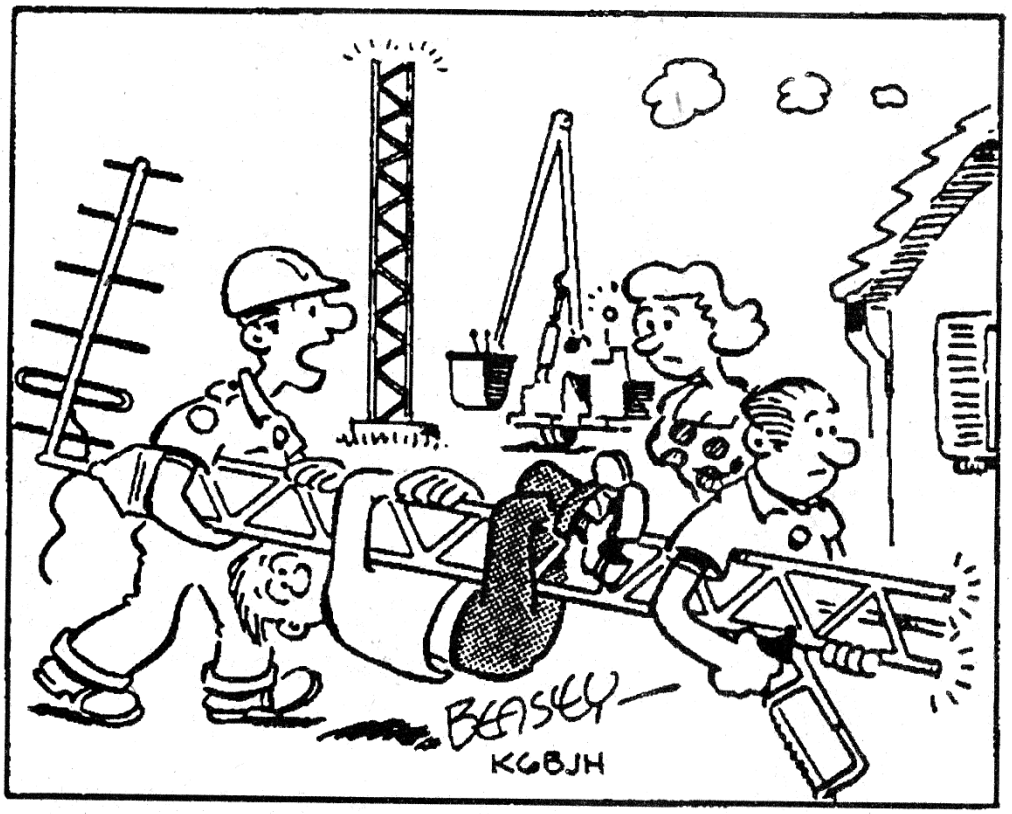
ATCO NEWSLETTER

VOLUME 40 NUMBER 3 **July 2023**

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



SORRY ABOUT THE TOWER, MA'AM — WE COULDN'T PRY YOUR HUSBAND LOOSE

ACTIVITIES ... from my Workbench

OK, the grass is cut and I've had my morning 5-mile hike so it's time to finish this Newsletter. Not many reportable items on the agenda this time except one! The ATCO repeater 439 analog and digital input has quit. It's time for a trip there to see what's going on (or off as the case may be).

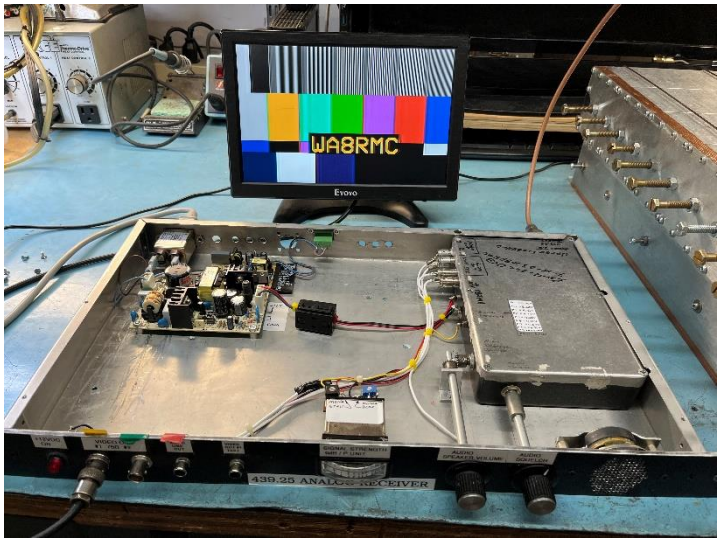
Once there, a close inspection did not reveal any issues. A quick check of the obvious, power plugs and loose AC power connections are OK. AC power to both the analog and digital receivers are on. I inspected the antenna, coax and filters for open or shorted conditions but found no problems. Next, I did a rough check of the preamp connected to the output of the filter. It feeds a 2-port splitter for the analog and DVB-T receivers that follow. The preamp is bad!!! OK, now what to do? Since I wanted to change the 439 analog from lower **V**estigial **S**ide**B**and operation to upper VSB, this was a chance to do that. That involved removing both the 16-pole dual filters and analog receiver to my place for the required "surgery". This process may be risky because there are many RF signals at this location just above the 439.25 MHz upper bandpass. Even our 446.350 MHz link transmitter is close to the 439.25 MHz bandpass. Desense could be a problem.

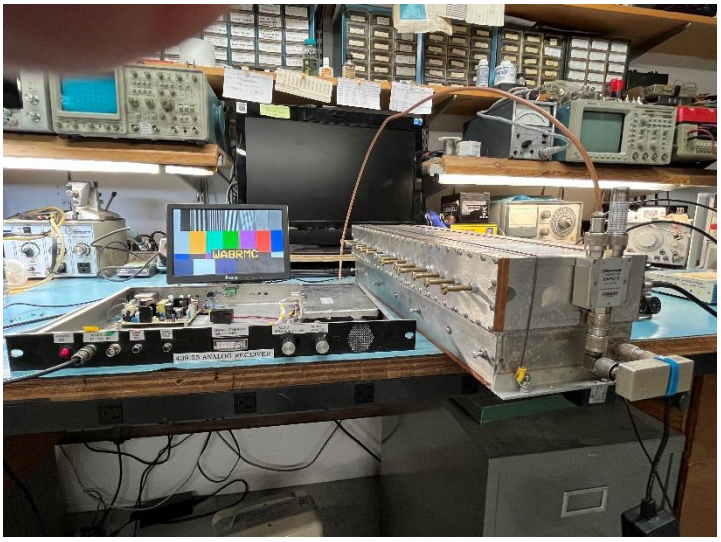
That was just the start of my issues. I won't go into detail here but below is a summary of my experiences over a 3-week period. No, I did not work on it continuously during that time. There were times when I simply did not want to look at it!

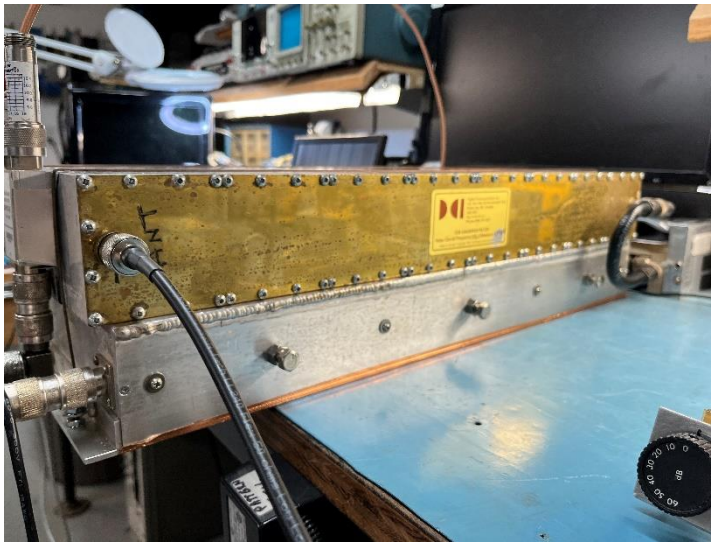
- Changing the receiver from lower sideband to upper sideband involves changing the local oscillator from 45 MHz below the carrier to 45 MHz above the carrier. That meant changing some caps in the LO chain.
- The crystal had to be changed. The entire LO chain had to be re-tuned.
- The IF module electrolytic caps had to be replaced.
- I used my ***"trusty"*** "Kreepy Peepy" PC Electronics 439 signal source to re-tune everything but it turned out it had some spurious emissions that made me think the signal was OK, but it was NOT. A monitor connected to the receiver output would not receive the signal. I did not suspect a bad test transmitter.
- Had to repair the Kreepy Peepy transmitter. Found bad 2N5770 transistor in LO crystal circuit. Funny thing: it looked like it was OK but had some strange parasitic oscillations in addition to the crystal frequency main signal. Replaced transistor. Now the Tx is OK.
- I decided the PC Electronics receiver would not work so I tried my Tektronix commercial television receiver thinking it was better than the PC unit. Nope! Sensitivity is poor. Setup was almost impossible. It had some internal problems also so I abandoned that approach.
- Switched back to PC unit. Finally, it tunes OK. Sensitivity is good. Noise floor is -127dBW! That's great.
- Now I tackled the filter tuning. After careful tweaking, I got all 16 adjustment rods in "alignment" so the overall bandpass loss is now only ~2.5 dB which is really good (8 pole homemade interdigital filter & 8 pole DCI combline filter in series). The return loss is also good, it's >20 dB.
- Installed Downeast Microwave preamp on filter output. The preamp has a measured gain of 16 dB but connected to filters, it only improves signal by 3 dB. No concrete idea of why but suspect it is a narrow bandwidth test signal vs a wide bandwidth ATV signal. My discussions with Mike WA6SVT and Tom W6ORG suggest a signal/noise ratio or a filter noise figure limitation. Tom says receiver AGC action may mask the preamp gain. If excessive preamp gain, AGC may not work correctly.
- Removed the 10 dB attenuator on output of filter which was there initially. I didn't remember why I added it before but that was >10 years ago. The signal looks good either way. Looking back at it, it may be required when installed at the repeater. I'll check that when I go back.
- Decided to stop "cutting bait" and start "fishing" so to speak so I called it quits and re-installed the combo at the repeater to see results. (I still have reservations about operating closer to the 440-450 FM signals).

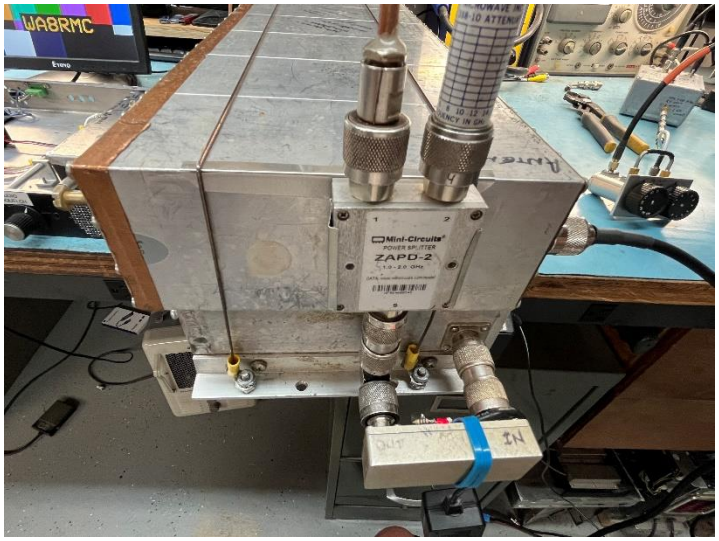
It is now installed but the signal level is too weak. Something is wrong. I expected a P5 signal and got only P3 at best from my location 15 miles away. The RF interference is there but it's too early to say if it will be problematic.

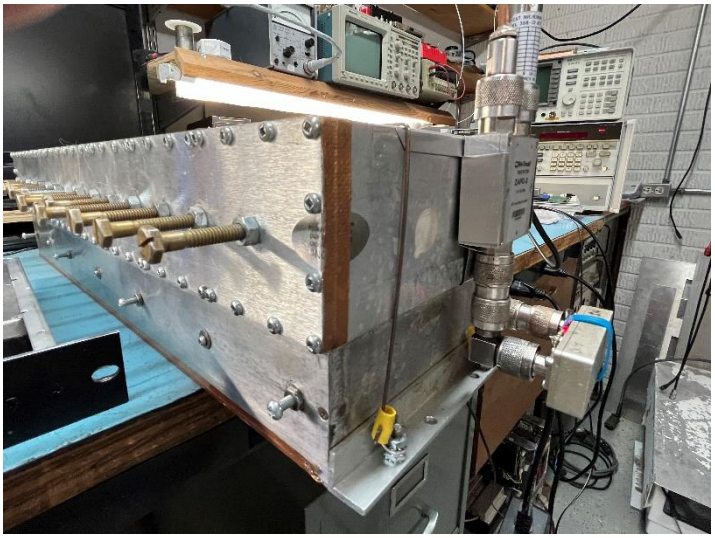
I see herringbone interference but not all the time. The good news is that our 5-watt 446.350 link transmitter does not interfere with it at all. I guess that at least another trip to the repeater is in order. Some pictures of the filter/ preamp/receiver combo are below.











That’s about it for now.

We still need more activity on ATV. Come on Guys, show up on the air a little more often. At least, join us on ZOOM each Wednesday at 8 PM. Detail later in this Newsletter.
…WA8RMC

THE FUTURE OF 23CM ATV HAM OPERATION

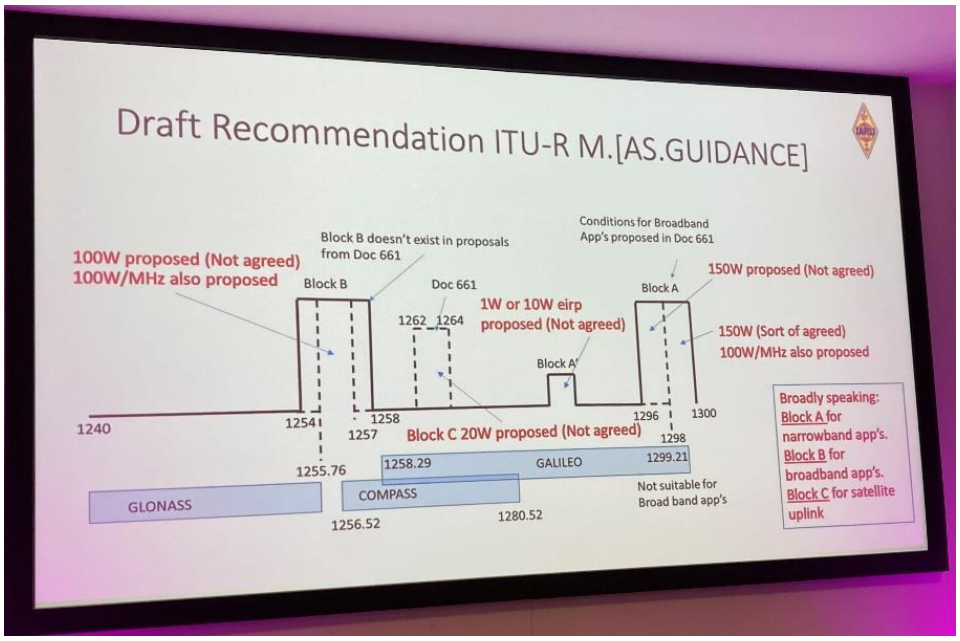
Listen up!!! Our 23cm Ham Band allocation which extends from 1240 MHz to 1300 MHz is in jeopardy of being taken away from us. The reasons are various but in general the commercial sector is demanding more room to operate their GPS positioning equipment. Now, understand that existing Ham operations are secondary on this band so the commercial operators can ask (demand) that we cease operations that interfere with them. That has existed for a number of years. You may remember about 15 years ago the Ohio Department of Transportation (ODOT) could not conduct GPS guided land surveys because our ATCO repeater output on 1250 MHz interfered with their reception. The FCC then asked me to find another frequency for our operations that did not interfere with them. At that time the transmitted GLONASS GPS signal was, and still is, operational on 1242 to 1252 MHz. We agreed to move to 1258 MHz in order to stay away from the GLONASS signal reception. That solved our issues at that time.

Now we have at least two additional GPS signals either planned or operational in the 23 cm band. One is GALILEO in Europe operating on 1259 to 1299 and COMPASS in China planned for operation on 1256 to 1280. So, the band will then be occupied from 1242 to the upper band edge of 1300. I do not know if there is anything planned for 1240 to 1242 so there may be a possibility for narrow band DATV operation there. We'll have to wait and see. Formal talks are to be held in January 2024.

Right now, there are talks going on to be able to preserve some narrow slice of frequency around 1262 to 1264 and another from 1254 to 1258 and 1296 to 1300. We will just have to wait and see. The talks are supposed to be concluded in 2024. In the meantime, I would not buy any new equipment for use in the 23 cm band. We probably will end up with some small segments in the 23 cm band sufficient for DATV use using 2 MHz bandwidths or narrower. It will probably be safe to say that any analog ATV operation will probably be out of the question in the future.

Below are excerpts from the BATC forum discussions for your reference. Bear in mind that band resolutions for the UK probably will differ from the USA allotments. The BATC forum discussion can be found at: https://forum.batc.org.uk/viewtopic.php?f=91&t=8436&sid=3f6fda9692e3edab3e39631a82744971
…WA8RMC

Barry G4SJH gave an update at the Martlesham Round Table last weekend on the negotiations ahead of WRC23. A video of Barry's presentation is available here: https://www.youtube.com/watch?v=0DnixRmJ0Hk
This amateur secondary usage threatens GLONASS (Russia), Galileo (Europe), and Compass (China) satellite navigation systems.



It should be noted that these are all proposals that might/maybe/could possibly be put to the WRC for approval and there is plenty of time for changes between now and the conference.

What that means is this presentation should be taken as an indication of the way things are headed but it will probably change significantly (but probably not for

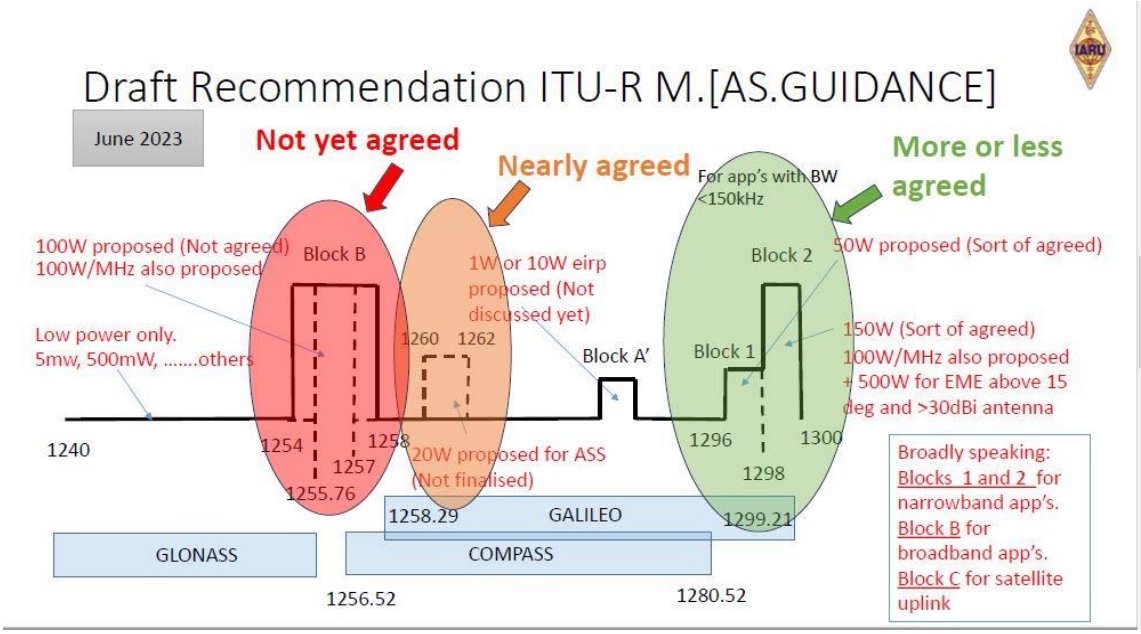
the better) between now and the end of 2024 when it is envisaged Ofcom will implement any changes.

It currently looks like we will lose access (we never actually owned it) to a large portion of 23 cm below 1300 MHz but potentially retain 2* 4 MHz slots - one centered on 1256 and one at 1298 MHz. What this means is that **FM ATV operation will no longer be possible below 1300 MHz**, however, we would be able to operate Digital repeater inputs around 1256 MHz.

UK repeater outputs above 1300 MHz are not affected by these changes, however there are other potential changes in the pipeline which may mean FM operation above 1300 MHz will not be possible.

It would seem sensible for operators not to invest too much money in 23 cm equipment at this point and UK ATV operators should be pleased that we are the only country that has access to 1300 to 1325 MHz - ATV operators in the rest of the world are in a far worse position.

Repeater groups affected by any changes in the future would be able to apply to the BATC bursary fund for potential funding of equipment purchases to migrate to digital and move input receiver frequencies.



Before asking too many questions and to understand the complex background behind all this please watch Barry's video - and while we are at it we should give a big round of applause to Barry who is doing this entirely as a volunteer. His work and that of other members of the spectrum management team are funded by the RSGB - I think that's a good use of my RSGB subscription!!
73
Noel - G8GTZ

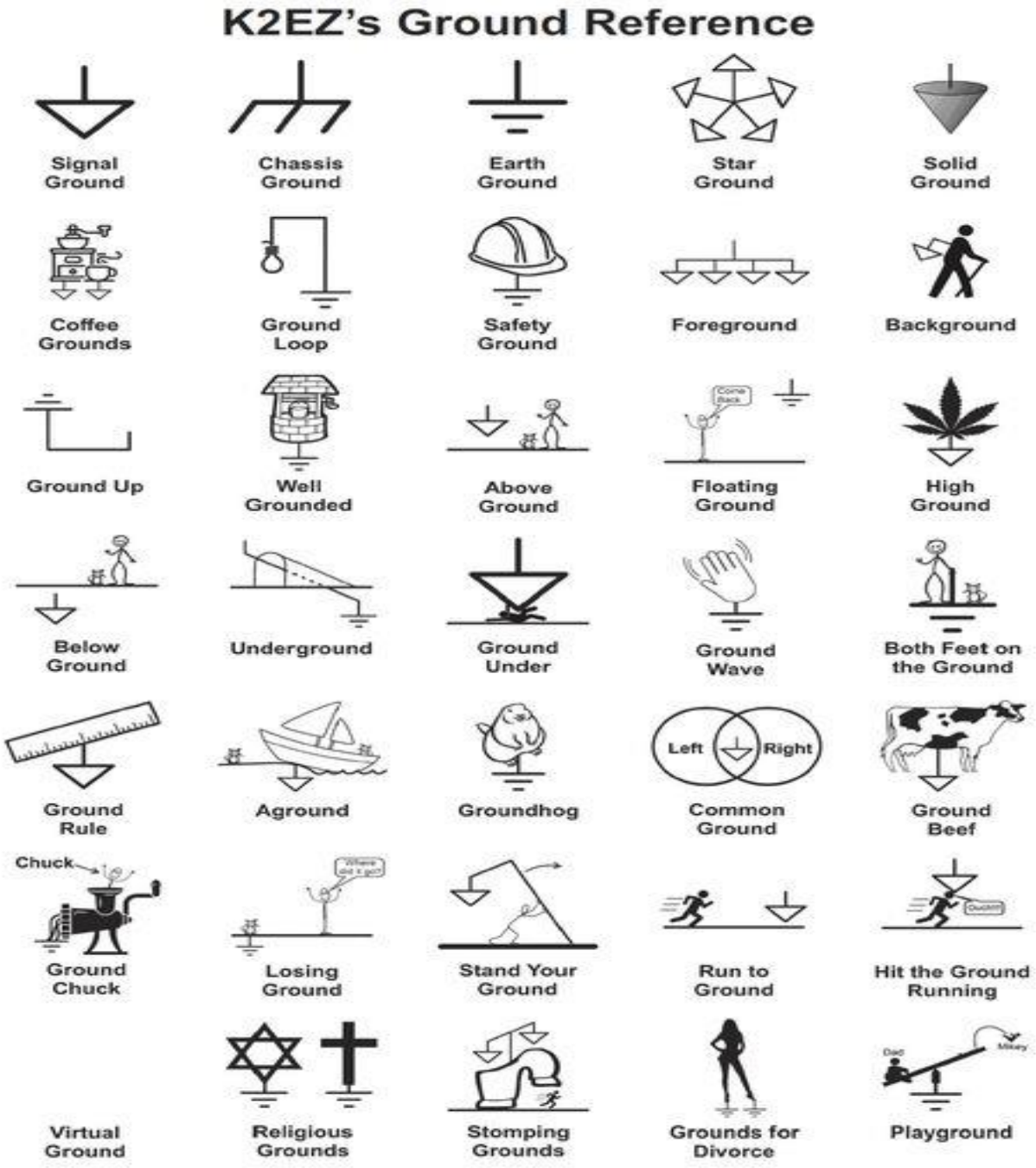
COMMENTS FROM N8COO AT NEW HI ALTITUDE LOCATION

I'm still thinking about ATV, though, I'm going to have to move where I was thinking of putting the antennas. Originally, I didn't stop to think about the ton of old growth trees immediately to the west of my property here in Alexandria, Ohio. (about 30 miles due west of Columbus on route 161). I'm talking about ~100-year-old maples and then a grove of pines at the neighbors. I need to take some sightings around the property and see if I can get a clear shot somewhere at least to the State Office Tower. (my ground elevation here is about 1250 ft) I don't want to have to go up any higher than 40 feet or so on the tower. I'll let you know when I am going to test. Hopefully, before the snow flies. Yeah, I say that every year, but eventually it gets done. At least I now have a dual band stick up and one HF antenna. Getting somewhere!
Take care,
…Mark N8COO

GROUNDING TERMS

Here are some grounding terms I'll bet you never learned in school. I'm sure you've heard and seen the first three, but I'm sure you didn't know about the others shown here. Suffice it to say that you've seen it first here!

If you can think of some more, please let me know so I can include them in the next ATCO Newsletter.
…WA8RMC



…WA8RMC

INTERNATIONAL SPACE STATION OPERATIONS EXTENDED THROUGH 2030

The International Space Station partners have committed to extending the operations of this unique platform in low Earth orbit where, for more than 22 years, humans have lived and worked for the benefit of humanity, conducting cutting-edge science and research in microgravity. The United States, Japan, Canada, and the participating countries of the European Space Agency (ESA) have confirmed they will support continued space station operations through 2030 and Russia has confirmed it will support continued station operations through 2028. NASA will continue to work with its partner agencies to ensure an uninterrupted presence in low Earth orbit, as well as a safe and orderly transition from the space station to commercial platforms in the future.

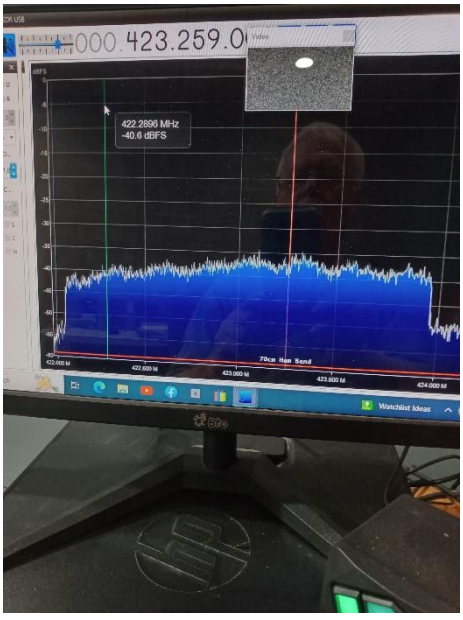
Since its launch in 1998, the International Space Station has been visited by 266 individuals from 20 countries. The space station is a unique scientific platform where crew members conduct experiments across multiple disciplines of research, including Earth and space science, biology, human physiology, physical sciences and technology demonstrations that could not be done on Earth.

… National News *(from arrl and other sources)*

ATV DX FROM ATHENS OHIO

Just wanted to let you know your friends in Southeast Ohio are having success making ATV contacts. Today I was able to see the Columbus repeater which is 86 miles away. I am able to work the DX group almost every day. We now have 4 local hams on ATV and 3 are using Jim Andrews preamps.

…Thanks Bill WB8YIF



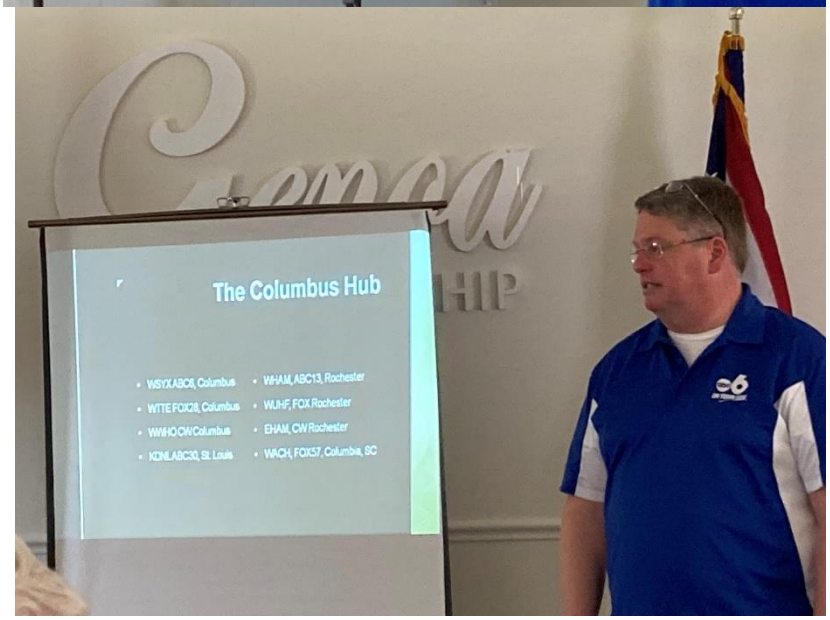
ATCO SPRING EVENT SUMMARY

Our Spring Event was held on Sunday May 7 this year in the Genoa Township shelter house. We originally planned it for the Westerville library but Library activities took priority. The Genoa Hall turned out to be a very acceptable location. Attendance was less than I expected but more than normal due to the presence of our guest speaker. However, I am seeing a gradual decrease in overall attendance.

In order to prompt more attendance, I scheduled Marshall McPeek, the chief meteorologist at WSYX channel 28 to speak. That was a very interesting talk. Marshall gave us a verbal tour of the channel 6/28 activities and pointed out some very interesting facts about their TV operation.

We had a free lunch for everyone but I must admit, I over ordered the food expecting a higher attendance. This year I brought chicken from "Hot Chicken Takeover" which turned out to be a good choice. Some people went home with enough chicken for evening supper. (Jay, I trust you got some of the Mac-and-Cheese available).

There were plenty of door prizes which we laid out on a table and asked everyone to take a single prize of their choice. Some prizes were from the surplus WB8CJW Dale items.



There were about 25 people that attended but I had received confirmation from 33 people so that is the reason for the extra food. Because of the limited turnout, it is questionable for a Fall Event this year. We'll have to see. Let me know if you have any suggestions on how to promote more activity.
…WA8RMC

DAYTON HAMVENTION® 2023 WRAP UP

Dayton Hamvention® 2023 was held May 19 - 21 in Xenia, Ohio -- all indications point to a successful event.

ARRL greeted attendees in its large exhibit area in the "Tesla" building. Traffic to the exhibit was brisk. Members and prospective members enjoyed meeting with dozens of ARRL program representatives and volunteers. The event hosted the ARRL Great Lakes Division Convention.

While the final count is still a few days away from being completed, Hamvention spokesperson Michael Kalter, W8CI, said this was a great year, a great event, and it all started with a great team.

"[We] had great [weather, tremendous] efforts by the 700 plus volunteers, [and] outstanding community support, including [from] the Greene County Sheriff's Office, the Xenia Police Department, and Xenia officials," said Kalter. "A big thank you to everyone, especially ARRL, for its work co-developing the Event App, and, of course, all of the amateur radio operators and everyone who attended the event."

ARRL CEO David Minster, NA2AA, greets ARRL Life Member David Gusman, KC7UI, in the ARRL Exhibit. QST Product Review Editor Pascal Villeneuve, VA2PV, looks on.

Kalter said ticket sales were up this year and he expects attendance to surpass last year's count of 31,367. The good weather helped draw crowds, and other than some rain in the early morning hours of Saturday, blue skies and fair temperatures prevailed.

ARRL Education and Learning Manager Steve Goodgame, K5ATA, said the Education and Learning booth was packed with people for the duration of the event. "We shared information with attendees about the ARRL Learning Center, the Teachers Institute, and using ham radio for STEM education and youth outreach," said Goodgame.

The ARRL Exhibit at Dayton Hamvention 2023.

"We also partnered with YouTube content creator Carlos Ortiz, KD9OLN, whose channel is *LifeAtTerminalVelocity*, and facilitated a youth-only parachute-mobile event. Carlos jumped from an airplane at 10,500 feet and made contacts with 13 youth, then their parents, for a total of roughly 25 contacts before landing. It was an amazing opportunity to engage youth in amateur radio with something that is different than the norm," Goodgame added.

ARRL Great Lakes Division Director Dale Williams, WA8EFK, moderated a Saturday afternoon ARRL membership forum, which included short presentations from ARRL Treasurer John R. Sager, WJ7S; Director of Operations Bob Naumann, W5OV; CEO David A. Minster, NA2AA, and President Rick Roderick, K5UR.

Jaylen Stoneburner,14, makes a contact with Carlos Ortiz, KD9OLN, parachute mobile at Hamvention. Steve Goodgame, K5ATA, serves as control operator.

Sager highlighted the work of ARRL's Investment Management Committee (IMC) and CAPTRUST, an outside investment firm that was selected to actively manage ARRL's investment portfolio for the benefit of its members. Naumann provided an update on The ARRL Logbook of The World (LoTW) that included recent improvements that have significantly reduced, and sometimes nearly eliminated, log processing queues. Minster highlighted a handful of ARRL initiatives including the yearlong theme, Year of the Volunteers, and its complementary operating event, Volunteers On the Air (VOTA). He encouraged members to "reach one rung higher" in their contributions to ARRL volunteerism and support. He also introduced the new ARRL Estate Planning Workbook, which is intended to help members develop a plan for their equipment and amateur radio legacy, which will ultimately benefit spouses and other family members following an amateur's lifetime. Roderick charged members with concentrating on their efforts to make an impact on amateur radio, encouraging newcomers and youth, and ensuring their legacy for amateur radio.

Seen at Hamvention: ARRL member Doc Smith, Jr, KW8C, of Huron, Ohio.

The ARISS booth drew in attendees to learn more about Amateur Radio on the International Space Station and opportunities to participate and volunteer. Among the program representatives were ARISS Chairman Frank Bauer, KA3HDO, and ARISS USA Delegate Rosalie White, K1STO, representing ARRL. ARISS is celebrating 40 years of amateur radio on human spaceflight vehicles.

In the ARRL exhibit area, a banner emblazoned with "ARRL Collegiate Amateur Radio Program" hung above a booth adorned with university pennants that was swarmed with young adults. Student hams from colleges and universities around the country volunteered to help ARRL promote the collegiate program and the participation of their respective radio clubs and schools. These young hams greeted attendees with stories of how amateur radio is furthering their interest in wireless communications and other areas of STEM education. Their experiences are also leading to advanced careers in radio technology and related fields. The bright spotlight on young hams contributed a welcome message to all who passed by: "The next generation of radio amateurs is already here, and they're already active." ARRL's YouTube channel includes a short video with some of the student participants.

L to R, Great Lakes Division Director Dale Williams, WA8EFK, ARISS USA Delegate Rosalie White, K1STO, and Rocky Mountain Division Director Jeff Ryan, K0RM

The Hamvention flea market was active again this year, and even picked up a nickname -- The Big Island -- a nod to its oval shape near the grandstand.

Kalter summed up the event as a great experience for everyone and noted that work has already started on the Hamvention, May 17 - 19, 2024. The event is planning to host the 2024 ARRL National Convention.

Read a complete recap of each day's events, written by ARRL Acquisitions Editor Mark H. Derks, KC1RVQ, using the links below.

See ARRL's photo album of Dayton Hamvention 2023 at https://tinyurl.com/ARRL-at-2023-Hamvention.

RASPBERRY PI STOCK TO HIT 1M UNITS MONTHLY, STARTING JULY

Sony helps by stockpiling Pi non-silicon parts.

Scharon Harding - 6/2/2023, 8:52 AM

There will be a 1 million unit stock of Raspberry Pi products available in the month of July and every month onward until consumer backlogs are cleared, Raspberry Pi CEO Eben Upton told hobbyists in a recent community newsletter.

As reported by Tom's Hardware on Thursday, the newsletter, said to be an "update from Eben" (screenshot via Tom's Hardware here), promises to assuage customer demand after small businesses were favored over individual consumers during the pandemic-fueled silicon shortage.

Upton's message reportedly reads:

We expect to sell over 600,000 units in May, 800,000 units in June, and from July onward, we are able to sustain million-unit months for as long as is necessary to clear our remaining customer backlogs and return to free availability.

This is despite the approximately 800,000 units shipped in Q1, the company's "worst quarter since 2015," according to the newsletter.

Stock is apparently being resurrected with the help of Sony, which is stockpiling the "non-silicon elements of" Raspberry Pi's bill of materials, Upton said. Sony has sold Raspberry Pi image sensors since 2016 and bought a minority stake in the company in April. Raspberry Pi now has an 11-year manufacturing contract with Sony, and in a May interview with Jeff Geerling, Upton said that Sony now manufactures "every core Raspberry Pi product."

Critically, Q2 2023 has brought "rapid recovery in the silicon supply." Now, Upton is feeling rather optimistic and predicted that more Raspberry Pi single-board computers and modules will sell this year than ever.

"It's been a painful two years since shortages kicked in in 2021, but we're confident that the shortages are behind us," the CEO said.

Stock check

Before you get too excited about finishing that project you haven't had the supplies to complete, let's take a quick look at what stock looks like now, compared to what Upton most recently promised.

In the aforementioned interview with Geerling a couple weeks ago, Upton said that Zero and Zero 2 stock would start returning and also said there would be "substantial" recovery for the 3, 3B+, and 4.

As of this writing, the Zero, Zero 2 W, 3, and 3B+ are out of stock at Raspberry Pi's listed authorized resellers. The 4 is available, though, as is the 3A+. Of course, as much as the stock has fluctuated over the past months, it's possible that it all will change by the time this article is published.

Meanwhile, accessory availability is hit or miss, too, with the Compute Module 4, for example, unavailable at Pi resellers as of this writing.

Trying to win back hobbyists

Replenishing available Raspberry Pi units isn't just about making money (although we're sure that's a huge driver as well) but also about ensuring hobbyists don't lose their appetite for Pi.

Upton admitted to neglecting maker demand when forced to choose between supplying businesses or individuals. That choice was "the single hardest decision I've had to make in my business career," Upton told Geerling in May. In hindsight, the exec would have stocked up on BCM2835 chips to help keep shelves full. But Raspberry Pi didn't and eventually fell behind on orders, and the perception of a shortage led to people stockpiling Pis, hurting availability more, according to the CEO.

Raspberry Pi 4 Model B

From $70 at Amazon

(Ars Technica may earn compensation for sales from links on this post through affiliate programs.)

Meanwhile, supply problems in 2021 led to the Pi 4 returning to higher 2020-level pricing, despite the company originally calling the 2GB Pi 4 price cut "permanent." The price going back up from $35 to $45 is supposed to be temporary, but as of this writing, official Pi resellers are still charging $45 for that model. $5 price bumps for Pi Zero models and Compute Modules are also still in effect.

Unreliable stock and higher prices are a lot to ask customers to stomach, especially creative ones who can scrounge up alternatives. Restoring Pi availability will be critical to ensuring DIYers remain hungry for Pi in the future.

ATN & ATCO HAMVENTION ATV BOOTH ACTIVITIES

For the first time in a number of years, nearly perfect weather was experienced at Hamvention 2023. Aside from a night rain shower that dispersed a half hour before the gates opened, very mild temperatures appeared. Maybe moving the Hamvention to Xenia finally broke the Dayton curse! The ATN booth drew in a large number of hams interested in ATV. Like last year, the ATV booth provided a live cross-link ATV demonstration, along with several different ATV-related projects displayed on the table. The crosslink consisted of a DVB-T transmitter (HV-310) transmitting on 1280 MHz, QPSK at 2 MHz bandwidth. A Jim Andrews 23cm amplifier (Model 23-11A) was being used as the intermediate driver, at reduced output, for the W6PQL XRF-286 amplifier to provide a final output of 50 watts. This 23cm transmission was linked to the W8BI ATV repeater in Huber Heights Ohio. The 21 mile path was then crosslinked back to the Hamvention ATV booth via a 70cm DVB-T transmitter at the repeater site on 428 MHz, QPSK, also using 2 MHz bandwidth. Along with the crosslink demo, W8CWM, Bill McCoy, participated at his home QTH in Englewood Ohio, by providing an ATV repeater link demonstration. Bill couldn't attend Hamvention this year, however, his "virtual presence" through the ATV repeater helped showcase digital ATV from 35 miles distance throughout the three days of the show. Of particular note was that on Sunday, a 70cm band opening occurred that appeared on the ATV repeater link. The ATV repeater was re-transmitting W8URI's 70cm analog ATV signal through for all to see at the ATN booth. This constituted an approximate 80 mile link between the DARA repeater site and Bill Heiden's location in Mt Gilead, Ohio.

Along with the active crosslink transmitter hardware on display and the W8BI ATV repeater reception, the following projects were also displayed at the ATN booth:

K0PFX, Mel Whitten provided his TX/RX Interface integrated with a 10 watt amplifier for the table display. During Hamvention 2023's ATV forum, he provided additional information about this project. Mel Whitten has also created helpful, very detailed comprehensive documentation on the construction of this interface. It can be found on his website: https://slatsatn.net/

WA8RMC, Art Towslee provided his VersaTune-Express digital receiver prototype that he has been working on. Shortages of Rasberry Pi's and some software work has held up the production start as he had spoken about during the ATV forum. Art's and Mel's ATV discussions during the ATV Forum about these ATV projects can be found on youtube at the following link: https://www.youtube.com/watch?v=aPALay4bqnI Please blame me (AH2AR) for recording the ATV forum in Portrait Mode instead of Landscape mode. I must say that the video does look great on smart phones!

Two separate extremely portable "self-contained" maintenance DVBT receiver-monitors were on display that I (AH2AR) had brought in for the table.

Also displayed was an AH2AR project that uses the TC70 series A5 transceivers as a host interface that provides T/R switching, 3 watts of RF power output, and additional DVB-T receiver gain for the HiDes HV series transmitter-receivers. The modification requires only nine components and once the mod is installed, it does not lose functionality of the analog (A5) transceiver. Here is the article: https://www.atco.tv/NewsLetter/ViewPdf/1135

Disaster struck when we found out that the ATV dinner was excluded from the Hamvention Program. Since the ATV Dinner was scheduled for Friday and the ATV forum was scheduled for Saturday, we were unable to let everyone know that the ATV Dinner was still on the docket. To make matters even worse, a number of ATV

anchors (Bill Brown WB8ELK and Mike Collis WA6SVT were unable to attend due to granddaughter / work commitments. The only good thing that became of this was that of the eight ATVers who attended, 50 percent walked away with door prizes!

Crosslink antennas outside the MAXIM 1 Building's door. That is a Directive Systems loop Yagi growing out of K8FIX's head!

Crosslink transmitter on 23cm. The demo consisted of a HiDes HV310 transmitter, a Jim Andrews 23-11A amplifier, an XRF-286 Amplifier, a SOLA 28 VDC 10 Amp power supply, a 13.8 VDC power supply and a Bird wattmeter with a 100 watt element. This equipment was used for the live demo that was operating for the three days during Hamvention

PC Electronics TC70 Series Host Transceiver used for T/R switching and amplification of HiDes HV-series Transmitter/Receivers

K0PFX TX/RX Interface with integrated amplifier for HiDes HV-Series transmitter/receivers

An inside look at Art's VersaTune-Express prototype DATV receiver

"Maintenance" style DVB-T Receiver-monitors on display

From Left to Right: Art WA8RMC, Rick KK4LW, Pete N8KKY, Live and in Digital Color, on the TV Monitor is Bill W8CWM, William WB8YIF, and the venerable N3BFZ

ATV Dinner attendees… This actually looks like a large number of ATVers, however, there is a mirror in the background. In attendance was KE0VR, N3BFZ, KC3AM, WA8RMC, KK4LW, K8FIX, K0PFX, and AH2AR (taking the photo in the background!)

2023 COLUMBUS HAMFEST

Electronics, Audio, Video and Computer Show

Saturday, August 5, 2023 8:00 am – 1:00 pm

(Proceeds are for the benefit of Aladdin Shriners Audio Unit. Payments are not deductible as charitable contributions)

Sponsored by: **The Aladdin Shrine Audio Unit – W8FEZ**

Talk-In W8FEZ 146.760 – PL 123.0

(Doors open at 6:00 am for vendor set-up)

SAME HUGE LOCATION! INDOOR TABLES, OUTDOOR SPACES

Located at: **ALADDIN SHRINE CENTER**
1801 Gateway Circle
Grove City, Ohio 43123

(Behind Tee Jaye's restaurant, off of Stringtown Road at I-71)

DOOR PRIZES! *Must be present to win*

FOOD AVAILABLE ON SITE!

USA ATV REPEATER DIRECTORY April 2023

NOTES:

1. All repeaters are NTSC, VUSB-TV, 6 MHz channel, unless otherwise noted. Some repeaters use non-standard lower sideband inputs VLSB to reduce interference with FM repeaters in upper portion of band. 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(s)	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 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 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/

Location	Call Sign	Output	Input(s)	Modes	Web Site & Contact for info
KANSAS					
Wichita	KA0TV	421.25	439.25	VUSB	k0wws@arrl.net
KENTUCKY					
Bowling Green	KY4TV	421.25 423.0 /2	439.25 1280 fm	VUSB FM DVB-T	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, LSB	VUSB	KC8LMI@hotmail.com
Grand Rapids	K8DMR	421.25	439.25	VUSB	ron_fredricks@att.net
Flushing	KC8KCG	1253.25	439.25 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 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 1280 dt	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 LSB	VLSB 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,
April 2023 – re-configured most listings, added 1280 for W8BI

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.

08/05/2023 - 2023 Columbus Hamfest

Location: Grove City, OH
Type: ARRL Hamfest
Sponsor: Aladdin Shrine Audio Unit
Website: http://www.columbushamfest.com

08/12/2023 - Cincinnati Hamfest℠

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

08/19/2023 - Portsmouth Radio Club Hamfest

Location: New Boston, OH
Type: ARRL Hamfest
Sponsor: Jett Fire, Shawnee Computer,
Website: http://www.portsmouthradioclub.org

08/20/2023 - WARA Tailgate Swap Meet

Location: Cortland, OH
Type: ARRL Hamfest
Sponsor: Warren Amateur Radio Association
Website: http://www.w8vtd.com/hamfest/

09/10/2023 - Findlay Hamfest

Location: Findlay, OH
Type: ARRL Hamfest
Sponsor: Findlay Radio Club
Website: http://findlayradioclub.org

09/24/2023 - Cleveland Hamfest

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

WEDNESDAY NITE ZOOM NET

Every Tuesday night @ 8:00PM WA8RMC **used to** host a net for ATV topic discussion. However, in order to consolidate the two nets, ATCO on Tue. and the DARA on Wed. we'd like to have only one net on Wednesday, same time at 8 PM. We'll rotate the net control host duty so you won't be bored with just me. All are invited as we get check-ins from all around the USA and sometimes from international participants. We normally have 12-20 check-ins.

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.

ATCO TREASURER REPORT - de N8NT

OPENING BALANCE (04/21/23)……	$ 6134.63
Receipts (dues)……...	$ 40.00
Additional dues……	$ 100.00
PayPal fee.…….…….….	$ (3.36)
Additional Spring event items……	$ (73.39)
Spring Event food……..	$ (750.46)
CLOSING BALANCE (07/25/23) ……	$ 5447.42

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, 10W FEC=7/8, Guard=1/32, Const=QPSK, FFT=2K, BW=2 MHz, PMT=4095, PCR=256, Vid=256, Aud=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 SR=3.125MS, FEC=3/4, PMT=32, Video=162, Teletext=304, PCR=133, Audio=88, Service =5004) **Two video channels on this output:** Channel 1 is fed from all receivers. Channel 2 is fed from 439.25 analog receiver.
	2397 MHz Mesh Net transceiver 600 mw output (channel 1 minus 2). ID is WR8ATV-2
	10.350 GHz: 1W continuous analog FM
Link transmitter:	446.350 MHz: 5W NBFM 5 kHz audio. This output used for control signals & to repeat 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 min.
	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 - Single slot rib cage horizontally polarized 3 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, Upper sideband. (Input here = output on all TV transmitters & also direct output 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, Vid=33, Aud=49 (In here=out on all Trans.)
	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 analog) Functions:	00* then 1 for Ch. 1	Select 439.25 analog /439 digital receiver (if video present on digital, it is selected. Otherwise,
	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 analog/439 digital rcvr. scan enable (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 July 2023

Call	Name	Address	City	St	Zip	
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	
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
KE8PN	James Easley	1507 Michigan Ave	Columbus	OH	43201-2636	
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
WA8RR	Richard Robbins	10483 Cambridge Place	Powell	OH	43065	
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
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.