ATCO NEWSLETTER

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ATCO WA8RUT REPEATER UPDATE

Well, sometimes no news *IS* good news. I hate to say it but for the moment, things seem to be running smoothly. New things are planned, but finding time to complete them is another matter. Dale says he needs to tweak the receivers and we now have new 2.4 GHz antennas in place to replace the one damaged during the winter. Read more about this and more inside.

ATCO

HAM IN THE SPOTLIGHT

This time we highlight Ric Wise, KB8YIO. Ric is working hard to establish video transmitting capabilities to complement the good reception equipment. His close proximity to downtown gives him many options and the repeater is so close so he has a desire to try Wavecom units for both transmission and reception even though his 427 reception produces P5 pictures. In addition to ATV, Ric also enjoys HF and 2 meter communication. However, his Kenwood 735 transceiver died recently. It looks like a pair of new RF output transistors is in order. Keep up the enthusiasm, Ric.

ACTIVITIES ... from my “workbench”

Hello again! Believe it or not, I'm just settling down after Dayton. It's a good thing too for I'm just now remembering the things I forgot to put on my "Must get at Dayton" list. I suppose I should start the new list now… if it were not for the fact that if I have *that* much time to think about it, I probably wouldn't want it by then. (Does that make sense?) Oh well, I hope that the rest of you think that way from time to time too so I won't be alone. When you think about it, the next hamfest (a good one) is in September (Findlay) but then the summer's almost all gone. OK, what projects are under way?

First, as you probably know, we fixed the 2.4 GHz repeater antenna. When we installed it last year, we knew that the antenna was not intended to be upside down mounted but we did it anyway. Since the best location was directly under the transmit antenna (it gives the maximum antenna isolation) we decided to give it a try. WRONG! Even though we "sealed" the connections and joints with rubber like tar (I don't know the formal name for this very sticky and messy stuff) apparently we missed something for when I removed the antenna and opened it up, about a quart of water was readily available. It was very special water though because it seemed to have a voice! Listening very carefully, I swear I could hear it say "see, I told you last year I could find my way in here!" Anyway, after a thorough drying and crack repair that obviously happened after the water entered and then froze, the antenna is ready for service. This seems like a good opportunity to examine the design and see if we can make a better one. Since it is end fed, there must be a lot of RF losses before the signal gets to the other end so if the antenna was designed to be center fed, perhaps …well, maybe later this year. I'll try to do something before antenna party time at Ted's like last year. More details on that one later in this issue.

More work on the 2.4 GHz stuff is in order. I removed the receiver, preamp and filter for a thorough bench testing just before Dayton. In fact, I took the stuff to Dayton for show and tell on Friday night. The removal was prompted by poor and intermittent reception. I suspected desense from the MMDS commercial transmitter less than 1000 feet away and at the same altitude. I probed the enclosures with a signal source to find a very "RF leaky" situation. Generous use of conductive adhesive copper tape improved the situation dramatically. Now the preamp seemed to want to oscillate under some reception signal levels. Tests proved that the preamp didn't like the output impedance of the interdigital filter in front of it. A slight retune of the filter output tuning adjustment produced stable preamp operation conditions so now the whole receiving combination performed much better together. One problem remains, though. A test of the preamp gain shows about 18 dB gain at strong signal levels but almost no gain (less than 1 P unit) under weak signal conditions. I suspect very a bad noise figure in the preamp transistor but I've got no way to prove it short of substitution. Maybe I'll buy another one from Downeast Microwave and compare. When I talked to Steve at Dayton, he said he'd be glad to take it back with him to test. I declined at that time because tests were incomplete. I guess now's the time to follow up.

Turning to things of a more personal nature, I decided to install a second 1.2 GHz antenna at my QTH. That way, I can eliminate any antenna relay and receive on 1250 while I transmit on 1280. I purchased a loop yagi at Dayton and just got around assembling it last week. An application of power showed that the SWR was higher than I'd like (but it would have worked ok as is) so I adjusted the driven element shape for lowest SWR. After getting it down to about 1.25 to 1, I figured that's as good as it's going to get it and soldered the line in place. Next, installation of 7/8 Heliax proved to be a much larger chore than I planned. Since I've been storing pieces of old Heliax in the garage attic for about 10 years now, I decided it was time to either use it or pitch it. (This is the spiral-ribbed stuff that has been obsolete for over 10 years now). I needed about 80 feet and the three pieces totaled 87 feet. Lucky, huh? Now I've got a problem! How to splice this stuff maintaining low loss. I found that using 1" copper water tubing slit lengthwise provided a snug sleeve. I machined a pin for the center conductor, forced the pieces together, slid on the sleeve, quickly soldered it in place while hose clamps held it tight, slid meltable liner shrink sleeving over the combo and voila, a good splice! An RF test later revealed that I had about 1.4 dB loss in the entire run. Not bad for Andrews says that the new stuff should measure 1.28 dB. So up the tower it went. Now, as soon as I finish this newsletter, I'll attach the antenna and see if it "plays OK". I hope I won't need filters to keep the transmitter from desensing the receiver. I'll know soon enough.

That's all for now. The antenna and coax effort last week during the hot muggy weather took it all out of me. Rest time. More next newsletter.
…Art WA8RMC

ANTENNA PARTY IS PLANNED AGAIN THIS YEAR!

Since the antenna party we had last year was so successful, we decided to do it again this year. Ted, N8KQN, was so gracious to lend us his back yard then and is willing to do so again this year, so come one, come all to our 2nd "annual" antenna party. Ted's ideal backyard conditions, his central location and great hospitality combine to make this an unbeatable combination. As it was last year we will ask everyone to bring some refreshments and munchies to help with the food. We will plan to have food so there will no need to eat lunch first. If we can arrive around 12:00 noon, we can get started a little sooner so we can work on more antennas.

I can have the antenna measuring equipment there to measure 439, 1280 or 2.4 GHz antennas so start the construction now so it'll be ready by then. Last year we didn't measure any 2.4 GHz stuff but I'm prepared this time so lets see what we can do. See you there.
…Art WA8RMC

THE ATV BOOTLEGGERS ARE AT IT AGAIN ... good detective work guys!

I just got an email from WA2SWS that a security company has put in a video system from the Las Vegas Paramedics to the ambulance and then to the hospital. Paramedics use 2.4 GHz but the ambulances use 900 MHz and high power (not part 15 and probably not licensed). They want more DX so are proposing to do it in our 420-450 MHz band. I am sending you this as a heads up so you can watch for it in your areas and get the FCC after them. Below are copies of the emails I got on it. There is still the perception that the ham bands are FCC enforcement free and there needs to be an example case soon or there will be quite a few of these bootleggers causing interference, and possibly taking over our bands if local governments and security companies pressure for it.
…Tom O'Hara W6ORG SCRRBA Technical Committee Member / ARRL TA for Spectrum Management and ATV

WA2SWS writes the following to Tom,
"Got a call from a purchasing agent in Las Vegas this morning. They have been trying to implement a wireless video program whose concept apparently was sold to them by one of these spy shop type places. The particular phase they called me about was the need for a video link from ambulances to a hospital 1.5 miles away. Apparently they need quite a number, and have immediate funding.

They have been using one of the spy shops that have been applying amateur 900 MHz video unsuccessfully. The guy who called said they have huge antennas, amplifiers hanging everywhere, tens of thousands of dollars in equipment coming in all rush overnight, no two pieces of equipment with the same brand name, homemade plastic boxes, and nothing is working at all. The guy who called was brought in specifically to try to get this wireless video project finally working. Now he is convinced he needs 400 MHz equipment to rescue the project. I'm not sure where or how he came up with that; most likely from their current vendors.

I educated him on the legality, and it ended up with him claiming none of that matters, huge amounts of money has been spent, it has turned into a political thing and several people's jobs are on the line. He kept saying they were government, it was a political project, and they could do anything they needed.

He kept pushing me for equipment, and I kept telling him the first thing they need to do is engage an engineer to design the system properly and legally on paper. If they build what was put on paper by a competent engineer, their system will work and only after the engineering should they start calling places looking to buy equipment, not before or instead of. He said "I don't have time for that, I have to get this working NOW" and finally hung the phone up on me when I told him his job probably was impossible to do legally. I did not get a name or number but it should not be hard to chase down. The FCC should pay them a visit.

I say they were using amateur video because the guy who called admitted such and also said the technicians trying to get the system working were using ham "walkie talkies" with ham callsigns to coordinate their work. Apparently the guys doing it were not trying to hide the fact they were using amateur.

I bet this fellow who called will get through to some spy shop who will make all sorts of promises, get an emergency overnight order for 5 figures, then ship all sorts of amateur gear and huge amplifiers out there. And the place that sells it will have zero field experience with wireless video and zero regard for any law. I repeat that I did tell the guy there were no local or state frequency allocations for wireless video in 900 or 400 MHz and even with federal auspices that did not mean he could do anything he wanted. Project is live video from the paramedics back to the hospital. Body worn video on 2.4 from the paramedic to a crossband repeater in the ambulance linking out on 900 MHz to the hospital.

The guy called back again today after my first message to you and we spoke for another hour. They are using a one-man company out there called "Pragmatic". A totally hobby company according to the guy I spoke with. The guy took apart one of the video transmitters while we were on the phone, and he said the boards had names scraped off of them and numbers sanded off the chips, but he did see one name underneath: "PRO-4". Doesn't mean anything to me.

Said the history of the project was no paperwork, engineered on the fly by the vendor, outrageous claims for performance (they originally were told to expect 100% coverage at 15 miles), Yagis and amplifiers everywhere and fans on the amplifiers. I've personally seen this myself in other law enforcement applications.

Las Vegas County is paying $7000 each allegedly for a 4 watt 900 MHz AM link supposed to go a mile and a half."
…WA2SWS

SILENT KEY

It is with great sadness that we must report the passing of Jake Fuller, W8WAU. He has been an ATCO member since 1994 and an active ATV'er much before that keeping the Dayton, Ohio area alive with ATV signals. Jake has been a loyal participant of the Spring and Fall Events in the past and now memories at the Events of the future. We'll miss him. ATCO sent flowers so he and friends would know we were thinking of him.

ATCO SPRING EVENT MINUTES

WOW! What a good time we had. It was great to see everyone again. Turnout was good, weather was perfect and food was delicious. What else could we ask for? We had about 33 people attend this year but for some reason, I can't find the roster so if you were there, you can stand up and take a bow at this time. Sorry.

We started at about 12:30PM when most people arrived. We shot the …..for a little while till the food arrived. Once again, Rick, WA3DTO, didn't disappoint us in the food department. There was plenty for everyone. After eating, we settled down a little and had a club meeting where we discussed upcoming Dayton activities, acknowledged new members K8KDR, W8RRF, KB8RVI and W8DXF, discussed the 2.4 GHz repeater, channel 4 radar, and last but not least an update of the severe weather network at Port Columbus by KA8ZNY. Following that we drew for door prizes. Again this year, no one went home empty handed. As you can see from the picture below, most were great prizes, which ranged from a computer to a monitor. A huge coil of plastic conduit was won, I believe, by Frank Amore, WA8HFK who plans to use it as underground conduit for his coax. We'll check with him in the fall to see how he made out!

The pictures below are of the participants at lunchtime. In the center of the left picture we can see Ken, WA8RUT returning to the table ready to eat. In the right picture is Dick, W8PGP with his backside toward us. I yelled "picture!" but I he didn't hear me. Sorry Dick.

Things drew to a close about 4:00PM that day. Now we have the Fall Event to look forward to. Keep it in mind. We haven't set the date yet but mark the last weekend in October till we make it formal. We'll let everyone know by next newsletter. See you then! Oh, by the way, don't forget to consider going to the next two activities we've got planned ***before*** the Fall Event. They are the Channel 10 tour on July 28 and the antenna party at Ted's on August 29. See details elsewhere in this newsletter.
…Art WA8RMC

YOU AIN'T GONNA BELIEVE THIS ONE! But…it's government soooo…

Scientists at NASA built a gun specifically to launch dead chickens at the windshields of airliners, military jets and the space shuttle, all traveling at maximum velocity. The idea is to simulate the frequent incidents of collisions with airborne fowl to test the strength of the windshields.

British engineers heard about the gun and were eager to test it on the windshields of their new high-speed trains. Arrangements were made, and a gun was sent to the British engineers. When the gun was fired, the engineers stood shocked as the chicken hurtled out of the barrel,
crashed into the shatterproof shield, smashed it to smithereens, blasted through the control console, snapped the engineer's backrest in two and embedded itself in the back wall of the cabin, like an arrow shot from a bow. The horrified Britons sent NASA the disastrous results of the experiment, along with the designs of the windshield, and begged the U.S. scientists for suggestions.

NASA responded with a one-line memo: **"Thaw the chicken first."**
…John, WA8DNI

WAVECOM HELP!…fear not, potential Wavecom modifiers

I can understand the hesitation to repackage the Wavecom if one has not seen the layout and info published in Amateur Television Quarterly Magazine. So I have converted the Wavecom Transmitter and Receiver Interface board info, parts list, sources, wire list and construction sheets into pdf format. The sheets are available upon email request to me by any licensed Radio Amateur. Email requests to Tom O'Hara at tom@hamtv.com. His homepage is **http://www.hamtv.com.**
…Tom O'Hara W6ORG P.C. Electronics

2.4 GHz WAVECOM BANDPLAN PROPOSAL

There really isn't room for 4 FM ATV channels in the 2390-2450 band segment given the up to 19 MHz occupied bandwidth without over lap. Broadcast uses 17 MHz channel spacing. However, under normal camera video you can get within 8 MHz of the band edge and be within the -26 dB mean power definition of bandwidth. Therefore the two closest to the band edge channels can be 2398 and 2442 MHz. 2442 is the primary channel since 2398 will overlap into the bottom end of the satellite segment, and should be used for simplex or inband repeater input only. 2418 would be good for simplex or links and be clear from any overlap with satellite or 2442 operations. So that gives 3 channels. If you have to throw one more in just because you can on the PIC, then 2430 as a split channel to be used for low power short distance on a non interference basis to the two channels on each side that it overlaps with. Overlapping will work if the adjacent channel is greater than 20 dBc down given the poor capture ratio of today's PLL type of FM detector IC's that have very little hard limiting. So I suggest 2442, 2430, 2418 and 2398 MHz as being a logical 4 channels to get if no band plan is in place in your area,
and using 2442 as the primary channel.
…Tom O'Hara W6ORG P. C. Electronics

2.4 GHz COMPETITION FOR THE WAVECOM?

The following detail is not intended to be an advertisement for the "Supercom 2400" transmitter/receiver pair, only information for those who may be considering purchase of units like this. If anyone does ***buy*** one, please report your findings… pro or con. ED.

"The following are some of the features of this new, exciting product: Supercom - 2400".

- RF power output is approx. 35mw right out of the box. No modifications are necessary.
- By removing the attenuator pad (similar to the type used in the Wavecom,) it may be possible to obtain approx. 100mw. I have not tried this yet but I was told that it could easily be done.
- Unlike the Wavecom, the Supercom has SMA connectors on the PC boards.
- The Supercom, comes with 2 Rubber Duckie Antennas for the Tx & Rx boards which screw on to the SMA connectors. This makes it ideal for portable use, R/C and Balloons etc.
- DX should be approx. 20 Miles line of sight, using the Supercom with it's 35mw output power, without any modifications and hooking up the built in SMA connectors to 2 Conifer Dishes @ 23db gain each. Conifer Dishes are available from R. Myers Communications (602-465-0936) for $64.95 + $10.00 shipping.

- Unlike the Wavecom, the Supercom Ham Version, is the FIRST and ONLY unit of this type that comes with all 4 Channels within the Ham band, right out of the box without any modifications! The Supercom Standard version has only the first 2 ch within the Ham band. However the Standard version does have the advantage that it is slightly cheaper and the Transmitter consists of two boards connected to each other with a small cable. This sometimes makes the standard version easier to use in tight spaces such as R/C use.

- The frequencies of the Supercom Ham version are: 2398, 2412, 2428 and 2442 This also makes it compatible with all the existing Wavecom's that are using the standard Custom programmed chip by Brian Miles, WB7UBB. The frequencies of the Supercom Standard Version are: 2400, 2427, 2454 and 2481 If anyone needs any custom frequency for the Supercom Ham version or for the Supercom Standard version they can order any 4 custom frequencies from Brian Miles, WB7UUB by sending a check or MO to 1205 N 34th St. Phoenix AZ 85028 - wb7uub@home.com. In the past the price for such a PIC (for the Wavecom) was $15 + $5 Shipping. Check with him before ordering to be sure of the current price and availability.

- The Supercom Ham version and Standard version all have easily removable PIC's so that if and when a custom frequency is needed, it can be done effortlessly without unsoldering and soldering the chip (as is the case with the Wavecom).

- Both the Tx and Rx boards have large easily adjustable Modulation level controls for deviation control.

- The Receiver has a special output pin, which allows you to measure the relative signal strength.

- The Supercom is also the first and only unit of its type that comes with extensive technical data sheets, including VERY detailed specs and schematics and Application sheets which will detail all Mods. that have been found work with these units (as they become available). This way, everyone who purchases one of these units will have more than enough information to make all the modifications that they want to, without having to wander from one web site to another and without having to search various msgs. on the net or various published articles in different periodicals etc.

- The Supercom Standard and Ham Versions are also the only units of this type that are not being dumped to the general public and are sold strictly to Licensed Amateurs ONLY.

- The Supercom is also the only product of this type at 2.4 Gig FM, that has an available OPTION to be MAST MOUNTED in a professionally tooled water proof enclosure that is now available for $99.00. It is expensive but very well made and very well worth it. This waterproof enclosure comes with a sturdy mount that allow it to be wall mounted or mast mounted.

The extra cost of this option is quickly made up by the reduced cost of expensive coax of any considerable length. Even with the best and most expensive coax or hardline the signal loss at these frequencies is very significant. The enclosure is much larger than the Supercom Tx or Rx boards and so they allow plenty of space to include, inside the same enclosure, any power amp or preamp. Depending on the range that you are trying to achieve, it is very likely that by using this Water Proof enclosure option, you will save MUCH more money than you would have otherwise spent on a power amp and or preamp to compensate for the signal loss of the coax or hardline.

Also keep in mind that even if you install best and most expensive new coax or hardline TODAY, and it may seem like, the loss in the cable is acceptable, this may only be true TODAY but as the coax ages and weathers it will deteriorate and the loss will be much greater than it was estimated to be and you may never know when that happens. This last point is most often overlooked.

The price for the Supercom Standard version is $160.00 + $8.00 shipping in the continental USA.
The price for the Supercom Ham version is $180.00 + $8.00 shipping in the continental USA.
Prices include the Transmitter and Receiver and 2 Rubber Duckie antennas and all the documentation, specs and Mod. ideas that are available at the time of the order.
…Rooven Blau N2WEM 383 Kingston Ave. Suite 180 Brooklyn, N.Y. 11213 Email: BLAU3@JUNO.COM

2.4 GHz. HOW IS THIS BAND FOR ATV?

Great! On this band ATV uses FM as compared to AM modulation. In ATV that is often the difference of a weak snowy picture (or even less, where sometimes the picture from a weak distant station is so poor that you can only see the sync bars (P0 signal) as compared to what you see when watching a beautiful satellite TV picture (P5 signal). With FM you usually either get the signal or you don't and if you get it, it is perfect or nearly perfect (unless the equipment simply wasn't adjusted right or wasn't performing properly but that could happen at any band and any mode)…This band is also much less crowded than the lower frequency ATV bands.

How well do the systems work? Great! Another big advantage at these frequencies is that they use much smaller antennas. This makes a big difference in cost and size and ease of mounting and wind load etc and there is also some limitation as to what we consider to be practical. Just one example: If you are using the 420-450 MHz band then the HIGHEST gain directional antenna that P.C. electronics sells from Directive Systems DSFO ATV-25, has a gain of ONLY 16db and is SEVENTEEN feet long! It costs $149.00. Now compare that with the 2.4 GHz band, where you can get 23 dB gain using the Conifer dish antennas from R. Y. Mayers which cost less than $75 including shipping and the size of this antenna is only 2 feet by 3 feet. P.C. Electronics also sells 13 dB gain vertical omni called GP-24 which is much smaller and much cheaper than an equivalent or inferior gain 420-450 MHz band Omni.

Is this line of sight ONLY? Officially the answer is yes. The reality is that to get the best range of course you need line of sight just as with any other ATV band. However at 2.4 GHz the signal does not penetrate trees or buildings very well at all but it does BOUNCE quite well off large structures especially metal which can get your signal around corners at times.

Does it go through walls on this band? Trees and walls are a problem in the lower frequency ATV bands too but this becomes much more pronounced the higher the frequency. Feed line loss and path loss is also greater, the higher the frequency is. Walls do greatly reduce the signal but it still gets through to some degree. The Wavecom was primarily designed for and is PRIMARILY used by thousands of people every day to penetrate the signal through the walls in their homes from one room to the next room. If the signal could not penetrate the walls of the average home, then there would be no consumer market at all whatsoever for the Wavecom or any other similar type of consumer product. However for our purposes in ATV where we want to communicate with another Ham and we usually try to achieve the best range possible, we certainly would try our best to be as close to line of sight as possible, at least wherever and whenever the circumstances permit.

What types of antennas are used, Yagi, loop Yagi, dish, horn? All of the above and many other types as well. You can use any type of antenna design as long as it is made for this frequency.

How does it work in the field? Great. I already pointed out, many of the advantages and disadvantages of this band. One more thing to consider is that because of its smaller antenna size etc, it makes it much more suitable for portable use, R/C etc. One more thing on the down side of the higher ATV bands is that the higher the frequency is, the more expensive the power amps are.

How well do these Wavecom devices work? They work perfectly well. In my original message I pointed out many of the differences and the advantages of the Supercom as compared to the Wavecom. The only advantage that the Wavecom has is that, the initial price is cheaper but you get what you pay for and by the time you're finished souping up the Wavecom you will have spent much more time and effort and much more money than it would have cost with the Supercom and even then it would still not quite have all the advantages of the Supercom.
…Rooven Blau, N2WEM

A NEAT ATV EXPERIENCE… my first ATV reception!

Late on Sunday afternoon I happened to check my e-mail and found a letter from Bill Brown saying that a group would be launching a balloon with an ATV transmitter at 4PM Central Time on Sunday. I checked my watch...OH NO! It's 2:30PM! I raced to set up a small 7 element beam, PC Electronics downconverter, and a b/w TV on the deck of our home. My wife was attempting to grill steaks, and seemed
a little miffed, but then she smiled that sweet, understanding smile and said not to make too big of a mess.

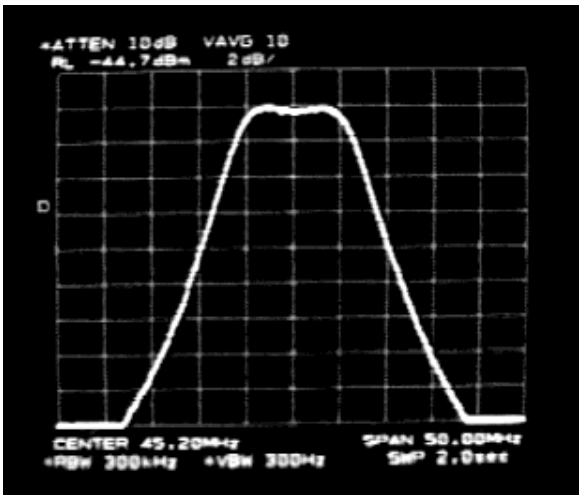
At 4PM, I searched the sky, tuned and re-tuned my downconverter with no luck. I also ran up and down the stairs to my ham shack to check for the CW beacon on 28.800. No luck! Damn. I logged back onto the net to check the Star page, and saw that the launch had been delayed until 6PM. At 6PM, I checked the page again. No update. I checked the live video stream on www.liveonthenet.com, no video yet. At about 6:15, we started getting a live stream but the balloon was just sitting on the ground. I had chores to do so I told my son to check the feed every few minutes for me. At about 6:55, my son came outside and said, "Dad, there's a funny "beep beep" tone on your radio. I rushed into the shack and checked the Internet video feed. Damn, the balloon was airborne! I rushed to the deck and began checking for a signal. First static, then "WOW!" I got a nice P2 copy of the shroud lines and the horizon wildly spinning. The overlay was pretty readable, complete with callsign (KE4ROC), GPS data, speed, and elapsed time. There was an altitude readout and something called HDG but I couldn't figure out what HDG might stand for (Heading?) and the altitude display was not working.

After about ten minutes, the signal peaked at about P3 but considering that I was using a small beam on a four foot section of PVC pipe, and a simple, downconverter, I was amazed! I started talking about buying pre-amps, and large beams and wow! Even my wife seemed to enjoy watching this...and after 1/2 hour or so, we had lots of curious neighbors stopping by to watch too. The cookout turned into a mini block party with ATV supplying the entertainment. At 22:40 into the mission, the clock stopped working, and it looked like the GPS was not functioning either. We continued to watch a beautiful sunset from high above the earth and be amazed at just how much fun ATV was.

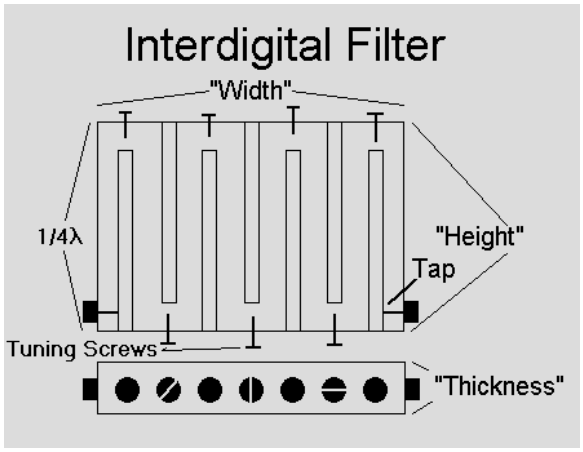
Consider that I am well out of range of any other ATV station on 440, and that I had never even considered moving beyond my short range
experiments with digital ATV because of the lack of interest here. And now, I think I want to buy that pre-amp and big beam. Maybe I could launch a balloon too. In a word, I'm excited and had a ball. Thanks to Bill Brown and everyone for such a fun day. Can't wait to get my first ATV QSL card!
…Les Rayburn, KT4OZ Helena, AL

PUTTING TOGETHER AN INTERDIGITAL FILTER…are you ready to build one?

Here is an article by Clint Turner that describes interdigital filters quite well. Complete construction details are contained in his complete article at the URL listed at the end of this article. We won't go into those details here but this part is informative as to how they work. ED.



What is a bandpass filter? A Bandpass filter, as the name implies, is a filter that only passes a certain range of frequencies (a graphical plot of a bandpass filter is shown to the left.) Bandpass filters are the elements that allow any receiver to have selectivity, eliminate image responses, and prevent overloads from off-frequency signals, to name a few examples. Bandpass filters take many physical forms from capacitors and coils, pieces of feedline, cavities, and waveguides. The interdigital filter is but one implementation of a bandpass filter. It is so-called because of the physical construction of filter itself. Referring to the image below, you can see that the elements are interleaved, and hence the name. The Interdigital Filter consists of these interleaved rods sandwiched between two parallel conducting plates (ground planes), usually with conductive plates along the sides. The "height" of the filter (the vertical dimension on the image) is typically one-quarter wavelength while the elements themselves are physically shorter (or else both ends of the rods would touch the walls!) Because the dimensions of these filters are one quarter of the physical wavelength at the frequency at which they were designed, building such a filter (using air as the dielectric) for frequencies much below the 70cm amateur band would involve a physically large filter. It is not uncommon to find an interdigital filter for frequencies as high as 8-10 GHz.



Why go through the trouble of building such a filter? Why can't one simply use a pile of coils and capacitors? At the frequencies involved, the losses and small physical sizes of such components make them difficult to work with and can severely limit their power-handling capabilities. Why can't one simply use a cavity or two? Well, you can, but the precise application may dictate something other than a cavity filter.

The response of a single cavity is limited to that of just a single peak (in the area of the fundamental design frequency, that is.) Its shape can be stretched to a broad peak with gently sloping sides, a narrow spike with fairly steep sides, or anything in between by adjusting coupling and/or Q but you cannot get a broad, flat response with steep sides.

Why would you want a filter that was both wide and sharp? This sort of filter is invaluable for video, data, and other applications where this is precisely the sort of response that is desired. To get this type of response, one requires several filter sections. This could be done with several cavities, but it takes very careful attention to details like coupling and tuning in order to provide a desired response and the resulting filter network will likely be quite large, fragile, and very expensive.

One (of the several) way(s) to get a multi-pole filter that can do what we want is with a properly designed interdigital filter. We needed such a filter for the transmitter of the WB7FID ATV repeater (a 70cm inband repeater) to attenuate the lower sideband (which was regenerated somewhat by nonlinearities in the amplifier chain) and to keep low-

level intermod products from the transmitter out of the receiver. The picture below shows an example of a filter that we (Clint KA7OEI, Dale WB7FID, and Marv KA7TPH, and Dave, N7UWQ) built several years ago. It is constructed of 1/8" thick aluminum plate and it is partly TIG welded and partly screwed together. (The "top" cover and coaxial connectors are really the only components that are held on by screws.)

Assembling a filter with the desired characteristics isn't trivial, though. The internal dimensions play a large part in determining the bandwidth, the steepness, the center frequency, and properties of the bandpass (i.e. ripple.) For design guidance, we have used a program that first appeared starting on page 12 in the January 1985 issue of Ham Radio magazine. This program was written in BASIC and it can downloaded from here. In this form, it has been written to run under the old GWBASIC but it should run with minimal modification on more current BASIC implementations. …Clint Turner http://www.ussc.com/~uarc/utah_atv/interdigital1.html

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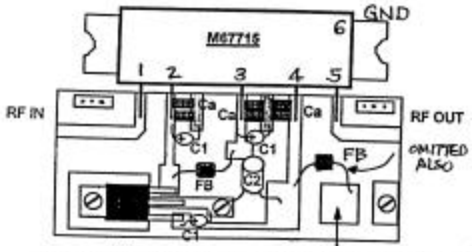
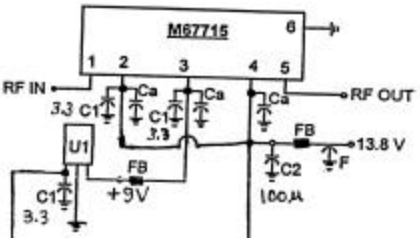
COPS TRANSMITTER 1200MHz BRICK AMP…Corrections…Corrections

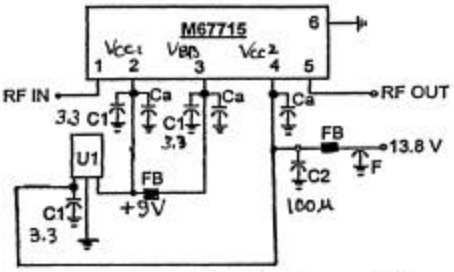
Downeast Microwave is selling the Mitsubishi 1200 MHz brick and circuit board to amplify the 50+ mW output from the Cops ATV transmitter described in the April 1999 issue of the ATCO newsletter. This is a great way to get about 2 watts output. There's only one problem. There are errors in the design documentation that must be addressed before you find the brick becoming an expensive "fuse". We won't go into construction details here…only the areas that are incorrect in the supplied details with the DEM #2303PA amplifier. With the proper issues addressed, the amplifier works beautifully. OK, let's look at the problems.

1). The +13.8 vdc regulator input connection is not shown on the supplied schematic. It should be connected to the input pin with C1. The PCB layout is correct, however. The center diagram illustrates the original diagram with the missing line added.
2.) Pin 2 of the brick, shown on the center schematic, is connected to +13.8 vdc. It should go to the regulator output (+9v) as shown in the right schematic. Again, the PCB layout shown at the extreme left is correct.
3.) The diagram does not show any connection to the brick mounting tabs on each end. These tabs MUST be connected to the PCB ground plane via copper straps at each end of the brick (low inductance connections).
4.) The assembly includes a 78S09CV 9 volt regulator. An insulator is not required between itself and the PCB.
5.) Do NOT apply the COPS transmitter output directly into the brick. This brick is designed for no more than 10 mw on the input and achieves maximum power output with only 7-8 mw. Exceeding 10 mw could destroy the brick. Use ***at least*** 8dB of attenuation between the COPS unit and the brick. A length of lossy coax is best. (It doesn't take much @ 1280 MHz).

The diagrams below should be self-explanatory. If not, tune in to the 147.45 net for clarification.







Ca = 0.1 μF } Parallel
Ca = 0.001μF }

DIAGRAM MATCHES NOW MATCHES PICTORIAL PROVIDED BY DEM.

ABSOLUTE MAXIMUM RATINGS (T_C = 25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CC1}	Supply voltage		9	V
V_{CC2}			16	V
V_{BB}	Base bias		9	V
I_{CC}	Total current		1.5	A
$P_{in(max)}$	Input power	$Z_G = Z_L = 50\Omega$	10	mW
$P_{O(max)}$	Output power	$Z_G = Z_L = 50\Omega$	4	W
$T_{C(OP)}$	Operation case temperature		−20 to 100	℃
T_{stg}	Storage temperature		−40 to 110	℃

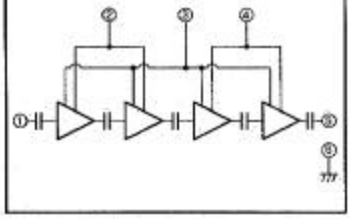
Note. Above parameters are guaranteed independently.

ELECTRICAL CHARACTERISTICS (T_C = 25℃ unless otherwise noted)

Symbol	Parameter	Test conditions	Limits Min	Limits Max	Unit
f	Frequency range	$V_{CC1} = V_{CC2} = V_{BB} = 8V$ $P_{in} = 10mW$ $Z_G = Z_L = 50\Omega$	1240	1300	MHz
P_O	Output power		1.2		W
η_T	Total efficiency		18		%
2fo	2nd. harmonic			−30	dBc
3fo	3rd. harmonic			−35	dBc
ρ_{in}	Input VSWR			2.5	−
−	Load VSWR tolerance	V_{CC1} = 9V, V_{CC2} = 15.2V, V_{BB} = 9V P_O = 1.5W(P_{in} : controlled), Z_G = 50Ω Load VSWR=10:1(All phase), 5sec	No degradation or destroy		−
IMD3	3rd. intermodulation distortion	$V_{CC1}=V_{CC2}=V_{BB}$=8V $P_{out(PEP)}$=1.2W, Δf=20kHz, $Z_G=Z_L$=50Ω		−23	dBc
IMD5	5th. intermodulation distortion	$V_{CC1}=V_{CC2}=V_{BB}$=8V $P_{out(PEP)}$=1.2W, Δf=20kHz, $Z_G=Z_L$=50Ω		−30	dBc

Note. Above parameters, ratings, limits and conditions are subject to change.

BLOCK DIAGRAM



PIN :
①P_{in} : RF INPUT
②V_{CC1} : 1st. DC SUPPLY
③V_{BB} : BASE BIAS SUPPLY
④V_{CC2} : 2nd. DC SUPPLY
⑤P_O : RF OUTPUT
⑥GND : FIN

M67715 Mitsubishi Brick
Data sheet specifications.

1999 DAYTON HAMVENTION POSTS SLIGHT ATTENDANCE INCREASE

The 1999 Dayton Hamvention General Chairman, Dick Miller, N8CBU, reports that attendance at the world's largest Amateur Radio gathering rose slightly again this year. The official attendance at the event May 14-16 was 28,176, up from 28,120 in 1998.

The 1999 figure marks the second year in a row that attendance at the Hamvention has gone up and continues a trend of growing attendance. Hamvention officials reported that 28,000 attended in 1997.

Most observers felt the crowd this year was particularly upbeat and in a spending mood. "People seemed chipper and genuinely having fun," said Jeff Reinhardt, AA6JR, who represents Alinco. "It was good to see several new products at the show." Reinhardt also says he perceived a greater interest in HF gear than in previous years.

ICOM's Chris Lougee, N7TJM, said this year's Hamvention "had an interesting feel to it." Judging from the dealers he spoke with, Lougee says, sales were generally up over previous years, possibly a result of the added hours and a crowd more evenly divided between indoors and out. "The Dayton Hamvention had some of the best prices on new gear seen in years," he said, adding that this year's gathering was "a great experience."

"Dayton was great!" enthused Yaesu's Chip Margelli, K7JA. Better weather meant less of a crush inside, Margelli said, echoing Lougee's assessment, that meant vendors could spend more "quality" time with potential customers. "Sales reflected the improved weather," he said.

Miller, who served as Hamvention general chairman for the past three years instead of the usual two, is stepping down after his extended tour of duty. The 2000 Hamvention General Chairman is Jim Graver, KB8PSO, and the Assistant Chairman is Bill Ervin, KA8WCF. Graver had served as Miller's assistant.

The 2000 Dayton Hamvention also will be the site of the ARRL National Convention. The Hamvention is operated by the Dayton Amateur Radio Association as a separate entity. For more information about the Dayton Hamvention, visit http://www.hamvention.org..

"KLUB KORNER"…ATV activity across the USA!

This is the 2nd time that I've been able to correspond with another major ATV club to find out what they're up to. As more clubs join in, we can have more than one reporting their activities. This time we get a glimpse of what the HATS ATV group in the Houston, Texas area is doing as reported by KC5ODM . WA8RMC.

Right now HATS is like everybody else. We are in the "summer doldrums" a bit with family vacations, Houston weather, work demands, etc. We are still working, albeit slowly, on three major projects. The first is a rework of our Delta transmitter to become a transverter IF. The second is a companion receive IF. The third is a video switching accessory for your shack. Hopefully these projects will make it to, or beyond, the prototype stage this year. In addition, several members are looking into ways to make another run of Delta transmitters. This would need to be a commercial, non-club activity and both funding and time constraints make it a complicated venture.

Field day is a "scattered representation" activity for HATS. Since there are few points to be gained by going to field day as a group, we

traditionally break into our respective interest areas and either demo or talk-up ATV at the field day sites. This year we had members with the QRP group, the AMSAT group, the Texas DX-Society group, and several local club groups. We have at least one or two ATV demos planned for this summer.
…Ron - KC5ODM

DAYTON FRIDAY NIGHT ATV FORUM… another great ATV gathering!

Well, I believe that it comes as no great suprise that the Friday Night ATV Forum was another success! For all that were unable to attend, it's too bad. You missed a lot of good ATV information. I'll try to summarize it for you here. For all that were at Dayton on Friday and chose not to attend…well, all I can say is "Shame on you". Try to put it into your schedule for next year!

Again, the event was sponsored by ATNA, the Amateur Television of North America group. It was held at the Lions Club in West Carrolton, Ohio just about 20 minutes south of Dayton for the second year in a row. I believe no one officially took a head count for there were a number of people coming and going all evening but my informal count produced about 100 heads, a pretty good turnout. Now that I look back on it, I think we almost had too many speakers and activities because it lasted till almost 11:00pm that evening and most of us wanted to get an early start on the Dayton flea market at 7:00am the next morning. Perhaps we should to scale it down about 10:00pm next year. In any case, fun was had by all.

The event started about 7:00pm hosted by John Jaminet, W3HMS. He introduced himself and discussed the advantages of ATNA and its impact on the ATV community. The need to organize, form bandplans and tackle regulation difficulties was highlighted. Next, Hank W4HTB discussed the features of crosslinking repeaters in Kentucky. Likewise, Mark, KA9SZX discussed sending NASA video on their repeater.

Midway through the meeting we took a break and enjoyed complementary refreshments and chips. We then had a chance to discuss ATV topics among ourselves and select a winner of the homebrew contest. When we again regrouped, door prizes were passed out to ten lucky participants. They were:

A 900 MHz preamp donated from Downeast Microwave was won by Tabitha Carty, N1IEQ of Salem, Ma
A 2 meter Interdigital filter from DCI Digital Communications was won by Dave Morris, WB8PJZ of Lima, Ohio
A 439 MHz Tridon transmitter from Wyman Research was won by Gabriel Baltaian, KC2AGV of Woodside, New York
A Black/White television camera from ATV Research was won by Eric Koch, NF0Q, of St Charles, Mo.
A 439 MHz yagi antenna from M^2 was won by Zygmunt Skrobanski, AF4MP, of Roswell, Ga.
A $100 discount coupon from Gekco Labs was won by Dave Rice, KD4SHH, of Woodstock, Ga.
A $50 discount coupon from PC Electronics was won by Gene Harlan, WB9MMM, Rockford, Ill.
A 1 year subscription from ATVQ magazine was won by Jef Basting, N8QPJ, of Southfield, Mich. (best homebrew project)
A 1 year subscription from ATVQ magazine was won by Ron Cohen, KeZKO, of Cheltenham, Pa
A 1 year subscription from ATVQ magazine was won by Randall Lawrence, KG7GI, of West Jordon, Utah.

After that, we continued with the speakers which included myself describing the 2.4GHz portion of the ATCO repeater and the filter design used in it and then Bill Brown talking about some of his balloon launch experiences. All in all, it was quite an enjoyable and informative gathering.

Finally, here is a glimpse of some of the speakers that evening. I must confess I don't remember the identity of the top two but I'm the one at the lower left. The photo at the lower right is an ATV equipped RC car that was the homebrew contest winner.

…73 See you there next year.
Art WA8RMC

RED-WHITE-BOOM PUBLIC SERVICE ACTIVITY… is this fun or what?

Each year on Independence Day weekend, the City of Columbus, Ohio hosts one of the best fireworks displays anywhere in the country, well known as "Red, White and Boom". The residents always seem to take advantage of the city's generosity and arrive early in the day to stake claim to "their spot" for the fireworks that evening. Since the headcount normally exceeds 500,000 people, the Columbus police usually have their hands full, maintaining law and order and preventing individual displays of emotion "so to speak". A number of years ago, while discussing the event, the police invited the ATCO ATV group to help the following year with amateur video of select spots in the crowd. The purpose is to provide crowd density information to the police so they can dispense foot patrol officers to these areas, hopefully before trouble occurs. The effort has been hugely successful and has expanded in subsequent years.

This year was no exception. Our group assembled about 3:00 PM on Friday, July 2, for another exciting time. We have two locations in which to view the crowd. John, W8SJV, and I assembled a camera with 1.2 GHz FM ATV equipment at the southern edge of the most densely populated area and on top of a local parking garage up 9 stories. At the northern edge of the area, about 3 miles away are Ken, WA8RUT; Phil, N8LRG; John, WA8DNI; Doug, KB8SFD and Ed, KB8TCF, with 3 cameras, video monitors and a video sequencer located on the roof of the police headquarters building, 15 stories above the crowd. They sequenced their 3 cameras, pointed at separate areas of the crowd below, (photo at right) with our 1.2 GHz signal and RF linked it downstairs via 2.4 GHz to the command center monitor assisted by John, WB8INY. In operation, the police dispatcher watched the sequenced video along with his other security links to dispatch additional officers where needed. Occasionally, they would relay a message via 2-meter handi talkies to one of us to switch camera positions so they could view reported potential trouble areas.

Everything worked exceptionally well again this year with good resolution P5 pictures of the event and I'm happy to say that, again this year, no trouble spots materialized. All participants had a lot of fun setting up, operating and watching the crowd. And most important, we had probably the absolute best seats "in the house". The local authorities who supplied us with parking passes, escorts and roped off areas, helped to make our job a little easier and a lot more fun. (We have already been invited back again next year!)

Left John,W8SJV and I stop to pose for the camera at the remote location.

At the right, Ed, KB8TCF, views one of the four TV monitors at the video sequence location.

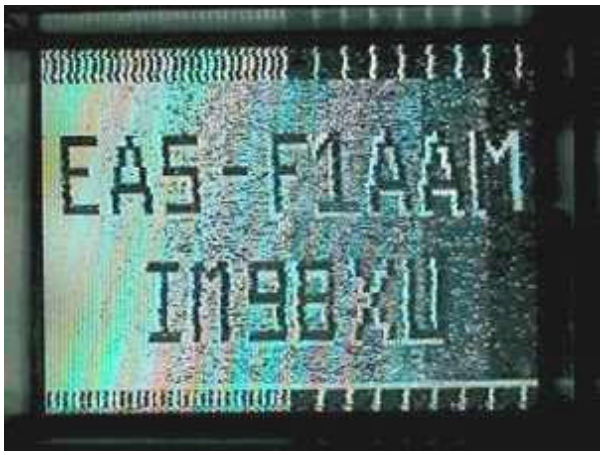
Left are the police headquarters roof crew (L to R) John WA8DNI, Phil W8LRG, Ken WA8RUT and Ed KB8TCF. The city buildings provide a backdrop. Right, John KB8INY, displays satisfaction with the command center proceedings.

NEW WORLD RECORD FOR ATV ON 10 GHz

by Michel Vonlanthen, HB9AFO

translated by John Jaminet, W3HMS, Mechanicsburg, PA.

EA5/F1AAM/P Grid Square IM98XU in Spain worked I5/HB9AFO/P Grid Square JN54BC in Italy, a distance of 1034 km or 630 miles.



Thursday 17 June 1999, about 0730, the QSO between EA5/F1AAM/P and I5/HB9AFO/P was made which moved the world ATV record from 821 km (500 mi.) to 1034 kilometers (630 mi.). The liaison link on 144 MHz started at 0600 with signals 59 +, exactly opposite to the preceding days where phone was just barely audible above the noise, despite the big signals put out by 200 Watts and 11 elements.

After some adjusting of the 10 GHz gear, the test pattern of HB9AFO was received in Spain by very quick bursts going to P5. Going the other way, signals were P4 waning with the passage of time. The QSO was shortened in order to allow F1AAM to contact Serge TM2SHF, in Corsica with F3YX ,and Michel F6BVA, on the French coast. The slow fall of the amplitude and frequency of signals, the propagation came to an end and it is therefore probable that we could have exchanged pictures more consistently if we had begun earlier.

We note that, in the preceding days, we tried all hours of the night and the early morning, but all in vein, as the propagation was not there on our schedule. In order to know if our altitude was optimal for this kind of QSO , as we were then at 1320 meters or 4092 ft of altitude, we next moved ourselves to the west of La Spezia, establishing our base camp in an ideally situated hotel at 300-400 meters or 930 –1240 ft of altitude with a magnificent protected view of the sea and Spain. For ourselves, we passed a part of Thursday night trying to QSO with F1AAM separating into two teams: Charley, HB9ADJ with his own equipment to a point called "Telegrafo" at an altitude of 550 meters and me in the hotel.

Unfortunately, we were victims of a black–out of the propagation which prevented us from a contact between us on 144 MHz, the fog and humidity were almost 100%.. While TM2SHF contacted some stations on the continent with propagation superior to normal, we heard absolutely nothing. It was not until Saturday, the day of our return to Switzerland, that we had the QSO at 0600 with TM2SHF.

(Photo caption) From left to right, Mauro IK1WVQ, Charley, HB9ADJ, and Michel HB9AFO study the maps and weather information while awaiting the opening.

CONCLUSION .It becomes more and more difficult to increase the distance on 10 GHz, and this is logical. In a week, we made only two QSOs on 10 GHz:, one with Mauro IK1WVQ/P, to Alassio (169 km) and one with EA5/F1AAM/P. All the other attempts with F6BVA, F5CAU and HB9RXV, as much on 10 as on 24 GHz, have failed due to the geographic position of the Gulf of Genes. We took advantage, for lack of anything better to do, to go to the Tuccoli surplus sales shop in Pisa and also to make some tests on 24 GHz with the Gunn diode transmitter of Mauro (5 mW and small horn) testing to 12 km, or 7.2 miles without problems.

If you desire to go to the Alpine Club, be warned! If you attempt night time QSOs, you either will not be able to enter there or go out between 2200 and 0600!. The other problem is ecology. In order to avoid disturbing the natives with the noise of our generator, we had to
vacate the parking where we were at first. Next, we had to operate with prudence at Sioux mounting and taking down the antennas before and after operations to avoid "terrorizing" the strollers with our antennas, which are forbidden in protected natural zones (fixed antennas ARE forbidden). We were questioned several times by strollers who believed that we made tests preliminary to the installation of a microwave relay, their mistrust was in play!

AND NEXT - To increase the distance becomes difficult now for there does not now exist longer trip distances in the north Mediterranean area. It will be necessary therefore to move more to the south but with a minimum distance of 5000 kilometers by car to cover; there is too much equipment to transport to take an airplane. From the equipment point of view, ours appears adequate for us to attempt the longer distances but we could again optimize liaison 2 meter phone equipment for quicker installation of the antenna. The energy production also could be improved, with the possibility of working using batteries for short periods of time even with the TWT amplifiers for fast work in urban zones.

THE TWO TEAMS - EA5F1AAM/P:Jean-Pierre, F1AAM, and John-Claude, F5BBUU at Climbs Pego , Spain close to Denia. in Grid Square IM98XU, at 200 meters of altitude. For 144Mhz: 200W and 11 element antenna. For 10 GHz: 39 " or 1 meter antenna, TWT amplifier with 12 W and another 1 meter antenna for reception.

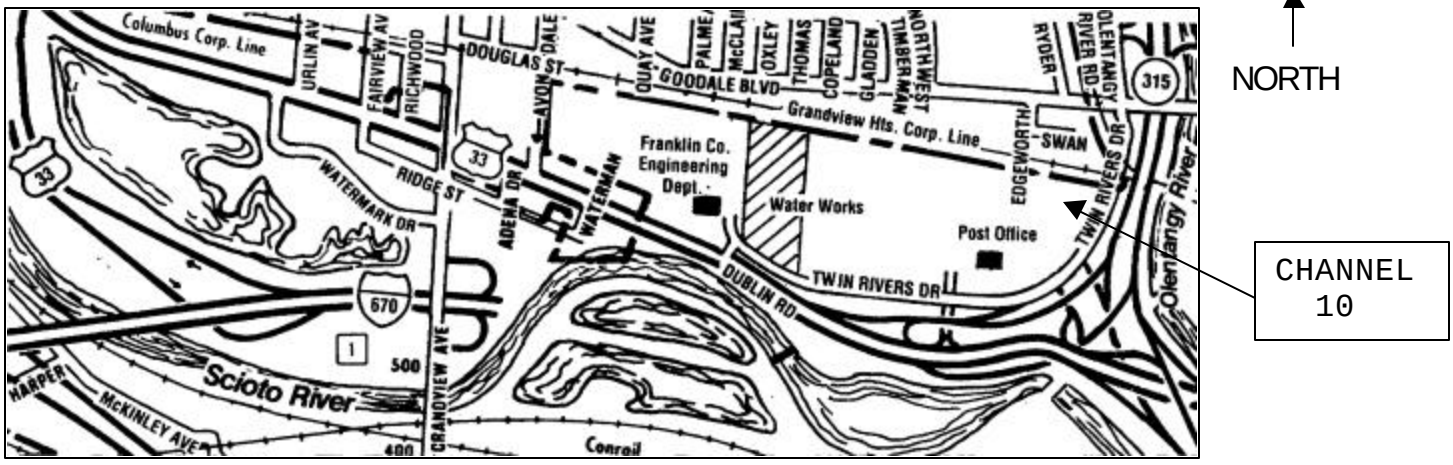
I5/HB9AFO/P:Charly, HB9ADJ; Michel, HB9AFO and Mauro, IK1WVQ from Sunday to Wednesday.). At Rifugio Carrara, above Carrara in Toscany, Italy in grid square JN54BC at 1320 meters of altitude. On 144: 180W and 11 element antenna. Two complete equipment sets: HB9AFO:10 GHz: 1 meter antenna, 12 watt TWT , receiver for automatic search for stations and narrow band scanner receiver. On 24GHz: 100mw and 65 cm antenna and 1 meter dish. HB9ADJ:10 GHz: 35 cm antenna , 12 watt TWT and 85 cm dish antenna, satellite TV receiver.

And to next year for new adventures!
... Michel Vonlanthen, HB9AFO,mvonlanthen@vtx.ch.

TV STATION CHANNEL 10 TOUR COMING UP SOON!

Great news! Jay, KB8YMQ, who works at TV channel 10 in Columbus, has arranged for a tour of their facilities on Wednesday evening July 28th at 7:00 PM. All ATCO members are invited. Come one come all to see how a commercial TV station is run, drool over the high tech equipment and maybe pick up some pointers for improving your ATV station. This is an awesome tour as reported from people who have taken a tour of their facilities in the past. Jay thought it best to assemble there at 7:00 PM in order to have enough light to see some of the tower and antenna equipment outside. No, we won't get a trip up the tower but the stuff on the ground promises to be just as exciting.

I will announce it each Tuesday nite Net till then so everyone will have time to prepare. Please let us know by Email, phone or Net night if you plan to come so we can accommodate everybody. A map is shown below for your convenience. The location is at the studio/transmitter/antenna facility on 770 Twin Rivers Drive and is accessible from US route 33 just east of the Franklin County Engineering Dept. Turn north onto Twin Rivers Drive and look for the tower. Meet in the Channel 10 parking lot.



ATV EQUIPMENT SUPPLIERS

Below is a list of manufacturers of ATV equipment that I have found. There is no endorsement of any of the manufacturers listed below so buyer beware. If I or anyone else that I know of has had any trouble with a manufacturer, it won't be listed. As I get more info, I'll add manufacturers. Likewise, if I hear of any trouble, it'll be removed. Good luck and keep me advised.
…WA8RMC

Michael Kohlstadt, KD6UJS
has a limited supply of used but working Pacific Monolithics 2.4ghz downconverters and power supplies which will work fine for the repeater.
Phone: 408-926-0430.

Downeast Microwave
Antennas, Power Amplifiers, Deluxe Downconverters, microwave parts.
954 Rt. 519 Frenchtown, NJ 08825
Phone: 908-996-3584
Fax: 908-996-3702

PC Electronics
ATV Transmitters, Receivers
Manufacturer/Reseller
2522 Paxson Ln.
Arcadia, CA 91009-8537
Phone: 626-447-4565
Fax: 626-447-0489
tom@hamtv.com www.hamtv.com

Phillips-Tech Electronics
MMDS, ITFS downconverters and antenna systems
P.O. Box 8533
Scottsdale, AZ 85252
Phone: 602-947-7700
Fax: 602-947-7799

ATV Quarterly (ATVQ)
ATV magazine publisher
5931 Alma Drive
Rockford, Il. 61108
Phone 815-398-2683
FAX 815-398-2688
Email: atvq@hampubs.com

Black Box
1000 Park Drive
Lawrence, PA 15055-1018
(800)552-6816 Voice
(800)321-0746 Fax
Email: info@blackbox.com
http://www.blackbox.com
Electronic Connections

Hamtronics Inc
Ham receivers, transmitters
Antennas, Preamps
http://www.hamtronics.com/

Allied Electronics
7410 Pebble Drive
Fort Worth, TX 76118
(800)433-5700
http://www.allied.avnet.com
Electronic Parts House

Cable X-Perts
416 Diens Drive
Wheeling, IL 60090
800-828-3340 Voice 847-520-3444 Fax
http://www.cablexperts.com
Wire and Cable

SHF Microwave Parts Company
10GHz Gunn oscillators and Antennas
7102 W. 500 S.
LA PORTE, INDIANA, 46350
Fax: 219-785-4552

CCI Communications Concepts, Inc.
508 Millstone Drive
Beavercreek, OH 45434-5840
(937)426-8600 Voice
(937)429-3811 Fax
Email: cci.dayton@pobox.com
http:://www.communications-concepts.com ATV Equipment

GEKCO Inc
TV test signal circuit boards
PO Box 642
Issaquah, Wa 98027-0642
Phone: 425-392-0638
Email: sales@gekco.com
www.gekco.com

DCI Communications
Interdigital filters and cavities
Box 293, 29 Hummingbird Bay
White City, SK, Canada S0G5B0
Phone: 306-781-4451
http://www.dci.ca/

ATV Research Inc.
TV cameras & related parts
1301 Broadway PO Box 620
Dakota City, NE 68731-0620
Phone: 402-987-3771
Homepage: www.atvresearch.com
Email: atc@pionet.net

Directive Systems
RR#1 Box 282 Dixon Road
Lebanon, ME 04027
(207)658-7758 Voice
(207)658-4337 Fax
Antennas
http://www.directivesystems.com/

M²
Antennas
7560 N. Del Mar Ave.
Fresno, Ca 93711
Phone: 209-432-8873
http://www.m2inc.com/

E. H. Yost & Company
2211-D Parview Road
Middleton, WI 53562
(608)831-3443 Voice
(608)831-1082 Fax
Email: ehyost@midplains.net
Battries

Fair Radio Sales
1016 E. Eureka P.O. Box 1105
Lima, OH 45802
(419)227-6573 Voice
(419)227-1313 Fax
Email: fairadio@wcoil.com
http://alpha.wcoil/~fairradio
Electronic Surplus Equipment

Herbach and Rademan
16 Roland Avenue
Mount Laurel, NJ 08054-1012
(800)848-8001 Voice
(609)802-0465 Fax
Email: sales@herbach.com
http://www.herbach.com
Electronic & mechanical Surplus

Jameco Electronic Components
1355 Shoreway Road
Belmont, CA 94002-4100
(800)831-4242 Voice
Email: infor@jameco.com
http://www.jameco.com
Electronic Parts

Mat Electronics
400 Pike Road
Huntingdon Valley, PA 19006-1610
(800)628-1118 Voice
(800)628-1005 Fax
Email: sales@matelectronics.com
http://www.matelectronics.com
Radio & TV Parts House

MCM Electronics
650 Congress Park Drive
Centerville, OH 45459
(800)543-4330 Voice
(800)765-6960 Fax
http://www.mcmelectronics.com

Mouser Electronics
958 North Main Street
Mansfield, TX 76063-4827
(800)346-6873 Voice
(817)483-0931 Fax
Email: sales@mouser.com
http://www.mouser.com
Electronics Parts House

Nemail Electronics, Inc.
12240 N.E. 14th Avenue
North Miamo, FL 33161
(800)522-2253 Voice
(305)899-0900 Voice
(305)895-8178 Fax
Email: info@nemal.com
http://www.nemal.com
RF Connectors

Hosfelt Electronics Inc.
2700 Sunset Boulevard
Steubenville, OH 43952-1158
(800)524-6464 Voice
(800)524-5414 Fax

Pauldon Associates
210 Utica Street
Tonawanda, NY 14150
(716)692-5451 Voice
ATV Receivers and Transmitters

Jensen Tools Inc.
7815 S. 46th Street
Phoenix, AZ 85044-5399
(800)426-1194 Voice
(800)366-9662 Fax
http://www.jensentools.com

Sauder Electronics
261 Mountain Drive
Fredericksburg, PA 17026
(717)865-5001 Voice
(717)865-9470 Fax
Email: sauder@leba.net
Surplus Electronics

Surplus Sales of Nebraska
1502 Jones Street
Omaha, NE 68102
(800)244-4567 Voice
(402)346-2939 Fax
Email: grinnell@surplussales.com
http://www.surplusales.com
Electronic Parts

Tech America
P.O. Box 1981
Fort Worth, TX 76101-1981
(800)877-0072 Voice
(800)813-0087 Fax
http://www.techam.com
Electronic Parts House

Spectrum International
J-Beams, KVG, Micromodules,VSB
John Beanland
Phone:978-263-2145.
Email:
Spectrum@ma.ultranet.com
filters

Techni-Tool
5 Apolio Road P.O. Box 368
Plymouth Meeting, PA 19462-0368
(800)832-4866 Voice
(610)828-5623 Fax
Email: sales@techni-tool.com
http://www.techni-tool.com
Tools

Tessco Electronics
34 Loveton Circle
P.O. Box 5100
Sparks, MD 21152-5100
(800)472-7373 Voice
(410)472-7575 Fax
http://www.tessco.com
Test Equipment-Antennas-Etc

Typetronics
P.O. Box 8873
Fort Lauderdale, FL 33310-8873
(954)583-1340 Voice
(954)583-0777 Fax
Vacuum Tubes

TE Systems
P.O. Box 25845
Los Angeles, CA 90025
(310)478-0591 Voice
(310)473-4038 Fax
RF Power Amplifiers

Wyman Research Inc.
8339 S 850 W
Waldron, In 46182-9608
765-525-6452
http://www.svs.net/wyman
wyman@svs.net
ATV transmitters & transceivers
SSTV equipt.

Webster Communications, Inc.
115 Bellarmine
Rochester, MI 48309

The Wireman, Inc.
261 Pittman Road
Landrum, SC 29356

(800)521-2333 Voice (800)727-9473
(810)375-0121 Fax (864)895-4195
Electronic Parts Wire and Cable

INTERNET ATV HOME PAGES **(list verified 7/10/99)**

If you have access to the INTERNET, you may be interested to know of some of the HAM related information that is available. Most addresses listed below are case sensitive, so type exactly as shown. (for comments or additional listings contact me at towslee@ee.net).

Domestic homepages

http://psycho.psy.ohio-state.edu/atco	Ohio, Columbus, ATV home page (ATCO)
http://www.radio-amateurs.com	Ohio, Dayton ATV group (DARA)
http://users.erinet.com/38141/atv.htm	Ohio, Xenia KB8GRJ
http://www.hayden.edu/Guests/AATV	Arizona, Phoenix Amateurs (AATV) Carl Hayden High School
http://www.qsl.net/aatv/	Arizona, Pheonix Amateurs(AATV)
http://www.citynight.com/atv	California, San Francisco ATV
http://www.qsl.net/atn.	California, **A**mateur **T**elevision **N**etwork in Central / Southern
http://w6yx.stanford.edu/~stevem/atv	California, South Bay ATV Group Stanford University
http://www.qsl.net/wb6izg	California, southern ATV Sights and Sounds
http://home.tampabay.rr.com/k4lk/	Florida,Tampa Bay Amateur Television Society (TBATS)
http://www.nfds.net/~kb4oid/atv.html	Florida, Emerald Coast Amateur Television Society (ECATS)
http://www.qsl.net/scats/	Florida, Melborn Space Coast Amateur TV Society (SCATS)
http://www.bsrg.org /aatn/aatn1.html	Georgia, Atlanta ATV
http://ww2.netnitco.net/users/stealth/kens.htm	Indiana KB9I homepage
http://members.tripod.com/silatvg	Illinois, Southern, Amateur Television group
http://www.ussc.com/~uarc/utah_atv/id_atv1.html	Idaho ATV
http://www.premiernet.net/~hcantrl/	Kentucky, Bowling Green (CKATS)
http://ourworld.compuserve.com/homepages/wd0giv/ATVPAGE.html	Lousiana, New Orleans
http://www.smart.net/~brats	Maryland**,** Baltimore Radio Amateur Television Society (BRATS)
http://www.icircuits.com/dats	Michigan, Detroit Amateur Television Ststem (DATS)
http://www1.minn.net/~n0mnb/	Minnesota Fast Scan Amateur Television (MNFAT)
http://www.intecnet.net/vidking/	Missouri, St Louis Amateur Television
http://www.mt.net/~erhardt/atvrptr.htm	Montana, Helena Amateur Television
http://www.njin.net/~magliaco/atv.html	New Jersey, Brookdale ARC in Lincroft
http://www.qsl.net/~no3y	New Mexico, Farmingham
http://www.lloydio.com/oatva.html	Oregon, Portland ATV (OATVA)
http://www.webczar.com/atv	Oklahoma, Tulsa Amateur TV (TARC)
http://www.usaor.net/users/ka3fzf/	Pennsylvania, Pittsburg Amateur Television in Pittsburg
http://www.voicenet.com/~theojkat/w3phl.html	Pennsylvania, Phila. Area ATV
http://www.geocities.com/Hollywood/5842	Tennessee, East ATV
http://www.stevens.com/HATS/home.html	Texas, Houston ATV (HATS)
http://www.hamtv.org/	Texas, North Texas ATV
http://www.ussc.com/~uarc/utah_atv/utah_atv.html	Utah ATV
http://www.qsl.net/w7twu	Washington, Western Washington Television Society (WWATS)
http://www.shopstop.net/bats/	Wisconsin, Badgerland Amateur Television Society (BATS)

Foreign homepages

http://www.ecn.net.au/~sbloxham/index.html	Australia, ATV, VK4GY (large list of other ATV & ham radio sites)
http://www.batc.org.uk/index.htm	British ATV club (BATC)
http://www.sfn.saskatoon.sk.ca/recreation/hamburg/hamatv.html	Saskatoon, Canada ATV
http://www.gpfn.sk.ca/hobbies/rara/atv3.html	Regina, Canada ATV
http://www.inside.co.uk/scart.htm	UK,Great Britain ATV (SCART)
http://www.cmo.ch/swissatv	Swiss ATV
http://WWW.Regio.Rhein-Ruhr.De/hamradio/atv.orig/welcome.htm	German ATV in "Niederrhein" area
http://lea.hamradio.si/~s51kq/	Slovenia ATV
http://www.arcadeshop.demon.co.uk/atv/	UK, G8XEU ATV homepage
http://www.burnabyradio.com/ve7rtv/	British Columbia, Canada VE7RTV repeater

INTERNET MISCELLANOUS HAM RELATED HOME PAGES **(list verified 7/10/99)**

The following addresses are helpful in searching for many different Ham Radio items on the INTERNET.

http://www.stevens.com/atvq	ATVQ Magazine home page. ATV equipment & article references.
http://www.hamtv.com	PC Electronics Inc. Lots of proven ATV equipment for sale.
http://downeastmicrowave.com	Down East Microwave Inc. Lots of uhf/microwave parts & modules.
http://www.yahoo.com/Entertainment/television/Amateur_television	Listing of some of the available ATV home pages.
http:/www.acs.ncsu.edu/HamRadio	General ham radio info- satellite track, call sign database etc.
http://www.arrl.org/hamfests.html	Current yearly hamfest directory.
http://amsat.org	AMSAT satellite directory/home page.
http://www.arrl.org	ARRL home page
http://www.ualr.edu/doc/hamualr/callsign.html	Search by call sign or name.
http://hamradio-online.com	Ham Radio Online "newsletter" Lot of Ham related information.
http://www.qsl.net/atna/	ATNA homepage
www.qth.net	ATNA members list server (click "select list" to subscribe to listserver)
http://www.ham-links.org	Ham Radio collection database
http://bro.net/explorer/part97.htm	FCC part 97 details. Look up the FCC regulations.
http://fly.hiwaay.net/~bbrown/index.htm	Tennessee Valley Balloon launch information (Bill Brown WB8ELK)
http://www.ipass.net/~teara/atv4.html	Arizona ATV 2.4Ghz Wavecom page (Wavecom mod. information)
http://www.ham.net/lisats.html	Space Shuttle Launch Info Service & Amateur TV System (LISATS**)**
http://www.svs.net/wyman/	Wyman Research Inc. W9NTP Don Miller ATV equipment
http://www.m2inc.com/	M^2 Antenna Systems Inc.
http://www.dci.ca/AMATEUR.htm	DCI Digital Communications Inc. Bandpass filters
http://scott-inc.com/wb9neq.htm	Kentucky, Airborn ATV from WB9NEQ in Bowling Green
http://www.icircuits.com/	Intuitive Circuits Inc
http://www.ipass.net/~teara/atv4.html	2.4 GHz Wavecom modificationdetails
http://www.qsl.net/kd4dla/ATV.html	KD4DLA ATV web page index

HAMFEST CALENDAR

This section is reserved for upcoming hamfests for as far in advance as we know about them. 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. I maintain some fliers that compile this list so for additional info Email me at towslee@ee.net. This list will be amended as further information becomes available.

July 18 Van Wert ARC, Van Wert, OH Bob Barnes, WD8LPY 411 North Walnut St., Van Wert, OH 45891 419-238-1877
E-mail: barnesrl@bright.net http://www.bright.net/~barnesrl/w8fy.html
July 24 OH-KY-IN ARS, Cincinnati, OH Dana Laurie, WA8M 280 Hillcrest Dr., Cincinnati, OH 45215-2610 513-761-7388
E-mail: wa8m@arrl.net
August 1 Portage ARC, Randolph, OH Joanne Solak, KJ3O 9971 Diagonal Rd., Mantua, OH 44255 330-274-8240
E-mail: ljsolak@apk.net http://parc.portage.oh.us
August 7 Voice of Aladdin ARC, Columbus, OH Jim Morton, KB8KPJ 6070 Northgap Dr., Columbus, OH 43229-1945 614-846-7790
August 8 Triangle ARC, Lisbon, OH Mike Mays, KB8JNM 48635 Bloomfield Ave., East Liverpool, OH 43920 330-386-6021
August 8 Triple States RAC, Martins Ferry, OH Ralph McDonough, K8AN 2011 State Highway 250, Adena, OH 43901 740-546-3930
Sept 12 Findlay Radio Club, Findlay, OH Bill Kelsey, N8ET 3521 Spring Lake Dr., Findlay, OH 45840 419-423-4604
Sept 19 Greater Cincinnati ARA, Cincinnati, OH Jim Weaver, K8JE 5065 Bethany Rd., Mason, OH 45040-9660 513-459-0142
Sept 26 Hamfest Association of Cleveland, Cleveland, OH Ron Nichols, N8LZA 800-CLE-FEST or 216-999-7388
Oct 10 Northwest Ohio ARC, Lima, OH Greg Schwark, N8WBD 600 Sunset Dr., Spencerville, OH 45887 419-647-6321
Oct 17 Ashland Area ARC, Ashland, OH David Fike, N8UCA 979 Twp. Rd. 1654, RFD 6, Ashland, OH 44805 419-289-1082
Oct 31 Marion ARC, Marion, OH Karen Eckard, N8KE 6583 South Street Meeker, Marion, OH 43302 740-499-3565
Oct 31 Massillon ARC, Massillon, OH Don Wade, W8DEA 7300 Sunset Strip NW, Apt. 7, North Canton, OH 44720 330-497-7232
Nov20 Grant ARC, Georgetown, OH Gordon Neal, W8YGW 11401 State Route 774, Bethel, OH 45106 513-379-1659

ATCO REPEATER TECHNICAL DATA SUMMARY

This space of each publication includes the technical information of our repeater. Each time a new feature is brought on line it's added here. Use this as a quick reference for up/down access codes as well as some of the more important parameters of our system.

Main repeater: 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

Transmitters: 427.25 MHz AM modulation, 1250 MHz FM modulation and 2433 MHz FM modulation.
interdigital filters in output line of 427.25 & 1250 transmitters
Transmitter Output Power - 40 watts average 80 watts sync tip (427.25)
50 watts continuous (1250)
8 watts continuous (2433)
Link transmitter - 1 watt NBFM 5 kHz audio (446.350 MHz)

Identification The 427, 1250 and 2433 transmitters identify simultaneously every 10 minutes with video showing ATCO and WA8RUT with four different screens. Audio identification is 4 sequences of Morse Code.

Transmit antennas: 427.25 MHz - Dual slot horizontally polarized 7 dBd gain major lobe west
1250 MHz - Diamond vertically polarized 12 dBd gain omni
2433 MHz - Comet vertically polarized 12 dBd gain omni

Receivers: 147.45 MHz for F1 audio input control of touch tones
439.25 MHz for A5 video input with FM subcarrier audio (lower sideband)
915 MHz for F5 video link data from remote sites
1280 MHz for F5 video input
2411 MHz for F5 video input

Receive antennas: 147.45 MHz - Vert. polar. Hi Gain "Comet" 12 dBd (also for 446 MHz output)
439.25 MHz - Horiz. polar. dual slot 8 dBd gain major lobe west
915 MHz - Vert. polar. dB Products 10 dBd gain
1280 MHz - Horiz. polar. single slot 3 dBd gain major lobe west.
2411 MHz - Comet vertically polarized 12 dBd gain omni

		UP	DOWN
Input control:	Major Touch tones: beacon (1 min)	*439	#
	regional weather radar	697	#
	Local radar (5 min)	264	#
	User repeat 1 minute	*45	*22
	Touch tone pad tester	#0	#5
	Manual mode (ID)	*77 pause 90	*22
	(439 input)	*77 pause 91	*22
	(910 input)	*77 pause 92	*22
	(1280 input)	*77 pause 93	*22
	(cabinet cam)	*77 pause 94	*22
	(roof cam)	*77 pause 99	*22
	5 second ID	#9	*22
	Bulletin board	285 pause 92	286
	Reset to scan mode	D37 or #437	

Remote sites: Local radar (from TV channel 4 - WCMH) (915 MHz link output 8 watts)
Aux link at WA8RUT QTH (915 MHz link output 1 watt)
Aux link at WB8CJW QTH (915 MHz link output 1 watt)

ATCO MEMBERS AS OF 12 July 1999

K8AEH	Wilbur Wollerman wilbur.w@juno.com	672 Rosehill Road	Reynoldsburg	Oh	43068	614-866-1399
KC3AM	David Stepnowski	735 Birchtree Lane	Claymont	De	19703-1604	kc3am@aol.com
KC8ASD	Bud Nichols	3200 Walker Rd	Hilliard	Oh	43026	614-876-6135
WB4BBF	Randall Hash	212 Long Street	Bluefield	Va	24605	
W4/F5BJV	Marcel Pitzini f5bjv@mindspring.com	443 Eastland Drive	Decatur	Ga	30030	404-378-2772
KC8BNI	Fred Stutske kc8bni@amsat.org	8737 Ashford Lane	Pickerington	Oh	43147	
WB8CJW	Dale Elshoff dale.elshoff@usiny.mail.abb.com	8904 Winoak Pl	Powell	Oh	43065	766-5823
WA8DNI	John Busic wa8dni@juno.com	2700 Bixby Road	Groveport	Oh	43125	491-8198
K8DW	Dave Wagner	2045 Maginnis Rd	Oregon	Oh	42616	419-691-1625
WA4DFS	Ed Walker ebwalker@preferred.com	PO Box 150	Mountain City	Tn	37683	423-727-9611
WA3DTO	Rick White wa3dto@aol.com	5314 Grosbeak Glen	Orient	Oh	43146	877-0652
W8DXF	Bob Lewis	192 Northview Rd	Blanchester	Oh	45107-8770	937-783-2740 docwest@in-touch.net
WB8DZW	Roger McEldowney wb8dzw@aol.com	5420 Madison St	Hilliard	Oh	43026	876-6033
KB8EAA,KB8VBF	Rick, Judy Hesket rjheskett1@worldnet.att.net	6261 Maple Canyon Dr	Columbus	Oh	43229	891-3887
W8EHW	Foster Warren	P.O. Box #32	No. Hampton	Oh	45349	
KB8FF	Dave Tkach tkack@copper.net	2063 Torchwood Loop S	Columbus	Oh	43229	882-0771
KS4GL	John Barnes ks4gl@juno.com	216 Hillsboro Ave	Lexington	Ky	40511	606-253-1178
K8GCS	Harry Covault k8gcs@megsinet.net	4820 Archmore Dr	Kettering	Oh	45440	937-434-5412
W8GUC	Reuben Meeks rmeeksjr@megsinet.net	428 Lewiston Road	Kettering	Oh	45429	937-294-0575
KA8HAK	Jim Reese	1106 Tonawanda Ave	Akron	Oh	44305	
WA8HFK,KC8HIP	Frank, Pat Amore	3630 Dayspring Dr	Hilliard	Oh	43026	777-4621
W3HMS	John Jaminet	912 Roberts St	Mechanicsburg	Pa	17055-3451	w3hms@aol.com
W8JND	Richard Knowles	573 Plaza Drive	Circleville	Oh	43113	477-8132
K8KDR	Matt Gilbert	5167 Drumcliff Ct.	Columbus	Oh	43221-5207	771-7259 mjgilbert@wcom.net
N8KQN	Ted Post n8kqn@juno.com	1267 Richter Rd	Columbus	Oh	43223	276-1820
WA8KQQ	Dale Waymire walkingcross@mail.bright.net	225 Riffle Ave	Greenville	Oh	45331	513-548-2492
N3KYR	Harry DeVerter Jr	303 Shultz Road	Lancaster	Pa	17603-9563	hdeverter@redrose.net
KC8LOW	Bob Harmon	831 McDonell Dr	Gahanna	Oh	43230	478-2193
N8LRG	Phillip Humphries phumphries@iwaynet.net	3226 Deerpath Drive	Grove City	Oh	43123	614-871-0751
KA8MID	Bill Dean ka8mid@qsl.net	2630 Green Ridge Rd	Peebles	Oh	45660	
KB8MDE	Shaun Miller kb8mde@bright.net	5061 County Rd 123	Mt Gilead	Oh	43338	419-768-2588
K8MZH	Leland Hubbell	7706 Green Mill Road	Johnstown	Oh	43031	967-8412
WD8OBT,KB8ESR, Tom	Camm & sons	1634 Dundee Court	Columbus	Oh	43227	860-9807
N8OCQ	Robert Hodge	3689 Hollowcrest	Columbus	Oh	43223	875-7067
N8OOA	Jeff Clark	9894 Fincastle-Winchester	Sardinia	Oh	45171	937-695-1229
N8OPB	Chris Huhn	146 South Hague Ave	Columbus	Oh	43204	279-7577
W6ORG,WB6YSS	Tom O'Hara & family tom@hamtv.com	2522 Paxton Lane	Arcadia	Ca	91007	626-427-4565
WB8OTH	Perry Yantis pyantis@compuserve.com	1850 Lisle Ave	Obetz	Oh	43207	491-1498
WA2PCH	Craig Stoll	PO Box 1117	Orchard Park	Ny	14127	
KE8PN	James Easley jeasly@freenet.columbus.oh.us	1507 Michigan Ave	Columbus	Oh	43201	421-1492
W8PGP,WD8BGG	Richard, Roger Burggraf	5701 Winchester So. Rd	Stoutsville	Oh	43154	474-3884
KF8QU	Bob Tournoux rtournou@columbus.rr.com	3569 Oarlock Ct	Hilliard	Oh	43026	876-2127

WA8RMC	Art Towslee towslee@ee.net	180 Fairdale Ave	Westerville	Oh	43081	891-9273
W8RRF	Paul Zangmeister w8rrf@copper.net	10365 Salem Church Rd	Canal Winchester	Oh	43110	
WA8RUT,N8KCB	Ken & Chris Morris wa8rut@aol.com	3181 Gerbert Rd	Columbus	Oh	43224	261-8583
W8RVH	Richard Goode w8rvh@glasscity.net	9391 Ballentine Rd	New Carlisle	Oh	45334	937-964-1185
WB8RVI	David Jenkins	4230 Lemert Drive	Grove City	Oh	43123	875-0664
WD8RXX	John Perone wd8rxx@juno.com	3477 Africa Road	Galena	Oh	43021	740-548-7707
WA8SAR	Gary Obee	3691 Chamberlain	Lambertville	Mi	48144	
N8SFC	Larry Campbell larry@psycho.psy.ohio-state.edu	316 Eastcreek Dr	Galloway	Oh	43119	851-0223
KB8SFD	Doug Nicodemus rimlight@aol.com	P.O. Box 232	Groveport	Oh	43125	
W8SJV	John Beal & family	2899 Castlebrook Ave	Columbus	Oh	43026	876-9412
W3SST	John Shaffer w3sst@juno.com	2596 Church Road	York	Pa	17404	
W8STB	John Hey & family heyjo@netzero.net	894 Cherry Blossom Dr	West Carrolton	Oh	45449	937-859-5295
K8STV	Jim Carpenter	823 Quailwood Dr	Mason	Oh	45040	
N8TBU	Ed Latham	8399 Fairbrook Ave	Galloway	Oh	43119	
KB8TRP,KB8TCF	Tom, Ed Flanagan ed.flanagan@ohcolu.ang.af.mil	1751 N. Eastfield Dr	Columbus	Oh	43223	272-5784
WA8TTE	Phil Morrison	154 Llewellyn Ave	Westerville	Oh	43081	
KB8UGH scaruso@freenet.columbus.oh.us	Steve Caruso	39 South Garfield Ave	Columbus	Oh	43205	461-5397
WB8URI	William Heiden	5898 Township Rd #103	Mount Gilead	Oh	43338	419-947-1121
KB8UU	Bill Rose	9250 Roberts Road	West Jefferson	Oh	43162	879-7482
WA8UZP	James jrr@cscc.edu	818 Northwest Blvd	Columbus	Oh	43212	297-1327
K7VE	Hays jhays@hays.org	P.O. Box 564	Sandy	Ut	84091	
WB8VJD	Rick Morris	203 Merton Street	Holland	Oh	43528	
KA8VUQ	Jack Wolff	2682 Hiawatha Ave	Columbus	Oh	43212	263-3092
N8WLT	James Neymeyer	2879 East Moreland Drive	Columbus	Oh	43209	237-2331
KB8WBK	David Hunter dhunter147@aol.com	45 Sheppard Dr	Pataskala	Oh	43062	740-927-3883
KB8YIO	Ric Wise rwise@columbus.rr.com	1465 25th Ave	Columbus	Oh	43211	291-6508
KB8YMN	Mark Griggs mmgriggs@aol.com	2160 Autumn Place	Columbus	Oh	43223	272-8266
KB8YMQ	Jay Caldwell	4740 Timmons Dr	Plain City	Oh	43064	
KB8ZLB	Dave Kibler k154@bright.net	243 Dwyer Rd	Greenfield	Oh	45123	937-981-4007
KA8ZNY,N8OOY	Tom & Cheryl Taft ka8zny@copper.net	386 Cherry Street	Groveport	Oh	43125	836-3519

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 the ATCO newsletter quarterly in January, April, July, and October. The newsletter is sent to each member without additional cost.

The membership period is from January 1ST to December 31ST. New Members 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. Your support of ATCO is welcomed and encouraged.

ATCO CLUB OFFICERS

President:	Art Towslee WA8RMC	Repeater trustees:	Art Towslee WA8RMC
V.President:	Ken Morris WA8RUT		Ken Morris WA8RUT
Treasurer:	Bob Tournoux KF8QU		Dale Elshoff WB8CJW
Secretary:	Rick White WA3DTO	Statutory agent:	Rick White WA3DTO
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 KF8QU 3569 Oarlock CT Hilliard, Ohio 43026

_____ TUESDAY

NITE NET ON 147.45 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 would like to 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 one hour so please join us if you can.

_____ ATCO

TREASURER'S REPORT - de KF8QU

OPENING BALANCE (4/10/99)..... $ 858.05
RECEIPTS (dues)..... $ 120.00
OTHER INCOME (bank interest)..... $ 6.39
EXPENDITURES (Spring Event)..... $196.05
CLOSING BALANCE (07/12/99)..... $ 788.39

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

FIRST CLASS MAIL

REMEMBER...CLUB DUES ARE NEEDED.
CHECK MAILING LABEL FOR THE EXPIRATION DATE AND SEND KF8QU A CHECK IF EXPIRED.