ATCO NEWSLETTER

VOLUME 12 NUMBER 1 **JANUARY 1995**

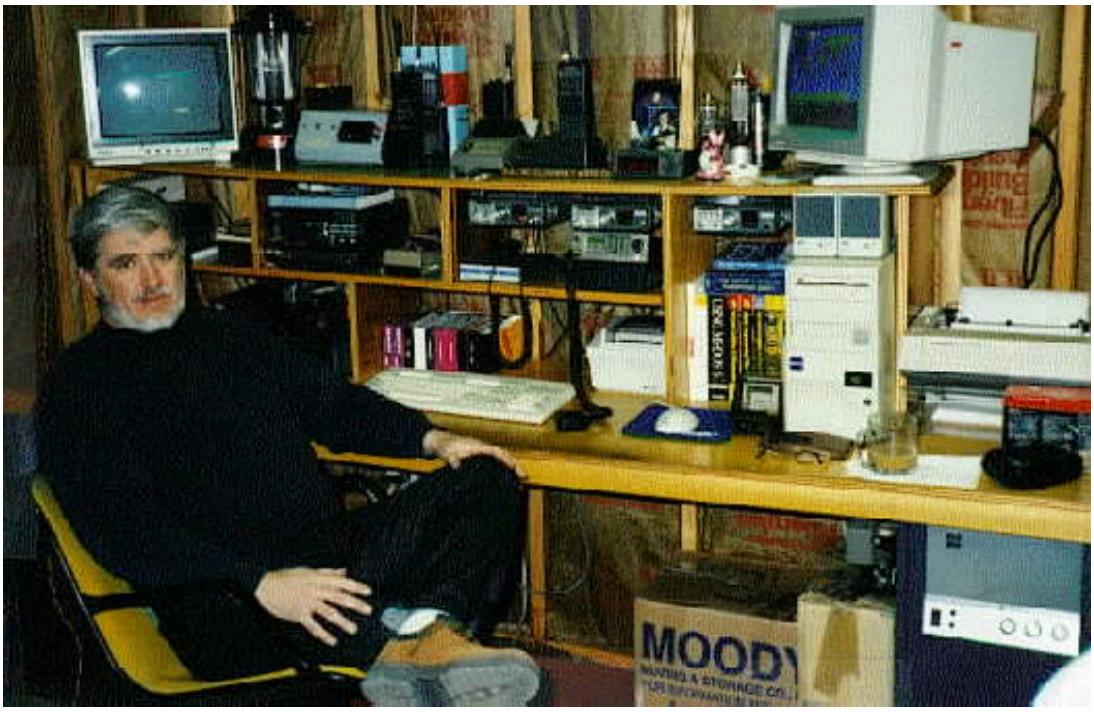
The ATCO newsletter is the official publication of a group of amateur television operators known as "AMATEUR TELEVISION IN CENTRAL OHIO Group Inc." and is published quarterly (January, April, July, and October)

ATV REPEATER UPDATE

Many things have happened since the last newsletter. Probably most important, the repeater is fully functional in the 439 to 427 repeat mode. It was a rocky road getting there but it's now reality. The 1280 input is another story. Also, the major rebuild talked about before is yet to happen. Turn to the inside pages for an in depth explanation.

ATCO HAM IN THE SPOTLIGHT

This month we feature Roger McEldowney WB8DZW. Roger has been with the group almost since its inception. There have been short periods of inactivity in the past but I feel we've got him hooked this time with the repeater. Roger has been working on his 910 Mhz Rabbit transmitter to work the repeater and has got it up to a near P5 now. I believe he's got it licked with his home brew 910 Mhz loop yagi. "Roger, hint! how about an article?"



ATCO FALL EVENT MINUTES

The annual ATCO ATV party on November 6, 1994 was a success as usual. We had 21 participants some who came from as far away as the Dayton Ohio area. Food was provided by Rick, WA3DTO and brats by Art WA8RMC. A number of donated door prizes were handed out. Wilbur won a 144 Mhz antenna, Clyde won an ATV book donated by Universal Radio and others which include KF8QU, W8RVH, WA8KQQ, WA8RUT, N8CYB, W8AER, W8WAU, W8EHW, WA8TTE, KB2ARL, KB8UGH and WB8CJW were recipients of prizes. After we got our fill of the delicious food, we held a short meeting to discuss the repeater status.

The event participants are as follows:

Rick White WA3DTO	Dick Goode W8RVH	Phil Morrison WA8TTE
Jake Fuller W8WAU	Dale Waymire WA8KQQ	Blaire Standly N8CYV
Art Towslee WA8RMC	Foster Warren W8EHW	Clyde Nimal AA8LX
Dave DiGiuseppe KB2ARL	Tom Taft KA8ZNY	Dick Burggraf W8PGP
Bob Tournoux KF8QU	Roger McEldowney WB8DZW	Steve Caruso KB8UGH
Dave Sears W8AER	Wilbur Wollerman K8AEH Dale Elshoff WB8CJW	
Ken Morris WA8RUT		

Below are some of the pictures taken that day.

439 MHZ ATV SUPER BAND OPENING

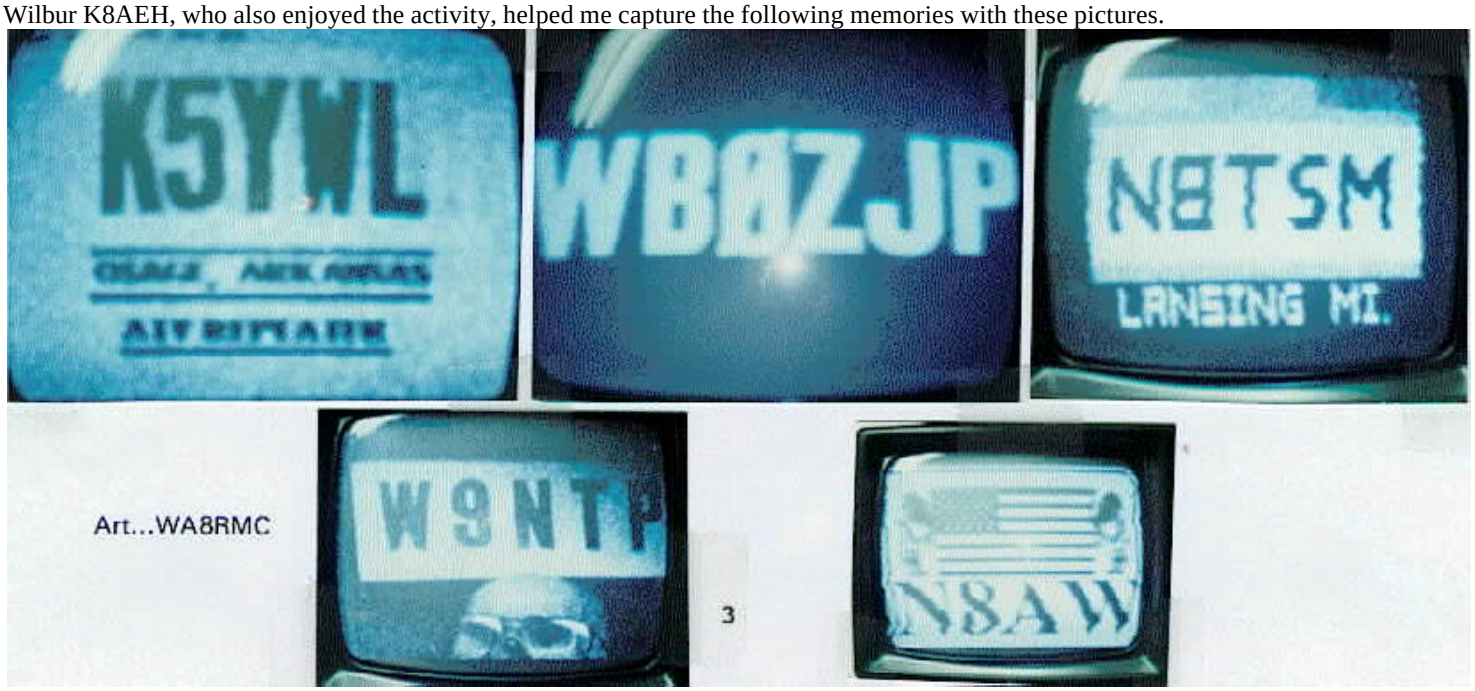
We have just had, in my opinion, the greatest ATV band opening in the last twenty years!!!! No kidding. If you weren't taking part in the activities on December 26th and 27th, you missed out on a lot of fun and the chance to establish a record ATV contact.

It started sometime during the morning on the 26th. Fortunately, on that Monday many of us were not working because of the Christmas holiday. I was casually listening while busy at the workbench when I noticed that WA8ZAH (Ron) from Cincinnati was creating near P5 pictures in my monitor. This is not at all unusual for Ron because he's got a high power rig with an excess of 200 watts and antennas to match but when even he is **that** good I know the band is up. Careful monitoring after that point demonstrated that the band was getting progressively better throughout the afternoon. By early evening, more people discovered that things were hopping and jumped on the "band wagon". (Nice pun, huh?) I checked the weather outside to find a very thick fog rolling in which helped even more. Most stations seen were primarily in Western Ohio and Eastern Indiana until about 11:00 PM that night and sometimes quite frustrating because the Dayton and Cincinnati guys were seeing Chicago, and Michigan stations P5 when I couldn't even detect sync bars. I eventually got my turn.

Sometime after midnight the full inversion moved over to Columbus Oh. too where Chicago Il, Milwaukee Wi, St louis Ms, Lansing Mi and Monroeville Pa came rolling in. It stayed that way for the rest of the night but I ran out of steam about 3:00 AM on the 27th and went to bed. When I got up later that morning, it was still good but didn't quite measure up to the previous night.

Some of the stations worked included:
KA3FZF Monroeville, PA P2
W8AHY Lansing, Michigan P5
N9LBN Milwaukee, Wisconsin P2
W9LPR Milwaukee, Wisconsin
WB0ZJP St Louis, Missouri P3 (This is a record contact for me)
WD9ASI Chicago, Illinois
N9AB Chicago, Illinois P4
N8AW Jackson, Michigan P4
K9SM Hillsboro, Illinois (NE of Chicago)
N8TSM Lansing, Michigan P4
KA8VSV Wheeling, West Virginia P2
WA4GSS Ashland, Kentucky P3

There were more but it was hard to keep track. Its been a long time since I've seen QRM on 439 Mhz ATV. I didn't think to grab the camera at first but here is a **sample** of what was seen in Columbus on those two days.
Wilbur K8AEH, who also enjoyed the activity, helped me capture the following memories with these pictures.



BOB CONQUERS THE 910 MHZ REPEATER LINK ACCESS

As my interest grew in ATV, I found it hard to transmit a picture to the repeater on 439 while trying to look at it on 427. While talking to one of the other club members, I learned of the 910.25 Mhz input link. After acting on a suggestion from ROGER (WB8DZW) a purchase was made. The following is a description of the system.

NAME: VIDEOCASTER (Rabbit)

MANUFACTURER: GEMINI

TRANSMITTER FEATURES;

Audio and video inputs, externally adjustable with a small slot head type screwdriver.
Three position frequency switch, A-B-C powered by an 18 vdc power supply, included.
Internal frequency adjustment.

RECEIVER FEATURES;

Outputs to a TV on channel 3.
Front panel fine tune adjustment.
Powered by 18 vdc power supply, included.

OTHER ITEMS SUPPLIED;

75 ohm cable /w F connectors 3' long.
1 A/B switch.
1 audio/video cable 3' long, with RCA jacks at each end.

The transmitter requires a frequency adjustment to bring it into the ham band. To do this remove the 4 cover screws and cover. Using a frequency counter with a short piece of wire inserted into the counter jack, touch the antenna of the transmitter and adjust VR 106 which affects channel "A". If you want to adjust the other two channels, VR 104 is for channel "B" and VR 103 is for channel "C". Since the output of the transmitter is in milliwatts, some counters may not be able to sense power levels this low. The transmitter is not crystal controlled and will drift slightly. I drilled a hole in the case to allow access to the adjustment with the cover on. Use this as a guide as each unit may vary. The system does not come with a schematic or parts list but parts are labeled on the PC board.

The receiver should not require any adjustment to tune the amateur band but it is not needed for repeater operation.

To adjust the transmitter frequency with the cover on requires a 1/4" hole drilled in the top of the cover. The center location of the hole should be 7/8" in from the front edge and 5/16" in from the side. This location may vary from one unit to another so measure your unit before drilling the cover.

The price of this system is $29.99 plus $6.00 s&h. Catalog number is j7-3816. It is available from Heartland America. Their phone number is 1-800-229-2901. They take orders 24 hours a day, 7 days a week.

Bob...N8OCQ

ATV GEAR FOR SALE

K8ZIM (Bart) who is moving to Florida has the following equipment for sale. He presently lives in Newark, Ohio and can be contacted at 614-344-2948. Equipment is as follows:
Color camera, ATV downconverter, Walkman ATV receiver, 2 antennas, UHF SWR meter, microphone & tripod.

Info by Bill Parker W8DMR.

ACTIVITIES ..... from my workbench

Well, what shall I talk about this time? I've covered the weather in detail previously so it's old stuff by now. Also I've discussed some "honey-do" projects here before...got in trouble from the wife for bringing them up...turned out it wasn't worth it...and now I'm back to square one!! We'll almost. I've finished painting the upstairs bedroom and I'm told it looks pretty good so we can move on to more interesting topics.

Repeater construction activity has progressed about as fast as can be expected in view of the multiplexed activities. First of all, we finally came to the conclusion that we weren't going to obtain that much needed remote receive site on the TV broadcast tower downtown. It's too bad because Ken, Dale and myself had already completed construction of most of the equipment. I had been talking all along that we should try to make the downtown site an inband repeater. That is, to install the receiver there also. I guess we'll get our chance. However, this posses a significant problem...receiver desense from the transmitter in the same cabinet is a real worry and can be expensive to overcome. To conquer this good filters as well as correctly positioned antennas are paramount. We do have room to mount the receive antenna directly beneath the transmitter antenna, so this was a natural choice. Actually it desirable to mount the receive antenna not only directly below but also a prescribed distance below the transmit antenna. This must be done experimentally, in my opinion, and I'm not willing to "play around" on the girder work to that extent so it'll have to work where the brackets will allow. We mounted the dual slot for the 439 Mhz receiver near where the 1258 Mhz transmit antenna used to be and used that 7/8" hardline. The 1258 Mhz antenna was then moved to a lower location and reconnected with a new run of 1/2" hardline. This new run is only about 35 ft long compared to the 65 ft run of 7/8" line previously so the total loss should remain nearly the same. The reduction in height of about 20 feet here is insignificant because we're working at the 630 ft point above ground level.

Since the 439 Mhz receiver is now located in the main cabinet with the 427 Mhz transmitter an interdigital filter for the receiver is mandatory. (The transmitter already has an interdigital filter.) I decided that instead of buying one I'd try my hand at building one. This was accomplished with what I feel was a moderate amount of success. (See the separate article about the filter construction later.) Everything worked so we now have good receive capabilities for the 439 Mhz input portion of the repeater. Success does not come without some degree of grief too. Now we found that a repeater coordination group permitted a repeater at 444.3 Mhz. This is hard to filter out. Additionally, the local 146.76 Mhz repeater's third harmonic (440.28 Mhz) produces about 200 microvolts at the 439 Mhz receiver input when 146.76 is on the air. This problem, in my opinion can only be solved with a hacksaw after midnight!!! (Just kidding, guys!!!) Fortunately, both repeaters are not on the air enough to pose a large problem for we must all share the available airspace shouldn't we? I feel better now...let's continue. All in all, this portion of the system works ok now. Some herring bars from interfering signals show up occasionally but we can cope with that.

We also installed a second run of 1/2 hardline for the now added 1280 Mhz input. This proved to be disappointing in two ways. First, I damaged the 1258.25 Mhz antenna relocating it so it had to be removed and repaired. Second, we found that with the two antennas in the same proximity severe desence occurred in the 1280 Mhz receiver. I personally felt that the 1258 to 1280 Mhz frequency separation would not require exotic filters but I was wrong. A new interdigital filter for at least the 1280 Mhz receiver will have to be constructed so here I go again. Fortunately, Ken donated enough extra 2" wide x 1/4" aluminum stock for the 439 Mhz filter, so back to the machine shop. As of this writing it's not complete so I'll have to keep the "success story" for the next issue At this time the 1280 Mhz receiver, although operational, is of little use until we install some filters because of transmitter desense.

The last, but most important item to get installed is the DS100 repeater controller. It is now fully functional scanning the inputs for a signal and sending out an ID on both the video and audio channels every 10 minutes. The codes are now changed so be sure to read and retain the new listings in the "ATCO Technical Data Summary" section. The most important code is now *439 on 147.45 Mhz to activate the 427 Mhz video ID for about 2 minutes. The previous code was just 439.

That's about it for now. Oh no, Ken just drove up with our new rack cabinet for use when we rebuild the equipment. He needs help unloading it. Looks like my idle time is coming to an end.
More next time...73's - Art.

A HORIZONTALLY POLARIZED OMNI ATV MOBILE ANTENNA

Interest in ATV mobile has increased in recent months with the coming of age of the ATCO repeater. The Columbus Repeater has inputs for 439.25 Mhz 910.25 Mhz and 1280 Mhz FMATV. The 70cm & 23cm repeater inputs are horizontally polarized and the 33cm input is vertical. Vertically polarized antennas for all three bands are readily available and a lot has been published about them in the past. However, we live in the Mid-west and our standard (70 & 23cm) is horizontal for ATV antennas. There did not seem to be a standard for 33cm, so we choose vertical! Antennas described here are horizontal, unity gain and offer nearly omni directional pattern.

In the 1950's an article appeared in QST describing a "Big Wheel" antenna for 2 meters. The designers (W1FVY and W1IJD) described a horizontally polarized OMNI directional antenna for fixed and mobile work on the two meter band. The antennas discussed here are adapted from the two meter version and scaled for both 439 and 1280 Mhz. They are in daily use and can be found on top of my Chevy Blazer and are primarily used to watch the repeater outputs on both bands. All material, except the "N" connector, was purchased at a hardware store.

Construction

The "Wheel" antennas are basically three one (1) wave length elements connected in parallel and arranged in a "clover leaf" shape. Electrically, it looks like 3 half wave dipoles in parallel, accounting for the low feed point impedance and the need for the matching stub. Figure 1 shows the shape of each element and Table 1 shows dimensions for 439 and 1280 Mhz. The antenna actually is harder to visualize than it is to build! The element material used was eighth inch (1/8") copper tubing (so called refrigerator tubing) although 10 gauge solid copper wire should work fine. Usually the tubing (or wire) has been coiled up and already has a shape that is hard to work with. I found that cutting the elements to length, putting one end of the cut tubing in a vise and other end in my variable speed drill and turning it 10 to 12 times (slowly!) makes the material easier to work to the desired shape. The length of the cut element will get longer if you use the drill method so you will then need to cut it back to the correct dimension.

The antenna is built on a connector of your choice, but I found "N" female works well. The "N" connector that works best (for antenna mounting) is the type that the locking nut threads from the front instead of the back.

Suggested steps to construct the antenna are as follows:

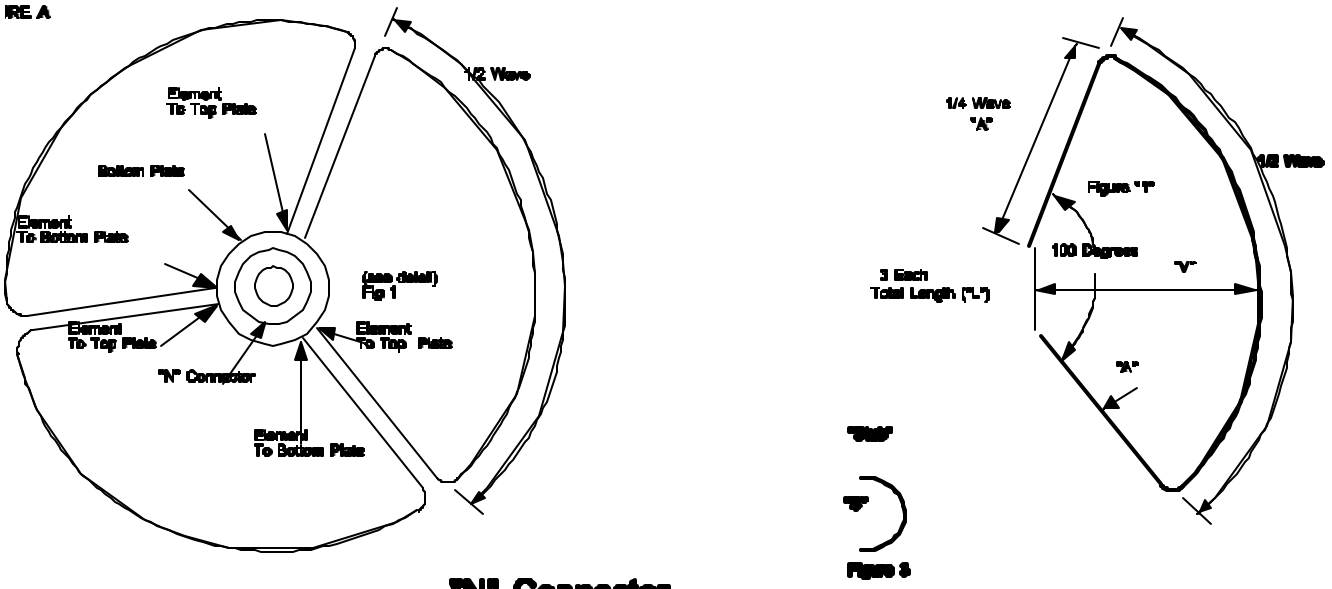
1. Select a connector to build the antenna on (I use "N" female).
2. From Table 1, cut 3 elements to length ("L")
3. Bend all 3 elements into the shape in figure 1 (measure twice, bend once)
4. Cut from sheet brass a 1 inch circle and drill a hole in the center to fit your chosen connector. You may want to drill the center hole before you cut the circle to avoid the drill bit from "eating" your brass circle. This part mounts on the connector outer shell body and the ground side of each element solders to it.
5. Cut from sheet brass a 1" brass circle. Drill a 3/32" hole in center. This part becomes the top solder plate for the other end of each element.
6. Firmly attach bottom brass plate and solder it to body of the connector.
7. Cut a 1/4" of 12 gauge solid copper wire and solder one end into the center conductor of the connector. You may need to file the end of the wire to fit, depending on your chosen connector.
8. Select a nylon "washer" 3/16" thick, 1" diameter to use as a insulated spacer. Place it over the center conductor where the 1/4" 12 gauge wire is soldered.
9. Place top plate firmly on top of the nylon washer with the 12 gauge wire sticking through the 3/32" hole in the center. Solder the 12 gauge wire to the brass top plate. Trim excess 12 Gauge wire.
10. As shown in Figure 2, solder first the bottom side of element 1 to the bottom plate and then solder the other end to the top plate.
11. Solder next element right under where element 1 solders to top plate. Solder element #2 to top plate.
12. Solder element #3 using same procedure as element #2.
13. If the elements are soldered correctly, each top element will start just above the previous element soldered to the bottom plate and solder to the top plate 120 degrees rotation to the top plate. The 1/4 wave sides of each element should parallel (above and below) each other. If not re-solder and re-shape the element until it does.
14. Cut from sheet brass a 1" long, 3/16" wide stripe and form it in a "U" as shown in figure 3.
15. Solder one end of the "U" to the bottom plate and the other end to the top plate.

This completes the basic construction of the wheel antenna. Mounting will be described after testing and tuning.

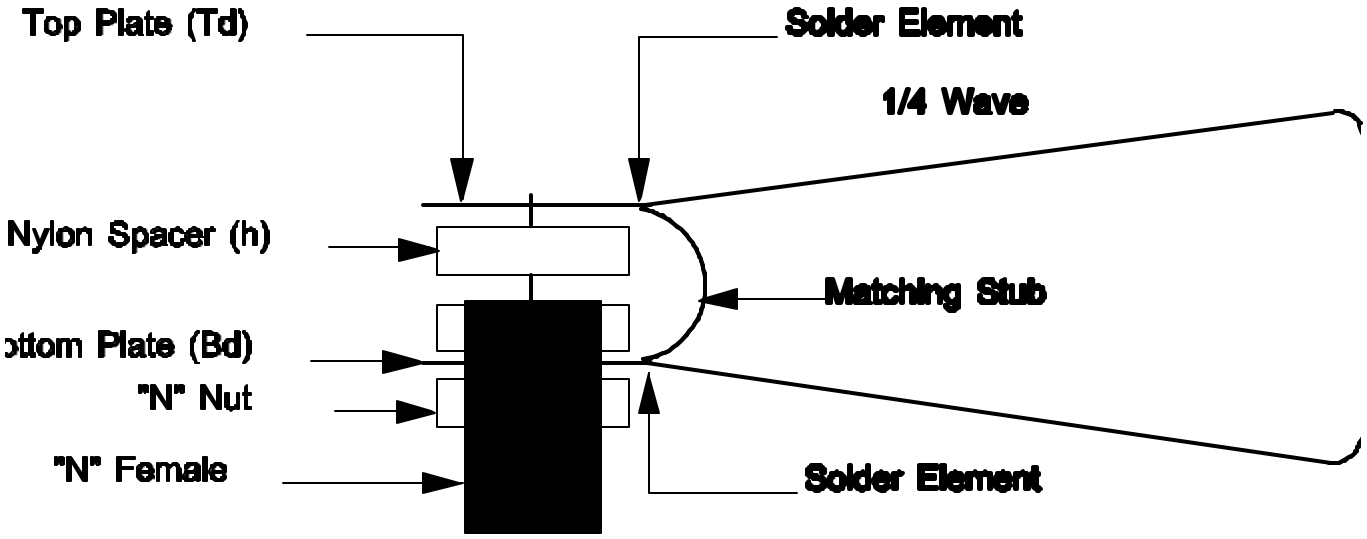
Table 1.

Band	L	A	V	h	S	Bd	Td	d
70cm	26"	6"	6 1/4:	1/4"	1"	1"	1"	1 3/4"
23cm	8 5/8"	2 1/8"	2 3/8"	5/16"	9/16"	1"	1"	5/8"

"L"= Total Element Length, "A" = 1/4 Side Length, "V" = Brass Plate to 1/2 Wave
"h" = top to bottom plate distance "S" = Matching Stub Length Bd = Bottom Plate diameter
Td = Top Plate Diameter
d = approx distance between adjoining (top to bottom) elements at intersection of the 1/4 and 1/2 wave bend.



"N" Connector Body Detail Figure 2



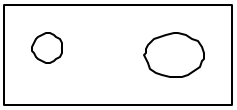
Top Plate Solders To "N" Center Conductor
Via 1/4" 12 Gauge Wire

Antenna Mounting

Two ways of mounting the Wheel are described here. If you have an existing mast mounted on a Mag mount (like the Husler 22" short mast for HF) you can use it directly. All you need is a matching thread nut to secure the bracket on top of the mast. If you don't have a Hustler or similar mast, one can be made from 3/8" thread rod (found in most hardware stores) cut 16-1/4" (5/8 wave on 70 cm) and fastened to a mobile magnet mount.

The mounting of the "Wheel" antenna is a flat sheet aluminum bracket 2" long and 1-1/4" wide. Drill a 5/8" hole in the center 3/4" (center) from one end. Drill a 3/8 hole 5/8" in from the other end (see Figure 4).

<-------- 2"------->



3 1-1/4 " wide Figure 4 (not to scale!!)

Mount the antenna to the 5/8" hole and secure with a second "N" connector nut.
Mount the antenna to the mast. The antenna is now ready for tuning & testing.
Use good quality RG 8x feed line even for very short runs. RG 58 has too much loss even at 400Mhz!

Tuning & Testing the Wheel Antenna & Checking Resonant Frequency

Check the SWR on the frequency it will be used (ie 439.25 /427.25 or 1280/1255).
If the VSWR is 1.2/1 or less, it will work fine for receiving the output of the repeater. If the VSWR is very high (>3:1), check for a feed line problem (connector?). If the VSWR is reasonable, no further tuning is necessary. If you would like to fine tune the antenna, the following procedure worked for me:

A good quality watt/SWR meter (like a Bird 43 or Diamond SX1000) for the 70 or 23 cm band is necessary to check out the antenna. Using a 440/1200 transmitter that will tune 430 to 450 Mhz, or 1250 to 1290 plot the VSWR curve for the antenna. To raise the center frequency, bend each element (slightly) using pliers at the point the element solders to the brass disks to separate the 1/4 wave feed section of the clover leaf (see Figure 4). Plot the curve again. Repeat as often as necessary to obtain the desired center.

Checking the Pattern

A very rough check of the OMNI directional pattern can be performed by using the repeater BEACON mode as a signal source. Use a Decade attenuator box to add enough attenuation to reduce the repeater signal to about "P2". In an "open" area and line of sight with the repeater, rotate the antenna while mounted over the car roof on the Mag mount. Watching the picture, you should see no change in picture strength. The antenna has been measured with a far more sensitive equipment to have -0.3db nulls 120 degrees apart in the OMNI pattern. Theses nulls can not be detected by watching the TV monitor (it takes 3db to change the picture 1/2 a "P" unit. If you have a sensitive IF AGC "P" meter on your ATV receiver, you may be able to detect the -0.3db nulls.

A final word

Don't expect this antenna to perform like your Beam or Loop Yagi! It does, however, perform like a Horizontal, OMNI Directional unity gain antenna. Using the 70 cm version, I routinely copy the Columbus repeater while mobile "P2" 40 miles from Columbus and the 23cm version, I can see the repeater anywhere in the Columbus area (12-15 Miles), shorter distances when the leaves are on the trees!

If you would like to buy this antenna ready made and tested, contact "The Olde Antenna Lab" in Denver, CO (303-798-5926). The basic antenna sells for $39.95 and a Mag Mount version sells for $59.95.

If you build this antenna, please let me know your experience with it. I have a Wheel antenna mounted up about 40 feet on my tower, if you would like to have a "Wheel to Wheel" contact, let me know!

REMEMBER, NEVER HAVE THE ATV MONITOR ON WHILE IN MOTION IF YOU ARE DRIVING! Its illegal & stupid.
73 & CU on ATV Ken...WA8RUT

NEW MEMBER SECTION

We want to welcome the following new member to our group. They're the ones who will hopefully become more interested in this hobby and provide active support toward this segment of Amateur Radio!!! The following list is a new entry since the last newsletter.

KB8UGH Steve Caruso

UPCOMING HAMFESTS

Even though it is winter, it seems that the lust for a good hamfest never ends. The following list summarizes the ones coming up that I know of. I will print others if you will let me know far enough in advance.

January 14
Middletown Hamfest...General Hamfest and Packet.
Theskens Hall at Miami University
Middletown, Ohio

January 22
Nelsonville Hamfest
At Hocking College
Talk in: 147.15/147.75 and 146.76

January 29
Dover Hamfest
National Guard Armory in Dover Ohio - $2.00 admission
Talk in: 146.13/146.73

February 12
Mansfield Midwinter Hamfest and Computer Show
Richland County Fairgrounds in Mansfield, Ohio - $5.00 admission
Talk in: 146.34/146.94

February 25 and 26.
Cincinnati Hamfest...Great Lakes Convention and Computer Show.
Convention Center in Cincinnati, Ohio
Talk in: 144.77/145.37 and 145.19

IT'S JANUARY...MEMBERSHIP DUES ARE NEEDED

Don't forget, guys. Our club success depends upon dues contributions. Also, it's a good way to keep receiving this ATCO newsletter. Please send in your $10.00 dues to Bob Tournoux KF8QU to the address detailed later in this newsletter. Thanks.

WANTED!!! HAMS INTERESTED IN PUBLIC SERVICE ATV

Our club has been approached by public service groups asking if we could provide portable ATV coverage of some of their activities. This would include Marathon races, parades, sports activities and the like. We ask "Is there anyone interested in helping out by providing either equipment or manpower". Join us at the Tuesday nite NET at 9:00 pm on 147.45 Mhz to discuss this possible upcoming opportunity. If there is enough interest, we'll pursue it further. However, we need more than one or two people to support this. Feedback needed...Is it a good idea?...Bad idea?...Suggestions invited!!!

MORE ATCO ATV REPEATER REPAIR NOTES

Our ATV Repeater has under gone some major changes since the last newsletter with more in the works. We stopped pursuing the "separate receive site" idea and decided to put all receivers at the transmitter site. In the past few weeks, we have added a 439.25 receiver, Interdigital Filter and Slot Antenna at the transmitter site. We have also installed a 1280FM receiver and Slot antenna, but since we have not built/installed the Interdigital filters for 1280 & 1258, the 1280FM receiver is being desensed badly by the 1258FM Transmitter. The filters will be installed in the coming weeks and should make the 1280FMATV input much more usable.

The 439.25 Repeater input is actually performing better than I expected. Chuck, WB8LGA was able to get into the receiver from 45 miles away running only 4 watts (and a good antenna!) Most every one in the Columbus area can access it with little difficulty and WA8ZAH in Cincinnati can get into the repeater most any time (Tom has however a "monster" ATV Station). KF8QU now does a good job getting into the system with his indoor antenna from 12-15 miles away. The inband (and in our bandpass!) 440 repeaters causing interference is better than expected, except one voice repeater, for the most part, wipes out a strong video input signal. There is little we can do at this site to reduce the problem (the repeaters are in our band pass of 439.25).

There have been a great number of comments that the repeater output on 427.25 is now stronger than it once was. Actually, the power output has not changed (Art recently measured the output with a line sampler and scope at about 80 watts PEP). We did do some adjusting of the video levels which I think accounts for the comments. There also have been some comments that the 1258 output is weaker than it once was. I believe that in some directions (west of Columbus mostly) that it's true. The 1258 TX antenna is now lower by a few feet, but its pattern may now be blocked in some directions by the "I" beam structure the antenna is mounted on. Art (WA8RMC), Dale (WB8CJW) and I (WA8RUT) will take a closer look at the antenna mounting possibilities when the weather warms up a little bit!

In the coming weeks, some the expected improvements include:

a. Install the 1280 Interdigital filter(s)
b. Re-package the repeater in a new cabinet
c. Track down reason for the weaker than normal color burst signal in the 427.25 Transmitter system.
d. Install the VS 100 Controller AUX control functions.
e. Put work in the Roof Top Camera (don't know when it will be installed)
f. Install a DTMF tone control link transmitter on 450 MHZ

If anyone has any ideas of what features they would like to see in the system, please let me know. How about 2.4Ghz output? A 33cm FMATV input? How about split screen video output showing 439.25, 910.25, 1280FM Receive input and the roof top camera on the same screen?! We need ideas! Current activity is coming to an end and we need to keep WA8RMC and WB8CJW busy! (Art/Dale, you can thank me later for this request!
73 & CU on ATV!

Ken...WA8RUT

BUILD INTERDIGITAL FILTERS FOR ATV

I mentioned earlier in the "ACTIVITIES...from my workbench" column, that I built an interdigital filter for the 439 Mhz input of our repeater with good success. Instead of reporting all details at this time, let me skim the highlights. Prospective builders can think about it while I finish the 1280 Mhz filter. I will report on both at the same time.

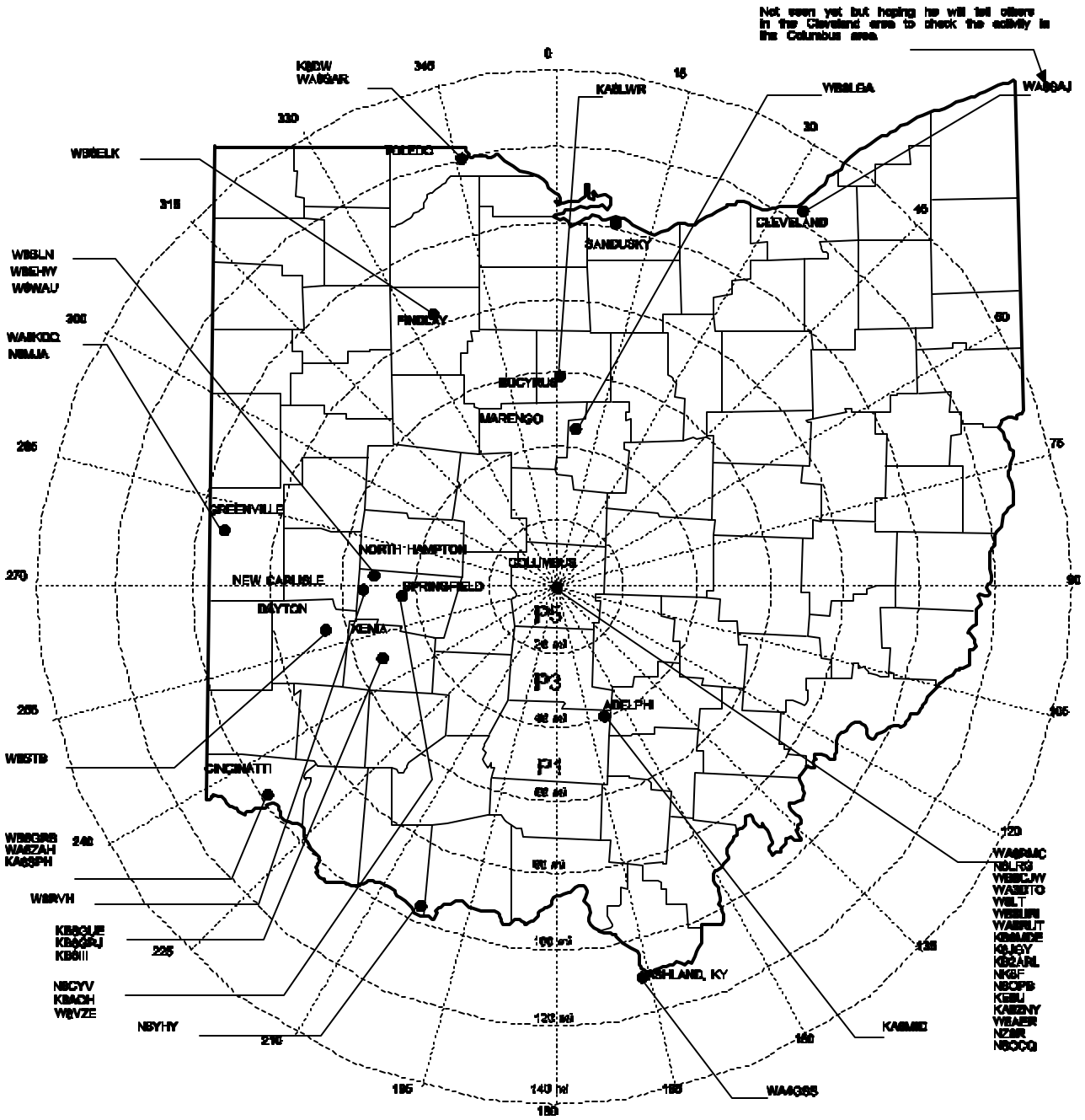
The filter was designed from the software program given to me by Dave Baxter W5KPZ at Dayton last year. It was hard to understand at first but after an explanatory phone call, it was much clearer and construction began.

Size: 7" wide x 23" long x 2.5" high. Construction: 1/4" aluminum for sides & 1/8" aluminum for top & bottom.
Number of poles: 7 Loss: 1.2 db. Bandwidth: Flat from 438.5 Mhz to 443.3 Mhz. Atten.: Down >30 db 3 Mhz away from each edge. Is this enough to arouse your interest? Stay tuned for the next newsletter.

Art...WA8RMC

ATV LOCATOR MAP

Below is an Ohio map complete with counties, main cities, beam heading (from Columbus) and all of the hams known to have had video on the air recently. Please report anyone that has had video on and seen recently. If video is not reported for a given individual in about a year, I will remove them from the map. Let's see if we can make Ohio near the top for ATV activity. The map also contains mile circles with approximate P levels expected. Generally the signal drops by 1 P unit each time the distance is doubled if all other factors remain unchanged. The P numbers are typical reported values under average (non band open) conditions.



ATCO REPEATER TECHNICAL DATA SUMMARY

This space of each publication of the ATCO Newsletter will include the technical information of our repeater. Each time a new feature is brought on line it will be added here. Use this "table of information" 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 and 1258.25 mhz FM modulation
vestigial sideband filter in output line of 427.25 transmitter
Power - 50 watts average 80 watts sync tip (427.25) 15 watts (1258.25)

Transmit antenna: 427.25 mhz - Dual slot horizontally polarized 7 dbd gain major lobe north
1258.25 mhz - Single slot horizontally polarized 3 dbd gain major lobe west

Receivers: 147.45 mhz for F1 audio input control of touch tones
439.25 mhz for A5 video input
910.25 mhz for A5 video link data from remote sites
1280.25 mhz for F5 video input

Receive antennas: 147.45 mhz - Vert. polar. Hi Gain "Comet" 12 dbd (also for 440 mhz input)
439.25 mhz - Horiz. polar. dual slot 8 dbd gain major lobe south
910.25 mhz - Vert. polar. DB Products 10 dbd gain
1280.25 mhz - Horiz. polar. single slot 3 dbd gain major lobe ?

				UP	DOWN
Input control:	Major Touch tones:	beacon (10 min)	*439	*22	
	(details on next page)	regional weather radar	697	#	
		CMH airport radar(5 min)	264	#	
		User repeat 1 minute		*45	*22
		Touch tone pad tester		#0	#5
		Manual mode		#77	*22
		NASA Select		*70	*20
		5 second ID		#9	*22
		Bulletin board		285	#

Remote sites: Airport radar at Port Columbus (910.25 mhz link output 8 watts)
NASA select at KA8ZNY QTH (910.25 mhz link output 10 watts)
Aux link at WA8RUT QTH (910.25 mhz link output 1 watt)
Aux link at WB8CJW QTH (910.25 mhz link output 1 watt)
Aux link at WA8RMC QTH (910.25 mhz link output 10 watts)

ATCO USER REPEATER CODE/FUNCTION SUMMARY

The following Touch Tone inputs are used on **147.45 Mhz only. Activate the Bulletin Board for up-dates to list.**

***439 User Video Beacon**. This turns on the video ID for 2 minutes. The first 3 digits turn it on for 1 minute and the next extends the "ON" time 1 minute. Good function to use to confirm receiving system is working.

***45 User repeat one minute**. This turns on the repeater transmitters to repeat anything that is being received for one (1) minute (if no signal, all that will seen is snow!). TV Sync is not required. This is a good function to use when trying to get a weak signal into the repeater.

***22 User Repeat Mode**.This puts repeater back into normal mode of operation. In normal mode the repeater scans the three input receivers (439, 910 and 1280) looking for TV horizontal Sync. Once sync is detected it will turn on the 2 transmitters (427 & 1258) and start all timeout timers (ID timers etc). Once sync is removed, the repeater will ID, open the window for about 2 seconds (this is the repeater "tail") then turn off the transmitters and continue scanning the receivers. If you are sending any user code, when finished, this should be the last code you send. If you don't know what mode the repeater is in when you start, this code will put it back in "normal" mode. When in doubt, send ***22!**

#0 Touch Tone (DTMF) Pad Tester. This will activate the DTMF Pad tester. When on, touch any tone and the digit will be sent back in Morse Code on the audio sub-carrier of both transmitters. ("*" will be sent as "S" and "#" will sent as "P"). Please send **#5** (Clear All) when finished.

#5 Clear All. This will turn off the DTMF Pad tester, the user beacon (before time out) and the user repeat one minute functions.

#9 Force transmitter ID. This will force one of the ID's on Video and CW (sub-carrier) on both transmitters. The ID will last only about 5 seconds.

#77 User Manual Mode. This puts the repeater into manual mode and turns the transmitters on for 30 Minutes (or until taken down by ***22**). The transmitters will be turned on even if no video is sent for 30 minutes! Once in manual mode, any video channel can be selected. To select, touch "9" followed by a digit,

"0" Video ID
"1" 910.25 Mhz receiver (default)
"2" 439.25 Mhz receiver
"3" 1280.25 Mhz receiver.
"4" Roof Top Camera (not yet in service)

Remember**,** the transmitter is locked on for 30 minutes, even if you only see snow! Please put the repeater back into repeat mode when you are finished. Send ***22**.

#70 NASA Select enable. (**#20** reset) "NASA Select", (the NASA Satellite Channel) is up-linked on 910.25 from KA8ZNY's QTH. It will remain on for 30 minutes or until ***20** is sent.

697 National Weather Service RADAR enable. (# reset) The regional weather RADAR map is up-linked on 910.25 Mhz from WB8CJW QTH

264 CMH Airport RADAR enable. (**#0** reset) The Port Columbus Weather RADAR is up-linked on 910.25 from Port Columbus. The call sign of the Up-link is WA8RMC.

285 ATCO BULletin Board enable. (# reset) The ATCO Club Bulletin Board is Up-linked on 910.25 Mhz from ABB Industrial Systems on Ackerman Rd. It is a 386 Computer with VGA/NTSC converter running Harvard Graphics with 5 to 10 pages of information. See the up-date/changes to User DTMF codes here.

 # NWS & BULLETIN BOARD RESET. See descriptions above.

#20 NASA SELECT RESET. See descriptions above.

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 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 MEMBERSHIP APPLICATION

RENEWAL ○ NEW MEMBER ○ DATE _____
OK TO PUBLISH PHONE # IN NEWSLETTER YES ○ NO ○ HOME PHONE _____
NAME _____ CALL _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____

FCC LICENSED OPERATORS IN THE IMMEDIATE FAMILY
_____
_____

COMMENTS_____
_____
_____
_____

ANNUAL DUES PAYMENT OF $10.00 ENCLOSED CHECK ○ CASH ○
Make check payable to ATCO or Bob Tournoux & mail to:

Bob Tournoux KF8QU
3569 Oarlock Ct
Hilliard, Ohio
43026

ATCO TREASURER'S REPORT - de KF8QU

CASH BALANCE (as of 10/15/94.....	$ 836.23
RECEIPTS (dues).....	$ 170.00
OTHER INCOME (bank dividend)	$
EXPENDITURES (postage for Jan. newsletter - 55 copies @ $.32).....	$(17.60)
(food for fall event).....	$(114.20)
(film and processing).....	$(22.68)
BALANCE (as of 1/10/95).....	$851.95

ATCO MEMBERS AS OF 01 JANUARY 1995

K8AEH	Wilbur Wollerman	1672 Rosehill Road	Reynoldsburg	Ohio	43068	866-1399
W8AER	Dave Sears	1678 Kaiser Dr	Reynoldsburg	Ohio	43068	861-0904
KB2ARL	Dave DiGiuseppe	2081 Elmore Ave	Columbus	Ohio	43224	478-4539
WB4BBF	Randall Hash	212 Long Street	Bluefield	Va.	24605	
WD8BGG	Roger Burggraf	5701 Winchester So. Rd	Stoutsville	Ohio	43154	
WB8CJW	Dale Elshoff	8904 Winoak Pl	Powell	Ohio	43065	766-5823
N8CYV	Blaire Standley	721 West North St	Springfield	Ohio	45504	
K8DW,W8FB	Dave & Paul Wagner	2045 Maginnis Rd	Oregon	Ohio	42616	419-691-1625
WA3DTO	Rick White	5314 Grosbeak Glen	Orient	Ohio	43146	877-0652
WB8DZW	Roger McEldowney	5420 Madison St	Hilliard	Ohio	43026	876-6033
W8EHW	Foster Warren	124 East Clark St	No. Hampton	Ohio	45349	
WA8EOY	John Schlaechter	3199 Lewis Rd	Columbus	Ohio	43207	491-4470
KB8EWX	Cris Bauer	6227 Arapahoe Pl	Dublin	Ohio	43017	761-3567
NK8F,N0IKJ	Rich & Ruth Budd	734 Hager Court	Gahanna	Ohio	43230	471-5354
N8FFO	Edward Hauff	2716 Columbus Ave	Columbus	Ohio	43209	253-5794
KB8GRJ	Adrian Oakes	155 Lower Hillside Dr	Bellbrook	Ohio	45305	
WA4GSS	Ron Curry	229 West Green Hill Rd	Ashland	Ky.	41101	
KA8HAK	Jim Reese	1106 Tonawanda Ave	Akron	Ohio	44305	
K8JGY,KA8WGX	Fred & Martha Yost	234 Schofield Rd	Gilbert	SC.	29054	
WA8KQQ	Dale Waymire	225 Riffle Ave	Greenville	Ohio	45331	513-548-2492
WB8LGA	Chuck Beener	2548 State Route 61	Marengo	Ohio	43334	419-864-7224
N8LMI,N8SIR,KB8UVK	Phil,Jim,Phil jr Buckholdt	153 East Bergey St	Wadsworth	Ohio	44281	
N8LRG	Phillip Humphries	3226 Deerpath Drive	Grove City	Ohio	43123-4100	871-0751
WD8LXX	Rob Peebles	PO Box 1334	Dublin	Ohio	43017	
KA8MID	Bill Dean	PO Box 458	Adelphi	Ohio	43101	
KB8MDE	Shaun Miller	3469 Oakcrest Rd	Columbus	Ohio	43232	238-0918
WD8OBT	Tom Camm	1634 Dundee Court	Columbus	Ohio	43227	860-9807
N8OCQ	Robert Hodge	3689 Hollowcrest	Columbus	Ohio	43223	875-7067
N8OPB	Chris Huhn	146 South Hague Ave	Columbus	Ohio	43204	
WB8OTH	Perry Yantis	1850 Lisle Ave	Obetz	Ohio	43207	491-1498
KE8PN	James Easley	1507 Michigan Ave	Columbus	Ohio	43201	
W8PGP	Richard Burggraf	5701 Winchester So. Rd	Stoutsville	Ohio	43154	614-474-3884
KF8QU	Bob Tournoux	3569 Oarlock Ct	Hilliard	Ohio	43026	876-2127
N8QLD	Rick Callebs	P.O. Box 266	Jackson	Ohio	45640	
NZ8R	Greg Radcliff	1763 Hess Blvd	Columbus	Ohio	43212	
WA8RMC	Art Towslee	180 Fairdale Ave	Westerville	Ohio	43081	891-9273
WA8RUT,N8KCB	Ken & Chris Morris	3181 Gerbert Rd	Columbus	Ohio	43224	261-8583
W8RVH	Richard Goode	9391 Ballentine Rd	New Carlisle	Ohio	45334	513-964-1185
WD8RXX	John Perone	3477 Africa Road	Galina	Ohio	43021	
WA8SAR	Gary Obee	3691 Chamberlain	Lambertville	Mich	48144	
N8SFC	Larry Campbell	316 Eastcreek Dr	Galloway	Ohio	43119-8914	
WA8TTE	Phil Morrison	154 Llewellyn Ave	Westerville	Ohio	43081	
N8TUU	Maxine Duemmel	3488 Darbyshire Dr	Hilliard	Ohio	43206	876-5986
KE8U	John Greene	7585 Central College Rd	New Albany	Ohio	43054	855-1475
KB8UGH	Steve Caruso	39 South Garfield Ave	Columbus	Ohio	43205	461-5397
WB8URI	William Heiden	4435 Kaufman Rd	Plain City	Ohio	43064	614-873-4402
WB8VJD	Rick Morris	3830 Doyle Street	Toledo	Ohio	43608	419-261-8583
W8WAU	Jake Fuller	PO Box 117	No. Hampton	Ohio	45349	
KA8ZNY,N8OOY	Tom & Cheryl Taft	386 Cherry Street	Groveport	Ohio	43125	836-3519
N8ZTL	Gregory MacCartney	3469 Oakcrest Rd	Columbus	Ohio	43232	

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

FIRST CLASS MAIL

REMEMBER, YOUR MEMBERSHIP DUES ARE DUE THIS MONTH.
HELP SUPPORT OUR REPEATER AND THIS NEWSLETTER WITH YOUR CONTRIBUTION.
(check date on postal label for expiration)
DON'T FORGET OUR NET AT 9:00PM ON TUESDAY NIGHT.
