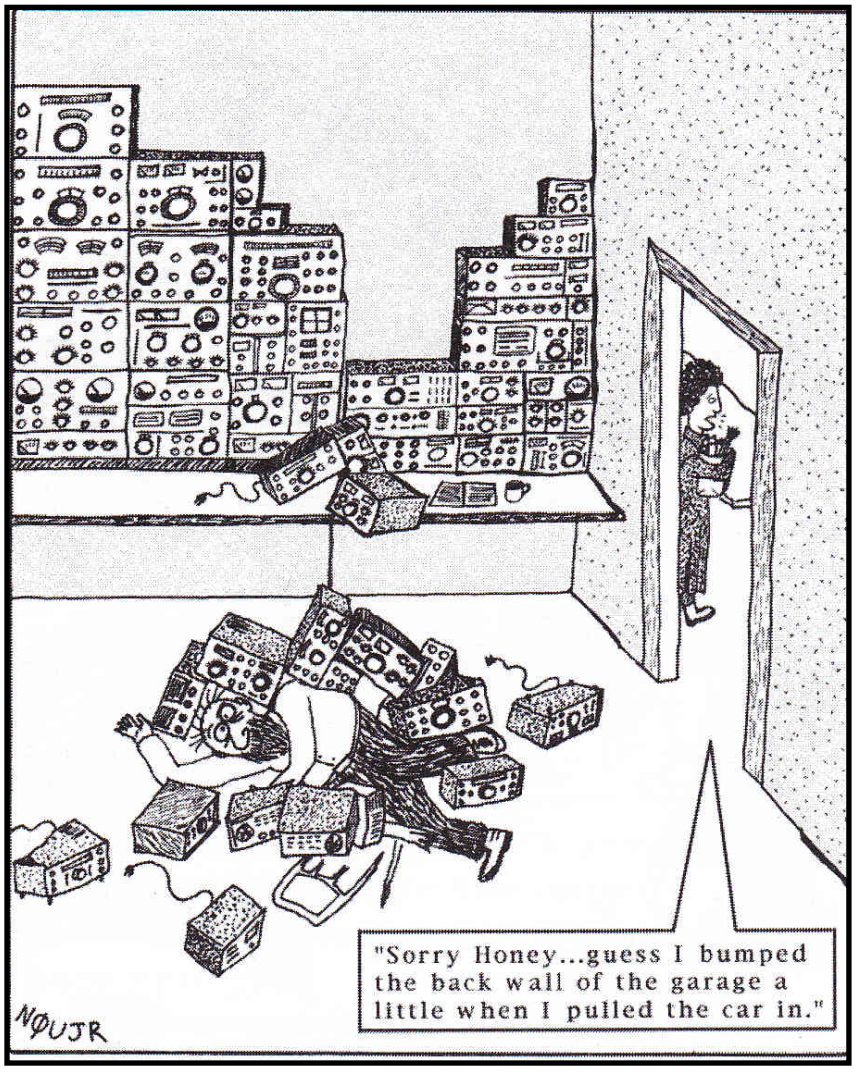
ATCO NEWSLETTER

VOLUME 29 NUMBER 1 **January 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

Gosh guys, not too much news or activities this time. The Newsletter is a little thin for it seems most people are concentrating on other activities. The Tuesday night 147.48 net has picked up somewhat in the last month or so but it still averages about 8-10 check-ins. On January 11 we had 15, but that was the exception. Maybe mild weather has diverted some attention elsewhere. Right now, however, we've just had our first significant snowfall in Columbus today (1/12/12). OK, the snow looks great but I've had my fill so it can leave and warm up any time! Fat chance.

Repeater activity has been at a minimum lately but I shouldn't complain because my temporary "Ham Shack" in the upstairs bedroom is still in operation as the basement location is not ready. I'm voice only until I get relocated. I'm working on it and have all new drywall in place and painted. Yesterday I installed some shelving and lighting for the workbench so I'll redirect some energy toward the Ham Shack construction shortly. The next step is to get some permanent wiring installed so I won't have to trip over line cords at each turn. Finally I'll have a false wall to locate the Ham equipment against. I always wanted this but the previous location did not allow it. The false wall will allow me to pass the data and power cables through the wall for connection on the backside thereby eliminating the rat's nest of tangled cables on the shelf behind the equipment. That wall is up but not finished yet.

The repeater seems to be working ok except for a problem that cropped up with the ID generator. For some reason, it kept working but most of the ID screens were missing. Also, the screens just snapped from one to the other rather than being faded into place. A power down-power up operation fixed it. It hasn't shown up since.

We seem to be plagued with more than our share of interference issues. First, it was the ODOT GLONAS interference we caused, then the construction signal interference on 438MHz caused by others and solved by the FCC and now we've got intermittent data transmissions right on our 446.350MHz link frequency. I tracked it to a 451.250 signal in downtown Columbus. It transmitted a weak, fast and garbled CW identification at random times. Dale, WB8CJW, worked diligently to successfully copy, record and decode the signal well enough to be certain of the call. It was KNFX536 registered to AEP here in Columbus. Tom Taft, KA8ZNY took on the task of contacting them which was met with complete cooperation. It was later determined that AEP is operating legally with no transmitter problems. However, we found that whenever AEP's signal on 451.250 and another one on 454.1125 were on at the same time, our interference on 446.350 showed up. The owner of the 454.1125 is identified and they are now working on the problem but don't think they are at fault either. All we know at this time is that the 454.1125 transmitter has been in operation on the building next door to our transmitter for a long time but that radio station WCBE on 90.5MHz went into operation at the same location just about the time our interference started. Hmmm….Is it just a case of strong signal mixing? The mixing of 454.1125, 451.250 and 90.5 won't produce a 446.350 signal as far as I can see so there must be something else involved. We don't know at this time. Stay tuned as the plot thickens!!!!!

I also had a loss of radar signal from Channel 4. That one was simple. I found that they inadvertently disconnected the video cable during some routine maintenance. Re-connection solved the problem.

That's just about it, guys. We need Newsletter material!

…73, WA8RMC

THE VK3RTV WORLD-WIDE DATV QSO PARTY

(Article source is the RF Newsletter September 2011, Orange County Amateur Radio Club, www.W6ZE.org)

In celebration of the 100 Years of Amateur Radio Victoria providing support for ham radio, organizer Peter Cossins VK3BFG and the hams associated with the VK3RTV digital-ATV repeater conducted the first world-wide DATV QSO Party on August 26-27 (UTC). The VK3RTV repeater is the first in Australia with a two channel multiplexed 100%-digital-transmitting output. In eastern Australia, many hams had contact directly line-of-sight by radio frequencies with the VK3RTV DATV-repeater (near Melbourne). In other parts of Australia, and Thailand, and United States, hams relayed their video to Peter VK3BFG by SKYPE video-connections…who then uplinked the video and audio to the VK3RTV digital repeater using the DVB-S protocol for DATV.

Getting a 1.2 GHz DATV Signal to Australia

The W6HHC digital-ATV signal was transmitted on 1.2 GHz using DVB-S protocol for DATV. The signal was then received on a nearby satellite-SetTopBox receiver that sent the video signal over by USB to a Dell notebook computer to be displayed. See **Fig 1** of the W6HHC DATV video being received in Orange, CA. The next step was to take the video display on the notebook computer and send it over the internet by SKYPE video-connection (called "shared-display" or "shared-desktop") to Peter VK3BFG, the net control station for the DATV QSO Party. See **Fig 2** for a block diagram explaining the video signal path. Peter VK3BFG then uplinked the received SKYPE video to the VK3RTV DATV repeater on 1.2 GHz using DVB-S protocol. The VK3RTV repeater in turn downlinked W6HHC video on 446.5 MHz using the DVB-T protocol. As shown in **Fig 2**, a 5.8 GHz link direct from the VK3RTV repeater site to an internet gateway sends the video over internet as streaming video to the BATC (British Amateur Television Club) server. Now the VK3RTV video could be seen all watch my DATV video come back from the VK3RTV over the world through the www.BATC.TV/ internet URL. It was exciting to digital-repeater via the BATC streaming server on the internet. This was an interesting combination of ham radio and internet!

Figure 1 – W6HHC 1.2 GHz DATV Video being Received on SetTopBox/Notebook-Computer

Getting my DATV Signal to Australia via W6ATN

Amateur Television Network (ATN) links several ATV repeaters in California-Arizona-NV-NM including W6ATN located on Saddleback Peak in Orange County.

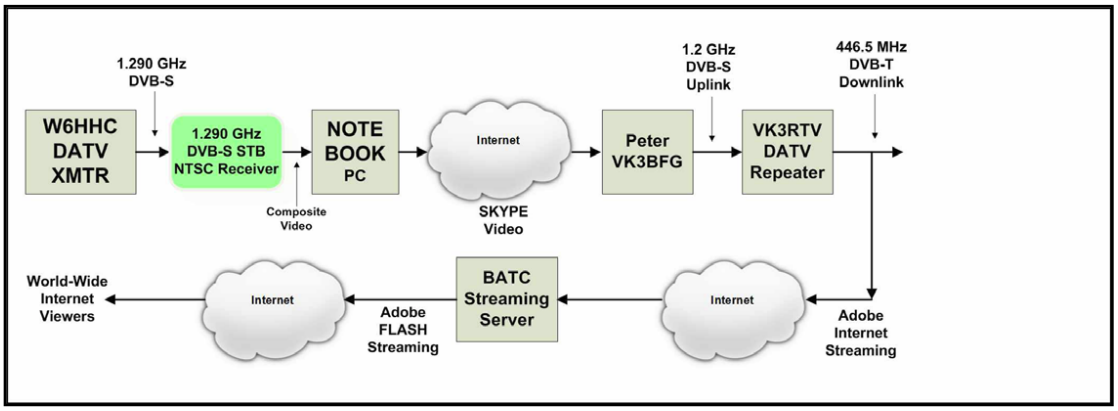


Figure 2 – Block Diagram Showing W6HHC DATV QSO Straight to Australia

Don KE6BXT in Mission Viejo worked very closely with Peter VK3BFG while planning for the DATV QSO Party to allow ATV hams in the US to uplink to W6ATN and then send the W6ATN repeater video to be sent to VK3BFG over the internet using SKYPE video connection. Don KE6BXT also allowed me to SKYPE my DATV video directly to him. KE6BXT then uplinked my signal to W6ATN on 2.4 GHz and then SKYPE'd the 1.2 GHz ATV downlink to VK3BFG via a separate SKYPE video-connection. **Fig 3** has video path details.

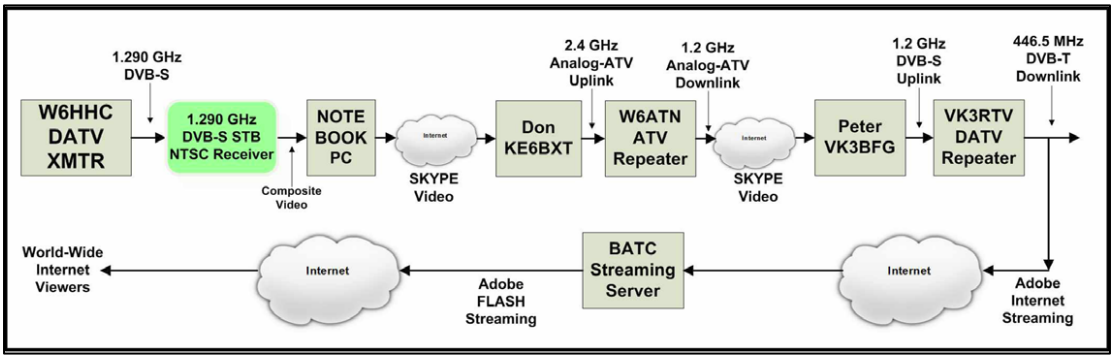


Figure 3 – Block Diagram Showing W6HHC DATV QSO to Australia via W6ATN

Summary

The VK3RTV world-wide DATV QSO Party was a success! Peter VK3BFG reported that he logged a total of 65 QSO's during the DATV QSO Party event, including three VK3 portable DATV stations operating in the field for the event.

Fig 4 – Typical VK3RTV Repeater Test Pattern seen over the Internet

Figure 5 – The Larger Picture is Peter VK3BFG testing with Don KE6BXT (smaller PIX in lower corner) (photo courtesy of KE6BXT)

Don KE6BXT reported that 16 different US hams checked into (by RF or by SKYPE-video) the VK3RTV DATV QSO Party via ATN. As said earlier, I thought this QSO Party was really an interesting and exciting inter-mixing of digital-ATV, analog-ATV and internet. My only disappointment was that I could not watch the BATC streaming video on my iPad. This small compatibility glitch was caused by Apple refusing to support FLASH-video on the iPad or iPhone. I want to thank Don KE6BXT for helping me sort out a dozen SKYPE issues before the QSO Party and Peter VK3BFG who took the time to test with Don and me using SKYPE before the QSO Party. The DATV QSO Party was great fun!! I got to meet (see) a lot of DATV hams. I think this event was great promotion of DATV!!

Interesting DATV Links

- VK3RTV Digital Repeater WEB site – see **www.VK3RTV.com**
- W6ATN Amateur Television Network (ATN) – see **www.ATN-TV.org/**
- Amateur Radio Victoria organization – see **www.AmateurRadio.com.au/**
- British ATV Club - Digital Forum – see **www.BATC.org.UK/forum/**
- British ATV Club – select from about 25 streaming repeaters – see **www.BATC.TV/**
- German ATV portal for streaming repeaters and forum – see **www.D-ATV.net/**
- 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/**
- ATCO homepage **– www.atco.tv**

IS DVB-S VIDEO “IMAGE” OR “DATA”?

70cm DATV is probably illegal in the US!

Despite having a quick contact with the ARRL to ask the question and getting back "IMAGE is NOT DATA" and referring to FCC rules 97.307(f)(2):

(2) No non-phone emission shall exceed the bandwidth of a communications quality phone emission of the same modulation type. The total bandwidth of an independent sideband emission (having B as the first symbol), or a multiplexed image and phone emission, shall not exceed that of a communications quality A3E emission.

This would make you think the Digital versus Analog is rightly just a Semantic argument and it's okay... but looking at commercial license grants for DVB-S/S2/C but maybe not T and for ATSC makes the definition for the emission designator the following:

DVB-S/S2/C = G7W and ATSC = C7W

The definition of Data as far as I can tell in the context of G7W/C7W per FCC rules in 97.307(f)(8) is:
A RTTY or data emission having designators with A, B, C, D, E, F, G, H, J or R as the first symbol; 1, 2, 7 or 9 as the second symbol; and D or W as the third symbol is also authorized.

The definition of Image per FCC 97.3(c)(3) Image is:
Facsimile and television emissions having designators with A, C, D, F, G, H, J or R as the first symbol; 1, 2 or 3 as the second symbol; C or F as the third symbol; and emissions having B as the first symbol; 7, 8 or 9 as the second symbol; W as the third symbol.

This means that type G7W and C7W is not legally IMAGE... it's DATA so the 97.307(f)(2) rule probably doesn't apply if your signal, G7W, for example isn't legally IMAGE. Unless this is cleared up somehow, it appears DVB-S/S2/C and even "broadcast ATSC" on 70cm is not allowed under current archaic US Rules. What a mess. When will the ARRL fix these 30+ year old rules?

I'd like to be proven wrong on this. I have a second inquiry in with the ARRL because of this research. I guess I'm sticking to 23cm in the meantime.
…Fred W0FMS 11/01/11

Ben Gelb ben@gelbnet.com responds the same day to say,

Hi Fred - I went through the same exercise after your thread last week. I found the reference to emission type C7W on the FCC's website for ATSC. I also searched license grants. For DVB-S, I found both G7W and G7F in different cases. Not sure why one vs. the other gets used, perhaps additional research might reveal the answer, though it seems that, at least in some circumstances 'F' is appropriate.

This leaves the matter of the 7. Most broadcast ATSC or DVB content actually has multiple video streams multiplexed together so it seems reasonable that this could become a 1 if you limit the transmission to a single video channel. I’m not sure why you would need 7 which is for 2 or more channels. I think that a single-channel DVB-S signal carrying television could be legitimately classified as G1F.

But maybe if you added audio to the video, you would have problems? I am sort of left wondering a little bit about the meaning of "channel" in this context. "Nature of signals modulating the main carrier" makes me think a lot more in the vein of OFDM rather than multiple program streams, which are really a single baseband signal by the time they get to modulating the carrier. Though the use of the '7' for DVB-S licenses would seem to suggest the opposite.

As an aside, the wording of 97.307(f)(8) seems very circular. Data is defined initially in 97.3(c)(2):

(2) Data. Telemetry, telecommand and computer communications emissions having designators with A, C, D, F, G, H, J or R as the first symbol; 1 as the second symbol; D as the third symbol; and emission J2D. Only a digital code of a type specifically authorized in this part may be transmitted.

97.307(f)(8) allows "a RTTY or data emission having the designators" G7W, C7W, etc... but by my reading of the definition of "Data" in 97.3(c)(2) there is no such thing as a "RTTY or data emission having the designator G7W or C7W" since by definition in 97.3(c)(2) a signal with G7W or C7W is not a data signal.

In any case, I definitely agree with your conclusion that it is a mess! I'm not sure it is possible to *prove* one way or the other. The rules seem less than clear in this situation. I think you can reasonably construe them in multiple ways. Until there is some precedent laid down through an enforcement action, a circular or something is issued clarifying their intent, or the rules are rewritten, we can really only speculate as to how they may or may not be applied.

Your approach of not running on 70cm seems a sure way to stay out of trouble. I will be interested to learn if the ARRL can provide further detail.
…Ben

Fred then responds,

Thanks, Ben. It is interesting that you came up with the same conclusion……..(snip).
I tripped the trigger over at the league by insinuating that 70cm isn't used enough and that allowing not only digital ATV but also data at similar data rates should be allowed and that the 30 year old data rules, well, suck.

Apparently the league has fought the 70cm "grab" and they think it's counterproductive for any one to suggest that 70cm is anything but full and allowing presently banned modes could help. It may be on the coasts but it's pretty dead in the Midwest.

The other league official suggested that I apply for an STA. Maybe I will and I'll run 70cm. I suppose if the FCC tells me it's not necessary that clears it up. If they give it to me, well, that clears it up.

G2F is allowed according to the rules. I did find a satellite license where G7F was specified. It was indeed DVB-S video with no audio (specified in the comments). The problem with "2" is really it seems that in real use it implies analog uses of the spectrum even though it says "modulated data" in the description.

In any case, all commercial licenses I could find show either G7W or G7F for DVB-S and obviously for ATSC all were C7W (or more specifically 5M38C7W which is the only valid 8VSB ATSC mode). None showed "2". I find it hard to justify calling my signal G2 when every commercial use that one can find calls it G7. It's cheating probably. Is it ok? I guess asking for forgiveness later is an option. But I was hoping to avoid that option and get it cleared up once and for all.

It's unfortunate that radio regulations are a grant of positive liberties as if it were defined correctly; it would be a no brainer. It would have been better if we were given examples of what we can't do and assume that new stuff like this isn't a problem until it is proven to be instead of the other way around.

I wanted to also irritate the ARRL a bit as it's time to fix the digital rules. Well it was time in 1990 but change is slow.

I guess I'm jumping the gun a bit though as probably getting 23 cm up is better. My only issue is that I live in the country and getting 21 miles into town would have worked a lot better on 70 cm. Oh well.
…Fred W0FMS

Finally, Grant sums it up as,

Hi all,
There is one thing that overrides the band plan, "**experimentation**". This lets you run any mode within the limits of the band used. I've done many tests over the years with new modes that do not fit within the current band plan. This provision is there giving Ham radio users the freedom to experiment on the understanding the technology is always changing. If a new mode comes along like DATV and there is a need amend the band plan, this can be done at the next revision. Here in New Zealand the band plans gets updated every ten years or so taking in the account these changes. So, on this basis, all new modes can be claimed as experimental allowing them to be used. Therefore, you can go ahead and enjoy ATV in all its forms.
Grant
ZL1WTT

Bottom line guys; don't sweat the details. It's entertaining to observe those who choose to sit back, pick apart the rules and say, "Look what I found" in order to make a point. Contrastingly, it's better to rule in favor of us where it could be questionable, enjoy the hobby and move on. Let's use 70cm for DATV and stop only if an official tells us to. Here's an area where it's better to seek forgiveness than ask permission! Case closed!
…WA8RMC

ATV EQUIPMENT FOR SALE

John Greene, KE8U, due to health problems, wishes to sell his ATV equipment.
If you are interested, call John at 740-697-0963. A list of what is for sale follows.

_____

Manufacturer	Model No.	Description
AEA	?	70 CM, 4 watt, transmitter
AEA	RLA-70	70 CM, 50 watt amplifier
AEA	MTS-100	Power Supply, 28 VDC
M Squared	?	70 CM, Yagi Beam,16 Els.
Videonics	?	Titler (for 525 Line Stds.)

Note: The RLA-70 is equipped for remote location and operation, if it be desired.

_____

…Submitted by Bill Parker, W8DMR on 10/21/11.

STREAMING DIGITAL-ATV VIDEO FROM BATC TO AN IPAD

(Article source is the RF Newsletter November 2011, Orange County Amateur Radio Club, www.W6ZE.org)

Many hams know that they can not receive Adobe Flash video to their iPad or iPhone. This restriction is because Apple Computer decided that Adobe Flash created too large of a security risk to be allowed to be installed on Apple Products. I know that my small security engineering company came to the same security conclusion and does not install Flash on our corporate computers. But, in TechTalk95 I complained that the lack of Flashvideo on my iPad prevented me from using the iPad as a spare monitor to watch DATV streaming over the internet from BATC (www.BATC.tv) or the VK3RTV DATV repeater (www.VK3RTV.com). Now there is a solution for watching streaming internet Flash-video on an Apple product. The November 2011 issue of MacLife magazine reported that two companies now sell an APP on the iTunes Application Store that allows an iPad or iPhone to receive internet Adobe Flash-video. The technology to allow this is "cloud computing"! Both companies sell a specialized web-browser product to install on your iPad. This web browser redirects your URL for a Flash video through their server in the "cloud". The cloud-server converts Flash-video into a video stream compatible with the iPad and then delivers the new stream to the iPad browser.

Photon Flash Web Browser

This APP is a specialized web browser for an iPad or iPhone and sells for US$4.99 on the Apple iTunes Application Store. This APP can handle Flash streaming video, as well as interactive Flash games and pre-recorded Flash video like often used on Facebook, YouTube, etc. It worked the first time I pointed the iPad browser to the BATC web site for streaming DATV repeaters.

Skyfire Web Browser

This APP is a second specialized web browser for an iPad or iPhone and sells for only US$1.99 on the Apple iTunes Application Store. This APP turned out to be a disappointment for me because it handles only pre-recorded Flash video files common on Facebook. The Skyfire APP could **NOT** handle the more sophisticated streaming Flash video found on the BATC site or online interactive Flash games.

Figure 1 – Screen Shot off iPad of BATC Server video stream using Photon Flash Web Browser

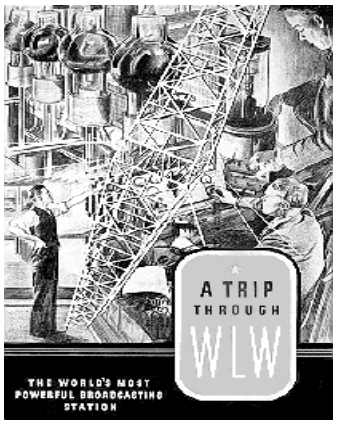
Conclusion

The Photon web browser for iPad works well with Adobe Flash-video! I now can use my iPad as a monitor to display BATC streaming ham television repeaters for my DATV activities.
…Ken Konechy W6HHC

WLW'S BIG-ARSE TRANSMITTER

The following is a neat article sent to me by Daun Yeagley N8ASB. Although not ATV material, I thought those nostalgia buffs among us would enjoy this material since it is from close to home. Also as Daun states, "Neat article... And one of our own LWTG guys, Paul Jellison has served as chief engineer there too". The original article is located at http://www.ominous-valve.com/wlw.html and was initiated by Jack Tiley AD7FO, an ARRL TC, TS and VE Instructor on 10/21/11.

700 kHz.
500 kW.
100% modulation.
no limiter...



AM radio used to be different. It was the only thing on the air. At night, signals traveled thousands of miles through the noise-free sky, and everyone kept a DX log. The FRC/FCC made the 5 kW hayburners leave the air at sundown, leaving clear channels for the big guys. The only interference was the electric fence in the cattle yard.

If you lived way out on a farm, you probably depended on one or more of these distant, clear-channel stations for your only night time contact with the world. They were the Class 1-A's, the superstations, the flame throwers. They had callsigns like KFI (Farm Information), KOA (King Of Agriculture), WSM (We Shield Millions), and KRVN (Rural Voice of Nebraska). There were no market areas, no Arbs, no sound-alike syndications, and no graveyard buzz from hundreds of close-sited coffee-warmers. AM was bigger stuff than that, and Ohio's WLW was the biggest.

WLW was, and still is, radio engineer heaven. They've been building, modifying, and improving equipment since there's been equipment to build, modify, and improve. WLW was the 1930s version of NASA, continually testing the limits of just what AM broadcasting could do under U.S. regulations. WLW was originally the extended shadow of Powel Crosley, Jr., yet another of those forgotten, 20th century visionaries. He invented things, and sold them. Lots of them. Crosley left the high end to other people, preferring simple, mass-produced merchandise with extremely attractive prices. It worked. He sold refrigerators, auto accessories, and for a time the autos to go with them. He sold a lot of them, and made a ton of money. He became owner of the Cincinnati Reds, who played in Crosley Field until fairly recently, and who still carry their games on WLW.

CROSLEY
THE CROSLEY RADIO CORPORATION
CINCINNATI

Crosley backed into the radio game. In the 1920s, when his son wanted one of those newfangled receiver gadgets, Crosley could not believe how expensive they were. He decided to build one himself, from directions in a book, and for a fraction of the cost. Something clicked in his brain, and soon he was selling absolutely astonishing numbers of little radios that people could afford.

Crosley Radio really took off after acquiring Precision Instrument Company, a manufacturer with an Armstrong license to build super-regenerative sets. Crosley's first regens were similar to Precision's Ace, a little, battery-powered box with a peep-hole so you could look in and set the filament voltage to the single tube by eye. This evolved quickly into the ten-dollar Crosley Pup, an even smaller, black cube with the single tube poking up on top, knobs to twiddle on three sides. and a "grid leak" on the back.

RCA had its dog, Little Nipper, hearing his master on the phonograph (or was it a gramophone?). Crosley had his own little terrier named Bonzo. He was shown wearing earphones, seeing as the Pup had no speaker. While Crosley came to offer a huge line at all prices and levels of sophistication, he continued to make an absolutely incredible amount of money on these little sets, breathlessly promoted as "The Armstrong Circuit," even when newer designs came in. Crosley certainly knew how to advertise.

Receivers didn't sell without something to receive, so Crosley, like most early manufacturers, built a radio station. 8CR, "The Station With A Soul," had an 8-foot acoustic horn on the mike. Crosley would stick his head halfway into the thing and announce, then someone else would hold a gramophone up to the gaping maw. Crosley seemed to like *Star of India*, so he'd play it over and over for hours. No focus groups or format consultants for this guy. Since Crosley Pups, and regenerative radios in general, worked best on strong signals, he wanted watts. Lots of watts. He saw to it that his stations always had the highest signal strength possible. Not the highest practical - the highest *possible*. He was the champ photon-slinger of American broadcasting, and knew it. He liked it that way. You know. It's one of those guy things.

In 1928, WLW was the first U.S. station to make it to 50 kW, courtesy of an enormous, water-cooled, Western Electric transmitter, the kind with those huge, Frankenstein-ish meters on top and plenty of ominous little windows where one could look in and see how hot the tubes were getting. By then, WLW occupied the choice frequency of 700 kHz, from a majestic antenna farm near Mason, OH, just outside Cincinnati. For several reasons, this was a killer site for coverage. When darkness fell, and the band opened up, the mighty skip wave from Mason's horizontal antenna ruled the sky.

Now, 50 kW was a hell of a lot of juice in 1932. In an old-style, plate-modulated transmitter, it's still a lot of juice in 2000. Crosley,

though, knew he could do better. Somehow, he finagled the Federal Radio Commission into an "experimental" authorization for 500 kW, first with the special callsign of W8XO, finally as commercial WLW.

Of course, W8XO really *was* an experiment, and not a cheap one. Half a megawatt, three-quarters fully modulated, millions of peak-envelope watts, on 700 kHz, with existing tube electronics, had never been tried. Building the beast required the combined engineering talents of RCA, General Electric, and Westinghouse. The investment, changed into today's dollars and at today's engineering prices, might not have been much less than a space mission, which in a way it was.

GE built most of the modules, but RCA put them together, and gave it the historic serial number one. "RCA 1" had a modular design with a lot of built-in redundancy, good for when something blew up, which everyone knew it would. It used the existing 50 kW, unmodulated in class C, for excitation. To this were added three parallel, water-cooled, 167 kW power amplifiers, each with four 100 kW RCA 867 tubes, two to a side in push-pull, making for 12 of these incredibly expensive, five-foot-tall firebottles. Most of this height was the anode's copper heat sink, which fit into a pipelike water jacket.

The huge, high-level modulator was also water-cooled. It could easily make 400 kW *audio* with both of its largely redundant modules simultaneously cranked to full rock and roll. Fortunately for the survival of civilization, this case was rare. Each module used four more of the biggest tubes made, bringing all of RCA 1's RF and AF output tube complement to twenty, with a total cost of $34,000 in 1930s' depression dollars. Even more mindboggling were the two modulation transformers, one per module, each 37,000 pounds, oil filled, and 10 feet high. It's possible that these two Westinghouse reactors were in fact the world's largest transformers for a brief time - "heavy iron" indeed!

Powel Crosley
throws the big switch

B+ and other voltages came from a bank of six huge, forced-air cooled, mercury-vapor rectifiers. These 450-amp monsters would shake the building's brick walls, not to mention your bones, when they arced back. Pure DC, *3000* amps of it, was put on RCA 1's many filaments. This awesome juice was homemade, by two large motor-generators, plus a hot standby. An early photo shows Crosley, with his left hand in his pocket for electrical safety, closing a huge switch to start up one of these. He does not look happy.

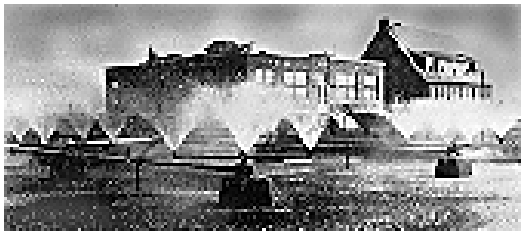
A new back was built onto WLW's already spacious building, 33 kV AC service was brought in, and ultimately RCA 1 grew 15 feet tall, 57 feet wide, and something like 30 feet deep. Enclosures weren't so much cabinets as rooms, where people might explode if they contacted the wrong circuits. There was a catwalk, a balcony really, across the front of the beast, for tube access through more of those ominous, glass doors. Under the catwalk were a few meters to watch, and a lot of water faucets to turn. Inside, the rig had as many Pyrex water pipes as wires. Outside, it looked more like a nuke plant.

RCA 1, then, needed a few features we don't see much anymore. Primary cooling water came from a distillery, and was circulated through a heat exchanger in the 700-gpm pump room. Secondary water went outside, to a fountain-like cooling pond. There were so many relay-driven contactors in the Westinghouse control system that they needed another large motor-generator for coils and auxiliary circuits. Huge AC transformers, and rows of those touch-and-you-die knife switches so popular at the time, were everywhere. The whole plant looked a bit like a power station, which to some extent it was.

Of course, there had to be a new, vertical antenna, and not just anything could do a good job on the expected 70 RF amps at the current loop. Up went a beautiful, Blaw-Knox diamond, the strongest and dizziest-looking AM radio tower ever designed, reserved for only the elite of broadcasters. You've seen pictures of these. They are pointy at the bottom, big in the middle, and pointy at the top.

Contrary to folklore, the diamond shape was for strength, and it worked. An airplane hit this tower once, barely denting it. The shape actually caused some weird RF issues. These were ultimately partially resolved by taking out some of the middle.

WLW's version was an 800-foot half-wave, guyed in the middle with bridge cables. It weighed nearly a million pounds, as much as a small building, and in fact it was very briefly one of the world's tallest structures. It all bore down to a point, on one giant base insulator with an air-gap lightning arrestor. An airplane hit this tower once, barely denting it. It's still the primary antenna at WLW, shortened slightly to move a cancellation node out of populated areas.



Needless to say, W8XO's late-night tests went on for months. This wasn't your mom's hot plate. When Ohio's famous lightning hit the tower, RF would simply sustain any resulting arcs, at the air gap or anywhere else, until the carrier was interrupted. There were folk tales, probably accurate, of talking rain gutters, sparking fences, singing water pipes, and nearby street lights dimming on modulation peaks.

This brings up the real fun part of 1934 AM broadcasting - NO LIMITERS! WLW, like any big-time station at the time, gave the Full Monty: 100 per cent modulation. Now, radio textbooks always have cute little pictures of sine waves at 100%, but people don't talk in sine waves. They don't beat drums, play hillbilly music, or yodel in sine waves. If the studio asked the big rig for some outrageously asymmetrical upward modulation barely crossing zero at all, the DC-sucking beast said FEED ME and obliged - briefly. Voltmeters dipped at the power company, antenna current went haywire, cows felt funny tingles in odd places, and various shotgun-loud bangs and sparks filled the transmitter building.

Operators tried gallantly to ride gain by hand, but this was still not a good place to work if you had a fear of electricity. Transmitter logs were pretty exciting reading, telling of antenna-house fires, hurried repairs on still-dangerous circuits, and rushed replacement of various melted or exploded parts.

Eventually, RCA 1 was stable enough for commercial service, or at least as stable is it was ever going to get. WLW started giving walking tours of its transmitter. Wires were rented, straight to the White House, for a grand opening live on the air.

On May 2, 1934, anticipation mounted as Eleanor Roosevelt sang the praises of technology and world understanding. Back at WLW, a warning klaxon echoed through the buildings, as pumps and generators came up to speed. Outdoors, in the pond, water fountains began to spray. In the filament room, bells rang as operators zapped those big switches into place. In the contactor room, huge relays banged closed. The vast plant came alive. It was ready. And then, at 9:30 Central, came the moment of an engineer's lifetime, as FDR, the President Of The United States for Chrissake, ceremoniously pressed the same golden telegraph key that Wilson had used to open the Panama Canal.... Nothing.

The President and First Lady had forgotten about the transmitter's hard-programmed, 30-minute warmup every time B+ was cycled. The great beast came on-air, all right, but when it was darn well ready. At long last, though, a new signal lit up the air worldwide. It soon became clear that its potential night coverage was global, propagation and power supplies permitting. Crosley's popular "Moon River" program took one request from Buckingham Palace, England!

Engineers later added a manual button to hot-start the transmitter. If the tubes were warm, this greatly cut downtime. If the tubes were cold, it cut the throat of whichever clown just blew up one of the world's most expensive rectifier banks.

WLW's advertising rates jumped 10 dB right along with the signal. The station ate money, but it made it faster. Much faster. Everyone wanted to pitch half the known world on a superpower, The Nation's Station, Whole Lotta Watts, World's Largest Wireless, The Voice From The Sky, the flame thrower, the mighty mike heard in London.

Seeing this high-voltage profit potential, fifteen other US stations filed for 500 kW. None were authorized. Soon, bitter competitors turned up the legal heat on WLW. Crosley couldn't build a cooling pond for that one. Twice a year, he and his lawyers would sweat, argue, present, plead, and wheedle an ever more hostile FCC into yet another 6-month extension of the experimental authorization.

Several stations complained of adjacent-channel interference. WLW briefly returned to 50 kW at night, to protect a station in Canada. The solution was one of the earliest known anti-skywave phasers. Two towers went up on the farm across the street to the north, fed by trolley car wire, to cancel out high-angle radiation in that direction. It worked, and WLW resumed full power. Too bad Crosley couldn't null out the US media lobby so easily.

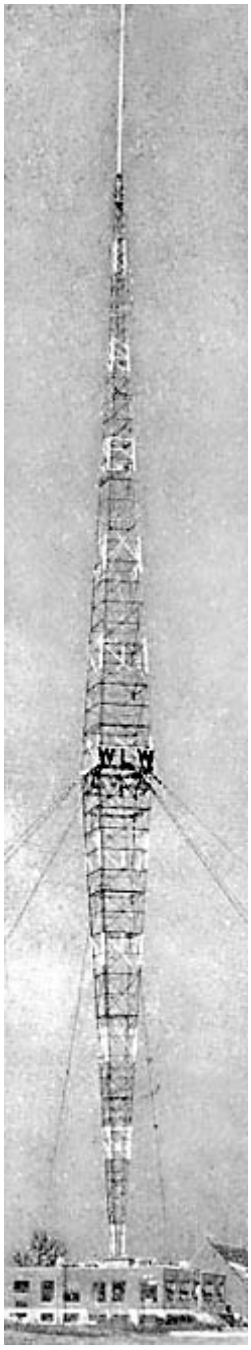
In 1938, the US Senate got into the radio consulting business, something Congress seems to have done periodically ever since. They passed the Wheeler Resolution, "asking" the FCC for an absolute limit of 50 kW. WLW's next renewal was denied. After a year of intense court battles, the station exhausted all appeals, and shut down the huge amplifiers, except for brief, experimental night periods as W8XO. Crosley noted, bitterly, that 50 kW wasn't that many more horsepower than a couple of speeding Buicks. (He was right, in fact, though it's still an awful lot of RF.) It wouldn't even make coffee as far as he was concerned. The law, however, was the law.

Super-power was not the only Crosley project. Another one, starting in 1939, was radiofacsimile. This was the "READO" system, using patents licensed from Finch Telecommunications. The name presumably meant radio that you read instead of heard.

The FCC allowed AM stations to transmit FAX between midnight and six AM. Crosley offered a home FAX machine, in a plain

woodgrained box, and an optional extra timer to turn it on while people slept. Daytime FAX was possible too, over stations on the high HF/ low VHF range, with a separate receiver and antenna.

This system scanned printing AND photographs on strips of paper just under 5 inches wide. It used a photocell on a rapidly oscillating arm, deriving sync from the AC current. A synchronized arm, again using the AC, recreated the pictures on rolls of treated paper in the receiver. The quality was actually pretty good, better and more permanent than the first grungy thermal faxes sold to consumers for telephone use.



At its peak, something like 13 stations had made arrangements to carry this service. It continued on WLW until early in World War II. Crosley also advertised a receiver in kit form for hams who wanted to experiment with this mode.

In a rather prophetic advertisement, Crosley stated that, "Eventually we believe that every home will be equipped to receive sound, facsimile, and television." 65 years later, it looks as if we're nearly there.

"Experimental" W8XO actually did some serious work, greatly improving RCA 1's power and reliability. By the end of World War II, the beast could easily make a megawatt if it had to, and it loafed along at 600 kW. There must have been some very interesting nights in Mason. The wartime government liked this just fine, considering The Nation's Station an important part of the nation's defense, ready to address the whole country at once in an emergency. With this as a selling point, WLW filed for a return to commercial super-power several more times, right up until the 1960s. It was always denied.

We mentioned before that several other stations had filed for super-power before the Wheeler Resolution put the lid on at 50 kW. One of these, WJZ in New Jersey, had actually ordered a 500 kW RCA transmitter. It was a modernized version of WLW's rig, still using 3 PA's in Class C and two high-level modulators in Class B, all water cooled. In this case, though, the 50 kW exciter was also contained in the transmitter, making for a rather awesome row of equipment.

WJZ never got permission to operate this flame thrower, and it remained mothballed at the RCA factory. When World War II came, the British government bought this transmitter for 112,000 English pounds, no small change in 1941. It was modified at the factory for a nominal 600 kW, at that time more than WLW/W8XO. The whole thing was then shipped off and installed in a huge, underground bunker near Crowborough, UK, where it became part of a super-power mediumwave site codenamed "Aspidistra." This was a reference to a popular Gracie Fields song, "The Biggest Aspidistra in the World." (When "Aspidistra" is not suggesting a part of the human anatomy, it's a rather unexceptional house plant with big leaves.)

Aspidistra was also specially re-engineered to be extremely frequency-agile. While most super-power mediumwave transmitters required modification and/or extensive re-tuning to change frequency, this one could jump all over the band at will. Its first task was as a BBC relay that could also be used as a jammer, by synchronizing the frequency with German MW stations and overpowering their signals.

However, the British Political Warfare Executive ultimately used the Aspidistra for "Black" Propaganda, a tactic in which the other side's own broadcasts are spoofed in order to gain trust and plant false or subversive information. For the remainder of the war, Aspidistra's high power and versatility were used extremely cleverly to inject bogus messages to German troops or civilians. Some broadcasts were even in Hellschreiber, an otherwise exclusively German teleprinting mode which produced hard copy on long, thin rolls of yellow paper.

The war also brought considerable change back in Mason, OH. For one thing, it got Crosley into the super-power business on short wave. WLW had experimented considerably with this mode all through the 30s, first as W8XAL, then as WLWU, WLWK, and the historic WLWO. After Pearl Harbor, U.S. non-government shortwave broadcasting was closed down, but the Office of War Information still saw a need to compete with the huge short wave stations being used by the enemy.

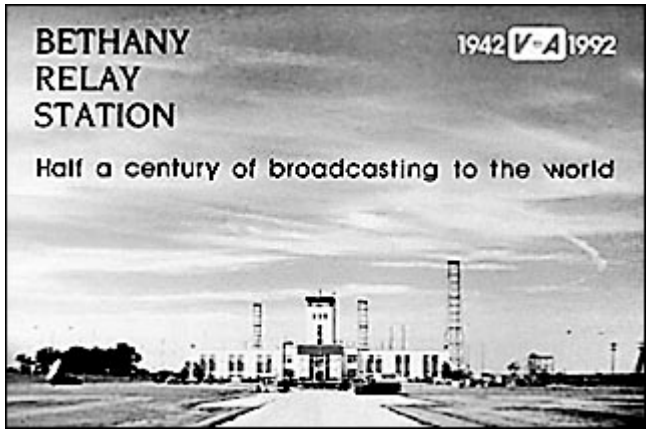
Once again, RCA, GE, and Westinghouse were called together. Someone mentioned that Crosley Radio had the real smarts both with super-power and short wave, and they were invited to the meetings. This was lucky, as it turned out. The OWI radio planners asked if anyone thought they could get to 200 kW, on HF, from six transmitters, by 1944. Crosley Radio, being a smaller, more focused company, was the only one that could meet the challenge without hurting wartime efficiency in other areas.

Once again, Mason was a great site. It was well back from the coasts, always a strategic advantage, and as a bonus it hit all of Latin America with no skip zones. At war's end there were five stations there, each with a WLWx call, each with a custom-built, Crosley transmitter. Three of these were 200 kW, one was 50, and WLWO carried on with 75.

Once again, the technical problems were horrendous. New tubes had to be designed for 50 kV RF voltages. High-gain rhombic antennas, the standard at the time, had to be improved for efficiency, not to mention fire safety. Advances had to be made in the fairly arcane art of "re-entrant termination," a scheme that let these antennas throw some real juice without simply melting. Switching between the resulting acres of carefully aimed and tuned rhombics was a nightmare, using open wire lines and long rows of pole disconnects that had to be operated by hand in all weather. Birds landing on these lines had a tendency to explode, simply vanish into very small pieces.

After the war, these stations became an important part of the US Information Agency's Voice Of America. In 1954, VOA moved to a heroic antenna farm in Bethany, the next little farm town over. For a very brief time, the Bethany complex was the world's most powerful short wave station. The 200 kW Crosleys were installed in a formidable row. With their catwalk and glass doors, they looked more than a little like good old RCA 1.

Bethany remained a key VOA site, often still using the proud callsign WLWO, until the end of the Cold War. Huge Sterba curtain antennas sprouted among the rhombics, and rows of giant Collins and Brown-Boveri transmitters replaced the old Crosleys.



Unfortunately, the VOA budget was shredded in the mid-90s, and the service came under considerable bureaucratic attack. Bethany, which was nearing the end of another expensive upgrade, was suddenly shut down, amid a huge controversy. Antennas were demolished for scrap, and some of the land was sold off to developers. Today, West Chester Township and a veterans' group are raising money to restore remaining portions of the site, including the old transmitter building and its guard tower, as a museum.

Meanwhile, back at WLW, the engineers weren't exactly sleeping. They kept the venerable, 50 kW, 1927 Western Electric going, decade after decade, modernizing its insides a number of times. In 1959, though, it got a friend. Legendary engineer R. J. Rockwell got Crosley interested in high-fidelity AM. They sprung some big bucks for a custom-built "Cathenode" transmitter, with a special modulator operating in class AB. This box was flat from 20 to 20 kHz audio, maximum 1% distortion, fed by one of the world's first microwave studio/transmitter links. WLW might not be able to call itself the world's largest AM station anymore, but it could sure advertise that it was the cleanest.

Crosley invited McIntosh Laboratories, the hi-fi tuner people, to check it all over, and indeed WLW was certified as up to state of the art. McIntosh noted that the signal actually measured better than several FM stations. Obviously, the bandwidth was pretty wide, but nobody complained. Remember this the next time someone says AM can't deliver high fidelity!

The rig, though, was understandably very inefficient. When hi-fi AM went nowhere, it was converted to the standard class B modulation. It remains usable today. Meanwhile, the old WE carried on. It outlasted Crosley Radio itself, which was sold to Avco Electronics for a bundle. In 1975, though, after almost half a century, it was finally retired for a 50 kW, screen-modulated, Continental 317c1, which became the primary transmitter. This gave WLW three completely usable 50 kWs.

Today, the mighty Blaw-Knox spits photons from yet another 50 kW, the fourth on the site. It's a new, solid-state, class D, all-digital, Harris box, a real nice rig, if a bit dull by comparison. It's about the size of a walk-in refrigerator, with no external modulator to leak PCB, and it's extremely efficient. As always at WLW, we're talking about the state of the art.

People moan that AM is dead, but nobody's told these guys. 700 WLW, still calling itself "The Big One," and "The Nation's Station," remains a well-engineered, profitable, class A nondirectional. Engineers have been known to live on-site, and a nearby ham has nailed W8XO for his own call.

A custom-built switching system allows instant connection from the primary Blaw-Knox, or a recently added backup tower, to any of the four working transmitters. Meanwhile, way out of sight in the back of the building, the 500 kW monster remains amazingly intact. It's in good shape, considering. The huge modulation transformers have been drained of PCB, a few parts are a bit rusty, and the catwalk is a tempting place to store things. Most of the huge tubes, though, are still clamped into place, as if awaiting the cool surge of the water and the order again to hurl lightning.

No surprise, then, that WLW saw the year 2000 in right. The chief engineer checked everything over, replaced one bad tube, and brought up the 70-year-old Western Electric. Fed through WLW's Orban audio processor, it sounded great. The station went out on it from 10:45 PM local time to 12:15 AM in the new year. The news announcers found this out, and talked it up. It was also noted how much more quietly water-cooled transmitters operate than new ones with air blowers..... Radio will survive.

CHRISTMAS CARTOON CAPTION

During the Christmas season, I Emailed the following cartoon wishing everyone "Happy Holidays". In addition, I asked for more creative caption suggestions with the idea of listing them here and picking the best one. Here they are in no particular order for your review.

1. "At this altitude, I always get a P5 picture from the ATCO repeaters!"
2. "Damn, the Russian relocation system is making me move from my favorite ATV frequency!!"
3. "all ATV'ers are nice, so I don't need a list".
4. "all ATV'ers are naughty so I don't need a list!"
5. "Rudolph, rotate 10 Degrees north, the ATCO repeater is only P3".
6. 

7. "Both beams are fully and independently steerable in AZ-EL!"
8. "Rudolph, turn your head a little to the left. AHH, now the picture is better".
9. "Thanks to the ATCO ATVers, I avoided a blizzard and finished early!"

WHY DO ICS NEED THEIR OWN DECOUPLING CAPACITORS?

For all of you hardware design guys out there and also for those of you trying to fix someone else's design, the following topic came from the latest Analog Devices Newsletter Q & A section. Although not strictly ATV, it is noteworthy none-the-less! ED.

To keep the HF in and the HF out. (HF = High Frequency) (This is not a claim that capacitors dance the Hokey Pokey.)

There are two important reasons why every integrated circuit (IC) must have a capacitor connecting every power terminal to ground right at the device: to protect it from noise which may affect its performance, and to prevent it from transmitting noise which may affect the performance of other circuits.

Power lines acting as antennas can pick up high-frequency (HF) noise, which can couple by electric fields, magnetic fields, electromagnetic fields, and direct conduction from elsewhere in the system. The performance of many circuits is impaired by the presence of HF noise on their supplies, so any HF noise which might be present on an IC's supply must be shorted to ground. We cannot use a conductor for this as it will short circuit dc and blow fuses, but a capacitor (usually in the 1-nF to 100-nF range) blocks dc while acting as a short circuit for HF.

1 cm (~0.25 inch) of wire or PC track has ~8 nH inductance (5 Ω at 100 MHz), which is scarcely a short circuit. A capacitor acting as an HF short circuit must have low lead and PC track inductance, so each supply capacitor must be located very close to the two terminals of the IC it is decoupling. It is also important to choose capacitors with low internal inductance–usually ceramic ones.

Many ICs contain circuitry which generates HF noise on their supply. This noise must also be short circuited by a capacitor across the supply before it can corrupt other parts of the system. Again, the length of leads and PC tracks is critical; not only do long leads act as inductances and make the short circuit less than perfect, but long conductors act as antennas, transmitting HF noise to other parts of the system by means of electric fields, magnetic fields, and electromagnetic radiation.

It is therefore very important that every supply terminal of every IC should be connected to its ground terminal (or terminals, which must all be joined together with broad, low inductance PC tracks so that there is no resistance or inductance to prevent them all behaving as a single low impedance unipotential star point) with a very low inductance capacitor.

…Analog Devices Inc.

ATCO BREAKFAST GROUP

Well, here we are again. It's Saturday morning and the comments are flying! This time we were at Bob Evans restaurant in Hilliard. It was a rather large group so subject matter varied widely. Remember, if you don't attend, we talk about you so if your ears are ringing on Saturday morning, you will know why.

Pictured this time are from left to right, Stan AA8XA (arm only visible), Bob, N8NT, Jay, KB8YMQ, Roger, WB8DZW, Mike N8CZO, Bob, N8OCQ and myself (taking picture).
…WA8RMC

ATCO PIZZA PARTY

It's Pizza Party Time again!!! We haven't been able to get together like this for over a year now so it's time to catch up. We decided that shortly after the Christmas/New Year's holidays were in the past would be a good time to get together and "visit' again. Also, **free** pizza seems to be the ticket to our successful gathering. We'll have to put this into our regular schedule.

Saturday January 14, we met at Tommy's Pizza in their party room for an informal gathering. I counted 22 people so it looks like we had a decent turnout in spite of the snowy weather. A number of relevant discussions took place but the most talked about topic was our interference problem on our 446.350MHz link. Nothing solved here but it was interesting to hear the various "spins" and how to track it down. Besides that, we kept it to mostly to non-ATV subjects and enjoyed the pizza.
No one went home hungry!

When will we have the next pizza party??? You decide.
…WA8RMC

ATCO 2011 FALL EVENT

Well, it's Fall Event time again. I counted 26 people this year, down a couple from last year at this time but up one from those at the Spring Event. It indicates that our hobby is not shrinking. However, I don't see it EXPANDING either. We really need to address this because we don't have enough young people entering our hobby. Show prospective ATVers this Newsletter to help demonstrate we are just a bunch of really great guys having a good time. The pictures below say it all, or at least, if we supply food, they will come.








The door prize table was emptier than normal this year. I wonder what that means? Maybe there are not enough of us cleaning out the Hamshack!

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

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

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

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.

01/15/2012 | SCARF Hamfest
Location: Nelsonville, OH
Type: ARRL Hamfest
Sponsor: Sunday Creek Amateur Radio Federation

01/29/2012 | Tusco ARC Hamfest
Location: Strasburg, OH
Type: ARRL Hamfest
Sponsor: Tusco ARC
Website: http://www.tuscoarc.org

02/05/2012 | Winter Hamfest
Location: Lorain, OH
Type: ARRL Hamfest
Sponsor: Northern Ohio Amateur Radio Society
Website: http://www.noars.net

02/12/2012 | Mansfield Mid-Winter Hamfest
Location: Mansfield, OH
Type: ARRL Hamfest
Sponsor: Intercity Amateur Radio Club
Website: http://hamfest.w8we.org

03/10/2012 | MOVARC Hamfest
Location: Gallipolis, OH
Type: ARRL Hamfest
Sponsor: Mid-Ohio Valley Amateur Radio Club
Website: https://sites.google.com/site/midohiovalleyarc/

03/18/2012 | TMRA Hamfest/Computer Fair
Location: Perrysburg, OH
Type: ARRL Hamfest
Sponsor: Toledo Mobile Radio Association
Website: http://www.tmrahamradio.org

04/14/2012 | Cuyahoga Falls ARC's 58th Annual Hamfest
Location: Cuyahoga Falls, OH
Type: ARRL Hamfest
Sponsor: Cuyahoga Falls Amateur Radio Club
Website: http://www.cfarc.org/hamfest2012.html

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

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

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. Then a second round follows with periodic checks for late check-ins. We rarely chat for more than an hour so please join us if you can.

ATCO TREASURER'S REPORT - de N8NT

OPENING BALANCE (07/20/11)....$2048.00
RECEIPTS(dues)....$ 280.00
Fall Event food....$ (200.98)
Paypal fee....$ (3.53)
CLOSING BALANCE (1/20/12).... $ 2123.49

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 January 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	
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	
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

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 O NEW MEMBER O DATE _____
CALL _____
OK TO PUBLISH PHONE # IN NEWSLETTER YES O NO O
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 O MONEY ORDER O

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.