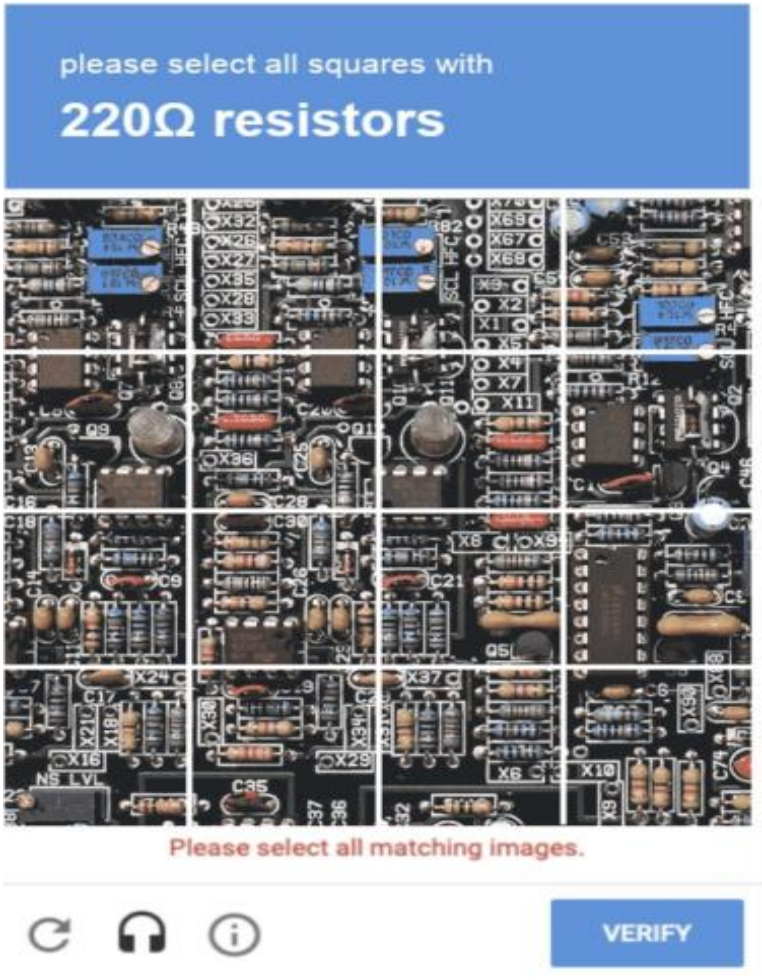
ATCO NEWSLETTER

VOLUME 39 NUMBER 2 **April 2022**

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, October)

ATCO SPOTLIGHT TOPIC



Hey guys!
I've incorporated a new security feature for the ATCO Newsletter. From now on, you must you must identify all matching images in the picture at the right before moving on. We've had non-Hams stealing words off the pages and pasting them into their own Newsletters which undermines my efforts to bring you quality material. To help prevent that, I've included a recognition feature that only Hams will know.

In the rare case where you might not know the resistor color code, I suggest you go back to the ARRL Handbook and look it up. Then return here and select the proper squares in order to move on.

In the next Newsletter I will select 470-ohm resistors so you will have sufficient notice to bone up on the color code.

(SEE PAGE 2 FOR A HINT!)

…WA8RMC

ACTIVITIES ... from my Workbench

FIRST, **“APRIL FOOL!”**

Now, let’s move on. I thank the Feb 21 edition of the Postscript newsletter for showing the image.

This time, it’s difficult to discuss any topic in particular. There are so many important happenings going on in the world around us that makes it hard to zoom in on just a few. So, for now, let’s just concentrate on Ham related topics. I know it’s difficult, but if we don’t simplify our surroundings for now, we’ll get all tied up in matters that don’t directly concern us and drive us crazy. To that end, what’s happening in the Ham radio world?

Well, for one, Hamvention is around the corner just about a month away. I am confident that this year’s event will be packed with people starved from not attending such an event for about 2 years now. My prediction, it’ll be a record year! Boy, I sure hope so! I have a number of items boxed and ready to sell so “bring it ON!”

OK, now moving on. The weather has finally gotten to the point where I can pay attention to my tower and antennas. Since my tower has not been extended to its full up position since last summer, the cable and associated movable parts need greasing and inspection. Also, my MESH antenna, installed at the very top is not working so it needs to be removed, inspected and repaired. That’s a huge job because to get to it I must remove all antennas and slide the mast down to a workable location at roof level. I’m not looking forward to it but it must be done. Along the way, the camera just below the MESH unit is not working either so it’ll be on my list too. I’m sure there is a cable break somewhere.

Now for the upcoming HUGE task upon us. The roof at the repeater site is finally going to be replaced as it’s been leaking for a year now. Now that the rest of the building is finally nearing completion (a $30-40 million job to replace all windows in the 40-story building and caulk all masonry joints) the communication roof is the last on their list. Sounds easy, doesn’t it??? No way. There are over (30) 7/8” or 1 5/8” Heliax cables which **all** need to be re-routed, our 8 included. They notified me last Monday that I need a plan to help make that happen. Our situation is special in that if re-routed the way they want, our existing cables will be too short. So, to eliminate the need to buy all new cables, we must re-locate our 6-foot-high enclosed rack cabinet to the other side of the room. The aisles are narrow with active RF equipment on both sides so how we’ll get it moved without disturbing the Columbus City transmitters and receivers may present a challenge. Also, I will need help as I can’t move all of that stuff by myself. Much of the relocation will involve re-routing the outside cables from each antenna as they now run down the opposite side of the building structure that they need to be. (I’m not looking forward to that as it’s over 650 feet above the street below and I’m not getting any younger). Work will start in mid-May so I’ve got to formulate a plan soon.

A last thought, the ATCO repeater is seldom used now. Everything works OK at the present but I now wonder if it is worth keeping it in operation. Please, give me your opinion as I would hate to do all of that work only to find there is little if any use of it. Speak up, it’s your repeater. I think most, if not all, inactivity is COVID related so we could return to near normal shortly. Also, if we decommission the repeater, it would be a near impossible task to get it back so it makes sense to keep it running if possible. However, I can’t do this alone and so far, no one has stepped up to help maintain it. **So, speak up or loose it!**

That’s it for now. Oh, one more thing. We suspended the Spring/Fall events during COVID. Is this now a good time to re-instate them? Let me know. We cannot have them at the ABB cafeteria any more so we need to find a new place. Any ideas?

…WA8RMC

Three SpaceX Crew-4 Crew Members Hold Ham Licenses

Three of the four crew members in the SpaceX Crew-4 launch to the International Space Station (ISS) are amateur radio licensees. They are Robert Hines, KI5RQT; Kjell Lindgren, KO5MOS; and Samantha Cristoforetti, IZ0UDF. Lindgren and Cristoforetti have served previously on the ISS. Crew-4 is set to launch on April 15 for a 6-month stay. Crew-4 will be the fourth crew rotation mission of SpaceX's human space transportation system and its fifth flight with astronauts, including the Demo-2 test flight, to the space station through NASA's Commercial Crew Program. The mission will launch on a SpaceX Crew *Dragon* spacecraft and Falcon 9 rocket from Launch Complex 39A at NASA's Kennedy Space Center in Florida.

NASA's SpaceX Crew-4 astronauts participate in a training session at SpaceX headquarters in Hawthorne, California. (L - R) Astronaut and SpaceX Crew-4 mission specialist Jessica Watkins; astronaut and SpaceX Crew-4 pilot Robert Hines, KI5RQT; astronaut and SpaceX Crew-4 commander Kjell Lindgren, KO5MOS, and European Space Agency astronaut and

Last month, NASA and its international partners approved crew members for Axiom Space's first private astronaut mission to the ISS. Called Axiom Mission 1 or Ax-1, the flight launched on April 3, from Launch Complex 39A at Kennedy Space Center on a SpaceX Falcon 9 rocket. The Ax-1 crew will fly on Crew Dragon *Endeavour* to and from the space station. After 10 days in orbit, the Ax-1 crew will splash down off the coast of Florida.

Axiom Space astronauts Michael López-Alegría, Larry Connor, Mark Pathy, and Eytan Stibbe are prime crew members of the Ax-1 mission. The quartet is scheduled to spend 8 days aboard the ISS, conducting science, education, and commercial activities before returning to Earth.

"This represents another significant milestone in our efforts to create a low-Earth orbit economy," said Phil McAlister, director of commercial spaceflight at NASA.

Dayton Hamvention is a “Go” for 2022

Hams and vendors hoping to attend Dayton Hamvention® 2022 have been asking what, if any, COVID-19 regulations will be in place at the event. Hamvention management says it's monitoring the situation closely. Hamvention General Chairman Rick Allnutt, WS8G, issued a statement:

" Hamvention 2022 is a go”. But we cannot guarantee what the government may decide about unknown changes in the pandemic. It has become obvious that the State of Ohio is very unlikely to call a halt to large gatherings anytime soon. Despite a recent large spike in [Omicron-variant] COVID cases and hospitalizations, there is no move to restrict large indoor or outdoor events such as sports events," Allnutt said.

Allnutt added that he anticipates that the official state guidance may be to recommend -- not require -- face masks and social distancing, but does not expect to be checking attendees' vaccination status on site. Hamvention will support state guidance. Some have asked whether COVID-19 testing will be available at Hamvention. At this time, there are no plans to have testing on site. Updates on Hamvention and COVID-19 regulations related to the event will be posted on the Hamvention website.

Hamvention, an ARRL-sanctioned event, will be held May 20 - 22, at the Greene County Fairgrounds and Expo Center in Xenia, Ohio.

SPACEX STARLINK SATELLITES DESTROYED BY GEOMAGNETIC STORM

February 10, 2022

A geomagnetic storm has destroyed at least 40 brand new satellites of Elon Musk's satellite Internet business Starlink. It makes up around 80% of the 49 satellites. On February 3, the company launched 49 Starlink satellites into low Earth orbit aboard a Falcon 9 rocket from Launch Complex 39A (LC-39A) at Kennedy Space Center in Florida.

The corporation claimed in a statement late Tuesday that the storm's escalation pace and severity caused atmospheric drag to increase by up to 50% compared to prior launches. "Unfortunately, the satellites deployed on Thursday were significantly impacted by a geomagnetic storm on Friday," SpaceX said in a statement. "These storms cause the atmosphere to warm and atmospheric density at our low deployment altitudes to increase."

"Preliminary analysis shows the increased drag at the low altitudes prevented the satellites from leaving safe mode to begin orbit-raising maneuvers, and up to 40 of the satellites will reenter or already have reentered the Earth's atmosphere," it added. The Sun has fired off a filament eruption as solar activity surge. It will hit the Earth on Wednesday and Thursday, producing another geomagnetic storm.

According to models developed by the Indian Institute of Science Education and Research's Center of Excellence in Space Sciences, a substance flying past our planet at a speed of 21,60,000 kilometers per hour (451-615 kilometers per second) has a very high chance of impacting the Earth. There is, however, no expectation that the impact will be dangerous. "The impact is unlikely to be very hazardous. Moderate geomagnetic storms are likely," CESS also said in a tweet.

De-orbiting satellites pose "zero collision risk" with other satellites and by design disintegrate upon atmospheric descent. Thereby, resulting in no orbital debris and no satellite parts hitting the earth as per the company. "This unique situation demonstrates the great lengths the Starlink team has gone to ensure the system is on the leading edge of on-orbit debris mitigation."

CMEs (coronal mass ejections) are enormous ejections of plasma and magnetic fields from the Sun's corona. They have the ability to expel billions of tons of coronal material as they travel outward from the Sun at speeds ranging from less than 250 km/s to almost 3000 km/s. A geomagnetic storm occurs when a CME collides with the Earth. CMEs to Earth can reach Earth in 15-18 hours if they're rapid enough, according to NOAA.

SpaceX recently passed the 2,000-satellite launch mark. The company also wants to launch a total of 12,000 satellites to bring cheaper internet access all over the world.

40 SpaceX Starlink Satellites were destroyed by Geomagnetic Storm This is almost 80% of the 49 satellites the company just launched a few days ago. “Unfortunately, the satellites deployed were significantly impacted by a geomagnetic storm on Friday,” SpaceX said in a statement. “These storms cause the atmosphere to warm and atmospheric density at our low deployment altitudes to increase.”

“Preliminary analysis shows the increased drag at the low altitudes prevented the satellites from leaving safe mode to begin orbit-raising maneuvers, and up to 40 of the satellites will reenter or already have reentered the Earth’s atmosphere,” it added.

A geomagnetic storm on February 4 "significantly impacted" the launch of some 49 Starlink satellites. The company said the satellites were intended to achieve low-Earth orbits after being sent aloft on a Falcon 9 launcher. Starlink is a satellite internet constellation operated by SpaceX to provide satellite internet access. SpaceX said it initially deploys its satellites into low-Earth orbit so that "in the very rare case any satellite does not pass initial system checkouts, it will quickly be deorbited by atmospheric drag." All did not go as planned, however.

"Unfortunately, the satellites deployed on February 3 were significantly impacted by a geomagnetic storm on Friday [February 4]," SpaceX announced. In fact, onboard GPS suggests the escalation speed and severity of the storm caused atmospheric drag to increase up to 50% higher than during previous launches."

The satellites were commanded into a safe mode, where, as SpaceX explained, "they would fly edge-on (like a sheet of paper) to minimize drag -- to effectively 'take cover from the storm' -- and continued to work closely with the Space Force's 18th Space Control Squadron and LeoLabs to provide updates on the satellites based on ground radars."

"The deorbiting satellites pose zero collision risk with other satellites, and, by design, [burn up] upon atmospheric reentry -- meaning no orbital debris is created and no satellite parts hit the ground," SpaceX said.

MORE HAMVENTION 2022 NEWS

Many Hamvention volunteers attended the recent Hamcation weekend in Orlando, FL. It was heartening to see so many of our friends at the show! The aisles were full of people, the vendors were pleased with the brisk business, and the Hamvention booth was bombarded with well-wishers and folks with one question on their mind: “Are you going to have Hamvention this year?”

It was a pleasure to assure one and all that Hamvention 2022 is a go. “Absolutely, we will be having Hamvention” echoed from our booth all weekend. We sold a bunch of tickets to Hamvention at the pre-show price, also available right now on the Hamvention.org website.

More recently, Michael Kalter W8CI and I were interviewed on a DX Engineering YouTube to unveil the official logo for Hamvention 2022. This year’s theme is Reunion – to celebrate getting a world of hams together after missing two Hamventions and to commemorate the history of the Dayton Hamvention stretching back to 1952.

The Logo represents Ham radio operators from around the globe getting together at Hamvention for a Grand Reunion. So, if anyone in your club asks, please let everyone know that, **WE WILL HAVE HAMVENTION!**

SILENT KEYS

It is with deep sympathy that we must report the passing of two of our ATCO members. Rest in peace my friends.

WA8KQQ Dale Waymire in Greenville, Ohio. Dale had frequent presence into the DARA ATV repeater. He also was an avid antenna builder.
KC8YPD Joe Ebright in Columbus, Ohio. Joe was always tinkering with his ATV transmitter trying to make it better. He was in constant discussion with his neighbor about their grow lamp electrical interference issues.

LOW-COST COLOR BAR GENERATOR

Have you been looking for something to serve as a fixed image for testing analog video? Here is a suggestion.

I have always wanted a simple ATV transmitter package to take with me when I travel to our ATCO repeater for testing. I have been using a PC Electronics "Kreepee Peepe" 1 watt transmitter board packaged in a small box with a standard security camera connected to it. The transmitter is OK but the camera is bulky and doesn't have a fixed image.

I found an HDMI to CVBS converter available on Amazon for $9.95 to be just the ticket to supply a complete self contained compact video "test signal". I removed the standard case the converter was packaged in and mounted the internal PCB in my transmitter test assembly. I added a simple 12v to 5v voltage converter to power the PCB from the internal 12v supply already in the box. Externally, I added some small attenuators so the output was in the order of 100 microvolts to test the RF input sensitivity of the repeater receiver. The complete package is now the test standard as a known ATV RF signal.

The Mini HDMI2AV converter is an HDMI to CVBS converter that outputs an analog vertical color bar pattern whenever there is no HDMI signal feeding it. Essentially the color bars replace the usual blue screen "no signal" pattern from other units. In this case, the converter is used to furnish a color bar pattern for a "poor man" fixed pattern signal generator. There is a "NO SIGNAL" message overlaid on the color bars in the upper left side of the pattrern but we'll just have to ignore it. The unit is normally powered from the USB port of the computer it is connected to which supplies +5V power. If you use it as a the test generator described above, you'll need to find a 5V power source. The supply current is less than 100 mA.

HAPPY TESTING!!!!!
…WA8RMC

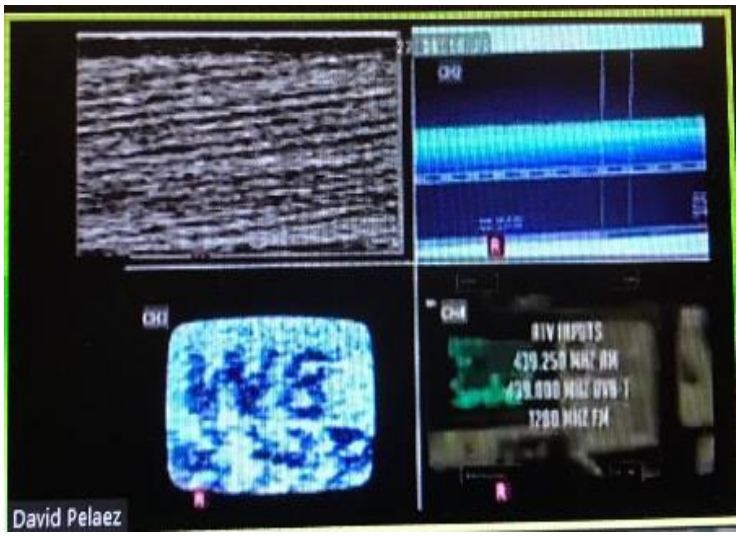
BAND OPENING!

A 70cm band opening occurred on Monday 28 Feb 2022 during the Midwest ATV DX Net. Shown below are some snapshots of the activity:

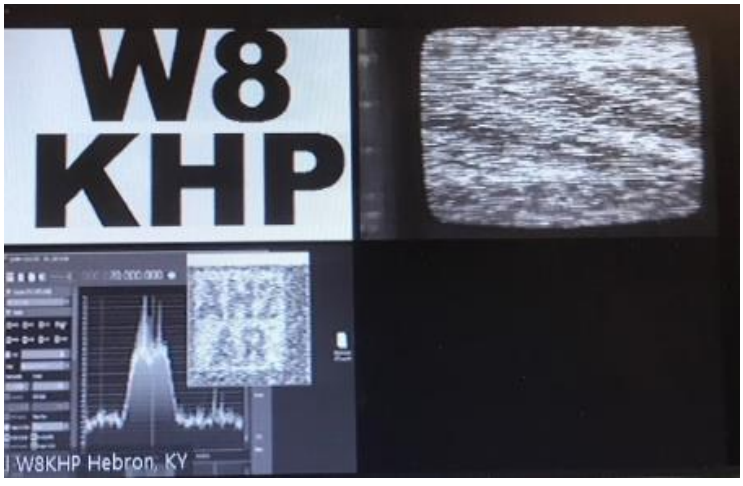
W8ZCF (Cincinnati) as received in Vandalia Ohio by AH2AR (67 miles)

WB8LGA in Morrow County Ohio as received in Vandalia Ohio by AH2AR (87 miles)

W8KHP in Hebron Kentucky as seen in Vandalia Ohio by AH2AR (72 miles)



AH2AR in Vandalia, Ohio as seen in Hebron Kentucky by W8KHP (72 miles)



That's all for now, See you at ATV net time!
… Cheers, Dave P. AH2AR

USEFUL SHACK ACCESSORY FOR CIRCUIT BOARD REWORK

An Inexpensive Yet Good Quality Microscope with High-Definition Color Monitor.

Last week, WB8LGA purchased a microscope from Amazon, and after seeing how nice the unit works, I went ahead and ordered one. Having constructed a number of printed circuit boards using SMD components, I have been using some wearable magnifying stereoscopic loupes that were OK for the job, but they had always been a little cumbersome.

I went ahead and purchased the microscope pictured here and frankly I was a little surprised at the resolution and sharpness of the video display. Also, the depth of field allows for a clear view of the surrounding components mounted at different heights. Typically, loupes and some microscopes seem to be limited by a relatively narrow depth of field and this rework microscope alleviated that issue well. Also, the stage articulates in a number of angles which also allows for placing the microscope over a Pana-vise clamp.

The price of the unit on Amazon is $75. This microscope also has a built-in 3 ampere hour lithium battery allowing for cord-free use. Included with the microscope is a micro-USB cord and wall-adapter that charges the lithium battery and will also power the unit. Additionally, the microscope has a built in "ring" LED light source with a control that varies brightness. Included with the microscope is a 32GB micro-SD card if you need to capture images with its built-in camera. The 7-inch mini-color monitor provides a 1080P live image of the work**.**

The exceptional clarity and color rendition that the monitor provides is stunning. This unit will definitely make a perfect inspection microscope. I went ahead and ordered an X-Y axis microscope stage that I plan to adapt for the microscope. Of course, this can be used for coin or stamp collecting (anybody still do that!?!?) and other hobbies that require close-in microscopic work. The microscope can be found on Amazon as "PalliPartners LCD Digital Microscope".

… DE AH2AR

2022 WORLD AMATEUR RADIO DAY IS APRIL 18

What: 2022 World Amateur Radio Day.

Who: All amateur radio operators worldwide.

When: Monday, April 18, 2022 until Tuesday, April 19, 2022.

Where: A global event covering all regions of the International Amateur Radio Union (IARU)

Why: World Amateur Radio Day, held on April 18 each year, is celebrated worldwide by radio amateurs and their national associations which are organized as member-societies of the International Amateur Radio Union (IARU). It was on this day in 1925 that the IARU was formed in Paris. American Radio Relay League (ARRL) Co-Founder Hiram Percy Maxim was its first president.

Amateur radio experimenters were the first to discover that the short-wave spectrum? could support long-distance radio signal propagation. In the rush to use these shorter wavelengths, amateur radio was "in grave danger of being pushed aside," the IARU's history has noted. Amateur Radio pioneers met in Paris in 1925 and created the IARU to promote the interests of amateur radio worldwide and to protect and enhance its spectrum privileges. Today, the IARU is a federation consisting of more than 160 national amateur radio organizations in as many countries and separate territories. The International Secretariat of the IARU is ARRL, the national association for amateur radio in the United States.

On World Amateur Radio Day, all radio amateurs are invited to take to the airwaves to enjoy our global friendship with other amateurs, and to show our skills and capabilities to the public.

How: World Amateur Radio Day is not a contest but rather an opportunity to "talk" about the value of amateur radio to the public and our fellow amateur colleagues. It is also a great opportunity to talk about your radio club and amateur radio in local media as a lead-up to ARRL Field Day (held each year during the fourth full weekend in June) and another ham radio related activity in your community – such as volunteers who serve in local emergency communication readiness including the ARRL Amateur Radio Emergency Service.

Here are just a few ways to participate in, and promote, World Amateur Radio Day:

- Get a station on the air! Create your own personal "event" to talk about amateur radio to others, including family and friends.
- Find out more about World Amateur Radio Day by checking the IARU website and other Resources listed below.
- Create and hold a special net or on-air event on World Amateur Radio Day to raise the level of attention for the celebration, and to encourage other hams to talk about our hobby. Consider creating and offering a commemorative certificate for contacting your special activation. It can be an electronic one as these are cost effective.
- Get the word out! If you are an ARRL Public Information Coordinator, Public Information Officer, or responsible for radio club publicity, send a press release and conduct some public relations outreach to highlight the day and/or events. Talk about all of the activities radio amateurs have continued to support during the pandemic, and how amateur radio serves our communities. Find recent examples of amateur radio in-the-news at **www.arrl.org/media-hits**.

- Promote your personal World Amateur Radio Day activity(ies) on social media platforms like Twitter and Facebook by using the hashtag **#WorldAmateurRadioDay**. Make sure you send it to various clubs, reflectors, and media.

Join us in celebrating World Amateur Radio Day and all the ways amateur radio brings us together!

Resources
ARRL, the national association for Amateur Radio
http://www.arrl.org/world-amateur-radio-day (this page)

IARU
https://www.iaru.org/on-the-air/world-amateur-radio-day

IARU Region 2: The Americas
https://www.iaru-r2.org/en/on-the-air/world-amateur-radio-day/

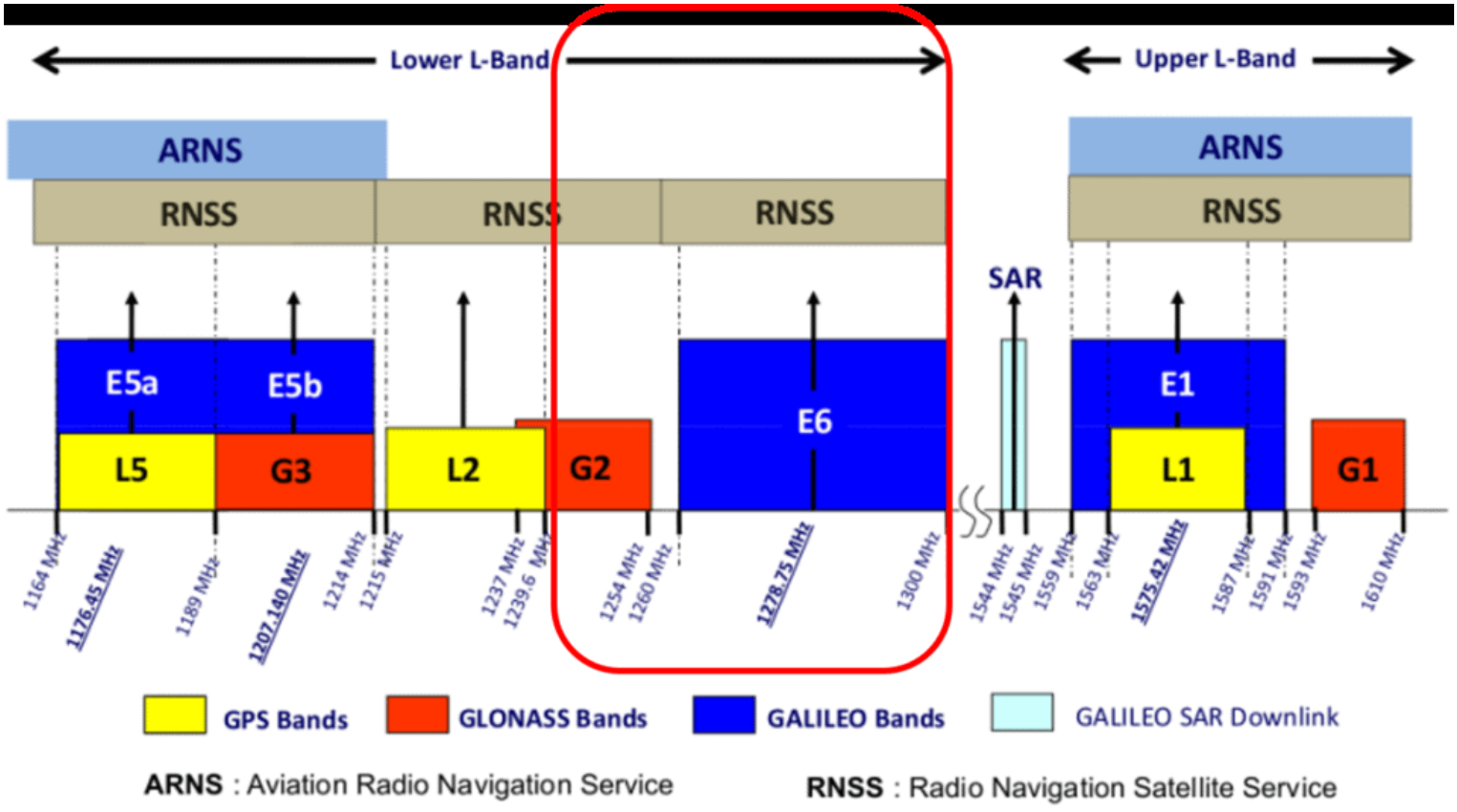
Article: "**Why World Amateur Radio Day is key to highlight crucial service**," ITU News Magazine (No. 1, 2021)
https://www.itu.int/en/myitu/Publications/2021/02/02/15/24/ITU-News-Magazine-No-1-2021

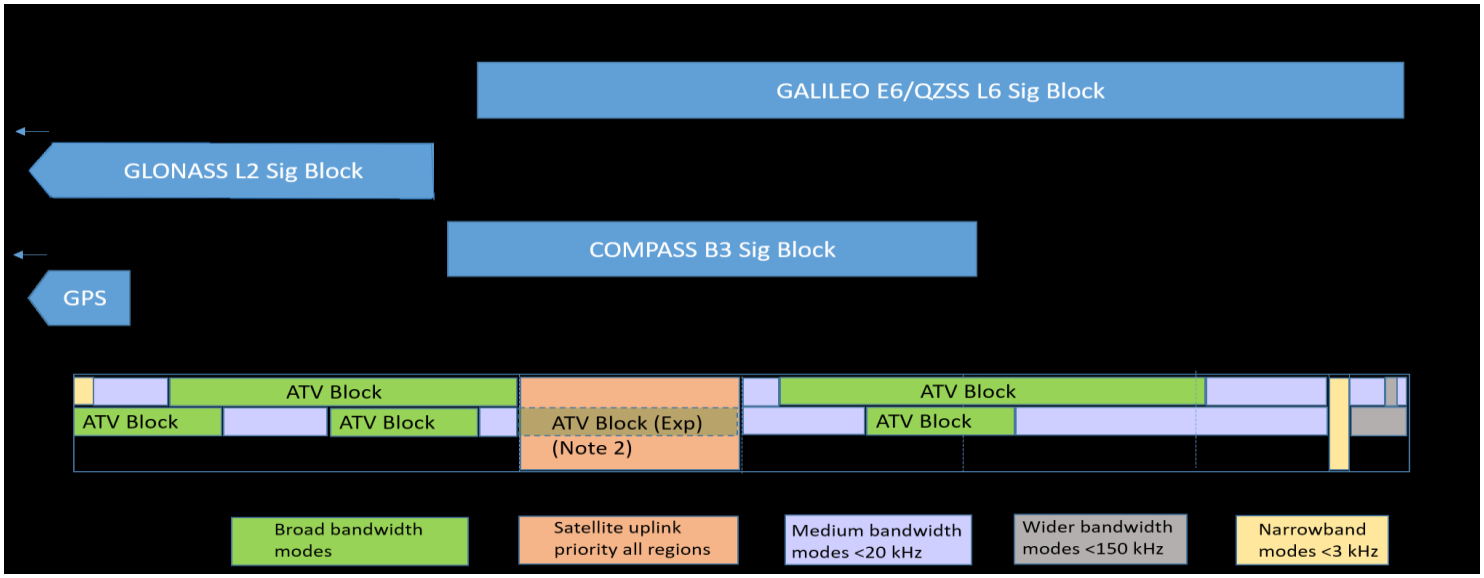
Public Relations and Outreach
2022 World Amateur Radio Day backgrounder (PDF)
2022 World Amateur Radio Day media advisory (WORD template)

Poster or flyer
World Amateur Radio Day poster (8-1/2 x 11 JPG)
Día Mundial de la Radioafición poster (8-1/2 x 11 JPG)
Special thanks to ARRL member Anne Frank, KD9LRB of Deer Park, Wisconsin, featured in these posters!

Social media and website graphics (JPG)
440 x 220 **English** **Spanish**
468 x 200 **English** **Spanish**
608 x 259 **English** **Spanish**
700 x 225 **English** **Spanish**
1080 x 1080 **English** **Spanish**
1200 x 628 **English** **Spanish**
5599 x 1566 banner **English** **Spanish**

23CM AMATEUR ACTIVITIES VS. GALILEO & GLONASS





It is a situation report from the IARU on a study of the interference potential of amateur radio activities on the 23cm band with the Radio Navigation Satellite Service. (Note that the Glonass G2 and Galileo E6 are in the 1240-1300 MHz Ham bands which we are secondary operators! Even if you choose to operate in the 1254-1260 segment of our band, you are in violation if you interfere with Glonass OR Galileo signals due to de-sense of their receivers! I know, I've been there with our ATCO repeater transmitter in Columbus, Ohio. WA8RMC)
…KH6HTV

REFLECTIONS on REBUILDING an ATV HAM SHACK

The Dec. 30th Marshall Fire Storm wiped out my 80 years of history and 68 years of ham radio. The only records I have left were the digital files I had stored on an old HP laptop which I grabbed while evacuating my house along with my beloved bulldog, Ruby. Fortunately, I had actually backed up the files from my main Dell All-in-One PC to the HP just that morning.

Since the fire, Janet & I have found another house to live in. It is in a 55+ retirement community, 15 miles east of Boulder. The long commute back into Boulder seems like we now live half way to Kansas! We are debating about rebuilding again on our 2 ¼ acre lot, another lovely home in the Spanish Hills area south-east of Boulder. But with the dramatically rising costs of materials and labor, it probably will not happen. In the meantime, ham radio is going to be more difficult as the new house is in a tightly CC&R controlled development. Any antennas need to be "invisible". Definitely no 50 ft antenna tower allowed here!

Using our fire insurance money, I have started to reequip my ham shack. I have replaced my ICOM IC-7300 HF rig. So far, the only HF antenna I have been able to cobble together is using some MFJ ham sticks with an MFJ mag. mount. I have parked my Saab in the driveway, ran an extra 25ft. coax cable out the bedroom window to a 20-meter ham stick on the trunk lid of the Saab. It does work. So far, I have worked California and Missouri on 20m SSB and I have heard a station from as far away as Argentina. Also have a 2-meter FM rig in the shack. Don, N0YE, has given me an SGC remote auto antenna tuner. Hopefully with this tuner and tacking a vertical wire to the side of the house and burying some ground radials in the backyard will give me a serviceable HF antenna.

Also making progress towards getting back on the air with ATV with the local Boulder, Colorado gang on our DATV repeater, W0BTV. I have replaced my CANON camcorder, my Hi-Des HV-320E, DVB-T modulator and HV-110 receiver. My ATV ham friend Jack, K0HEH, had previously purchased from me a model 23-11A, 4.5 Watt, 23cm rf linear power amplifier. Jack has loaned it back to me until I am able to build more of them myself.

I am fortunate in that the house we purchased does look west towards the Rocky Mountains and backs onto Boulder County open space. We do not have any houses behind us blocking our view of the mountains. We also lucked out being on a bit of high ground out on the Colorado eastern prairie. As luck would have it, from my back deck, I actually have a line-of-sight rf path to the W0BTV, tv repeater.

The distance to the repeater is 19km (11.8 miles). This past Sunday, Feb. 20th, I had finally gotten enough gear purchased to see if I could receive the tv repeater. I temporarily set up a new M-Squared model 440-6SS, 6 element, 70cm Yagi antenna (11dBi) on an antenna tripod on my rear deck. I was able to key up the repeater in beacon mode with my HT and YES! I was able to receive the test pattern signal. The HV-110 receiver measured it at -66dB with S/N of 17 to 20dB. I also ran the Radio Mobile rf path prediction program and it predicted the signal strength would be -66dBm. Great Correlation!

The next test was to see if I could get a 23cm signal into the repeater. I set up the Canon camcorder, the Hi-Des HV-320E and the 4.5-watt, amplifier feeding directly a Directive Systems model DSE2414LYRMK, 14 element, loop Yagi antenna (15dBi) also mounted on the same tripod as the 70cm Yagi. Yes! It also worked. The tv repeater reported the signal strength on 23cm was -75dBm with S/N of 23dB. Dropping the amplifier's power down to 300mW, I was still able to key the repeater with a S/N of 13dB.

I am using an extra bedroom as my new ham shack and electronics workshop. The next step will be to drill several holes in the house to then be able to run coaxial cables from the rear deck into the ham shack.
…Jim, KH6HTV

WHAT IS IN YOUR HDMI CABLE?

HDMI stands for **H**igh **D**efinition **M**ultimedia **I**nterface. It is used as a serial interface to carry digital video & audio from one product to another. It has become the "de-facto" standard for consumer electronics.

Technically, the standard supports three differential serial data channels that carry the uncompressed video and audio. The protocol is called transition minimized differential signaling (TMDS), developed by Silicon Image. An 8B/10B coding scheme converts bytes into 10-bit codes for error detection and correction. Video is transferred as 24-bit pixels in synchronization with a separate clock channel. Ten bits are transferred per pixel clock period. The standard supports up to 48 bits of pixel data. Pixel clock rates can be any value within the 25-MHz to 340-MHz range. This allows 720p and 1080p resolution video with a 60-Hz refresh rate to be accommodated. The overall maximum possible composite data rate is 10.46 Gbits/s.

As for audio, HDMI uses linear pulse code modulation (LPCM). Support is provided for most popular digital audio formats like Dolby Digital, DVD and super CD audio, and DTS HD audio. The audio capability supports up to eight channels. HDMI also includes the audio return channel (ARC), which carries the audio from your TV set to an AV receiver without a separate audio connection as is common in some systems.

HDMI also incorporates High-bandwidth Digital Copy Protection (HDCP) to encrypt copyrighted video and audio material. It prevents protected material from being played or copied during transmission over the interface.

A separate display data channel (DDC) link provides a two-way communications capability between the transmitting source and the receiver. It is based on the popular I2C interface. DDC is used to notify the transmitter about the receiver configuration and features. Another separate consumer electronics control (CEC) channel provides control of multiple devices from a single source. Up to 15 devices are supported, so a single remote control can handle all HDMI-connected products.

These multi-wire bundles include four shielded twisted-pair lines (100-Ω impedance) for the data and clock plus individual data lines for the DDC and CEC connections as well as ground and power lines.

There are four defined connectors for different applications. The most familiar is the A type with 19 pins that is used on most consumer electronic products. The B type connector uses 29 pins and doubles the data connections to six channels to provide a higher pixel rate to carry higher-definition formats. The type C connector is a mini version of the type A with the same 19 pins. A micro type D connector is also available for even smaller devices. It too has 19 pins, but the pin-out is different from the other connectors.

An interesting feature of the latest version of HDMI is the HDMI Ethernet Channel (HEC). By using two pins in the standard connector plus a special cable, a single 100- Mbit/s Ethernet channel is implemented. HEC is used primarily for audio control. HDMI was first introduced in 2003. Manufacturers wanting to use it have to pay a royalty on every product sold.
Editor's Note: This information about HDMI came directly from an on-line article posted by Electronic Design magazine. Thanks to Ken, KV5Y, for finding the article and passing it on. Thanks to KH6HTV also.

USA ATV REPEATER DIRECTORY June 2021

NOTES:

1. All repeaters are NTSC, VUSB-TV, 6 MHz channel, unless otherwise noted. Some repeaters are using non-standard, lower sideband instead of upper sideband. The frequency listed is the video carrier frequency.
2. Digital TV lists center frequency. 6 MHz channel, unless otherwise noted. dt = DVB-T, ds = DVB-S, da = ATSC
3. For full details, go to the listed web site, or send an e-mail to the contact person
4. Some ATV groups also post repeater info on www.qrz.com under their call sign

Location	Call Sign	Output	Input(s)	Modes	Web Site & Contact for info
ARIZONA					note: AZ is linked to W6ATN in S. CA & NV www.atn-tv.org
Phoenix, White Tank	W7ATN	1253.25	434.0, 434 / 2 dt 2441.5 fm	VUSB, FM DVB-T	wb9kmo@gmail.com kwjacob@icsaero.com
Mesa	W7ATN	1289.25	434.0, 434 / 2 dt 2441.5 fm	VUSB, FM DVB-T	wb9kmo@gmail.com kwjacob@icsaero.com
Tucson, Mt. Lemmon	W7ATN	1277.25	434.0, 434 / 2 dt 2441.5 fm	VUSB, FM DVB-T	wb9kmo@gmail.com kwjacob@icsaero.com
N.E. AZ & NM Green's Peak	W7ATN	1289.25	434.0	VUSB	wb9kmo@gmail.com kwjacob@icsaero.com
CALIFORNIA					W6ATN rptrs linked to AZ & NV
Orange Santiago Peak	W6ATN	1253.25 5910 fm	434.0, 434 / 2 dt 2441.5 fm	VUSB, FM DVB-T	www.atn-tv.org wa6svt@gmail.com
Los Angeles, central Mt. Wilson	W6ATN	1265.25	434.0, 434 / 2 dt 2441.5 fm	VUSB, FM DVB-T	www.atn-tv.org wa6svt@gmail.com
Los Angeles, north Oat Mtn.	W6ATN	919.25 3380 fm	434.0, 434 / 2 dt 2441.5 fm	VUSB, FM DVB-T	www.atn-tv.org wa6svt@gmail.com
Jobs Peak	W6ATN	1253.25	434.0, 434 / 2 dt 2441.5 fm	VUSB, FM DVB-T	www.atn-tv.org wa6svt@gmail.com
San Bernardino Snow Peak	W6ATN	1242 / 4 dt	434.0, 434 / 2 dt 2441.5 fm	VUSB, FM DVB-T	www.atn-tv.org wa6svt@gmail.com
Santa Barbara	WB9KMO	1289.25	434.0, 434 / 2 dt 2441.5 fm	VUSB, FM DVB-T	www.atn-tv.org wb9kmo@gmail.com linked with W6ATN
San Diego	KD6ILO	423 dt 1243 dt 1268 ds	441 dt 1286 ds 5885 fm	DVB-T, DVB-S, FM	kd6ilo@yahoo.com also AREDN mesh
San Jose	W6SVA	427.25	910 fm, 1255 fm	VUSB, FM	www.k6ben.com :w2nyc@pacbell.net
Clayton	W6CX	1244.5 ds	1292.5, 1273, 915 ds, & 1273 fm	DVB-S, FM	www.mdarc.org info@mdarc.org
Palomar	W6NWG	1241.25	915 fm 2441.5 fm	VUSB, FM soon be DVB-S	w6nwg@palomararc.org mountain.michelle@gmail.com
COLORADO					
Boulder	W0BTV	423 / 6 dt or 421.25 5905 FM	1243 / 6 dt 441 / 6 dt 439.25	DVB-T, VUSB, FM	www.kh6htv.com kh6htv@arrl.net
Pueblo	W0PHC	423 / 6 dt	441 / 6 dt	DVB-T	billn@billnicoll.com www.puebloradio.org
DELAWARE					
Wilmigton	KC3AM	423 / 6 dt	439.25 AM, LSB	DVB-T AM	KC3AM@verizon.net qrz.com
FLORIDA					
Cape Coral	W1RP	421.25	439.25	VUSB	paul@cardlink.com
Cocoa Beach	K4ATV	427.2	439.25	VUSB	www.lisats.org
Panama City	KV4ATV	434.0	919.25	?	kv4atv@gmail.com
S.W. Idaho	WI7ATV	1257 fm	426.25	VUSB, FM	ka7anm@yahoo.com under construction
IOWA					

Davenport	W0BXR	421.25	439.25	VUSB	http://www.arcsupport.com/drac/
KANSAS					
Wichita	KA0TV	421.25	439.25	VUSB	k0wws@arrl.net
KENTUCKY					
Bowling Green	KY4TV	421.25	439.25 1280 fm	VUSB FM	w4htb@ieee.org www.qrz.com www.atn-tv.org
LOUISIANA					
New Orleans	WD0GIV	421.25	439.25	VUSB	wd0giv@att.net
MARYLAND					
Laurel	W3BAB	421.25	434.0	VUSB	www.qsl.net/w3bab
Towson	W3BAB	1291 fm	434	VUSB, FM	www.qsl.net/w3bab
Baltimore	W3WCQ	439.25 911.25	426.25 1253.25	VUSB	http://bratsatv.org/ brats@bratsatv.org
MICHIGAN					
Jackson	KC8LMI	923.25	439.25, AM LSB	VUSB	KC8LMI@hotmail.com
Grand Rapids	K8DMR	421.25	439.25	VUSB	ron_fredricks@att.net
Flushing	KC8KCG	1253.25	439.25 AM LSB	AM	kf8ui@mscginc.org
Flint	KC8KGZ	1253.25	439.25	VUSB	www.mscginc.org kf8ui@mscginc.org
MINNESOTA					
Wabasha	KD0HWX	421.25	439.25	VUSB	jonmcpete@yahoo.com
MISSOURI					
St. Louis	W0ATN	426 / 4 dt	440 / 4 dt	DVB-T	k0pfx@arrl.net
NEBRASKA					
Omaha	WB0CMC	421.25	434.0	VUSB	wb0cmc@cox.net
NEVADA					
Las Vegas	N7ZEV	1253.25 912 fm	434.0, 434.0 / 2 dt 2441 fm	VUSB, FM DVB-T	frank.n7zev@gmail.com linked to W6ATN S. CA & AZ
NEW JERSEY					
Vernon	W2VER	5885 fm	5665 fm	FM	jaythienel@yahoo.com
OHIO					
Columbus	WR8ATV	423 / 2 dt 427.25 1258 fm 1268 ds 2397 mesh 10350 fm	439 / 2 dt 439.25 AM LSB 1288 fm 1288 ds 10450 fm	VUSB AM FM DVB-T DVB-S MESH	www.ATCO.tv gkenmorris@gmail.com towslee1@ee.net
Dayton	W8BI	421.25 428 / 2 dt 1258 fm	439.25, 439 / 2 dt 1280 fm	VUSB, FM DVB-T	www.w8bi.org dpel@aaahawk.com
Van Wert	W8FY	434.0	923.25	VUSB	ka8zge@w8fy.org
OREGON					
Portland	W7AMQ	1257 fm	426.25	FM, VUSB	belles73@comcast.net
Portland	WB2QHS	426.0	910 fm	VUSB, FM	emellnik@emavideo.com
PENNSYLVANIA					
Delaware County	KC3AM	421.25	439.25 AM, LSB	VUSB, AM	KC3AM@verizon.net
PUERTO RICO					
Aguas Buenas	KP4IA	426.25	439.25, 1252 fm	VUSB, FM	kp4ia@yahoo.com
WASHINGTON					
Seattle	WW7ATS	1253.25	434.0	VUSB	https://www.qsl.net/ww7ats/ ww7ats@gmail.com qrz.com

Revision Notes:
Aug. 2019 --(1) corrected data for Kentucky (2) changed call sign for Boulder, CO Sept. 2019 - -added Pueblo, CO
Oct. 2019 --added San Diego, CA Feb. 2020 -- changed K6BEN to W6SVA, CA --added KC8KGZ, MI Mar. 2020 -- added Davenport, IA
May 2020 --corrected typos Jan. 2021 -- updated Boulder, CO repeater info June 2021 -- found 20 more ATV repeaters listed on www.repeaterbook.com -- attempted to contact all of their trustees to confirm them. Most are obsolete listings and are no longer on the air. Added only two -- Cocoa Beach, FL, Wichita, KS,

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.

04/24/2022 - Athens Hamfest

Location: Athens, OH
Type: ARRL Hamfest
Sponsor: Athens County Amateur Radio Association
Website: http://www.ac-ara.org/

04/25/2022 - 04/29/2022

RV Radio Network Spring Rally

Location: Millersburg, OH
Type: ARRL Convention
Sponsor: RV Radio Network
Website: http://rvradionetwork.com

05/01/2022 - Lucas Cty.Trunk Sale/Swap Meet

Location: Toledo, OH
Type: ARRL Hamfest
Sponsor: Lucas County Amateur Radio Emergency Setvice
Website: http://tinyurl.com/lcaresswap

05/20/2022 - 05/22/2022 Dayton Hamvention

Location: Xenia, OH
Type: ARRL Hamfest
Sponsor: Dayton Amateur Radio Association
Website: http://hamvention.org

05/28/2022 - Scioto Valley Ham Radio Club Har

Location: Piketon, OH
Type: ARRL Hamfest
Sponsor: Scioto Valley Amateur Radio Club

06/04/2022 - FCARC Summer Hamfest

Location: Wauseon, OH
Type: ARRL Hamfest
Sponsor: Fulton County Amateur Radio Club
Website: https://k8bxq.org/hamfest

07/09/2022 - Mansfield Mid Summer Trunkfest

Location: Mansfield, OH
Type: ARRL Hamfest
Sponsor: Intercity Amateur Radio Club
Website: http://www.w8we.club

07/17/2022 - Van Wert Hamfest

Location: Van Wert, OH
Type:
Sponsor: Van Wert Amateur Radio

08/13/2022 - Cincinnati Hamfest℠

Location: Owensville, OH
Type: ARRL Hamfest
Sponsor: Milford ARC
Website: https://CincinnatiHamfest.org
Website: http://W8FY.ORG

09/17/2022 - Mound Amateur Radio Assoc. Swap Meet

Location: Miamisburg, OH
Type: ARRL Hamfest
Sponsor: MARA
Website: http://W8DYY.ORG

09/25/2022 - Cleveland Hamfest

Location: Berea, OH
Type: ARRL Hamfest
Sponsor: Hamfest Assoc. of Cleveland
Website: http://www.hac.org

TUESDAY NITE ZOOM NET (We listen to 147.48 also)

Every Tuesday night @ 8:00PM WA8RMC hosts a net for ATV topic discussion. There is no need to belong to the club to participate, only an interest in ATV. All are invited. We usually chat for about an hour so please join us via the internet using ZOOM on your computer. We also listen to 147.48 during the meeting so if there is anyone checking in there you will be heard and included. It would be great if some of the previous ATCO members would join us as it's been a long time since we've heard from you.

We normally have 10-15 check-ins from various parts of USA and beyond. It's a fun informal time with various topics and jokes. Share with us a funny story or one liner you have if you can.

To join ZOOM for the first time, simply type **https://zoom.us/join** then download, install the .exe program and run it. ZOOM will start. Click on **join**, enter the **9670918666 meeting ID** then the **191593 password.** Use video or just audio if you don't have a camera.

Note: The DARA ATV ZOOM Net is on Wednesday at 8PM using this same ZOOM link. Feel free to join the discussion there as well.

ATCO TREASURER REPORT - de N8NT

OPENING BALANCE (01/22/22)	$ 3893.81
Receipts (dues)	$ 30.00
Postage	$ (15.60)
PayPal fee	$ (0.84)
CLOSING BALANCE (04/15/22)	$ 3907.37

ATCO REPEATER TECHNICAL DATA SUMMARY

Location: Downtown Columbus, Ohio
Coordinates: 39 degrees 57 minutes 47 seconds (latitude) 82 degrees 59 minutes 58 seconds (longitude)
Elevation: 630 feet above the average street level of 760 feet ASL (1390 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)
Two video channels in this output: Channel 1 is fed from all receivers. Channel 2 is fed from 439.25 analog receiver only.
2397 MHz Mesh Net transceiver 600mw output (channel 1 minus 2). ID is WR8ATV-2
10.350 GHz: 1watt continuous analog FM
Link transmitter: 446.350 MHz: 5 watts NBFM 5 kHz audio. This is an output used for control signals and to repeat the 147.48 MHz and 449.975 MHz input.

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 5 dBd 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 minus 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 horizontally polarized 16 dBd gain omni

Receivers: 147.480 MHz - F1 audio input with touch tone control. (Input here = output on 446.350)
439.000 MHz - DVB-T QPSK, 2MHz BW. Receiver will auto configure for FEC'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 & also direct to 1268 MHz DVB-S output channel 2.)
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 SR=4.167MS, fec=7/8. PIDs: PMT=133, PCR=33, Video=33, Audio=49 (Input here=output on all Transmitters)
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)
439.00/439.250 MHz - Horizontally polarized dual slot 7 dBd gain major lobe west (Shared with 439 digital & 439.25 analog 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 MESH is 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)**
	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 1288 digital receiver
	00* then 3 for Ch. 3	Select 1288 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#	No function at this time
	C2* or C2#	No function at this time

ATCO MEMBERS as of April 2022

Call	Name	Address	City	St	Zip	Phone
KD8ACU	Robert Vieth	3180 North Star Rd	Upper Arlington	OH	43221	614-457-9511
KC3AM	Dave Stepnowski	735 W Birchtree Ln	Claymont	DE	19703	
AH2AR	Dave Pelaez	1348 Leaf Tree Lane	Vandalia	OH	45377	937-264-9812
W8ARE	Terry Meredith III	6070 Langton Circle	Westerville	OH	43082-8964	
K9BIF	Charlie Short	415 West Pike Street	Goshen	IN	46527-0554	
VK3BFG	Peter Cossins	14 Coleman Road	Melbourne	Au	03152	
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	8774 Jersey Mill Rd	Alexandria	OH	43001	614-836-2521
N3DC	William Thompson	6327 Kilmer St	Cheverly	MD	20785	301-772-7382
K8DMR	Ron Fredricks	8900 Stonepoint Ct	Jennison	MI	49428-8641	
WA8DNI	John Busic	2700 Bixby Road	Groveport	OH	43125	614-491-8198
WB8DZW	Roger McEldowney	5420 Madison St	Hilliard	OH	43026	614-405-1710
KB8EMD	Larry Baker	4330 Chippewa Trail	Jamestown	OH	45335-1210	
WB4IR	Bob Holden	7725 Tressa Circle	Powell	TN	37849	865-314 - 4285
WA8HFK,KC8HIP	Frank & Pat Amore	P.O. Box 2252	Helendale	CA	92342-2252	760-503-8106
W8KHP	Allen Vinegar	2043 Treetop Lane	Hebron	Ky	41048	
WA8KKN	Chuck Wood	5322 Spruce Lane	Westerville	OH	43082-9005	614-523-3494
WB9KMO	Rod Fritz	8334 E. Culver Street	Mesa	AZ	85207	
WB8LGA	Charles Beener	2540 State Route 61	Marengo	OH	43334	
W8MA	Phil Morrison	154 Llewellyn Ave	Westerville	OH	43081	
KA8MID	Bill Dean	2630 Green Ridge Rd	Peebles	OH	45660	
N8NT	Bob Tournoux	135 Barrett Hill Road	Center Rutland	Vt	05736	614-563-7443
W8NX, KA8LTG	John & Linda Beal	5001 State Rt. 37 East	Delaware	OH	43015	740-369-5856
WU8O	Tom Walter	15704 St Rt 161 W	Plain City	OH	43064	614-309-7134
KB8OFF	Jess Nicely	1888 Woods Drive	Beavercreek	OH	45432	
W6ORG,WB6YSS	Tom, Maryann O'Hara	2522 Paxson Lane	Arcadia	CA	91007-8537	626-446-2750
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	Dave Jenkins	100 Miller Ave Apt. 108	Ashville	OH	43103	740 954-9221
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
WA6SVT	Mike Collis	PO Box 1594	Crestline	CA	92325	
NR8TV	Dave Kibler	243 Dwyer Rd	Greenfield	OH	45123	937-981-1392
KB8UWI	Milton McFarland	115 N. Walnut St.	New Castle	PA	16101	
WA8UZP	James Reed	818 Northwest Blvd	Columbus	OH	43212	614-297-1328
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	4080 Dill Road	Centerburg	OH	43011-9771	
KB8YMQ	Jay Caldwell	4740 Timmons Dr	Plain City	OH	43064	614-879-9946
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
W8ZCF	Farrell Winder	6686 Hitching Post Ln.	Cincinnati	OH	45230	513-218-3876
N8ZM	Tom Holmes	1055 Wilderness Bluff	Tipp City	OH	45371	

ATCO CLUB OFFICERS

President: Art Towslee WA8RMC
V. President: Ken Morris W8RUT
Treasurer: Bob Tournoux N8NT
Secretary: Mark Cring N8COO
Corporate trustees: Same as officers

Repeater trustees: Art Towslee WA8RMC
Ken Morris W8RUT
Dale Elshoff WB8CJW
Statutory agent: Stan Diggs AA8XA
Newsletter editor: Art Towslee WA8RMC

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.

No new members this time.

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 of 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 weekly 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 if after the due date. If before the due date then it is due one year from the due 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 135 Barrett Hill Road, Center Rutland, Vermont 05736.
Or, if you prefer, pay dues via the Internet with your credit card. Go to www.atco.tv log in, click on **Members** then **Pay Dues** and fill out the details. Credit card payment is made through "PayPal" but you DO NOT need to join PayPal to send the dues. Simply DO NOT fill out the password details and there will be no "PayPal" involvement.

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 MEMBERSHIP IS EXPIRED.