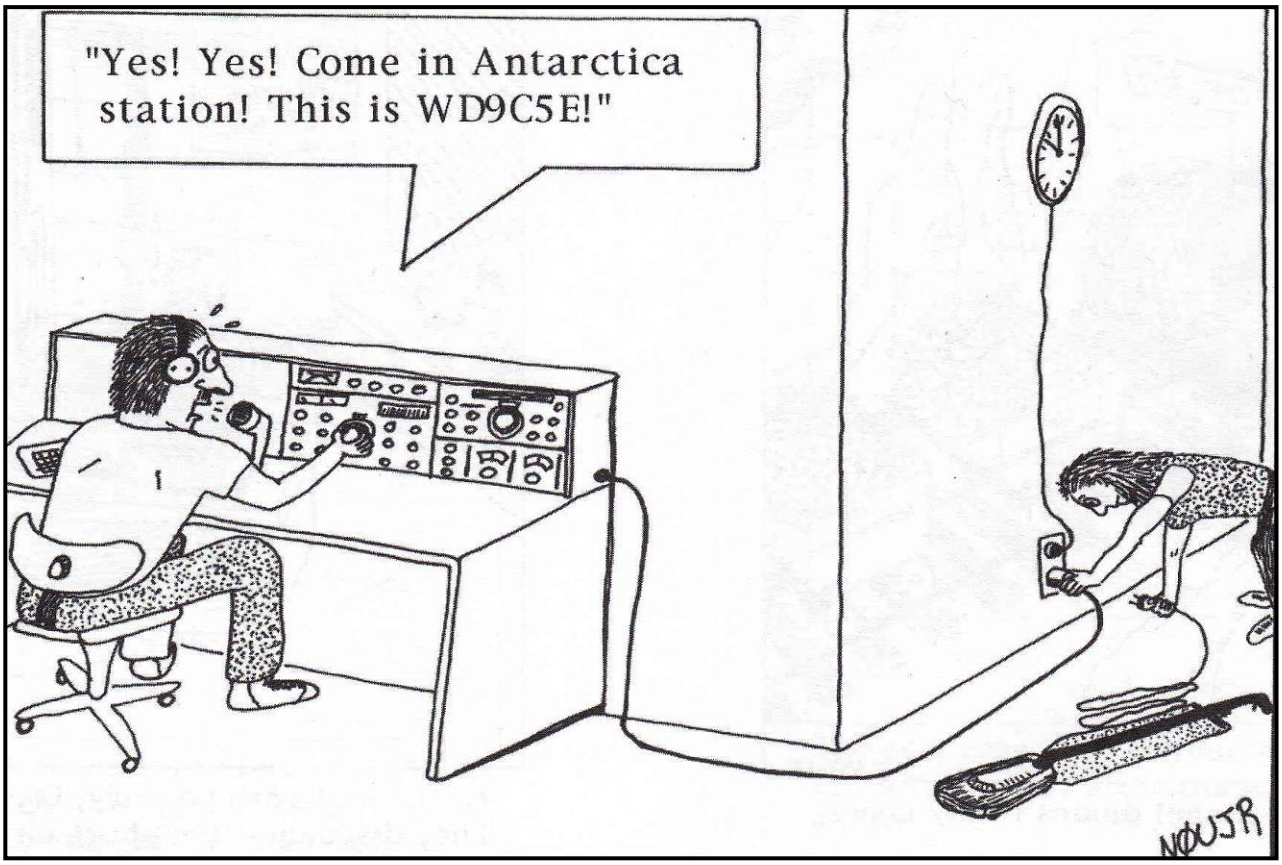
ATCO NEWSLETTER

VOLUME 29 NUMBER 2 **April 2012**

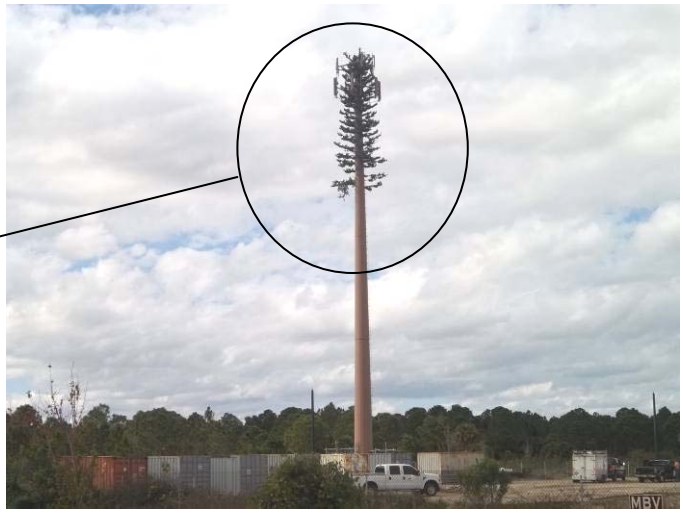
The ATCO newsletter is the official publication of a group of amateur television operators known as "AMATEUR TELEVISION IN CENTRAL OHIO Group Inc" and is published quarterly (January, April, July, and October)

ATCO SPOTLIGHT TOPIC

Thanks to Greg Trook N0UJR for allowing us to share one of his cartoons. See also http://incolor.inetnebr.com/n0ujr/.



ACTIVITIES ... from my "*Crippled*" Workbench



The workbench is not too crippled now and still needs some work but it's functional. For the time being, I'll say it's in the semi-crippled stage. Next time the title will change unless I have yard work to keep me busy. The Ham shack is also functional but the antennas are still in a fixed position. Now that the weather is getting better, my thoughts are turning toward how to erect a pleasant looking tower. Since the neighborhood is technically a "no tower" area (but the neighbors are friendly and accommodating), we'll see what happens when it goes up. Maybe I'll have to create a "stealth" look camouflaged with artificial branches like what is done for some cell sites in Florida. See the pictures above. I took them from the Florida interstate this past winter. My planned tower is very close to my Birch tree clump in the front yard so I reason that if I attach some artificial Birch branches to the tower…who will know???? Notice how the Florida "tree" above fits in so well with the surrounding landscape.

So much for my stuff, so what's going on with the repeater? Interference has been the main topic. All of a sudden we experienced what appeared to be random bursts of digital data right on our 446.350 MHz link output. Further investigation showed it was coming in through the alternate 449.975 MHz link input. Occasionally we could hear parts of a CW Morse identifier but it was almost unrecognizable. Finally with the diligent and persistent help from Dale WB8CJW, he deciphered and identified it as a commercial 453 MHz signal from our AEP Electric Power utility. Fortunately the communications manager is a Ham and agreed to track it down for us. After an exhaustive study, he found the interference to be a combination of 3 different transmitters ON all at the same time. AEP added filters to their output but that only reduced the interference slightly. We could have perused the matter with the other "participants" but we chose to instead install a 131.8 Hz PL tone on the 449.975 input. We haven't heard the interference since.

That brought up another problem. While I had the link transmitter home for the tone "implant" I checked the deviation levels. The 449 audio was low so I increased the 446.350 MHz transmitter deviation output to bring it up to about 5KHz for normal audio input. That fixed the 449 input level but found later that it caused the 147.48 audio to be severely distorted since both the 449 and 147 signals get equally mixed in the 446.35 output. DECREASING the 147 input audio fixed it. Now both signal inputs sound the same. Too bad I created extra repeater trips to fix it. That's what happens when everything is not checked when a "simple" addition is made.

All interference issues are behind us, right! Well, not quite. Recently, we discovered a CW unmodulated carrier on 436.00 MHz. Since it was extremely strong and within the passband of our 439.25 ATV input (Lower sideband) it caused a severe degradation to everyone that sent a 439 ATV signal to the repeater. On a recent Sunday afternoon, I decided to load up my handi talkie and IFR service monitor to see if I could locate the source. It took me directly to downtown Columbus but not at the repeater location as first thought. A spectrum analyzer on our 439 receive antenna at the repeater showed we had a -6dBm signal at the input. That's a HUGE signal so no wonder the input was swamped. Further tracking brought me to the Columbus number one Fire Station about 1000 feet away from the repeater location. I went inside and asked the attendants if they knew of any transmitters left on continuously. I was met with that "deer-in-the-headlights" stare from all firefighters there so I decided to not elaborate and left. The next day I contacted the Columbus City communications manager who said he'd track it down. Later that day the signal disappeared never to return (so far). He told me that he checked a couple of antennas on their roof with no luck but the signal was very strong there. As they continued checking, it disappeared. No explanation. This is my conclusion: One of the Firefighters is a Ham who may have had a signal on the air as a beacon or signal source for his personal use. He saw the communication guys checking things and quickly removed it. Case closed…I hope!

That's all the information this time. Don't forget the Spring Event is coming up May 6. We have some real neat prizes this time so don't miss it! See you there.

Oh, by the way, you will notice the Newsletter a little thinner than normal. That's because no one is sending me material. Get with it guys. I need material. If you can't compose anything but have an idea about a new gadget, let me know. I'll work on it. Have you or heard of someone that solved a problem with a special tool or circuit? Tell me about it so I can let others know. That's what keeps the Newsletter alive.
…73, WA8RMC

NTIA THUMBS DOWN LIGHTSQUARED

February 15, 2012 from “GPS World” Newsletter. See the complete article at: http://www.gpsworld.com/gnss-system/news/ntia-thumbs-down-lightsquared-fcc-concurs-12634?utm_source=GPS&utm_medium=email&utm_campaign=Wireless-Pulse_02_15_2012&utm_content=ntia-thumbs-down-lightsquared-fcc-concurs-12634

"We conclude that LightSquared's proposed mobile broadband network will impact GPS services and that there is no practical way to mitigate the potential interference at this time." These words from Lawrence Strickling U.S. assistant secretary for communications and information and head of the National Telecommunications and Information Administration (NTIA), appear to signal the end of LightSquared's run.

Strickling's letter to Federal Communications Commission (FCC) Chairman Julius Genachowski appeared in public on February 14. Later that same day, FCC spokesperson Tammy Sun released a statement from that agency that "the Commission will not lift the prohibition on LightSquared," and that it plans to "vacate the Conditional Waiver Order, and suspend indefinitely LighSquared's Ancillary Terrestrial Component authority."

Together, the NTIA and the FCC share responsibility for controlling U.S. radio spectrum use and making band allocations. The FCC supposedly has final authority in these matters, although the NTIA, representing government interests, may swing the bigger cat in the room. LightSquared's inability to satisfy the requirements of the Federal Aviation Administration (FAA), coupled with unremitting frowning and glowering from the Department of Defense, may have been the deciding factors — more so than the uproar among most GPS manufacturers. The FAA and the U.S. military, two key government entities with widely fielded GPS equipment and applications, constituted the backbone that the NTIA finally showed, although the military has been, with one notable exception, silent on the issue, and indeed is not mentioned in the NTIA letter.

Strickling's letter recaps the background of our story, with a July 6, 2011 early climax: "The test results demonstrated that LightSquared's then-panned deployment of terrestrial operations posed a significant potential for harmful interference to GPS services." He continues with the history of the further NTIA testing of cellular GPS receivers, joint continued analysis by FAA and LightSquared of impact on aviation receivers, and testing of general/personal navigation GPS receivers by the Executive Steering Group of the Interagency National Executive Committee for Space-Based Positioning, Navigation, and Timing (EXCOM).

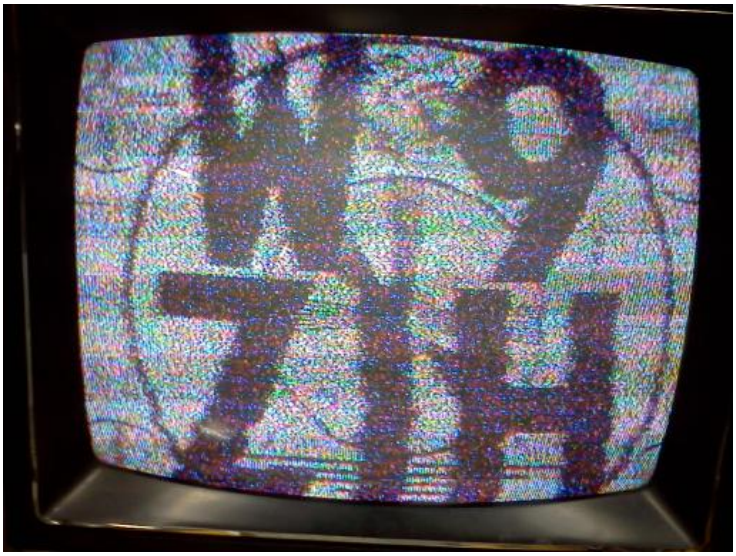
"It is the unanimous conclusion of the test findings by the EXCOM agencies that both LighSquared's original and modified plans for its proposed mobile network would cause harmful interference to many GPS receivers. Additionally, an analysis by the FAA has concluded that the LighSquared proposals are not compatible with severl GPS-dependent aircraft safety-of-flight systems. Based upon this testing and analysis, there appear to be no practical solutions or mitigations that would permit the LightSquared broadband service, as prosposed, to operate in the next few months or years without significantly interfering with GPS. As a result, no additional testing is warranted at this time."

But wait, we're not done yet. Strickling calls for GPS receiver standards to be developed, citing the EXCOM's decision that "federal agencies will move forward this year to develop and establish new GPS spectrum interference standards that will help inform future proposals for non-space commercial uses in the bands adjacent to the GPS signals."

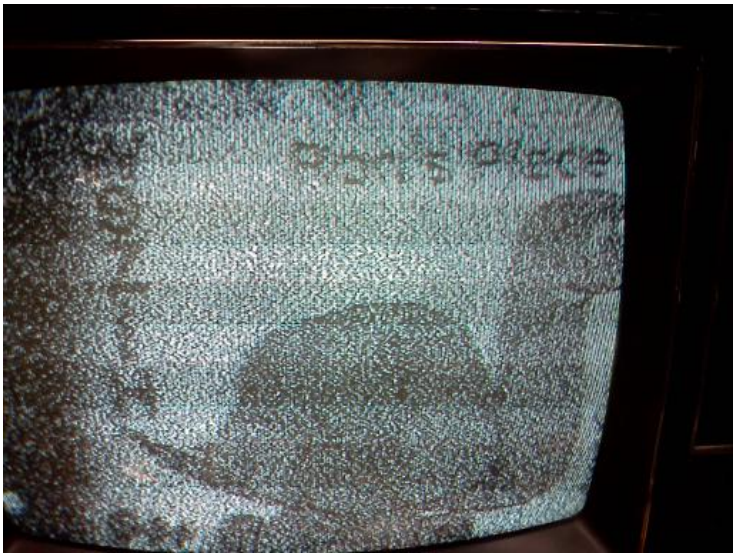
The FCC, in its concurrence statement to the NTIA letter, actually begins by reciting the mantras of "economic growth, job creation, and to promote competition . . . freeing up spectrum for mobile broadband," and only gradually works its way around to its decision. This signals an ongoing, solid commitment to make further sallies in this area.

ATV DX FROM W8URI

Bill sends us this information about his recent DXing with ATV. Now, let's see some of the same from the rest of you. How about it?



Here is a picture of W9ZIH as received at my location at about 9 P.M. on 02/06/2012. I gave him a P3. I received a similar report from him. Ron is located in Malta, Illinois near Chicago.



Same day contact with Ron, W9ZIH. As you can see, the band was fading but a good picture none the less. The picture was taken with my cell phone on the TV screen and sent to my Email. It was then forwarded to you.

Here is one from Oct 2011. The pix are from Farrell, W8ZCF in Cincinnati as he received me at his house at our morning get together on 3930 around 7:45 - 8:30 ish.

…W8URI

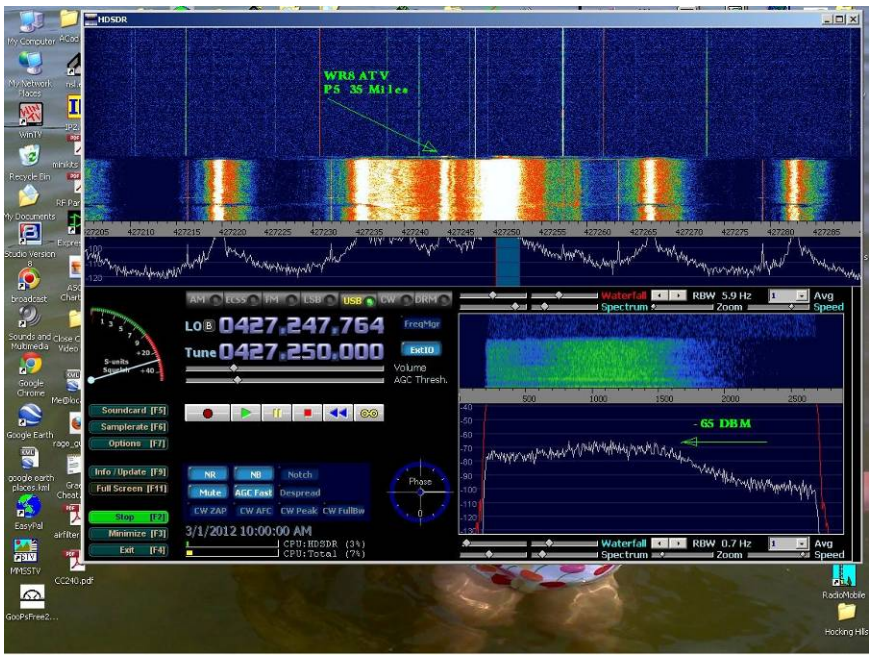
SOFTWARE DEFINED RADIO DONGLE HELPS LOCATE WEAK ATV

WB8LGA reports that there is a "super" FunCube radio dongle available that plugs into your computer's USB port to receive radio signals from 64 to 1750 MHz. It is super sensitive and able to resolve signals as weak as -140dBm. The only drawback is its ability to only receive an 88 KHz wide signal. That sounds like a killer for 4-5MHz wide ATV signal reception but…not so fast! Although it cannot detect an entire 4 MHz video passband, it CAN see any desired 88 KHz part of it. For example, if it is tuned to 427.25 MHz, you can see the ATCO repeater horizontal sync pulse in the signal just 15,750 Hz away from the center carrier. You can tune 4.5 MHz higher and see the 4.5 MHz sound subcarrier and its modulation. In short, you can't see the entire signal at once, but you CAN tune through the bandpass to see the subparts. That way you can identify if the signal is upper or lower sideband, double sideband or any other type of modulation. You can even "pick apart" the DATV signal and identify it as digital and see some of the "haystack" components. The time display, detailed below, can identify non repetitive random signals to provide a type of "peak sample and hold" function.

The unit at first glance, is a rather pricey cost of $180 USD shipped postpaid from the UK in about 2-3 days. No, the manufacturing cost is not near that to but they donate a portion of the profits to the UK AMSAT project group that helped develop it. So, you're helping the European Amateur Radio efforts. The unit software is available as a free download as well as any software improvements and related software programs that run using this dongle. Already there is a companion up-converter module available to extend the lower RF receive range down to less than 1 MHz making the dongle useful as an HF spectrum scope!

A number of Hams in our area either own this unit or are awaiting receipt of a purchased one. The list includes Hank W4HTB, Dick W8RVH, Ross WA8MFD, Ferrel W8ZCF and Charles WB8LGA. They claim it is a great tool to detect the presence of a weak signal far before it is ever possible to hear or see it on normal receiver. WB8LGA can see an ATV signal at about -130dBm whereas his regular receiver won't detect it below -80 dBm. That's 50 dB below what the communication receiver can detect. (For comparison, an ATV signal has a 30 dB range from P0 to P5.) The link to the unit is http://www.funcubedongle.com/?page_id=2 and if you want to download the HDSDR program to just "test drive it" control-click the link here at: http://www.sdr-radio.com/LinkClick.aspx?link=http%3a%2f%2fwww.ham-radio.ch%2fkits%2fsdr-radio.com%2f1.4%2fSDR-RADIO_v1.4b824.exe&tabid=178&mid=1287&language=en-US&forcedownload=true.
Software upgrades are at:http://www.lb3hc.net/archives/1248.
The FunCube HF companion converter for DC to 100 MHz operation is at:
http://www.ct1ffu.com/site/index.php?option=com_content&view=article&id=178&Itemid=104 or
http://www.george-smart.co.uk/wiki/FunCube_Upconverter

On the right is a picture of what WR8ATV 427.25 MHz P5 signal looks like.



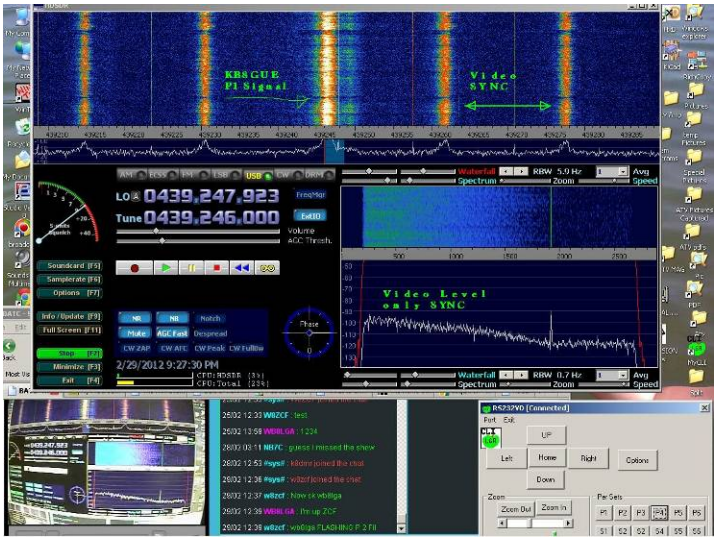
The top portion is the "waterfall" time display. **Time** is vertical and the most recent time slice at the bottom. The older unfinished portion is at the top. The lower "rainbow" portion is the start of the display moving upwards toward the top. The colors represent levels of signal intensity. The white portions are strongest and dark blue is weakest. The wide white band is the center carrier portion of the 427.25 MHz signal.

The "spectrum" graph below the "waterfall rainbow" is what you'd see on a spectrum analyzer. **Frequency** is horizontal.

The two screens below and to the right of the "spectrum" graph are magnified portions of the "waterfall/rainbow" display shown in blue. The lower section is where the signal level in dBm is measured.

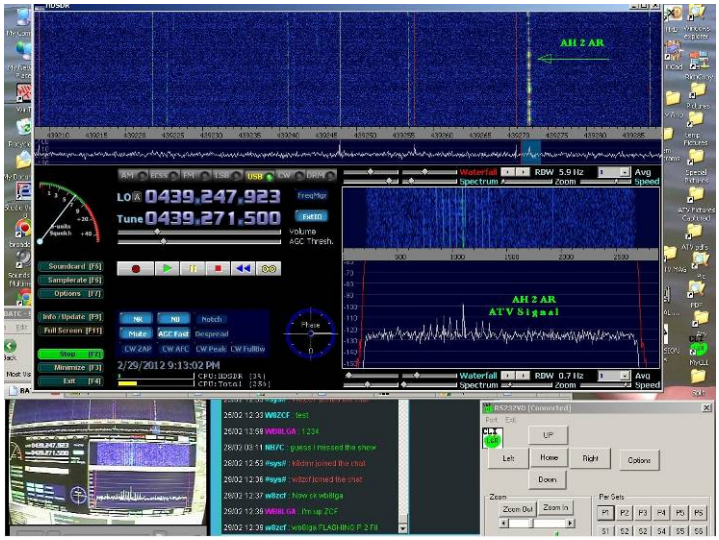
OK, enough about the details. There are more, but IS a rather intimidating collection of information so it's best for you to download the program and "play" with it first. Then, I'm sure you will want to run out and buy one but I'd wait for Dayton and see it there. I don't know for sure if they will be selling these at Dayton but suspect they will. So, look it over and road test it first so you can ask intelligent questions to the representatives when you get there.
…WB8LGA & WA8RMC

The following is a sample collection of various reception screens. Enjoy!

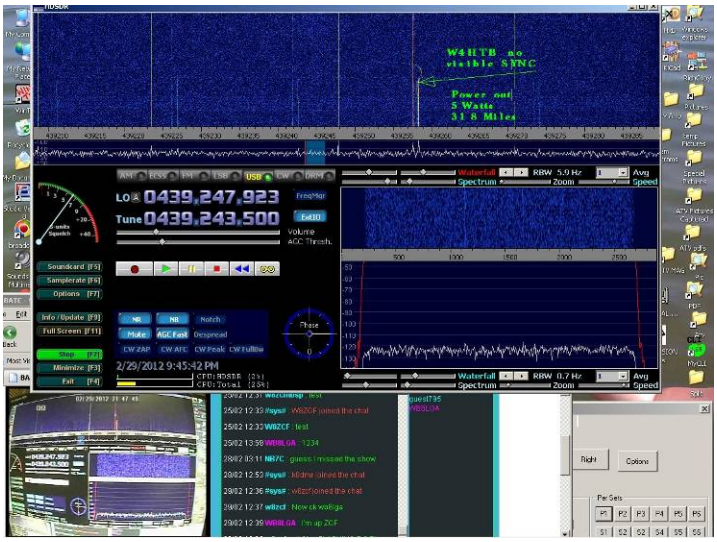


This is the 439.25 MHz signal of KB8GUE near Dayton. Notice the orange bands in the rainbow display indicating “sync” and the white band as the carrier center. Because there are bands below and above the center carrier indicates a double sideband signal. A vestigial sideband signal would be missing the lower bands.

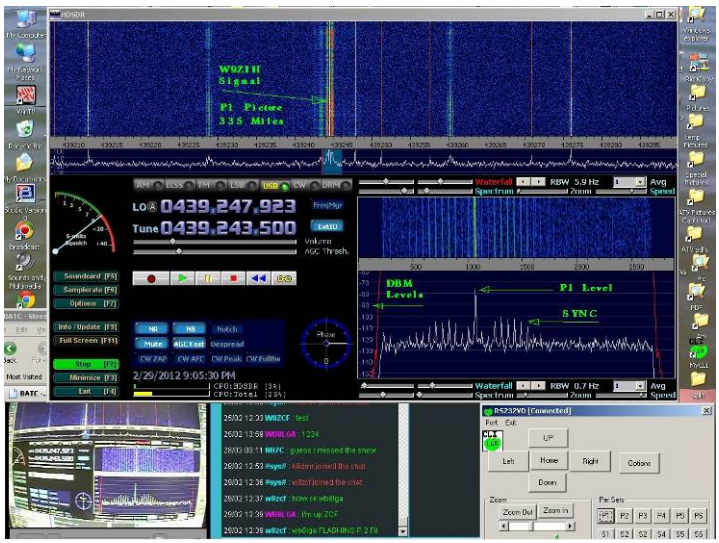
"The blip in the lower right hand display shows the FunCube local oscillator center carrier which is the 439.25 MHz picture and signal strength".



Here is Dave AH2AR in Dayton. The signal was too weak to see on an ATV receiver and could not detect any sync or video. However, it displayed vividly in the “waterfall” display and also in the magnified signal strength portion below showing about -100 dBm level. That’s way too weak to be detected by normal means!



Here is Hank’s W4HTB 5 watt video signal. Sync or video could not be seen on the ATV receiver. A repeat of this signal three days in a row was seen under unfavorable band conditions.



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Here is W9ZIH in Chicago at a P1 level with a little band enhancement.

…WB8LGA

DATV INTERNET GROUP

If you are interested in Digital ATV (DATV), here's an internet group within the Yahoo family that is a very informative discussion group. It contains new DATV topics as well as questions and answers pertaining to Digital ATV. Initated in July 2009, we now have over 300 members from various parts of the world so we get a great mix of knowledge.

To subscribe to the Digital ATV group, control click on the following URL and it will take you to the subscription screen.
http://groups.yahoo.com/group/DigitalATV/

If you're using or experimenting with DATV technologies currently let the group know how you're using DATV by sending a message to the group, adding a Link in the Links area and/or Uploading a File to the Files area.

There are already dozens of messages in the group's message log and numerous files & links in the Files & Links areas available for review.

Please let other ATVers, both Analog & Digital, who aren't members of the group know about the DATV group.
…WA8RMC

ATCO REPEATER 427.25 HAS AUDIO SUBCARRIER!

OK, here's something I learned a short time ago that I didn't know about. Some time ago I discovered that while the ATCO repeater bulletin board was present, I could hear the NOAA weather radio information on 431.75 MHz. I thought that was strange and wondered how Dale's bulletin board signal from his place could mix with anything to enable my receiver to pick up the 162.255 signal. I didn't spend much time trying to work out possible combinations but wondered how this could happen.

Then one day a short time ago while talking with Dale, I mentioned the scenario to him. He smiled and replied, "There's a simple explanation. For a few years now I've been inserting the NOAA broadcast on the 1280 MHz link frequency audio channel to the repeater. Then it goes to the 427.25 MHz repeater audio subcarrier". (427.25 MHz + 4.5 MHz = 431.75 MHz is exactly where I was receiving it). Now I feel REAL stupid for not having thought of that first!!!!!

Well, anyway, now I can sleep nights. So, if any of you like to monitor the 427.25 ATV bulletin board, turn up the audio volume and get a 5 minute summary of the current weather conditions while the bulletin board is broadcast. Neat, huh?

DAYTON HAMVENTION ATV FORUM SCHEDULE

The ATV Forum will be held at 1530-1700 3:30-5:00 PM in ROOM 2

1530-1532 Art Towslee WA8RMC - Introduction.
1532-1542 Gordon West WB6NOA - GORDO ON "LIGHTS, CAMERA, AND ACTION"
1542-1602 Ken Konechy W6HHC(*)- DATVexpress DATV transmitter design
1602-1606 Art Towslee WA8RMC - DATVexpress design follow up
1606-1616 Mike Collis WA6SVT - DATV QAM64 California field test report
1616-1626 Lou McFadin W5DID - DATV "HAMTV" Space Station project
1626-1636 Bill Brown WB8ELK - ATVQ Magazine/Balloon launch follow up
1636-1656 Brian Jordan G4EWJ(*) - DigiLite DATV transmitter design
1656-1600 Charles Beener WB8LGA - DigiLite design follow up

*Note: Ken and Brian will not be at Hamvention. They'll present via recorded DVD.

The schedule is very tight this year, Folks! I'm trying to include as much topic material as possible. Therefore I eliminated the time between talks for questions. There should be time for questions and answers after the last presentation because we are the last group using this room for the day.

If anyone has any "show/tell" items, bring them along and I'll place them on the table in the front. I will have actual DATVexpress and DigiLite boards to review.

Kind regards,
Art Towslee
WA8RMC
ATV forum moderator

SURPRISE REPEATER INPUT

The other day while I was preparing for a short trip to WB8LGA's place, he called me to say there is someone operating ATV in an RC airplane around the Alum Creek Dam and is getting into the 1280 MHz repeater input. Charles suggested that since I had to pass by that place en route to his house, I stop by and converse with them about it. I complied.

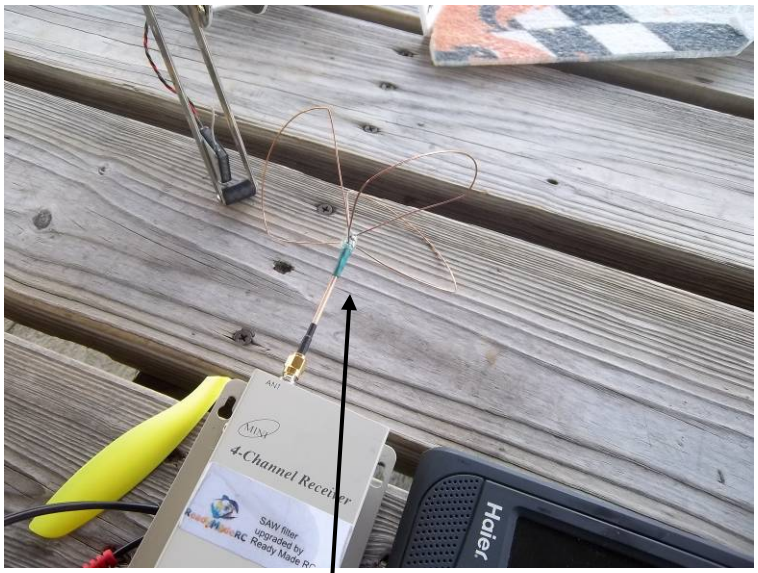
I found a person who had an RC helicopter equipped with a camera in the front of it and also a regular plane equally outfitted. The ATCO repeater is located about 15 miles south and was, according to Charles, providing a P2 to P3 picture. I probably should have informed him that he was operating an illegal transmitter on Ham frequencies without a ham license. However, although I didn't encourage such operation, I didn't try to discourage it either. (Sorry guys!). He was having a good time and not interfering with us so I let it be. If it turns out to be a regular activity, it may be another matter. Maybe we can convince him to get a Ham ticket.

Anyway, he was very surprised to find his signal traveled that far. He uses it to navigate the planes when they are nearly out of sight. (Too bad there are no nudist colonies nearby).
…WA8RMC

Here' a picture of the helicopter. I asked for another demo flight but he said he just crashed it and must go to the "shop" for repair. Note the one broken propeller.

The camera is located in the middle pointing down.

He uses a 6" "Prizm" type of LCD monitor.



He uses an "eggbeater" type of antenna that is circularly polarized. Good choice as he'd otherwise loose the signal as the craft changes direction or banks on a turn.
…WA8RMC

DATV – HIGH-GAIN "PANEL" ANTENNA FOR 1.2 GHZ

by Ken Konechy W6HHC

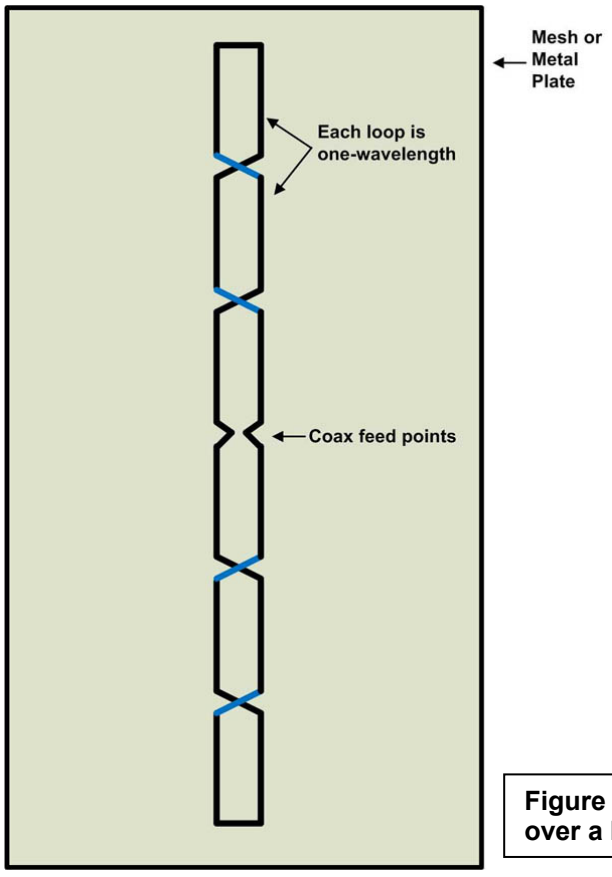
From the RF Newsletter Orange County Amateur Radio Club. www.W6ZE.org

*The following antenna article inspired me to do some thinking about applications beneficial to our repeater. Many years ago I constructed collinear antennas for both 432 and 1296 MHz. The 432 antenna had 96 elements and the 1296 was 2 times that for 192 elements. Both occupied about the same amount of real estate and were mounted back to back on a single mast. They both worked extremely well but I digress. That's another story so let me follow up on my present thinking. Since the antenna presented below is horizontally polarized, I wonder if a 2.4 GHz version consisting of (4) 48 element panels arranged every 90 degrees could be used in place of our present vertically polarized 2.4 GHz repeater antennas? We **do** suffer from quite a bit of WiFi interference on that band and since they are vertically polarized, a horizontally polarized antenna would give us about 20-25 dB of WiFi attenuation. Our individual antennas would need to be rotated 90 degrees to accommodate that but shouldn't be too much trouble. Each 48 element panel should have about 14 dBd gain so that could be better than the 12 dBi gain antenna we have now. The omni pattern could be an issue which would need investigation and experimentation soooooo…is there anyone out there with comments or wants to do some antenna construction? At 2.4 GHz, size should be well within manageable limits!!! Can anyone help? Let's talk about it at the Spring Event! …WA8RMC*

I am always interested in discovering antenna designs that can be easily built by hams. While scanning the British Amateur Television Club (BATC) web site for digital television forums, I noticed the posting by Keith GØKTD. Keith had posted photos of his "lantern" antenna for 1.2 GHz that was constructed of four "panel" antennas. The panel antenna turns out to have a good gain, low cost, and the design can be made into several variations.

Basic Panel Antenna

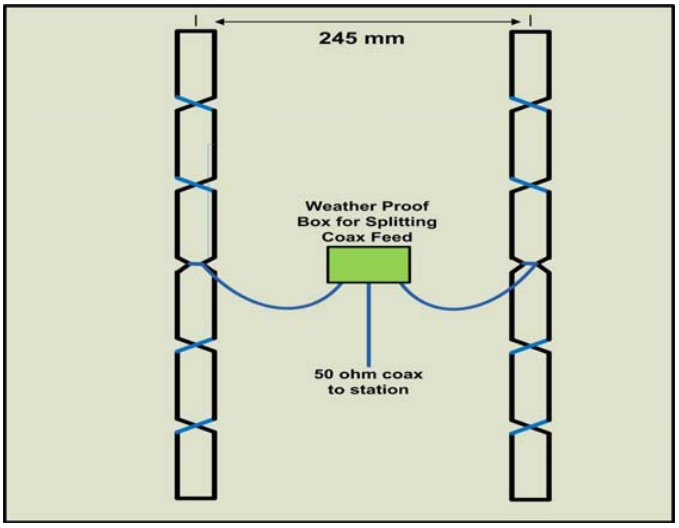
Back in 1997, John G8MNY published a short article in the BATC CQ-TV magazine that introduced the ATV readers to a panel antenna made with loops of heavy wire positioned above a reflector panel. **Fig 1** shows the basic construction concept for the panel antenna.



The design of **Fig 1** can achieve a theoretical gain of about 14 dBd. Each loop is one-full wavelength (electrically) and can be thought of as two half-wave dipole antennas with 3 dBd of gain. Two loops double the number dipoles to provide 6 dBd of gain. Four loops provide 9 dBd. Six loops of wire can produce a gain of about 11 dBd. Finally, adding a metal reflector spaced behind the loop array will add another 3 dB and provide a total of 14 dBd!! [NOTE: an earlier CQ-TV article stated theoretical gain of 6 loops with the reflector at 16 dBd. I am convinced the 16 dBd value was a typo or slight miscalculation? One of the simplicities of this design is that the resulting feed impedance for the coax is 50 ohms for **Fig 1** …how simple can you get? Most articles on this design recommend a 1:1 balun to feed the antenna. The wire size usually chosen is 2 mm diameter copper. Stranded copper wire can be used if you leave the insulation on…since skin-effect is a factor at these frequencies. Most construction articles show insulated solid wire being used. The dimensions of the loop are 88 mm long by 28 mm wide for each of the loops. The spacing of the loops should be about 30 mm above the mesh (screening) reflector panel. Most hams construct the reflector to be about 8 inches wide by 20 inches long using garden screening with about 0.5 inch squares.

Figure 1 – Six Loops of wire are positioned over a Mesh Reflector for basic Panel Antenna

How About More Gain?
The beauty of this antenna is that you can double the number of arrays and easily use two sets of six-loops over a lightly larger reflector panel as shown in **Fig 2.**



The coax splitter feeds the two arrays in phase. Special note – the two pieces of coax from the coax-splitter need to be chosen carefully to "transform" each of the 50 ohm antenna loads to look like 100 ohms at the splitter
end. Then two 100 ohm loads when connected in parallel look like 50 ohms again to the feed coax. This "transformation" of impedance in the coax is usually accomplished by carefully choosing the length of the "splitter coax" section of coax. The ARRL Antenna Handbook (Chapter 26) calls these sections of coax "quarter-wave transformers". To get the 50 ohm antenna to look like 100 ohms,
Ztransformer = (50 x 100)1/2 = 70.7 ohms
use quarter-wave or 3/4-wave sections of 70 ohm coax.
It is possible to continue to increase the number of the six-loop arrays to obtain even more gain.

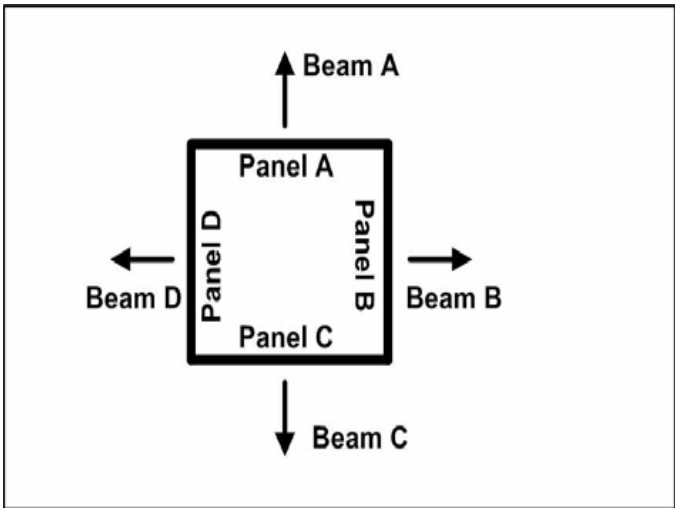
Figure 2 – Two sets of Six-Loop Arrays provide 3 dB More Gain for a Total of 17 dBd

Number of 6-Loop arrays	Antenna Gain
1	14 dBd
2	17 dBd
4	20 dBd
8	23 dBd

(I question these gain claims. A 6 loop array is essentially a 12 element broadside antenna that should have about 8dBd of gain, not 14 as stated)…WA8RMC)

Remember that all of the six-loop arrays need to be fed in-phase. The antenna gain will be a very sharp (narrow) beam that is perpendicular from the front of the panel.

The Omni-Directional Lantern Configuration
Keith GØKTD recently posted about his "Lantern" antenna that is constructed by bolting four panels together, each aimed at 90 degrees from each other (see **Fig 3**).



By sending the beams out in four different directions, the test results by GØKTD, GB3NQ and G3MCD indicate a fairly circular gain pattern is radiated. The gain in any direction is the gain of the facing panel.

Tricks of the Trade
One way to adjust the resonance and SWR on the panel antenna is to prepare a "trombone" adjuster for the feed line connection to the 6-loop array. The tubes used for the trombone feed sections are made from 2.5mm ID M83 brass tubes as shown in **Fig 4**. The solid wires of the loop-arrays can be flattened slightly to create a snug fit into or out of the hollow tubes.

Figure 3 – Looking down onto the top of the four panels used for the Lantern Antenna

In **Fig 4**, the coax can be seen coming up through the insulated spacer that supports the feed point.

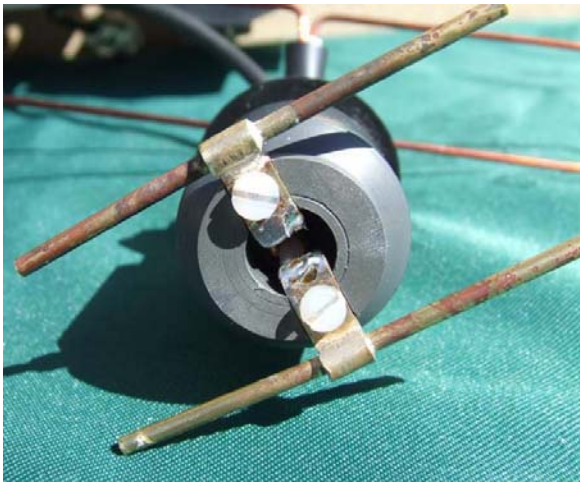


Figure 4 – A Trombone coax feed section that allows the wire in loops to slide in or out for adjustment (Courtesy of Maurice Richards, G3WKF and BATC)

Conclusion

This looks like a neat 1.2 GHz antenna that can be built as a beam or as an omni!! This appears to be a straight-forward construction project. The referenced articles below provide additional construction details for interested hams. The reader can make it as small or as large as desired. I have added the hi-gain Panel Antenna to my list of DATV projects.

Interesting Links

- British ATV Club – Digital-ATV and DigiLite Forums – see **www.BATC.org.UK/forum/**
- British ATV Club – select from about 25 streaming repeaters – see **www.BATC.TV/**
- BATC CQ-TV Magazine Archive – see **www.BATC.org.uk/cq-tv/archive/index.html**
- John G8MNY article “Flat Plate Aerial” in BATC CQ-TV magazine, 1997 issue 180
- Paul G8GMLand Ian G3KKD article “23 cm Panel Antennas” in CQ-TV-182 magazine, 1998
- Ian G3KKD and Paul G8GML “Correction to Drawing 3” in CQ-TV-197 magazine, 2002
- Maurice G3WKF article on “Update on Panel Antennas” CQ-TV-234 magazine, 2011
- Orange County ARC newsletter entire series of DATV articles – see **www.W6ZE.org/DATV/**
- Yahoo Group for Digital ATV - see **groups.yahoo.com/group/DigitalATV/**

THE BREAKFAST GROUP MEETS AGAIN!

Here we are again folks! This Saturday we met at TJ's on Morse Road and High Street. It changes every week so check the ATCO bulletin board for the monthly listings. Everyone is welcome and beware. Those not present get talked about. We'll see you there.

Let's see if I can remember the attendees this time.

Top photo, left to right clockwise. Bob N8NT in foreground, my empty seat, Jay KB8YMQ just barely in picture, Roger WB8DZW out of picture, Roger's wife (Mrs. Roger), Mike KB8SSH, Bob N8OCQ, Frank, WA8HFK and Joe KC8YPD.

Bottom photo, same people from a reverse angle. I got Jay and Roger in this one.

NEW MEMBER(S)

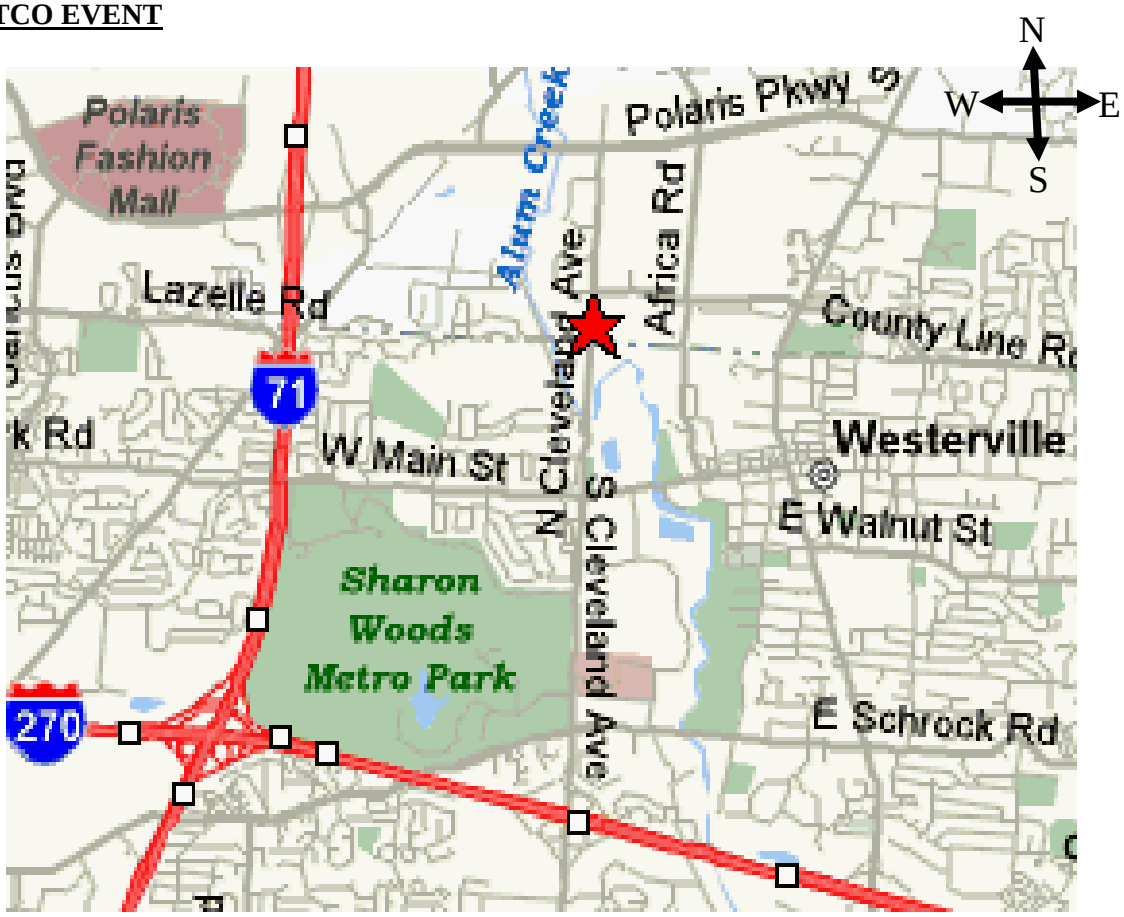
Let's welcome the new members to our group! If any of you know anyone who might be interested, let one of us know so we can flood him or her with information. New members are our group's lifeblood. It's important that we actively recruit new faces aggressively.

None this time.
…WA8RMC

A T C O
2012 SPRING EVENT

12 Noon – SUNDAY (For hamfest)
(Lunch starts about 12:30 PM)
MAY 6, 2012
ABB PROCESS AUTOMATION CAFETERIA
579 EXECUTIVE CAMPUS DRIVE
FOR MORE DETAILS, CONTACT
ART – WA8RMC - 891-9273
LUNCH PROVIDED – DOOR PRIZES
BRING A FRIEND AND SEE OLD BUDDIES
MINI HAMFEST – SHOW AND TELL

DIRECTIONS TO THE ATCO 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.

CONSTRUCTION ARTICLE INDEX

The following list is an index of all construction related material that has appeared in the ATCO Newsletter since its inception in the early '80's. This is a handy reference for that particular construction article that you knew existed but didn't want to wade through each issue to find it. All Newsletters below are also listed in order in the ATCO homepage under "Newsletters". Once you locate the Newsletter section, the displayed list can then be re-sorted as needed by clicking on the "date" in the header.
…Bob N8OCQ

Issue	Page(s)	Article
Vol 1 II	5	439 Beam
Vol 2 I	4	439 Beam
Vol 2 II	8,9	439 Parabolic Ant
Vol 2 II	9	Video Modulator
Vol 2 III	7	1296 Ant 45 Ele loop yagi
Vol 2 III	10	RF Power Indicator (in-line) for 1296 MHZ
Vol 2 SE	2,3	Diode Multiplier for 23 CM
Vol 2 SE	4,5	1296 MHZ 10 Watt Solid State Linear Amp
Vol 4 I	3	RF/Video Line Sampler
Vol 4 II	3	P-Unit Meter
Vol 4 II	7,10,11	UHF Gated Noise Source
Vol 4 II	12	420 – 450 Broom Handle Rhombic Ant
Vol 4 III	4,8	25 Element 1.26 Loop Yagi
Vol 4 IIII	6	Video Modulator (Tube Type)
Vol 5 I	3	Video Modulator One Transistor
Vol 5 II	4,7	900 MHZ Yagi Ant
Vol 5 II	6	Video Modulator for 2C39 Final
Vol 5 III	3	440 MHZ Hidden Transmitter Finder
Vol 6 I	3	Video Line Amp
Vol 6 I	8	25 Ele 910 MHz Loop Yagi
Vol 6 II	4,6,7	Microwave Oven ATV Xmiter
Vol 6 II	5	Matching a Quad Driven Ele
Vol 6 II	8	Power Divider for 33CM
Vol 9 IIII	5,7	16 Ele Loop Yagi for 439.25 MHz
Vol 10		No Articles
Vol 11 II	4,5,6	439 48 Ele Collinear Ant
Vol 11 IIII	7	1280 MHZ Cavity Filter
Vol 12 I	6,7,8	439 & 1200 Horz Polarized Mobile Ant
Vol 12 II	5,6,7	ATV Line Sampler
Vol 12 II	10	439 & 1280 Interdigital Filter(s)
Vol 12 III	6,7,8	439 Cheap Attic Ant
Vol 13 I	9, 10	High Level Modulator for ATV
Vol 13 II	5	VGA to NTSC Converter for Computer
Vol 13 III	9, 10	AM Video Modulator
Vol 13 IIII	4	1200 MHZ Transistor Linear Amp
Vol 13 IIII	6	900 & 1200 MHz Loop Yagis
Vol 14 IIII	8	439 31 EleYagi
Vol 14 IIII	12, 13	1250 MHZ FM ATV 3 Watt Xmiter
Vol 15 I	16	427.25 Horz J-Pole Ant
Vol 15 II	14	2400 MHZ Loop Yagi
Vol 15 III	8	Wavecom Modification
Vol 15 III	12,13,14	2.4 Gig Antenna's
Vol 16 II	20	2.4 Gig Helix Ant
Vol 16 IIII	4	1280 MHZ Loop Yagi
Vol 17 I	14, 15	Video Amp (Multi Output)
Vol 18		No Articles
Vol 19 IIII	4	Pwr Supply for 28 Volt Ant Relay
Vol 20 III	9, 10	Video Sampler
Vol 21 II	4	RF Pwr Amp for 900/1200 MHZ
Vol 21 II	14	10-14 Volt Doubler for 28 Volt Ant Relays
Vol 21 III	5	S-Video To Composite Adaptor
Vol 21 IIII	3,4	Video Noise Rejection Amp
Vol 21 IIII	14,15,16 ,17	"S" Meter For Comtech Boards
Vol 22 I		No Articles
Vol 22 II	10	1260 MHZ Cavity Filter
Vol 22 III		No Articles
Vol 22 IIII		No Articles
Vol 23 I		No Articles
Vol 23 II	5,6	Linear 60 Watt For 70CM
Vol 23 II	8,9	Video Modulator Update
Vol 23 III		No Articles
Vol 23 IIII		No Articles
Vol 24 I	13	RF Sniffer For 2.4 GIG
Vol 24 II		No Articles
Vol 24 III	3	Quantum 1500 Rec Tuner Mod
Vol 24 IIII	9	Battery Recharge Ckt
Vol 25 I		No Articles
Vol 25 II	6,7	Comtech TX Module Improvement
Vol 25 III	11	Comtech TX Module Improvement Correction
Vol 26 I	6	Isolator (Circulator) Mod. 850 To 1260 MHz
Vol 26 II	5,6	Comtech 1200 MHz rec. module improvements
Vol 26 III		No Articles
Vol 26 IIII	9	Remote Touch Tone Decoder For Your Shack
Vol 27 I	10	ATV Low Pass Filter (427 Mhz)
Vol 27 II	15	PictureTel Camera Data Cable Wiring
Vol 27 II	10	ATV Low Pass Filter (427 Mhz)
Vol 27 II	15	PictureTel Camera Data Cable Wiring
Vol 27 III		No articles
Vol 27 IIII		No articles
Vol 28 I	11	Super 1280 MHz amplifier
Vol 28 II		No articles
Vol 28 III		No articles
Vol 28 IIII		No articles

This is the complete list for construction articles shown in past ATCO newsletters. The page numbers listed may not match the actual page in the newsletter. They are the number shown in the PDF file. Some issues are missing. Art did not have a copy of every year. This list is complete through Volume 28 III.
…Bob N8OCQ

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.

4/21/2012 | **2012 Jackson County ARC Hamfest**
Location: Jackson , OH
Type: ARRL Hamfest
Sponsor: Jackson County Amateur Radio Club
Website: http://jacksoncountyarc.org/index.html

05/18/2012 | **Dayton Hamvention**
Location: Trotwood, OH
Type: ARRL Hamfest
Sponsor: Dayton Amateur Radio Association
Website: http://www.hamvention.org

06/02/2012 | **Fulton County ARC Hamfest**
Location: Tedrow, OH
Type: ARRL Hamfest
Sponsor: Fulton County Amateur Radio Club
Website: http://k8bxq.org

06/16/2012 | **Milford Hamfest**
Location: Milford, OH
Type: ARRL Hamfest
Sponsor: Milford Amateur Radio Club
Website: http://www.w8mrc.com

07/22/2012 | **Van Wert Amateur Radio Club Hamfest**
Location: Van Wert, OH
Type: ARRL Hamfest
Sponsor: Van Wert Amateur Radio Club
Website: http://www.w8fy.org

07/29/2012 | **Portage Hamfair '12**
Location: Randolph, OH
Type: ARRL Hamfest
Sponsor: Portage Amateur Radio Club
Website: http://www.hamfair.com

08/04/2012 | **Columbus Ohio Hamfest**
Location: Columbus, OH
Type: ARRL Hamfest
Sponsor: Voice of Aladdin ARC (W8FEZ)
Website: http://www.aladdinshrine.com/hamfest.htm

08/04/2012 | **Ohio State Convention**
Location: Columbus, OH
Type: ARRL Convention
Sponsor: ARRL Ohio Section
Website: http://www.arrl-ohio.org

09/16/2012 | **GCARA Hamfest**
Location: Cincinnati, OH
Type: ARRL Hamfest
Sponsor: Greater Cincinnati Amateur Radio Association
Website: http://www.gcara.org

04/29/2012 | **Athens Hamfest**
Location: Athens, OH
Type: ARRL Hamfest
Sponsor: Athens County Amateur Radio Association
Website: http://ac-ara.org/

09/23/2012 | **Cleveland Hamfest and Computer Show**
Location: Berea, OH
Type: ARRL Hamfest
Sponsor: Hamfest Association of Cleveland
Website: http://www.hac.org

10/28/2012 | **Massillon Hamfest**
Location: Massillon, OH
Type: ARRL Hamfest
Sponsor: Massillon Amateur Radio Club
Website: http://www.w8np.org

INTERNET ATV HOME PAGES (list verified 01/21/12)

Domestic homepages

http://www.atco.tv	Ohio, Columbus, homepage (ATCO)
http://www.w8bi.org/atv/atvresources.html	Ohio, Dayton ATV group (DARA)
http://www.citynight.com/atv	California, San Francisco ATV
http://atn-tv.org/ATN.htm	California, Amateur Television Network in Central / Southern
http://members.tripod.com/silatvg	Illinois, Southern, Amateur Television group
http://www.ussc.com/~uarc/utah_atv/id_atv1.html	Idaho ATV
www.bratsatv.org.	Maryland, Baltimore Radio Amateur Television Soc. (BRATS)
www.qsl.net/k7atv/	Salem, Oregon Amateur Television Associations-Salem
http://www.qsl.net/kd2bd/atv.html	New Jersey, Brookdale ARC N2SMT/R repeater
http://www.ipass.net/~teara/menu3.html	North Carolina, Triangle Radio Club (TEARA)
http://www.oregonatv.org	Oregon, Portland OATVA ATV Association W7AMQ/R repeater
http://members.bellatlantic.net/~theojkat/	Pennsylvania, Phila. Area ATV W3PHL repeater
http://www.hotarc.org/atv.html	Texas, WACO Amateur TV Society (WATS)
www.qsl.net/ww7ats	Washington, Western Washington Television Soc. (WWATS)
http://www.shopstop.net/bats/	Wisconsin, Badgerland Amateur Television Society (BATS)
http://www.kcatvg.org	Kansas, Kansas City ATV Group WR0ATV repeater (KCATVG)

Foreign homepages

http://atv.hamradio.si	Slovenia ATV
http://www.batc.tv.	British ATV club (BATC)
http://www.**batc.org.uk/cq-tv**	British ATV Club and CQ-TV Magazine

Misc other ATV related sites

http://www.atv-tv.org	The Amateur Television Directory
http://www.atn-tv.org	Amateur Television Network
http://www.atvquarterly.com	Amateur Television Quarterly Magazine
http://gb3lo.camstreams.com	"GB3LO" Repeater Camstream westoft, UK
http://www.ham-radio.com/sbms	"SBMS" San Bernardino Microwave Society
http://www.qsl.net/kc6ccc/	"METS" Microwave Experimenters Television System
http://www.icircuits.com/store/index.html	Intuitive Circuits ATV products
http://www.atvresearch.com/	ATV Research Co, cameras & related security products
http://www.downeastmicrowave.com/	Down East Microwave, UHF/Microwave parts
http://www.directivesystems.com/	Directive Systems, UHF/VHF/Microwave antennas
http://www.m2inc.com/	M2 Antenna Systems
http://www.hamtv.com/	PC Electronics, ATV equipment

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 checkin requests or comments. We rarely chat for more than an hour so please join us if you can.

ATCO TREASURER'S REPORT - de N8NT

OPENING BALANCE (1/20/12)…….$ 2123.49
RECEIPTS(dues)……..$ 140.00
Winter Pizza Party……$ (243.87)
Internet 2011 domain fee ……$ (39.99)
Paypal fee……$ (2.65)
CLOSING BALANCE (4/21/12)…… $ 1976.98

ATCO REPEATER TECHNICAL DATA SUMMARY

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

TV Transmitters: 427.25 MHz VSB AM mod, 1258 MHz FM mod, 1268 MHz QPSK digital, 2433 MHz FM mod, and 10.350 GHz FM mod.
(multipole filters in output lines of all transmitters)

Output Power - 427.25 MHz: 50 watts average 100 watts sync tip
1258 MHz: 40 watts continuous (Analog ATV)
1268 MHz 20 watts continuous DVB-S (QPSK) DATV SR=3125, FEC=3/4 , 2 video channels.
2433 MHz: 15 watts continuous
10.350 GHz: 1 watt continuous
Link transmitter - 446.350 MHz: 5 watts NBFM 5 kHz audio

Identification: 427, 1258, 1268, 2433, 10.350 GHz transmitters video identify every 30 min. with ATCO & WR8ATV on 6 different screens.
1268 MHz digital & 10.350 GHz analog - Continuous transmission of ATCO & WR8ATV with no input signal present.

Transmit antennas: 427.25 MHz - Dual slot horizontally polarized "omni" 7 dBd gain major lobe east/west, 5dBd gain north/south
1258 MHz - Diamond vertically polarized 12 dBd gain omni (Analog ATV)
1268 MHz - Diamond vertically polarized 12 dBd gain omni (Digital DVB-S ATV)
2433 MHz - Comet Model GP24 vertically polarized 12 dBd gain omni
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)
439.250 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. (Input here = output on 446.350).
1280.00 MHz - F5 video analog NTSC. (Input here = output on all TV transmitters)
- DVB-S (QPSK) digital SR=4167, FEC= 7/8. This input feeds all transmitters and also goes directly to 1268 MHz digital output channel 2. Therefore a 1280 DATV input and 439 or 2398 can be ON at the same time.
2398.00 MHz - F5 video analog NTSC. (Input here = output on all TV transmitters)
10.45 GHz - F5 video analog NTSC (not installed yet)

Receive antennas: 147.480 MHz - Vert. polar. Diamond 6dBd dual band (also used for 446.350 MHz link output)
439.250 MHz - Horizontally polarized dual slot 7 dBd gain major lobe west
1280.00 MHz - Diamond vertically polarized 12 dBd gain omni
2398.00 MHz - Comet Model GP24 vertically polarized 12 dBd gain omni
10.45 GHz - Commercial 40 slot waveguide horizontally polarized 16 dBd gain omni (not installed yet)

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 up for 5 minutes) Select # to shut down before timeout.
697	Select Time Warner radar. (Stays up till turned off). Select # to shut down.

Manual mode functions:

00* then 1 for Ch. 1 Select 439.25 receiver
00* then 2 for Ch. 2 Unused
00* then 3 for Ch. 3 Select 1280 receiver
00* then 4 for Ch. 4 Select 2398 receiver
00* then 5 for Ch. 5 Select video ID (4 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 (not in use at this time)
03* or 03#	Channel 3 1280 MHz scan enable
04* or 04#	Channel 4 2398 MHz scan enable
A1* or A1#	Manual mode select of 439.25 receiver audio
A2* or A2#	Unused channel at this time
A3* or A3#	Manual mode select of 1280 receiver audio
A4* or A4#	Manual mode select of 2398 receiver audio
C0* or C0#	Beacon mode – transmit ID for twenty seconds every ten minutes
C1* or C1#	C1* to disable 427 MHz transmitter, C1# to enable it
C2* or C2#	C2* to disable 1268 MHz digital transmitter, C2# to enable it

ATCO MEMBERS AS OF April 2012

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	
W8ARE	Larry Meredith III	6070 Langton Circle	Westerville	OH	43082-8964	
KC8ASF	Tom Pallone	3437 Dresden St.	Columbus	OH	43224	614-268-4873
WB4ATV	Don Coy	489 Crystal Lake Drive	Melbourn	FL	32940	
KC8BTX	Dudley Field	357 N. Ridge Heights Dr	Howard	OH	43028	
W6CDR	Wynn Rollert	1141 Pursell Ave	Dayton	OH	45420	937-256-1772
WB8CJW	Dale Elshoff	8904 Winoak Pl	Powell	OH	43065	614-210-0551
N8COO	C Mark Cring	3941 Three Rivers Lane	Groveport	OH	43125	614-836-2521
N8CXI	Garry Cotter	2367 Northglen Drive	Columbus	OH	43224	
N9CX	Bill Erwin	231 Gateside Ct.	Gahanna	OH	43230	
WB8CXO	Mike Young	289 Gayloard Dr	Munroe Falls	OH	44262	
N8CZO	Mike Flaharty	1025 Josiah Morris Road	London	OH	43140	
N3DC	William Thompson	6327 Kilmer St	Cheverly	MD	20785	
WA8DNI	John Busic	2700 Bixby Road	Groveport	OH	43125	614-491-8198
K8DMR	Ron Fredricks	8900 Stonepoint Ct	Jennison	MI	49428-8641	
K8DW	Dave Wagner	2045 Maginnis Rd	Oregon	OH	42616	419-691-1625
WB8DZW	Roger McEldowney	5420 Madison St	Hilliard	OH	43026	614-876-6033
KC8EVR	Lester Broadie	108 N Burgess	Columbus	OH	43204	
WA8FLY	Rod Shaner	16012 London Rd.	Orient	OH	43146	740-279-3614
N8FRT	Tom Flanagan	1751 N Eastfield Dr.	Columbus	OH	43223	
W8FTX	George Biundo	3675 Inverary Drive	Columbus	OH	43228	614-274-7261
W8FZ	Fred Stutske	8737 Ashford Lane	Pickerington	OH	43147	
KB8GHW	Mike Amirault	5560 Refugee Rd.	Baltimore	OH	43105	614-859-7005
WA8HFK,KC8HIP	Frank & Pat Amore	3630 Dayspring Dr	Hilliard	OH	43026	614-777-4621
W4HTB	Henry Cantrell	905 Wrenwood Dr.	Bowling Green	KY	42103	270-781-9624
WG8I	Chris Vojsak Sr,	3536 W Henderson Rd	Columbus	OH	43220-2232	614-203-6000
WB2IIR	Michael Anthony	370 Georgia Drive	Brick	NJ	08723	
W8KHP	Allan Vinegar	2043 Treetop Lane	Hebron	Ky	41048	
WA8KQQ	Dale Waymire	225 Riffle Ave	Greenville	OH	45331	937-548-2492
N8LRG	Phillip Humphries	3226 Deerpath Drive	Grove City	OH	43123	614-871-0751
WB8LGA	Charles Beener	2540 State Route 61	Marengo	OH	43334	
KA8LWR	Mel Alberty	1645 Olentangy Road	Bucyrus	OH	44820	419-468-2971
W8MA	Phil Morrison	154 Llewellyn Ave	Westerville	OH	43081	
KA8MFD	Ross McCoy	227 S Boundary St PO Box 9	Edison	OH	43320	
KA8MID	Bill Dean	2630 Green Ridge Rd	Peebles	OH	45660	
W0MNE	Mike Doty	4300 Winchester Southern Rd	Circleville	OH	43113	740-420-9060
N8NT	Bob Tournoux	3569 Oarlock Ct	Hilliard	OH	43026	614-876-2127
WU8O	Tom Walter	15704 St Rt 161 West	Plain City	OH	43064	614-733-0722
N8OCQ	Bob Hodge Sr.	3750 Dort Place	Columbus	OH	43227-2022	
KB8OFF	Jess Nicely	742 Carlisle Ave	Dayton	OH	45410	
W6ORG,WB6YSS	Tom, Maryann O'Hara	2522 Paxson Lane	Arcadia	CA	91007-8537	626-447-4565
KE8PN	James Easley	1507 Michigan Ave	Columbus	OH	43201	614-421-1492
W8PU	Gary Poland	3347 S.R. 28	Midland	OH	45148	
W3RCJ	Thomas Farrell	1912 Burnwood Road	Baltimore	MD	21239	
WA6RCW	Ed Mersich	34401 Columbine Trl W	Elizabeth	CO	80107-7866	
WA8RMC	Art Towslee	438 Maplebrooke Dr W	Westerville	OH	43082	614-891-9273
W8RRF	Paul Zangmeister	10365 Salem Church Rd	Canal Winchester	OH	43110	
W8RRJ	John Hull	580 E. Walnut St.	Westerville	OH	43081	614-882-6527
W8RUT,N8KCB	Ken & Chris Morris	2895 Sunbury Rd	Galina	OH	43021	
W8RVH	Richard Goode	9391 Ballentine Rd	New Carlisle	OH	45334	937-964-1185
W8RQI	Ray Zeh	2263 Heysler Rd	Toledo	OH	43617	
KB8RVI	David Jenkins	1941 Red Forest Lane	Galloway	OH	43119	614-878-0575
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
W8SJQ	Rocky Eramo	795 Riverbend Ave	Powell	OH	43065	614-207-2740
W8SJV, KA8LTG	John & Linda Beal	5001 State Rt. 37 East	Delaware	OH	43015	740-369-5856
KB8SSH	Mike Cotts	3424 Homecroft Dr	Columbus	OH	43224	614-371-7380
W3SST	John Shaffer	6706 Gilette Dr	Reynoldsburg	OH	43068	614-751-0029
W8TIP	Gene Hawkins	1720 Liberty Street	Toledo	OH	43605	
K8TPY, K8FRB	Jeff & Dianna Patton	3886 Agler Road	Columbus	OH	43219	
NR8TV	Dave Kibler	243 Dwyer Rd	Greenfield	OH	45123	937-981-1392
W8URI	William Heiden	5898 Township Rd #103	Mount Gilead	OH	43338	419-947-1121
KB8UWI	Milton McFarland	115 N. Walnut St.	New Castle	PA	16101	
WA8UZP	James R. Reed	818 Northwest Blvd	Columbus	OH	43212	614-297-1328
KB8WBK	David Hunter	45 Sheppard Dr	Pataskala	OH	43062	740-927-3883
KC8WRI	Tom Bloomer	PO Box 595	Grove City	OH	43123	
AA8XA	Stan Diggs	2825 Southridge Dr	Columbus	OH	43224-3011	
N8XYJ	Dan Baughman	4269 Hanging Rock Ct.	Gahanna	OH	43230	
KB8YMQ	Jay Caldwell	4740 Timmons Dr	Plain City	OH	43064	
KC8YPD	Joe Ebright	3497 Ontario St	Columbus	OH	43224	
N8YZ	DaveTkach	2063 Torchwood Loop S	Columbus	OH	43229	614-882-0771
K3ZKO	Ron Cohen	915 Rowland Ave	Cheltenham	PA	19012	215-828-1263
KA8ZNY,N8OOY	Tom & Cheryl Taft	386 Cherry Street	Groveport	OH	43125	614-202-9042

ATCO MEMBERSHIP INFORMATION

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

ATCO publishes this Newsletter quarterly in January, April, July, and October. It is sent to each member without additional cost. All Newsletters are sent via Email unless the member does not have an internet connection.

The membership period is from January 1ST to December 31ST. New members joining before August will receive all ATCO Newsletters published during the current year prior to the date they join ATCO. For example, a new member joining in June will receive the January and April issues in addition to the July and October issues. For those joining after August 1ST, they can elect to receive a complementary October issue with the membership commencing the following year or get the previous (3) Newsletters. Your support of ATCO is welcomed and encouraged.

Membership expiration notices will be sent out in January in lieu of Newsletters for those with an expired membership.

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. The actual expiration is on January of the following year so we can keep the dues clock consistent with the beginning of each year.

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:	Frank Amore WA8HFK	Statutory agent:	Frank Amore WA8HFK
Corporate trustees:	Same as officers	Newsletter editor:	Art Towslee WA8RMC

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

FIRST CLASS MAIL

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