ATCO NEWSLETTER

VOLUME 35 NUMBER 2 **April 2018**

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

ATCO SPOTLIGHT TOPIC

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

I WISH YOU WOULDN'T PUT YOUR TRIXIE ON CAMERA WHILE RUPERT IS IN MY SHACK--- HE'S FOGGING MY MONITOR!

ACTIVITIES ... from my Workbench

News flash! It's Newsletter publication time and I don't have anything to say…. intellectually that is. Let's see now, grass needs cutting…Nope, you're not interested in that; garage needs cleaning…No, not that either. How about the latest gossip in our neighborhood? Well, although juicy, I better leave that one alone too. Soooooooo…On to the ATV related stuff. Sorry guys!

Repeater wise, not too much happening but you may have noticed that we have a new ID screen now. It's mostly the same as before with a couple of new slides. More importantly, I replaced the Sandisk ID module with a "new" and improved one generously donated by Dale WB8CJW to hopefully prevent lock-ups. I say "new" but it's actually an older Sandisk model that doesn't require a re-start after losing power. I thought I had that covered with the existing unit by adding a battery backup circuit but somehow it occasionally still "goes out to pasture" and changes the sequence or just locks up requiring another trip downtown to reset. I feel it was RF interference related. It's too early to tell if the new unit is any better but it's running OK now for a month or so with no issues.

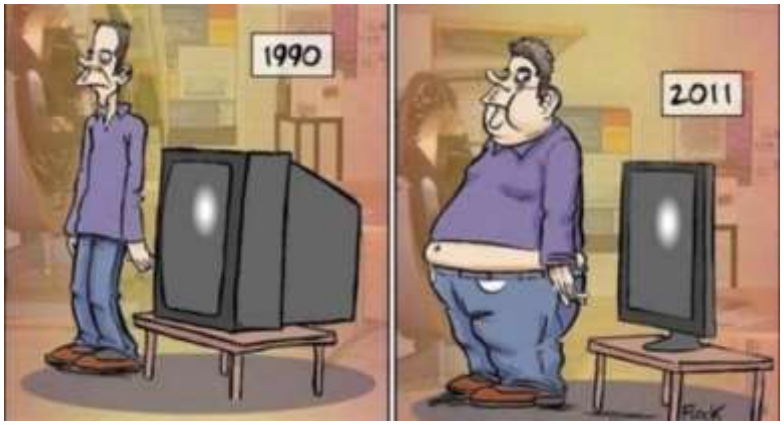
I REALLY need to schedule a repeater trip to replace the 427 MHz Tx slot antenna. It's been operational since we first built the repeater about 1994. Now the Mylar radome is completely off and subject to rain. I'm sure you've noticed the signal reduction during rain activity. I need to characterize the radiation pattern of the Lindsay antenna then replace the Tx slot with the Lindsay while I rebuild the Tx slot. When the Tx slot is rebuilt I'll replace the 439 MHz Rx antenna with it and rebuild the Rx slot. Then I'll replace the Lindsay with the rebuilt Rx slot (unless the Lindsay is better than the slot). Testing will determine that. Did you follow that! Great, now moving on.

Next, I plan to pay more attention to the MESH installation at the repeater. I have to run a control cable to the top-most MESH unit so I can add a computer interface. That could eliminate the need for interface equipment at W8RUT's place. That will streamline the ability to control the repeater from a remote location and possibly replace the bulletin board at Dale's QTH. Dale, we would still need your help to compose the material.

Be sure to attend the Hamvention ATV Forum in room 2 at 10:45AM on Saturday and stop by the ATN booth at numbers 6101 and 6102, the same place as last year, in the tent on the end. We will have a 25-foot mast with a 70cm antenna on top pointing toward the DARA ATV repeater.

Join us at the Spring Event on May 6 for more interesting subjects then on to Hamvention. I'll have some MiniTiouner DATV DVB-S receive modules for sale if anyone wants one. Price is $75. The sensitivity is better than any commercial set top box and you get some great free signal diagnostic software to use with it. It displays the constellation and gives real time signal strength readings so you can accurately position your antenna.

That's about it for now.
…WA8RMC



HAMVENTION UPDATE

The Anticipated New Building Won't Be Ready for Hamvention 2018, but Flea Market will Expand.

Due to circumstances beyond their control, ® 2018 organizers are reluctantly walking back an earlier announcement that a new building would be available for this year's event at the Greene County Fairgrounds and Expo Center in Xenia, Ohio.

"Despite all of the best efforts and intentions by Greene County, the Greene County Agricultural Society, and Hamvention, we have learned the anticipated new building will not be constructed in time for Hamvention 2018," Hamvention General Chair Ron Cramer, KD8ENJ, said. "The prefab sections bid on and architecturally required are currently backlogged. We expect construction to be delayed until after our show and the Greene County Fair." Cramer said construction should be completed this year in time for Hamvention 2019. "We regret this; however, it is well out of our control," Cramer said.

On the plus side, he continued, Hamvention 2018 will have more room for inside exhibits, with the addition of the vacated Furniture Building, and the Flea Market will gain new space as well.

"After consultation with professionals, we are in the process of solving the mud issue in the Flea Market area," Cramer said. They are installing asphalt in the “mud areas” between flea market setups. We anticipate work to start as soon as weather allows. We are rearranging the soccer field parking to eliminate use of the low areas where we had problems last year."

A revised exit plan and additional off-site parking are also in the works, along with easy-to-use maps to help visitors navigate. Parking and shuttles will be free. Talk-in also has new equipment and a taller tower to extend its reach.

"There are many new ideas we are working on to make your stay with us more enjoyable," Cramer added. "Keep watching our website for updates."

-- Thanks to Hamvention General Chair Ron Cramer, KD8ENJ

W8URI to AH2AR via ATCO REPEATER

01/27/18
W8URI's A5 signal in Mt Gilead Ohio passing through the ATCO repeater in Columbus, being received by AH2AR in Vandalia Ohio on the DVB-T (UT-100 dongle)

NEW DIGITAL TV STANDARD IS APPROVED

OK Guys, here it comes, ready or not. Don't have a clue what this is??? Read on! It's our new broadcast video standard due to be rolled out within the next couple of years. Remember the switch from analog to digital TV? Well, we're just about to have an entirely new standard but this time the government WILL NOT pay for the needed converter boxes. Ready to buy a new TV? ***Better wait because existing TV's will not be compatible with the new standard.***

(From Microwave and RF today On-Line magazine FEBRUARY 20, 2018 by Barry Manz | Feb 16, 2018. See magazine for complete article.)

Over-the-Air TV Gets a Makeover

ATSC 3.0 isn't a tweak: It's a complete transformation that combines over-the-air content up to 4K UHD with streaming content from broadband, along with high-def audio, interactive features, and lots more.

The first Advanced Television Standards Committee (ATSC) standard for over-the-air (OTA) digital television broadcast (ATSC 1.0) was approved by the FCC in 1996. That was seven years after the World Wide Web was created, when only 0.04% of the world's population had internet access and cellular technology was in its second generation. It's obviously time for a change, and the new ATSC 3.0 provides just that—and then some. In fact, ATSC 3.0 is so much more advanced and comprehensive than its predecessor, it effectively makes OTA a true competitor to cable, fiber, satellite, and internet streaming for the first time.

With the vast majority of people receiving programming via cable, fiber, or subscription video-on-demand (SVOD) services like Netflix, Amazon, and Hulu, OTA probably seems archaic. However, the usage of OTA has actually increased about 4% per year in the last two years, mostly the result of cord-cutters supplementing their SVOD service with local content. The remainder of OTA users are mostly either people who cannot afford broadband or cable, are happy with they get over the air, or simply don't watch TV. ATSC 3.0 should increase penetration even further, as it has some unique benefits.

Finalization of ATSC 3.0 effectively relegates ATSC 2.0 to telecom history—even Wikipedia devotes a paltry 73 words to the topic. The reason for the leapfrog from "1.0" to "3.0" is that even though ATSC 2.0 exists as a standard with full documentation, by the time it was finalized it was clear to the ATSC that additional capabilities would be required to keep OTA relevant in the future. Most of the features within ATSC 2.0 were "ported over" to ATSC 3.0, which is more comprehensive, requiring 20 standards and more than 1,000 pages of documentation.

ATSC 3.0 should serve the broadcast industry for a very long time, as it includes features previously available only via cable, fiber, or internet streaming, as well as some that aren't available from any other source. To provide such features, while also allowing the standard to accommodate enhancements in the future, ATSC 3.0 (unlike ATSC 2.0) is not backward-compatible with current ATSC 1.0 tuners.

To receive OTA channels, consumers will need new TVs, dedicated streaming boxes, external tuners, or a new type of appliance called a home gateway. The need to replace existing equipment was a major concern as the standard was being developed. Thus, last November, the FCC ordered broadcasters choosing to begin voluntary ATSC 3.0 transmission to simulcast ATSC 1.0 signals so that OTA viewers could retain service. The ATSC 1.0 simulcasts must offer similar programming to ATSC 3.0 channels for five years.

Based on the current pace of ATSC 3.0 rollouts, ATSC 3.0-enabled equipment, from TVs to home gateways and other ATSC 3.0 enablers, will be available a lot sooner than five years. In fact, at the Consumer Electronics Show (CES) in January—where with much fanfare the "ribbon cutting" for ATSC 3.0 formally took place—ATSC 3.0-capable TVs were announced by almost every manufacturer.

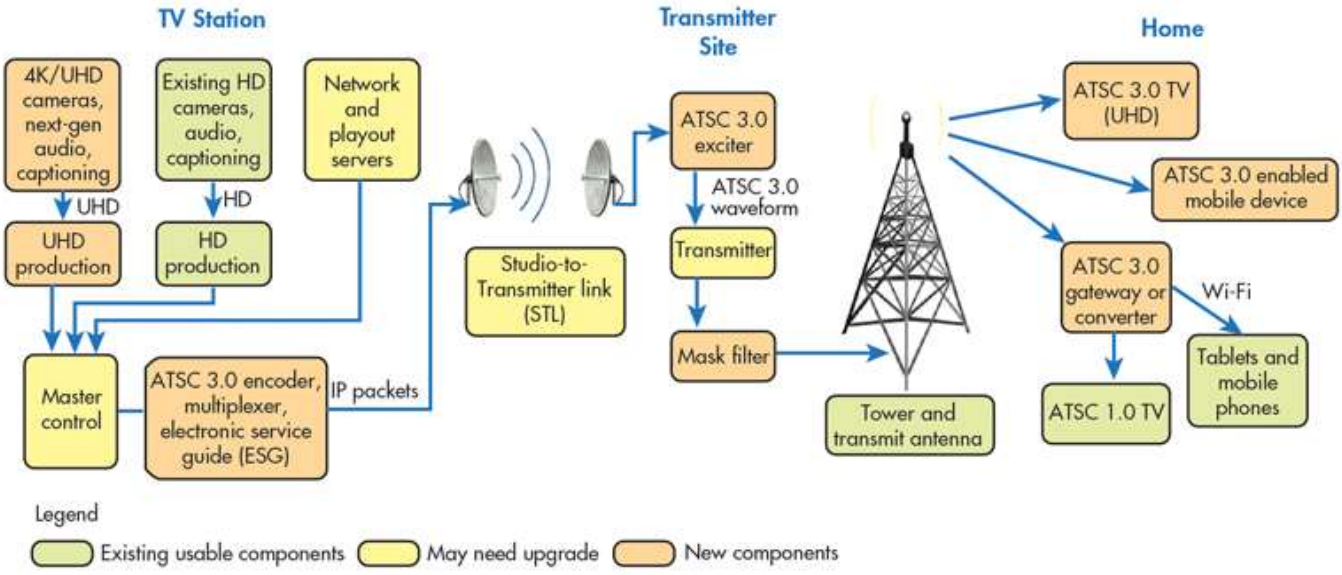
The drive to accelerate the pace was driven primarily by the South Korean government and its major manufacturers. LG Electronics introduced the world's first ATSC 3.0-capable 4K TV for the Korean market early last year with Samsung following shortly thereafter. The service is already available in Seoul and some other areas of the country from its leading terrestrial broadcasters, and the entire country should be covered by 2021. The 2018 Winter Olympics in PyeongChang are showcasing the country's accomplishments, as multiple events were broadcast OTA in 4K.

In the U.S., the ATSC 3.0 rollout will take longer. However, it probably will not take as long as projected, as it is not the complete paradigm shift that 2009's analog-to-digital transition was. Sinclair Broadcast Group, the largest TV station operator in the U.S., and Korea's SK Telecom have signed a pact to build an ATSC 3.0 platform before this July.

The platform, called NG TV platform (for next generation), will deliver 4K content, customized IP-based interactive services, personalized and location-based advertising, fixed and mobile broadcast service, and emergency alerting. Sinclair's deployments and others should help speed the release of 4K content, which is currently mostly the domain of Blu-ray players, satellite providers DIRECTV and Dish, as well as Netflix, Amazon, and Comcast.

What's Inside ATSC 3.0

ATSC 3.0 is an IP-based technology that combines OTA signals (i.e., received from an antenna) with supplementary content delivered via broadband, thereby making it a hybrid system *(Fig. 1)*. The result is a combination of the interactive capabilities of streaming with the low cost of "one-to-many" OTA broadcast and the high image and audio quality of cable or satellite TV.



1. The ATSC 3.0 broadcast system as envisioned by the NAB shows the ability to use some existing broadcast equipment along with the new equipment that will be required. (Source: NAB)

The ability to integrate internet-delivered content with that from OTA paves the way for finely-targeted advertising and two-way interactive services, as well as authenticated, tiered broadcast services. ATSC 3.0 supports legacy SD video resolutions up to 720 × 480, interlaced HD video resolutions up to 1920 × 1,080, and progressive-scan video

with resolution up to 3,840 × 2,160 and frame rates up to 120 fps, as well as digital watermarking of the audio signal and video signal.

In addition, ATSC 3.0 enables the long-awaited overhaul of the Emergency Alert System (EAS) via an Advanced Warning and Response Network (AWARN). Rather than a simple alert, it can deliver photos, surveillance video, storm tracks, evacuation routes, shelter instructions, hospital wait times, power outage locations, and other information. It can also "wake up" devices that are not powered on to deliver alerts.

Although TVs will soon be ATSC 3.0-compatible, the home gateway is also appealing. It performs multiple functions, combining OTA and internet-delivered content and sending it to a Wi-Fi router to stream devices throughout the home. As indoor reception is projected to be much better than with ATSC 1.0, many areas won't require an outdoor antenna. Instead, the antenna will be part of the home gateway. Greater signal strength is achieved by adaptable frequency capability that lets signals travel further and penetrate deeper into buildings and other RF-constrained places.

LG Electronics has been showing such a device called an "ATSC 3.0 Smart Antenna" at CES for the last three years *(Fig. 2)*. The module employs an electronically-steerable directional antenna and is very small, allowing it to be placed almost anywhere in a home. It integrates an ATSC 3.0 tuner-demodulator system-on-a-chip (SoC) and ATSC 1.0 analog tuner for backward compatibility. The National Association of Broadcasters (NAB) has developed its own gateway architecture through its PILOT initiative that has similar capabilities.

Key Technologies

When the ATSC 1.0 standard was developed, it was based on the analog TV formula in which every channel was allocated 6 MHz of spectrum. This was enough bandwidth to deliver digital video at 19.39 Mb/s and to accommodate two HDTV and three SDTV channels. Now, in this same 6-MHz channel, ATSC 3.0 uses a more spectrally-efficient H.265 HEVC, (High Efficiency Video Coding) video compression technique rather than MPEG-2 used in ATSC 1.0. This makes it possible to transmit more video content with less data—it delivers 4K video in half the bandwidth of ATSC 1.0.

ATSC 3.0 also has better audio compression via Dolby AC-4 rather than the current Dolby AC-3 and supports viewing on ATSC-3.0-capable mobile devices as well as enhanced video capabilities from 3D to high dynamic range (HDR), high frame rate (HFR), and wide color gamut (WCG) technology currently available only via wired and satellite solutions. ATSC 3.0's mobile television support is enabled by its more robust signals, and the broadcast and automotive industries are working with developers to create an alternative to cellular-based delivery of everything from telematics and infotainment to diagnostics and emergency alerting *(Fig. 3)*.

ATV BANDPASS FILTER QUESTION

Hello everyone,
I am working with a 25-year-old ICM VSB filter on 421.250. All the tuning screws / nuts are rusted together. I have replaced them with Stainless Steel screws / nuts. Should I expect to see a difference in filter performance using Stainless vs steel hardware?

The environment it was in for many years was a very damp, humid hence the rusting. I have about a 2.9 dB loss which seems a little excessive. I have another similar filter with original hardware and it has about 1.9 dB loss.
…Dave KC3AM

Mike Collis WA6SVT responds:
You should not see any significant loss difference between regular steel and stainless. If the old hardware was Invar type metal, the difference would be in tuning shift over large temperature changes. If I recall, the ICM filters were of Interdigital design using slightly less than 1/4 wave resonators with the screws used to add slight capacitance to fine tune the resonators. That area is the low current side of the resonators so the steel would not be an issue with loss.

You mentioned the filter was in a damp environment for 25 years, I would suspect the real issue is oxidized resonators. I do not recall if those were copper or silver-plated copper, usually some silver oxidation would not significantly change the loss but copper oxidation would be significant. I would suggest you take the filter apart, take a photo of the inside for reference and also the resonator length (the interdigital design input and output resonators may be different diameter and length than the Hi Q resonators (as in the Spectrum International filters).

I would take some silver polish or Tarn-X and polish each resonator removed. I would suggest wiping them down with denatured alcohol to remove any residue and oil from your fingers (Wash your hands prior to the alcohol or use clean white gloves for handling). This will restore the Q and lower the resonator loss. Check to make sure the connection to the aluminum chassis is clean as this is the high current point and critical for proper operation.

Pull the input and output N connectors and clean them up too and the aluminum housing inside if dirty or corroded. Re-assemble with very clean hands or use gloves. It is best to tune the filter with a network analyzer or at minimum a spectrum analyzer with tracking generator.

I find it best to have about 10 dB of padding dialed (on the test gear) in or added on each side of the filter to properly tune in a 50-ohm system. Tune starting at center channel frequency using the center resonator (middle of filter) then the next resonator each side of the center then last the resonators next to the input and output. You want a nearly flat response 6 MHz wide with less loss in the center and about 1/4 to 1/2 db down at the knees. If using the network analyzer or if you have a directional coupler to use with the spectrum analyzer/tracking filter, look at the return loss (VSWR) curve. You should have about 20 dB return loss or better in the center and 15 dB next to the knees. There should be less than 3 dB ripple in return loss over the center 5 to 5.5 MHz of the bandpass.

You can touch up the tuning to optimize the return loss but stay away from sharp dips, tune for about 15 to 25 dB flat return loss. Having said that, the return loss will not be as flat as the bandpass. When done look at the bandpass and you may gain 1/4 to 1/2 dB in pass band loss reduction because you optimized the return loss.

If you need help, you are welcome to send the filter to me for tuning, I have a network analyzer. You should be able to get the loss down to 1.5 dB on that filter. The skirts are not as sharp as a new DCI 8 pole filter but usable for analog or DVB-T ATV.
…73, Mike WA6SVT

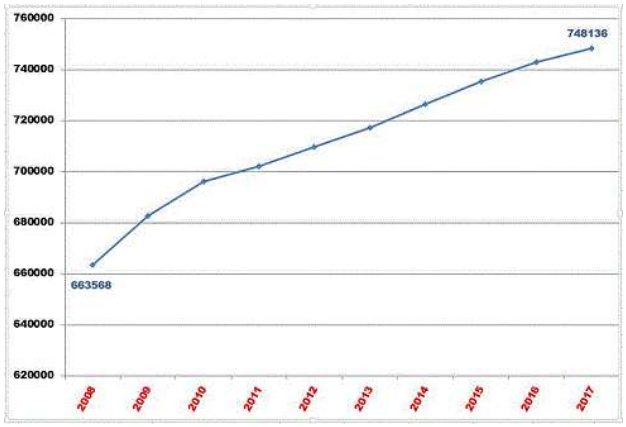
The following is my "2 cents" worth:

I concur. Well said Mike!
I tried to use brass screws once hoping the lower resistance would improve things. (At that time, I forgot it was the low current point and resistance wasn't an issue). It seemed to help a little but not worth the effort. The largest issue if you use brass is the dissimilar metals. Assuming the enclosure is aluminum, corrosion with brass and aluminum after time will be a major problem so it should be avoided. Stainless is the best alternative.

The largest single improvement is to make sure the connection between the resonator and aluminum housing is clean and smooth. Be sure the connection screws are very tight. I used some silver paint to coat the point where the resonators contact the housing. That bought me about 0.5 dB less loss. Also, you will find that the tightness of the tuning screws helps too while you're tuning. I know it's difficult to tune with tight screws but as you get closer to optimum setting the tightness becomes important. Hex head bolts would be better than screw heads. Adjust them moderately snug and tighten more as you get close. Make sure they are real tight after you finish. Hope my additional comments help.
…Art Towslee WA8RMC

HAM LICENSE REVIEW

From ARRL Letter April 5, 2018



More than 30,000 New Ham Licensees and 7,000 Amateur Radio Exam Sessions in 2017. (*However, how many existing Hams have died in this same period???? It really makes a difference in the graph…WA8RMC)*

For the fourth year in a row, more than 30,000 new licensees joined the Amateur Radio ranks, and ARRL Volunteer Examiner Coordinators (VEC) conducted more than 7,000 Amateur Radio exam sessions, serving some 35,350 candidates for a new or upgraded license. At the end of December 2017, the US Amateur Radio population stood at 748,136.

The Amateur Radio population has grown steadily over the past decade.

At nearly 378,000, Technician licensees represented the largest segment, with General (174,206), Amateur Extra (145,034), Advanced (41,938), and Novice (9,056) trailing. Licensee numbers showed continued growth across all classes except Advanced and Novice, which the FCC no longer issues; those numbers continue to drop.

"I'm hopeful that the number of new licensees will be more than 30,000 at the end of this year," ARRL VEC Manager Maria Somma, AB1FM, said. "I would love to see this trend continue!"

New Licenses 2008 - 2017

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
28,066	30,144	27,528	24,072	27,082	28,886	33,241	32,077	32,552	32,196

Despite the optimistic influx of 32,196 newcomers last year, the net growth of 5,349 -- about 0.72% over December 2016 -- reflects some 27,000 expired or cancelled licenses in the FCC database over the past year. In making the case for changes to the entry-level license, the ARRL Board's Entry-Level License Committee referred to "the large number of Baby Boomers (roughly born 1945 - 65) [who] will soon be aging off the licensee rolls." The committee predicted the likelihood of "a significant decline in the number of hams, unless we take steps to reverse it." Read more.

NEW 23CM ATV AMPLIFIER AT DARA REPEATER

I have upgraded the DARA W8BI 23cm ATV repeater site equipment to a higher output power level (100 watts output on 1258 MHz). Attached are the "before" and "after photos" showing the modifications/additions to the amplifier/transmitter cabinet, less covers and top-fan.

-- The top photo is the amplifier/transmitter cabinet internals prior to the upgrade.

-- The bottom photo is after the installation of the new intermediate amplifier stage and the new Dual XRF-286 amplifier (W6PQL product). Several audio lines are not hooked up inside the cabinet in this second photo.

Due to heavy rains and some water intrusion on the floor in the repeater room (imagine that!), I had to hold off on the installation, but should hopefully have the cabinet in place in the rack soon.

The particular W6PQL 23cm amplifier being used in the cabinet is capable of 180 watts, but I have lowered the RF output to the 100-watt level.

There are three fans that are used on the amplifier. One on the right side of the amplifier, one fan to blow the air out of the cabinet below the amplifier heatsink, and a fan which is bolted on the lid which is not in the photo since the lid is removed to view the amplifier.

Notice that the RF output cable that was heating in this infrared image. When I found that issue prior to buttoning up the cabinet, I changed that "new-old-stock" cable out and replaced it with conformable semi-rigid miniature hardline, that now runs cool.
Cheers,

…Dave P AH2AR

W8URI CREATES "NEW" COMMUNICATION DEVICE

OK Bill! Nice, but it isn't pushing the DATV frontier very much. Upon further inspection, I think I see a more modern transformer used in the photo below. I guess that blows the "antique" part, doesn't it?

Seriously, it DOES look like really good work. We appreciate it Bill, even though it doesn't fit the ATV subject! WA8RMC

Here is a view of the completed radio. This is not your grandfathers regenerative radio. Interstage transformer coupled audio amplifier section using 6SN7 and a #45 final. Really good audio, all 1.25 watts of it. I connected my 1946 FM Pilot tuner to the audio section. Sounds really good. Regen receiver using 76 tube with a 6SN7 and 45 as audio amplifier. RF section uses bare copper wire. Audio section uses antique style cloth covered wire.

…73 All W8URI

HAMVENTION ATV MAST

FYI Guys!!!!!!
Here is the mast we will be using this year at Hamvention for ATV transmissions to the DARA repeater. It will be located outside the ATN booth located at booths 6101 and 6102.

It's called a "Hurry-Up" Mast, made by Will-Burt Company in Orrville, Ohio. It is 30 feet high when fully extended with air pressure. They will use LMR-400 Ultraflex coax to a 14.5 dBd gain 70cm antenna.

(*Now we're looking for volunteers with good windpipes to help extend it).*

…Dave Peleaz 3/16/2018

KEN'S KORNER

Integrating Mesh Video with ATV, ATCO-Style *Ken Morris W8RUT*

(Reprinted by permission from W8RUT and ATVQ Magazine)

[This article is one in a series of increasingly advanced ATVQ Mesh Video articles. Refer to Spring 2017 and Summer 2017 ATVQ issues or to the www.aredn.org AREDN website to learn Mesh Networking basics. Our Practical Guide to Mesh Video, Part 2 article will appear in the next ATVQ issue. This article is an excellent lead in to that one. - Rod Fritz, Editor]

Integrating Mesh Video with ATV, ATCO Style is a case study of how the ATCO ATV Club in Ohio combined Mesh Networking Video (Mesh Video) with their conventional ATV repeaters (Analog and Digital Television). Each video mode has its advantages and integrating them together yields the best of all worlds!

This is what you'll learn in this article...

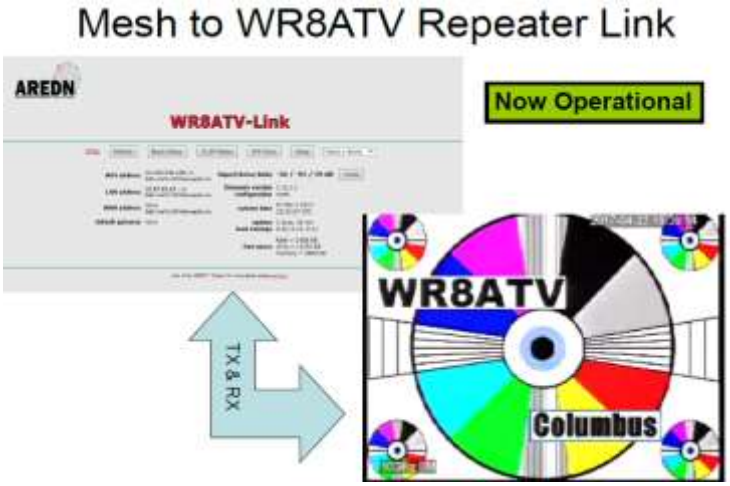
- **A Brief History of ATV and Mesh Video at ATCO**
- **Sending ATV Repeater Video and Viewing it on the Mesh**
    1. *Hardware Connections to Send ATV Repeater Video and Bulletin Board Video to the Mesh*
    2. *How to View the ATV Repeater Video and Bulletin Board Video on the Mesh*
- **Sending Mesh Video and Viewing it on the ATV Repeater**
    1. *Hardware Connections and Overview to Send Mesh Video to the ATV Repeater*
    2. *How to Set Up Your Shack to Send Mesh Video to the ATV Repeater*
    3. *How to Use TightVNC to Remotely Select the Video Source and Transmit on ATV*
    4. *How to Watch Mesh Video on the ATV Repeater and Control Mesh Video Sources*

A Brief History of ATV and Mesh Video at ATCO

In Ohio, our ATCO ATV club members have a great interest in Mesh Networking Video as well as Analog and Digital ATV. It seems only logical that we would link the technologies together. Since April of 2017, we have been able to send our mesh video to the WR8ATV repeater and send three channels of ATV repeater video and an ATV/Mesh Bulletin Board to the mesh system.

Mesh Video to ATV Two-way Link Since April 2017

About 3 years ago during an ATV Saturday breakfast, the table topic was how we can attract more and younger members to our club. WB8DZW mentioned that adding Mesh Networking (Mesh) to our system might be the ticket to attract younger members. The problem was, none of us knew anything about Mesh! Mesh on Amateur Radio at the time was still in its infancy, using repurposed Linksys WRT54G routers. Naturally, we weren't going to let not knowing anything about the technology stop us. How hard could it be?

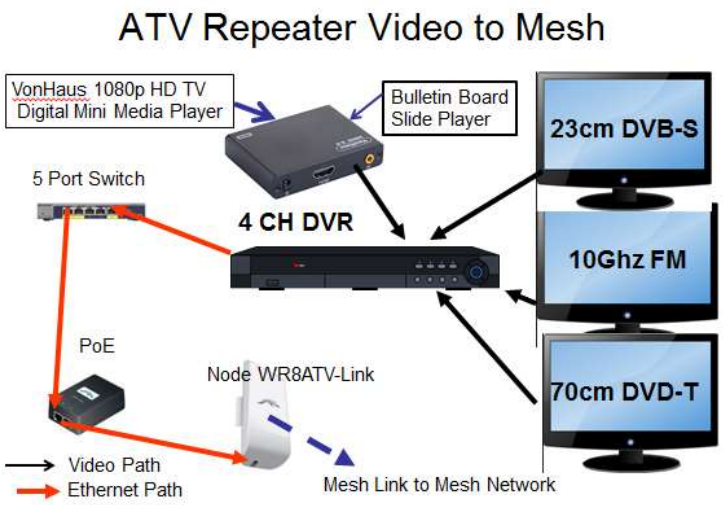


Fast forward 2+ years... A two-way link was established between these video-centric modes of ham radio: Amateur Television and Mesh Video. **I believe it was the first permanent link of two amateur radio modes in the world.**

Sending ATV Repeater Video and Viewing it on the Mesh

1. Hardware Connections to Send ATV Repeater Video and Bulletin Board Video to the Mesh

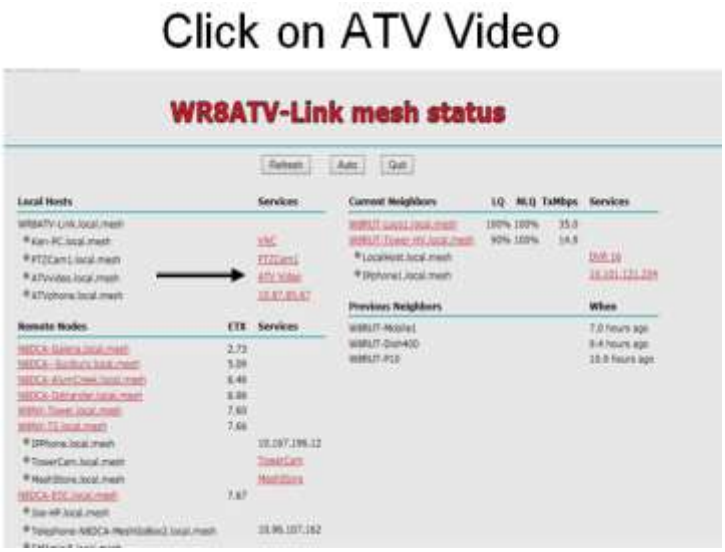
The following picture shows that a conventional 4-channel DVR is the heart of the system to receive ATV repeater video (on the right side) and deliver it to the Mesh (bottom center). The DVR has four inputs, three for ATV receiver audio and video: 423 MHz DVB-T, 1268 MHz DVB-S and 10.350 GHz FM ATV, and a fourth input for a VonHaus Digital Mini Media Player (top center) running an ATCO/Mesh Bulletin Board. The DVR audio and video outputs are sent to monitors for local viewing. The DVR Ethernet port connects the selected digitized video stream to a Ubiquiti mesh node called **WR8ATV-Link.** The equipment is at my QTH. It could be at the repeater (and it would simply the installation), but for now, it's at my QTH connected on 3 bands.



Sending ATV Repeater Outputs to the Mesh

2. How to View the ATV Repeater Video and Bulletin Board Video on the Mesh

In the examples in this article, we're pretending you're **W8RUT**. Your node names begin with your callsign to function as a legal ID. Your objective is to open the **ATV Video** service on the **WR8ATV-Link** node to see the video you select. Here we go...



Connect a PC to your home mesh node, in this case it's called **W8RUT-Loco1.local.mesh**. Browse to **localnode:8080** and click on your node's **Mesh Status** button. On your node's **Mesh Status** screen, look for the **WR8ATV-Link** node and click on it so it becomes the Local Host. The **WR8ATV-Link** node **Mesh Status** screen will look like the picture below.

The WR8ATV-Link Mesh Status Screen

Note that the **LQ** and **NLQ** percentage values for **W8RUT-Loco1.local.mesh** are both 100%. Try to ensure that your node is connected to the **WR8ATV-Link** node with excellent signal strength, as close to 100% **LQ/NLQ** as possible (70-80% ought to work). Lower values indicate weak connections that will degrade the response speed of the video.

Pretend for a moment that you are DCA. Your node is a "Remote Node" (**DCA-Galena.local.mesh**) that connects to **WR8ATV-Link** through a "Current Neighbor" node **(W8RUT-Loco1.local.mesh).** Try to ensure that the **ETX** value on your node is 5.0 or less although stations have been successful with higher ETX values. Higher values will degrade the response time of the video.

Note the **Services** for **WR8ATV-Link** listed near the top of the left column. **ATV Video** is your target. Click on the **ATV Video** service and you should see four panels of video on your computer, three from ATV repeaters and one from the ATCO/Mesh Bulletin Board. Click on one of the panels to display it full screen. If the panels don't display as in the following picture, ensure that the proper Active X control is installed on your PC. All IE browsers I have used work, the key is the active X with a proper (lower) security level. Most of the DVR & IP Camera Active X have worked for me. Down load this one: http://xmeye.net as an example.

Click on a Picture for a Full Screen View

Congratulations, you just sent live ATV repeater video to your mesh node! Now, try going the other way...

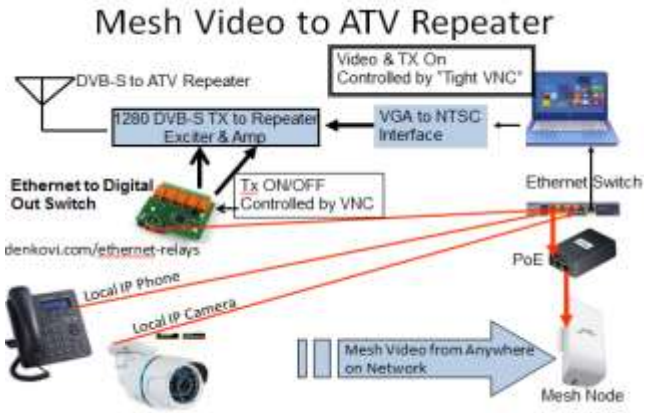
Sending Mesh Video and Viewing it on the ATV Repeater

1. Hardware Connections and Overview to Send Mesh Video to the ATV Repeater

The following picture shows equipment at the ATV repeater site that selects one of three video sources and sends it to the 1280 MHz DVB-S ATV repeater transmitter. At this time since all of the equipment is at my QTH, I transmit it on 1280 MHz DVB-S to the 1280 MHz Rx at the repeater site (some 20 miles away). Once the 1280MHz Rx sees the video, it is then re-transmitted by the repeater on all bands and modes (400MHz VSB & DVB-T, 1200MHz- FM & DVB-S & 10Ghz FM). (It would be simpler to have equipment at the repeater site as the 1280 Tx, amp and antenna at my QTH would be eliminated from the system. Plans are to change that. We do our ATCO Bulletin Board the same way).

Sending Mesh Video to the ATV Repeater Input

An IP (could be, but it's not) phone, an IP camera and Mesh Video from the mesh network up load site at W8RUT's QTH are connected to an Ethernet switch. The mesh video passes from the external mesh network (like your home mesh node or someone else's), through the ATV repeater mesh node and a Power-Over-Ethernet (POE) adapter to the Ethernet switch. A CAT5 cable (with all three source video streams on it) connects to the Ethernet port on the ATV repeater laptop.



An ATV operator (typically from a home PC) uses a TightVNC app to remotely connect to the ATV repeater laptop and selects video source streams from anywhere on the network, including the stations own local camera by selecting that video source from the Mesh network. The laptop converts the selected video stream to VGA video. That video is connected through a VGA to NTSC converter to the analog NTSC input on the DVB-S local 1280 MHz local Transmitter to the repeater site.-The ATV operator then remotely instructs an Ethernet Relay Card (digital switch) to activate PTT on the transmitter and amplifier simultaneously by closing two relays. The digital switch used is a $93 5-Channel Ethernet Relay Card from DENKOVI (https://denkovi.com). The transmitter digitizes the NTSC video and transmits DVB-S through the exciter and amplifier so it can be received by area hams.

2. How to Set Up Your Shack to Send Mesh Video to the ATV Repeater

Ensure that you have a home mesh node that is connected directly (or through another mesh node) to the **WR8ATV-Link** node. As stated earlier, ensure the connection has LQ/NLQ greater than 80% (or ETX less than 5.0) for best results. (For extra credit, try using the camera on your smart phone and connect to the mesh through an Ubiquiti Air Gateway.) I have not used my I-phone in this way, but it should work. Connect your home PC to your mesh node, browse to http://**localnode.local.mesh:8080** (or http:// localnode:8080) and click on your node's **Mesh Status** button.

Connect an IP Camera to your node. Set it up as a mesh **service** with a meaningful name like **W8RUT Tower Cam**, **W8RUT Shack Cam**, etc. (the callsign prefix avoids network confusion in case other nodes have similar names). The **service** installation may not be very intuitive so try to track down an experienced friend to help or refer to www.aredn.org.

If you don't have an IP Camera, try setting up a different video source like your laptop camera, a video phone, a PTZ webcam or even an analog video camera through a capture device.

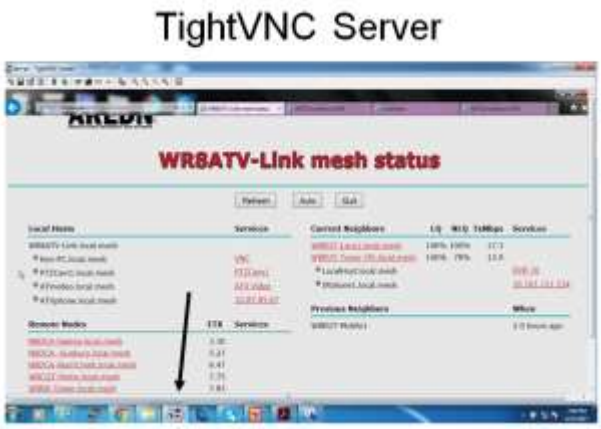
On your home PC, ensure that TightVNC is installed. It's a free program that can be downloaded from www.tightvnc.com. This software allows you to use your home PC to remote control the transmit laptop at the ATV repeater site.

3. How to Use TightVNC to Remotely Select the Video Source and Transmit on ATV
First, an overview... In this section, you'll use your home PC to remotely control the ATV Repeater laptop to select a video source. Then, you'll instruct the DENKOVI relay board to turn on the ATV repeater transmitter & amp. The video sources are listed in the hardware diagram above and in the mesh status diagram below as...

- The **Local IP Phone** device, which is the **10.87.85.67** mesh service This not a video phone, only used to coordinate voice with other Mesh nodes
- The **Local IP Camera** device, which is the **PTZCam1** mesh service
- The **Mesh Video from Anywhere on the Network** device which is a **ATV Video** mesh service. The 4 panel video source is INCOMING video, it will have its own tab on the IE Browser on your local PC. TightVNC is working outside your Browser. The mostly full screen (depending on your resizing) you see is the remote PC screen. You will see two lines of program selection at the bottom of your screen with TightVNC running, one from the remote PC and (the most bottom line) your local PC.

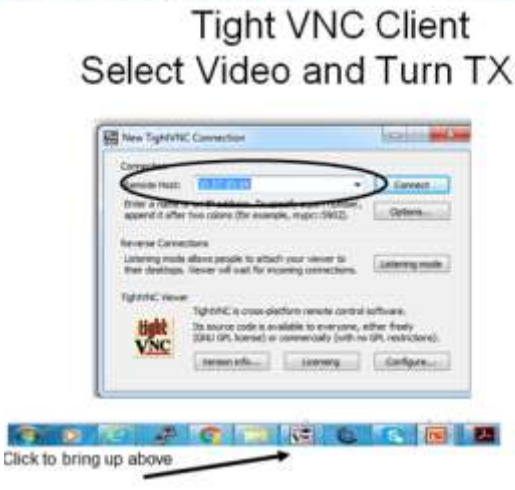
Now, the procedural details... Run TightVNC by clicking the VNC icon at the bottom of the screen shown below. **NOTE:** It's easy to be confused about which task bar is at the bottom of the screen, your home PC or the ATV repeater PC. Be sure to shrink and move the windows around so you know which is which. Otherwise, one may obscure the other.

On Your Home PC, View the Mesh & Run the TightVNC Program
On the **TightVNC Viewer** window, return to the browser and display the **WR8ATV-Link mesh status** page, as shown below. From here you can select any video service that appears on the mesh network, including your own. That video will be sent to the NTSC input on the ATV Repeater transmitter, awaiting push-to-talk.



Example: Under W8RUT-Tower, Click DVR 16 Service
Refer to the picture below and enter the IP Address of the ATV Repeater PC (like **10.87.85.66**) in the **Connection - Remote Host** box. Click **Connect** and, if required, enter the password.

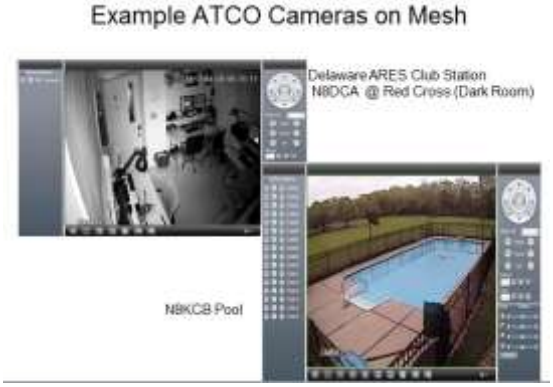
Enter the WR8ATV Link Repeater PC's Address & Click Connect You will likely see the **Denkovi Relay Manager** (relay control) screen below when you connect your home PC via TightVNC to the remote ATV repeater laptop (**WR8ATV-Link**). If the relay control screen doesn't display, click the DENKOVI icon on the remote ATV repeater PC task bar to bring up the relay control page.



Click the ALL ON Button
Click the **ALL ON** button to activate two remote control relays on the DENKOVI circuit board and turn on the ATV transmitter and amplifier. The **ALL OFF** button turns them off. The software will automatically turn the relays off after 10 minutes if you don't turn them off first.

Congratulations, you just sent mesh video through the ATV repeater! Here's how to watch it...

3. How to Watch Mesh Video on the ATV Repeater and Control Mesh Video Sources
Go back to your **home PC** browser and click on the **ATV Video** service under the **WR8ATV-Link** Local Host in the left column. Your computer monitor will display what is transmitting on the ATV Repeater. Of course, you can also look at a TV connected to an ATV repeater receiver. During transmit, you can watch the 4 panel RX screens, the 1280 DVB-S screen will be blank while the TX is on (the TX is blocking the RX out). If all equipment was located at the ATV repeater site, this would not happen.

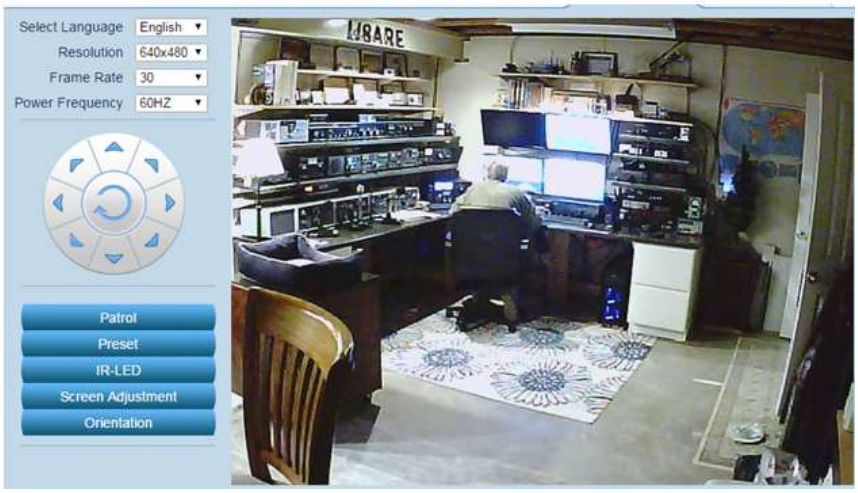


The screen captures below are examples of Mesh video that you might see on the ATV repeater output...

W8ARE
Typical ATV Repeater Pictures from Mesh Video Cameras
The video camera used in the above examples can be controlled over the Mesh by using your **home PC**. Manipulate the controls on the left side of the screen to select different cameras. The video can display full screen if you click the left-most icon on the bottom of the screen (that looks like an **X**) in the top pictures above. With some cameras, you can manipulate pan, tilt, zoom and other parameters using the controls on the right. The bottom picture is a little different but can be controlled in a similar way.

When you are finished transmitting video, use your **home PC** to instruct the **ATV repeater laptop** to display the **relay control** screen. Then, select **ALL OFF**. If you forget a 10-minute timer will automatically turn off the relays.

By integrating ATV and Mesh Video, we have made ATV more interesting, brought new and younger people into our group and expanded our video sources. If you're in the ATCO area in Ohio, give this feature a try.
…73, Ken Morris W8RUT



DAYTON HAMVENTION DETAILS

Below is the Fast Scan ATV forum Hamvention schedule for this year. We have been assigned room 2 from 10:45 to 11:45 on Saturday.

The presenter list and schedule is as follows:

Time	Presenter	Call	Topics
10:45 - 10:50	Art Towslee	WA8RMC	Welcome statement and general comments.
10:50 - 11:00	Gordon West	WB6NOA	Warm up ATV Forum with fun audio sounds, couple of one liners and preview of all excitement Mike, WA6SVT, and team are doing for digital ATV on the West coast.
11:00 -11:20	Mel Whitten	K0PFX	Selecting, Buying and Building a Hi-Def Digital ATV Station. With the growing availability of Digital ATV gear, Mel will help determine what is needed to assemble your first station or add capability to an existing one. The latest Modulators, Demodulators, Cameras, Amplifiers, and other video devices will be explored in a fast moving and informative presentation on this ever changing technology.
11:20 - 11:40	Rod Fritz	WB9KMO	Introduction to this new ATV mode called "Mesh Video", MESH operation & how it can be used during emergencies. Mesh Networking is an Internet-like amateur radio mode becoming a very popular exciting new form of Amateur Television. Hams are integrating it with conventional ATV. He will also outline ATVQ Magazine typical topics.
11:40 – 11:45	Art Towslee	WA8RMC	Wrap up and introduction to the new $75 DVB-S receiver module for sale.

ATV Friday Night dinner.

The ATV Friday Night Dinner will be at China Garden Buffet restaurant starting at 6:30PM on 112 Woodman Drive in Dayton, Ohio 45431 (Airway Shopping Center). Buffet Dinner $11.99 (937-781-9999). We have dinner then presentations about various ATV topics with door prizes concluding about 9:30PM. All are invited.

China Garden Buffet
Located in Airway Shopping center at:
112 Woodman Drive
Riverside, Ohio 45431
937-781-9999

Directions to the ATV Friday Night dinner and conference 2018.

19 min (12.7 miles)

Via US-35 W

Greene County Fairgrounds
210 Fairground Rd, Xenia, OH 45385
Take Fairground Rd, Hawkins Rd and Dayton Xenia Rd to US-35 W in Beavercreek Township
3.8 mi
Follow US-35 W to Woodman Dr in Riverside. Take the OH-835/Woodman Dr exit from US-35 W
7.3 mi
Drive to Woodman Dr/Wright Brothers Pkwy
1.5 mi
110 Woodman Dr in Airway Shopping center
Riverside, OH 45431

Dinner is $11.59 buffet and starts approximately 6:30PM. After dinner we will have speakers and a round table discussion and wrap it up at 9:30PM. Call me on my cell at 614-580-4793 if there are any questions.
SEE YOU THERE!! Art…WA8RMC

A T C O
2018 SPRING EVENT

11:30 AM – SUNDAY (For hamfest)
(Lunch starts about 12:30 PM)
May 6, 2018
ABB PROCESS AUTOMATION CAFETERIA
579 EXECUTIVE CAMPUS DRIVE, WESTERVILLE
FOR MORE DETAILS, CONTACT
ART – WA8RMC - 891-9273
FREE LUNCH PROVIDED – DOOR PRIZES
BRING A FRIEND AND SEE OLD BUDDIES
MINI HAMFEST – SHOW AND TELL

DIRECTIONS TO THE ATCO EVENT

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

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

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

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

KENWOOD TRANSCEIVER FOR SALE

Guys,
I've had this Kenwood transceiver for over a year now waiting to offer it to a deserving person that will give it a good home. It was donated to me by WA8FLY who was getting rid of all of his Ham gear, exiting Ham Radio and moving to another part of the country. Rod donated it to ATCO who in turn can sell it as needed to help raise money for the treasury.

I'm embarrassed to hold on to it this long but I've procrastinated long enough and want to get it to a good home. It is a Kenwood model TS-520 all mode HF transceiver with the following accessories:

AT-200 Kenwood antenna tuner
SP-520 Kenwood speaker
DG-5 Kenwood Digital display
MC-50 Kenwood microphone
All manuals (copies)

I have not operated it but believe it to be functional. If the high bidder finds it not in the working order he had hoped, it can be returned which in turn will be offered to the next highest bidder and so on till it finds a home.

I will take bids Emailed to me at towslee1@ee.net until the Spring Event. I will take the items to the Spring Event for inspection and announcement of the winner after lunch. You'll have until that time to submit a bid. You do not have to attend the Spring Event to win but it would be great if you were there so we could take a picture.
Happy bidding!
…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.
KB8OFF Jess Nicely Dayton, Ohio (re-newed member)

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.

04/21/2018 | Portsmouth Radio Club Hamfest
Location: Portsmouth, OH
Type: ARRL Hamfest
Sponsor: Portsmouth Radio Club
Website: http://www.facebook.com/groups/portsmouthradioclub/

04/28/2018 | 2018 JCARC Hamfest
Location: Jackson, OH
Type: ARRL Hamfest
Sponsor: Jackson County Amateur Radio Club
Website: http://www.jacksoncountyarc.org

04/29/2018 | Athens Hamfest
Location: Athens, OH
Type: ARRL Hamfest
Sponsor: Athens County Amateur Radio Association
Website: http://www.ac-ara.org/

05/18/2018 | Great Lakes Division Convention (Dayton Hamvention)
Location: Xenia, OH
Type: ARRL Convention
Sponsor: Dayton Amateur Radio Association
Website: http://hamvention.org

06/02/2018 | FCARC Summer Fest
Location: Wauseon, OH
Type: ARRL Hamfest
Sponsor: Fulton County Amateur Radio Club
Website: http://k8bxq.org/hamfest

06/16/2018 | Milford Hamfest
Location: Owensville, OH
Type: ARRL Hamfest
Sponsor: Milford Amateur Radio Club

07/08/2018 | 20/9 ARC Hamfest, Electronics & Computer Show
Location: Austintown, OH
Type: ARRL Hamfest
Sponsor: 20/9 Amateur Radio Club
Website: http://20over9.org
Website: http://www.w8mrc.com

07/21/2018 | GARS Germantown Hamfest
Location: Germantown, OH
Type: ARRL Hamfest
Sponsor: Germantown Amateur Radio Society (GARS)
Website: http://GARSohio.org

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

08/04/2018 | 2018 Columbus Hamfest / Ohio Section Conference
Location: Grove City, OH
Type: ARRL Hamfest
Sponsor: Voice of Aladdin Amateur Radio Club (W8FEZ)
Website: http://columbushamfest.com

TUESDAY NITE NET ON 147.48 MHz SIMPLEX

Every Tuesday night @ 9:00PM WA8RMC hosts a net for the purpose of ATV topic discussion. There is no need to belong to the club to participate, only a genuine interest in ATV. All are invited. For those who check in, the general rules are as follows: Out-of-town and video check-ins have priority. A list of available check-ins is taken first then a roundtable discussion is hosted by WA8RMC. After all participants have been heard, WA8RMC will give status and news if any followed by late check-in requests or comments. We usually chat for about ½ hour so please join us locally or via internet at www.BATC.tv then ATV repeaters thenWR8ATV.

ATCO TREASURER'S REPORT - de N8NT

OPENING BALANCE (01/16/18)	$ 1617.59
RECEIPTS(dues)	$ 110.00
Web site hosting service	$ (197.99)
Flowers	$ (85.94)
PayPal fee	$ (4.28)
CLOSING BALANCE (04/20/18)	$ 1439.38

ATCO REPEATER TECHNICAL DATA SUMMARY

Location:	Downtown Columbus, Ohio
Coordinates:	82 degrees 59 minutes 53 seconds (longitude) 39 degrees 57 minutes 45 seconds (latitude)
Elevation:	630 feet above the average street level (1460 feet above sea level)
TV Transmitters:	423.00 MHz DVB-T, 10 W cont, FEC=7/8, Guard=1/32, Const=QPSK, FFT=2K, BW=2MHz, PMT=4095, PCR=256, Video=256, audio=257
	427.25 MHz Analog VSB AM, 50 watts average 100 watts sync tip (cable channel 58)
	1258 MHz 40 watts FM analog
	1268 MHz DVB-S QPSK 20W continuous. SR=3.125MS, FEC=3/4, PMT=32,Video=162,Teletext=304,PCR=133,Audio=88,Service =5004)
	2397 MHz Mesh Net transceiver 600mw output (channel 1 -2). ID is WR8ATV-2
	10.350 GHz: 1 watt continuous analog FM
Link transmitter:	446.350 MHz: 5 watts NBFM 5 kHz audio. This input is used for control signals.
Identification:	423, 427, 1258, 1268 MHz, 10.350 GHz transmitters video ID every 10 min. with active video and information bulletin board every 30 minutes.
	423 MHz digital, 1268 MHz digital & 10.350 GHz analog - Continuous transmission of ATCO & WR8ATV with no input signal present.
Transmit antennas:	423.00 MHz – 8 element Lindsay horizontally polarized 6dBd gain "omni"
	427.25 MHz - Dual slot horizontally polarized 7 dBd gain "omni" major lobe east/west, 5dBd gain north/south
	1258 MHz - Diamond vertically polarized 12 dBd gain omni
	1268 MHz - Diamond vertically polarized 12 dBd gain omni
	2397 MHz - Ubiquiti dual polarity omni 13dBi gain slot for channel 1 -2 MESH Rx/Tx operation
	2397 MHz - Comet Model GP24 vertically polarized 12 dBd gain omni (Used for experimental Mesh operation)
	10.350 GHz - Commercial 40 slot waveguide slot horizontally polarized 16 dBd gain omni
Receivers:	147.480 MHz - F1 audio input with touch tone control. (Input here = output on 446.350)
	438.000 MHz - DVB-T QPSK, 2K BW. Receiver will auto configure for FEC's and PID's. (Input here = output on all TV transmitters)
	439.250 MHz - A5 NTSC video with FM subcarrier audio, **lower sideband**. (Input here = output on all TV transmitters)
	449.975 MHz - F1 audio input aux touch tone control. 131.8 Hz PL tone. (Input here = output on 446.350).
	1288.00 MHz - F5 video analog NTSC. (Input here = output on all TV transmitters)
	1288.00 MHz - DVB-S QPSK digital SR=4.167Msps, FEC=7/8. PIDs: PMT=133, PCR=33, Video=33, Audio=49 (Input here feeds all TV transmitters and also goes directly to 1268 MHz DVB-S digital output channel 2.)
	2398.00 MHz - F5 video analog NTSC. (Input here = output on all TV transmitters) (inactive at this time because of MESH on 2397)
	10.450 GHz - F5 video analog NTSC. (Input here = output on all TV transmitters)
Receive antennas:	147.480 MHz - Vert. polar. Diamond 6dBd dual band (Shared with 446.350 MHz link output transmitter)
	438.00/439.250 MHz - Horizontally polarized dual slot 7 dBd gain major lobe west (Shared with 438 & 439 receivers)
	1288.00 MHz - Diamond vertically polarized 12 dBd gain omni (shared with analog and DVB-S receivers)
	2398.00 MHz - Comet Model GP24 vertically polarized 12 dBd gain omni (inactive at this time because of MESH on 2397)
	10.450 GHz - Commercial 40 slot waveguide horizontally polarized 16 dBd gain omni

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

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

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

ATCO MEMBERS as of April 2018

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	
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	2844 Sussex Place Dr.	Grove City	OH	43123	614-836-2521
N8CXI	Garry Cotter	2367 Northglen Drive	Columbus	OH	43224	
N3DC	William Thompson	6327 Kilmer St	Cheverly	MD	20785	301-772-7382
K8DMR	Ron Fredricks	8900 Stonepoint Ct	Jennison	MI	49428-8641	
W8DMR	Bill Parker	2738 Florbunda Dr	Columbus	OH	43209	
WA8DNI	John Busic	2700 Bixby Road	Groveport	OH	43125	614-491-8198
N8DUK	Ron Reynolds	2173 Noe Bixby Rd	Columbus	OH	43232-4131	
WB8DZW	Roger McEldowney	5420 Madison St	Hilliard	OH	43026	614-405-1710
KB8EMD	Larry Baker	4330 Chippewa Trail	Jamestown	OH	45335-1210	
N8FRT	Tom Flanagan	6156 Jolliff St.	Galloway	OH	43119	
W8FZ	Fred Stutske	8737 Ashford Lane	Pickerington	OH	43147	
WA8HFK,KC8HIP	Frank & Pat Amore	P.O. Box 2252	Helendale	CA	92342-2252	614-777-4621
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	
WA8KQQ	Dale Waymire	225 Riffle Ave	Greenville	OH	45331	937-548-2492
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	3569 Oarlock Ct	Hilliard	OH	43026	614-876-2127
W8NX, KA8LTG	John & Linda Beal	5001 State Rt. 37 East	Delaware	OH	43015	740-369-5856
KB8OFF	Jess Nicely	1888 Woods Drive	Beavercreek	OH	45432	
N0OBG	Jim Conley	33 Meadowbrook C C Est	Ballwin	MO	63011	
W6ORG,WB6YSS	Tom, Maryann O'Hara	2522 Paxson Lane	Arcadia	CA	91007-8537	626-447-4565
N8OCQ	Bob Hodge Sr.	3750 Dort Place	Columbus	OH	43227-2022	
AE6QU	Ron Phillips	2227Via Puerta unit N	Laguna Woods	CA	92637	
WA8RMC	Art Towslee	438 Maplebrooke Dr W	Westerville	OH	43082	614-891-9273
W8RUT,N8KCB	Ken & Chris Morris	2895 Sunbury Rd	Galina	OH	43021	
KB8RVI	David Jenkins	1941 Red Forest Lane	Galloway	OH	43119	614-853-0679
W8RWR	Bob Rector	135 S. Algonquin Ave	Columbus	OH	43204-1904	614-276-1689
W8RXX, KA8IWB	John & Laura Perone	3477 Africa Road	Galena	OH	43021	614-579-0522
WA6RZW	Ed Mersich	34401 Columbine Trl West	Elizabeth	CO	80107	
WA6SVT	Mike Collis	PO Box 1594	Crestline	CA	92325	
KD8TIZ	Bob Holden	5161 Goose Lane Rd	Alexandria	OH	43001-9730	614-562-8441
K8TPY, K8FRB	Jeff & Dianna Patton	3886 Agler Road	Columbus	OH	43219	
NR8TV	Dave Kibler	243 Dwyer Rd	Greenfield	OH	45123	937-981-1392
KB8UWI	Milton McFarland	115 N. Walnut St.	New Castle	PA	16101	
WA8UZP	James Reed	818 Northwest Blvd	Columbus	OH	43212	614-297-1328
KB9VGD	Gary Oaks	472 Storle Ave	Burlington	WI	53105-1028	
KC8WRI	Tom Bloomer	PO Box 595	Grove City	OH	43123	
AA8XA	Stan Diggs	2825 Southridge Dr	Columbus	OH	43224-3011	
AC8XP,KE8GTT,KE8HPA	Troy,Seamus Bonte	5210 Smothers Road	Westerville	OH	43081	
AC8YE	Larry Howell	1163 Cloverknoll Ct	Columbus	OH	43235-4008	
KB8YMQ	Jay Caldwell	4740 Timmons Dr	Plain City	OH	43064	
KC8YPD	Joe Ebright	3497 Ontario St	Columbus	OH	43224	
KD8YYP	Anna Reed	818 Northwest Blvd	Columbus	OH	43212	
WB8YTZ	Joe Coffman	233 S. Hamilton Rd	Gahanna	OH	43230-3347	
N8YZ	DaveTkach	2063 Torchwood Loop S	Columbus	OH	43229	614-882-0771
W8ZCF	Farrell Winder	6686 Hitching Post Ln.	Cincinnati	OH	45230	513-218-3876
N8ZM	Tom Holmes	1055 Wilderness Bluff	Tipp City	OH	45371	

ATCO MEMBERSHIP INFORMATION

Membership in ATCO (Amateur Television in Central Ohio) is open to any licensed radio amateur who has an interest in amateur television. The annual dues are $10 per person. Additional members within an immediate family and at the same address are included at no extra cost.

ATCO publishes this Newsletter quarterly in January, April, July, and October. It is sent to each member without additional cost. All Newsletters are sent via Email unless the member does not have an internet connection. Dues payments are as the date paid and will expire on the same month/year on the due date year.

Your support of ATCO is welcomed and encouraged.

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

ATCO MEMBERSHIP APPLICATION

RENEWAL ○ NEW MEMBER ○ DATE _____
CALL _____
OK TO PUBLISH PHONE # IN NEWSLETTER YES ○ NO ○
HOME PHONE _____
NAME_____
INTERNET Email ADDRESS_____
ADDRESS _____
CITY _____ STATE _____ ZIP _____-_____
FCC LICENSED OPERATORS IN THE IMMEDIATE FAMILY
_____
COMMENTS_____
_____
_____

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

Make check payable to ATCO or Bob Tournoux & mail to: Bob Tournoux N8NT 3569 Oarlock CT Hilliard, Ohio 43026. Or, if you prefer, pay dues via the Internet with your credit card. Go to www.atco.tv and fill out the "pay ATCO dues" section. Alternately, you can use the ATCO web site www.atco.tv/PayDues.aspx directly. Credit card payment is made through "PayPal" but you DO NOT need to join PayPal to send your dues. Simply DO NOT fill out the password details and there will be no "PayPal" involvement.

ATCO CLUB OFFICERS

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

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

FIRST CLASS MAIL

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