Ct	Hilliard	OH	43026	614-876-2127
W8NX, KA8LTG	John & Linda Beal	5001 State Rt. 37 East	Delaware	OH	43015	740-369-5856
WU8O	Tom Walter	15704 St Rt 161 West	Plain City	OH	43064	614-733-0722
N0OBG	Jim Conley	33 Meadowbrook C C Est	Ballwin	MO	63011	
W6ORG,WB6YSS	Tom, Maryann O'Hara	2522 Paxson Lane	Arcadia	CA	91007-8537	626-447-4565
N8OCQ	Bob Hodge Sr.	3750 Dort Place	Columbus	OH	43227-2022	
WA8RMC	Art Towslee	438 Maplebrooke Dr W	Westerville	OH	43082	614-891-9273
W8RUT,N8KCB	Ken & Chris Morris	2895 Sunbury Rd	Galina	OH	43021	
KB8RVI	David Jenkins	1941 Red Forest Lane	Galloway	OH	43119	614-853-0679
W8RWR	Bob Rector	135 S. Algonquin Ave	Columbus	OH	43204-1904	614-276-1689
W8RXX, KA8IWB	John & Laura Perone	3477 Africa Road	Galena	OH	43021	614-579-0522
WA6RZW	Ed Mersich	34401 Columbine Trl West	Elizabeth	CO	80107	
WA6SVT	Mike Collis	PO Box 1594	Crestline	CA	92325	
KD8TIZ	Bob Holden	5161 Goose Lane Rd	Alexandria	OH	43001-9730	614-562-8441
K8TPY, K8FRB	Jeff & Dianna Patton	3886 Agler Road	Columbus	OH	43219	
NR8TV	Dave Kibler	243 Dwyer Rd	Greenfield	OH	45123	937-981-1392
W8URI	William Heiden	5898 Township Rd #103	Mount Gilead	OH	43338	419-947-1121
KB8UWI	Milton McFarland	115 N. Walnut St.	New Castle	PA	16101	
WA8UZP	James Reed	818 Northwest Blvd	Columbus	OH	43212	614-297-1328
KB9VGD	Gary Oaks	472 Storle Ave	Burlington	WI	53105-1028	
KC8WRI	Tom Bloomer	PO Box 595	Grove City	OH	43123	
AA8XA	Stan Diggs	2825 Southridge Dr	Columbus	OH	43224-3011	
AC8XP,KE8GTT,KE8HPA	Troy,Seamus Bonte	5210 Smothers Road	Westerville	OH	43081	
AC8YE	Larry Howell	1163 Cloverknoll Ct	Columbus	OH	43235-4008	
KB8YMQ	Jay Caldwell	4740 Timmons Dr	Plain City	OH	43064	
KC8YPD	Joe Ebright	3497 Ontario St	Columbus	OH	43224	
KD8YYP	Anna Reed	818 Northwest Blvd	Columbus	OH	43212	
WB8YTZ	Joe Coffman	233 S. Hamilton Rd	Gahanna	OH	43230-3347	
N8YZ	DaveTkach	2063 Torchwood Loop S	Columbus	OH	43229	614-882-0771
KA8ZNY,N8OOY	Tom & Cheryl Taft	386 Cherry Street	Groveport	OH	43125	614-202-9042
W8ZCF	Farrell Winder	6686 Hitching Post Ln.	Cincinnati	OH	45230	513-218-3876
N8ZM	Tom Holmes	1055 Wilderness Bluff	Tipp City	OH	45371	

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 per person. 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. All Newsletters are sent via Email unless the member does not have an internet connection. Dues payments are as the date paid and will expire on the same month/year on the due date year.

Your support of ATCO is welcomed and encouraged.

Membership expiration notices will be sent out via Email starting 30 days prior to expiration date.
NOTE: Dues records on your individual portion of the ATCO website are listed as the date money is received and shows due one year from that date.

ATCO MEMBERSHIP APPLICATION

RENEWAL ○ NEW MEMBER ○ DATE _____
CALL _____
OK TO PUBLISH PHONE # IN NEWSLETTER YES ○ NO ○
HOME PHONE _____
NAME_____
INTERNET Email ADDRESS_____
ADDRESS _____
CITY _____ STATE _____ ZIP _____-_____
FCC LICENSED OPERATORS IN THE IMMEDIATE FAMILY
_____
COMMENTS_____
_____
_____
ANNUAL DUES PAYMENT OF $10.00 ENCLOSED CHECK ○ MONEY ORDER ○

Make check payable to ATCO or Bob Tournoux & mail to: Bob Tournoux N8NT 3569 Oarlock CT Hilliard, Ohio 43026. Or, if you prefer, pay dues via the Internet with your credit card. Go to www.atco.tv and fill out the "pay ATCO dues" section. Alternately, you can use the ATCO web site www.atco.tv/PayDues.aspx directly. Credit card 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.

ATCO CLUB OFFICERS

President:	Art Towslee WA8RMC	Repeater trustees:	Art Towslee WA8RMC
V. President:	Ken Morris W8RUT		Ken Morris W8RUT
Treasurer:	Bob Tournoux N8NT		Dale Elshoff WB8CJW
Secretary:	Mark Cring N8COO	Statutory agent:	Stan Diggs AA8XA
Corporate trustees:	Same as officers	Newsletter editor:	Art Towslee WA8RMC

ATCO Newsletter
c/o Art Towslee -WA8RMC
438 Maplebrooke Dr. West
Westerville, Ohio 43082

FIRST CLASS MAIL

REMEMBER...CLUB DUES ARE NEEDED.
CHECK THE
MEMBERS PAGE OF ATCO WEBSITE FOR THE EXPIRATION DATE.
SEND N8NT A CHECK OR USE PAYPAL IF EXPIRED.