

ATCO NEWSLETTER

VOLUME 13 NUMBER 1

JANUARY 1996

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)

Re-publication of ATCO newsletter material is encouraged as long as source credit is properly given.

ATCO WA8RUT REPEATER UPDATE

Yes, we wouldn't let an ATCO newsletter go by without doing something to the repeater! I'm happy to report that the 446 MHz link is now operational. That and a number of additional items appear on the inside pages. Read on!

ATCO HAM IN THE SPOTLIGHT

This month the ATCO Newsletter takes a peek at Ted Post N8KQN. Ted is one of our senior members but probably works at this hobby as hard as anyone else around. In addition to ATV, I know of at least two repeaters that he maintains in the 450 MHz band.

His hamshack is an outbuilding neatly located behind the garage which, as you can see, is very adequately equipped. Our hats are off to you Ted for supplying a superior ATV signal for us to watch. Keep it up!



ACTIVITIES from my workbench

OK, I guess it's time to generate another Newsletter. The last time I sat down to do this, the window was open to allow some fresh air in for brain stimulation (It didn't help much). Now, I'm all tired because I just finished shoveling about 10 inches of snow off the driveway.

As I type, I'm thinking of the next hamfest. Stop daydreaming and work on the Newsletter. OK, I'll start now!!!

As you may be well aware, I'm always searching for ham related projects to create. I'm a builder as well as an operator so for the most part I'll be constructing while others are talking so a rather long list of construction projects should come as no surprise.

The long awaited shielded repeater transmitter is now installed. As you might remember, the transmitter was built inside an RF tight box in order to prevent desense to the receivers nearby. However, it did not go without problems. First, we found that the Mirage D1010 final amplifier was not constructed as I was informed. (The amplifier had to remain in service until we swapped parts at the site so I didn't have the luxury of building it into the box beforehand). I found the connectors on the opposite end than I had planned. Fortunately, I built the box large enough to allow the amp to slide around to fit existing cables. Besides that, the unit installed and worked very well. The desense appears to be gone but it's too early to say everything is OK. The 446.350 link transmitter in the same box was powered up and is now working well. We noticed a little desense into the 439.25 MHz receiver when the 446.350 MHz link transmitter is on but is not severe. A number of corrective options are available here. We need to monitor the signal strength for a while to determine if we can cut back the output power. It's now putting about 1 watt into the antenna and preliminary indications are that it can be reduced to at least 1/2 watt without any problems. Second, the internal cable from transmitter to cabinet bulkhead connector is about 3 feet of RG8 which can radiate within the cabinet because of the less than perfect shield. The next time we go to the repeater we'll replace it with some Andrews hard line. Hopefully, that'll reduce it to below the receiver threshold.

Check out the 446.350 link NBFM signal and report the quality. It's there to serve as a control signal for the remote sites so the user won't have to point his antenna at the specific site...only point it toward the main repeater. The repeater will then receive the 147.45 MHz signal and retransmit it out on 446.350 MHz. Therefore, each remote site has its receive antenna pointed toward the 446.350 MHz repeater output. This link has a secondary advantage. Since the 147.45 MHz signal is repeated in its entirety, it serves as a reliable monitor signal of 147.45 MHz when it is hard to hear the person direct but receives well at the repeater. At my QTH intermod is quite often a problem on 147.45 but not on 446.350!!!

When we installed the repackaged transmitter, we also took the opportunity to install a 920.25 MHz FMTV receiver. Since FM television is becoming popular, this provides a means to transmit FM ATV signals to the repeater. The receiver seemed to work OK but later analysis determined that it interferes too much with the 910.25 MHz link input so it is temporarily disabled until we can determine the cause and corresponding action required. Hopefully it will be up and running in the near future.

My next project is to find out why my own 439.25 MHz ATV signal is so bad. It started when my 10 year old 4CX250B tube in the final decided to retire in the RF tube graveyard. A new tube produced oscillations and suspecting a poor video modulator I decided to not only make the RF cavity better but also redesign the modulator. The reason that I'm here writing this article is evidence that the amplifier and new modulator is working fine! (See my modulator article later in this issue.)

The next project I'm working on is a computer VGA to NTSC video converter design. The parts are setting on the workbench waiting for me to dig into this project. I feel that it is a worthwhile project because it seems that most ATVers nowadays use or want to use their computer to generate their callsign and related graphics. Since most VGA/NTSC converters cost about \$150 commercially, a unit that could be built for under \$50 and work better than commercial units will be happily received. I found a manufacturer that makes a single chip IC that does the complete conversion and requires only about a half dozen extra parts (xtal, resistors and bypass capacitors). The chip only costs about \$25!!! More on this next newsletter for I don't have enough time to complete it and report on it here.

About the only other thing that has happened around here is my purchase of a small milling machine. I've now got it cleaned up and operating so uhf cavities and interdigital filters will be much easier to construct in the future. This has been biting into my time but electrical construction should soon be back on track soon. More about my milling machine experiences when I have some to report.

That's about all for now. My antenna projects are on hold till the weather breaks so I feel that some well deserved home repair and improvement projects will fill the space for the next couple of months. More exciting stuff next issue.

Art...WA8RMC

ATCO FALL EVENT MINUTES

Our annual ATCO Fall Event was held on Sunday, November 5th. Although it was a very cold day we seemed to all have a good time. The attendance was somewhat lower than expected but about 23 brave souls decided to disregard the cold as a reason to stay home. Those who attended, were rewarded with a good time. It's always fun to have a good eyeball with friends. It's a good thing that I remembered to bring wood for the fireplace. It was well appreciated by all. Although the weather did not permit outside antenna comparisons, we found many things to talk about inside where it was warmer. The food provided by Rick WA3DTO was good and I helped by cooking brats on the charcoal grill outside. We had a number of door prizes which were passed out to the lucky winners. The prizes included donations from Universal Radio as well as a collection of TV goodies that were donated to the club by the Newark school television group. I hope that those B/W cameras get put to good use. The puzzle submitted to us by Bill Parker W8DMR was partially solved by Ted N8KQN so he got a little extra goody bag to take home. The attendees in random order are as follows: WA3DTO, N8OPB, KB8TRP, W8PGP, WA8TTE, N8CYV, N8KQN, W8STB, KA8MID, W8AER, N8TBU, N8OCQ, W8EHW, W8WAU, KF8QU, WA8RUT, K8AEH, WB8CJW, NZ8R, WB8URI, WB8DZW, KA8ZNY. and WA8RMC

Some pictures of the event are included below.



Art...WA8RMC

DAYTON 96...IS IT TOO CROWDED?

Yes, I **do** feel that the Dayton hamfest is getting too crowded. However, I don't have a better idea so I'll leave it to those who have more to say about the subject. NO it's not too early to talk about Dayton but much more can be said at a later date. (Don't forget that to help get us away from the cold and rainy weather, they moved the dates into May two weeks. **YEA, RIGHT!** Maybe they should check with the Muirfield Golf Course Planning Committee). In any case, here is what a couple of us had to say about it.

"Because of the high cost (over \$1,600) to "do" Dayton, the poor facilities, and the change in date that throws attendance into question, ATVQ will NOT "do" Dayton in 96. There will be NO ATV meeting at the Holiday Inn and we will NOT have a booth. We would like to pick an alternative hamfest to have a big ATV meeting each year. The table is open to suggestions. Perhaps one of the clubs would like to start it, say in Houston, Dallas, Orlando, Miami, LA, name it. Besides the unpredictable weather, hardly pleasant, they moved the date into May. Whether the high cost of hotel /motel rooms, meeting room, booth, food, and poor facilities at HARA (the bathrooms are awful, even the ventilators are in sad need of repairs, poor food service especially for vendors, always too hot or too cold, stuffy /smoky from the BBQ pits, too crowded in the aisles, and someone always parks their truck taking up 406 parking spaces instead of 1-2, etc.) will impact the move I don't know. Rather than take a chance we will pass this year and see how it develops. If Dayton 96 goes well, we will return in 97."

Henry...KB9FO

"After 18 straight years at the Dayton Hamvention, Maryann and I are taking a break and letting one of our dealers, Ed, WA6BFR, of Micro Video Products have all the fun. Ed specializes in R/C ATV and has a line of small cameras. So drop by booth 355 to see the P.C. Electronics ATV gear and Micro Video Products cameras and R/C stuff.

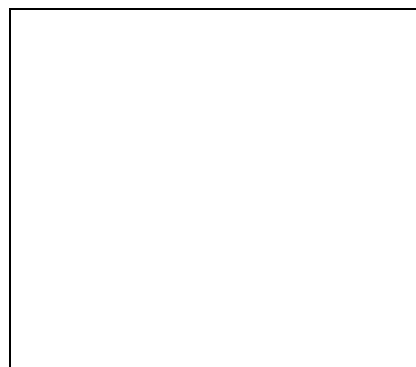
We have a time conflict with the Hamvention shift to mid May and also increased costs. It has also been so tough to get the extra production built, tested and shipped to Dayton that we are somewhat pooped out at the start of the show. We want to keep our reputation of always having shelf stock and shipping within 24 hours of a call even during April and May, but Dayton is like three weeks of sales in three days."

Tom...W6ORG

A TREE ANTENNA?

The following article was found in an unidentified magazine which was quickly related to KF8QU's situation where he can't have any outside antennas because of housing development restrictions. Bob, this one's for you. Does it give you any ideas?

When a specialized radio carrier based in Denver decided to erect a radio tower on Monument Hill in El Paso County near Pikes Peak, it didn't want to ruin the pristine setting with a huge, skyline-splitting shaft. Instead the firm contacted a company that makes lightning and communication poles - and radio towers disguised as trees. "I had worked with them before and was aware that in the past they had made tree poles out of galvanized steel, piping, and epoxy resin" he said. "We called them up and asked them to make us a conifer tree". The El Paso County Commission loved the idea and the "tree" was erected in 1993. The structure houses a compartment at its base that contains radio equipment, while the wiring and cables are housed inside the hollow trunk. While these trees can cost almost five times as much as poles, they felt the price was right. "When you think about the legal and arbitrary fees that we would have had to pay to put a tower up, this is a lot cheaper" he says.



Bob, you now can go to work and secure the materials but I'd like to know what type of tree would look best in your back yard? This could open up all kinds of doors...how about a moose antler antenna, Bob?

Art...WA8RMC

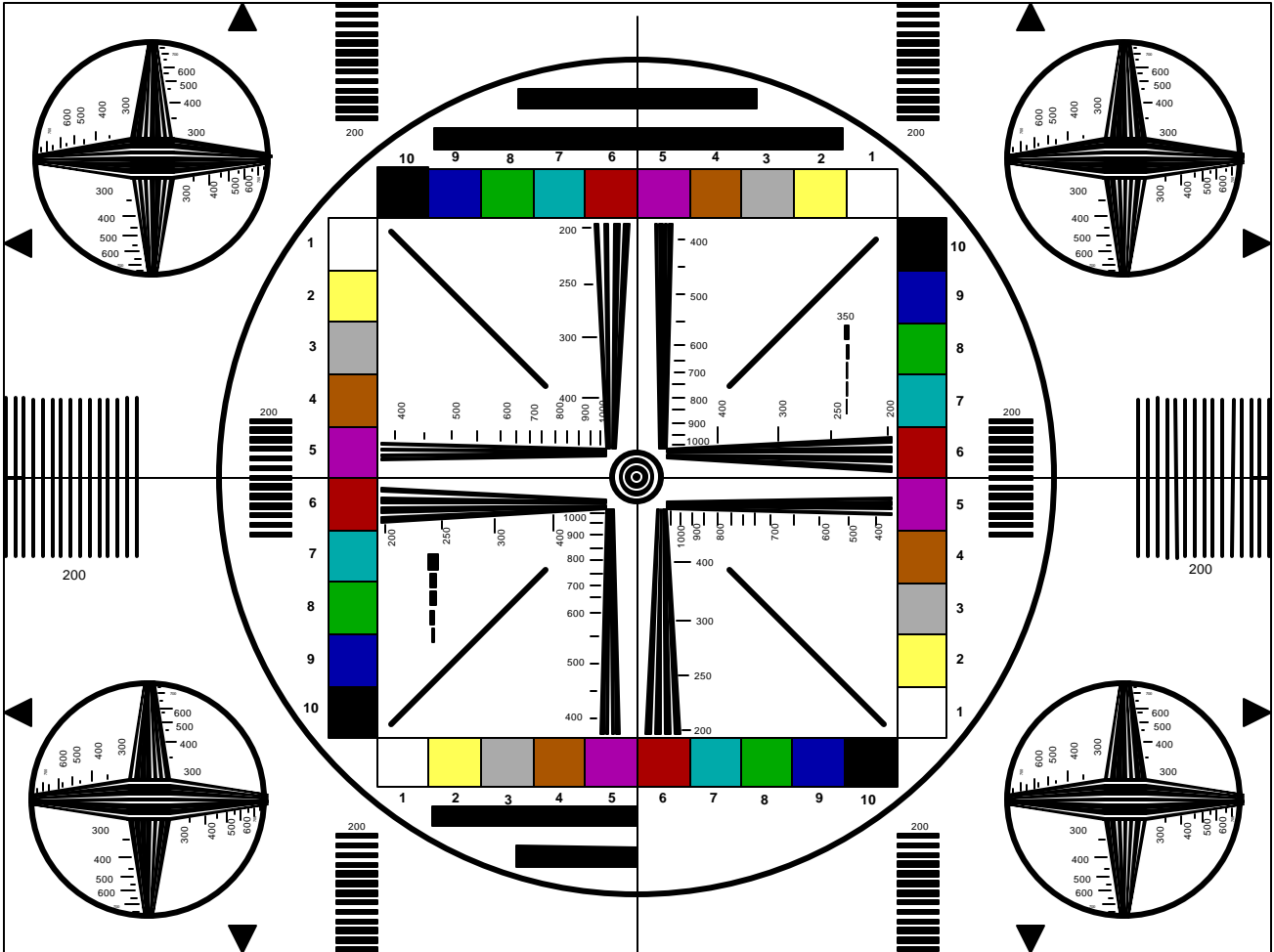
SILENT KEY

It is with great sadness that we report that Dave Williams WB0ZJP died of cancer on 12/8/95 at the age of 42. Some of the local TV dxers remember Dave who gave us video contacts from the St Louis area. He was a long time ATVer who also worked DX on VHF, UHF and microwave bands. He was also a one time holder of the ATV dx record. He will be greatly missed.

As a tribute to Dave we would like to share with you one of Dave's contributions to ATV....his infamous P report chart which many of us have seen in ATVQ magazine as well as other publications in the past. Dave is well represented in the pictures which follow.

"The P level reporting system was originally developed in England and eventually adopted by the rest of the world. It's called P Level (for picture) and ranges from P0 (no picture) to P5 (closed circuit). P1 is visible sync bars, P2 is lots of snow, P3 is some snow, P4 is nearly snow free and P5 is broadcast quality, closed circuit. You can also indicate color or sound as in, "Your signal is P4 with color and sound." Or "I'm getting a P3 with occasional color and no sound" etc. Snow is the word we use to indicate noise in the picture. The system is more subjective than scientific although P5 is about 200 microvolts whereas 1 microvolt is full quieting in FM mode".

TEST PATTERN



SOLVE THIS PUZZLE!

The puzzles presented last issue were not totally solved! N8KQN solved the first one shown below with the following answer: The letters actually represent the numbers **One, Two, Three, Four, Five, Six, and Seven**. Then obviously the next three letters are **E, N** and **T**. Pretty simple now that the answer is shown, huh? Thanks Bill for the test of all our analytical abilities...WA8RMC.

An author named Clifford Stoll was shown a series of letters written on a blackboard in an office of the FBI. He was asked to determine the next letter in the series. After a brief moment he was able to provide it. Can you?

The letters on the blackboard are: O, T, T, F, F, S, S

Once you find the next letter in the series, finding the next two letters should be very easy.

OK. No one got the answer to this next one and Bill isn't telling except for the following clue: "One is just One One". My analysis of the first one proved I was looking too deep for a solution but a shallower approach still produces no results! Can any of you help? Let's not let Bill stump us again...WA8RMC.

After successfully solving the first puzzle Cliff was then shown a series of numbers on the blackboard. He was asked to determine the next number in the series but was unable to do so and it remains a mystery to this day. Can you help?

The numbers on the blackboard were 1, 11, 21, 1211, 111221

See if you can determine the next number in the series. Remember that your answer must explain the logic that validates how you arrived at the correct solution. Cliff will appreciate it.

Bill...W8DMR

NEW MEMBER SECTION

Lets welcome the following new members to our group! Its a good start but we need more people interested in ATV. If any of you know someone who might be interested, let one of us know so we can flood them with information.

K8AOH Charley Tucker Springfield, Ohio

W8MTJ George Hoadley Newark, Ohio

KG8SN Paul Ernst Columbus, Ohio

KB8UU Bill Rose Columbus, Ohio

N8TBU Ed Lathum Galloway, Ohio

HAMFEST CALENDAR

This section will be reserved for upcoming hamfests for as far in advance as we know about them. The listings will be limited to Ohio and vicinity and easily accessible in one day. I trust that anyone who is aware of an event that is not listed here or incorrectly listed will notify me so it can be corrected. The list will be amended as further information becomes available.

LOCATION	SPONSOR	DATE
Nelsonville, Ohio		Jan 21
Mansfield, Ohio	Intercity Amateur Radio Club	Feb 11
Toledo, Ohio	Toledo MRA	March 17
Madison, Ohio		March 24
Medina, Ohio	Medina 2-M group	May 12
Dayton, Ohio	Dayton ARC	May 17, 18, 19
Youngstown, Ohio	Twenty Over Nine ARC	May 26
Milford, Ohio	Milford ARC	June 15
Van Wert, Ohio	Van Wert ARC	July 21
Wheeling, W. Va.	Triple States ARC	September 15
Cincinnati, Ohio	Greater Cincinnati ARC	September 22
Berea, Ohio	Hamfest Assoc of Cleveland	September 29

OHIO AREA ATV REPEATER LISTING

The following list is compiled from actual repeater sightings in the Columbus, Ohio area. We need to keep an up-to-date and accurate listing so the newer operators know what to look for when the band is open. Our repeater is obviously the best so I'll list it first.

LOCATION	CALL SIGN	INPUT FREQ	OUTPUT FREQ	BEAM HEADING	NOTES
Columbus, Ohio	WA8RUT	439.25	427.25	~	A signal on any listed input causes
		910.25	1258.25	~	an output on both listed
frequencies		1280		~	
Xenia, Ohio	KB8GRJ	443.25	421.25	240	*10 on 144.36 = tone up for 1 minute
Dayton, Ohio	W8BI	439.25	426.25	250	*10=ID, *71= bul board, on 147.45.
		1245	1287		
		1249.5	1291.5		
Lima, Ohio	WB8ULC	439.25	421.25	315	
Ashland, Ky.	WA4GSS	439.25	421.25	180	
Elizabethtown, Ky.	W4BEJ	439.25	421.25	210	
Bowling green, Ky.	W4HTB	439.25	426.25	200	
			1280		
Weeling, W.Va	WB8QHO	439.25	426.25	080	
Acme, Pa	W3PVH	439.25	421.25		
Pittsburgh, Pa	W3KWH	439.25	426.25	090	

INTERNET INFO

If you have access to the INTERNET, you may be interested to know of some of the HAM related information that is available. We've tried to start a list of interesting places to look in case you get in the "surfing" mood. If any of you find different places to look, I'd appreciate having the info passed on to me so I can include it in this list. The ATCO home page is updated periodically so be sure to check often for late breaking NEWS. The addresses listed below are case sensitive, so type exactly as shown below. (If anyone has comments or would like additional listings contact me via EMAIL at towslee.@mt-two.mhs.compuserve.com)

http://psycho.psy.ohio-state.edu/w8lt	Ohio State University W8LT radio station.
http://www.ualr.edu/doc/hamualr/callsign.html	Search by call sign or name.
http://asp1.sbs.ohio-state.edu	Local & global weather map information (good detailed info)
http://www.arrl.org	ARRL home page
http://www.acs.ohio-state.edu	Ohio State University home page. Lots of neat stuff.
http://psycho.psy.ohio-state.edu/atco	ATCO home page.
http://www.geopages.com/SiliconValley/1242	East Tennessee ATV home page
http://www.portal.com/~jpawluk/KB6MMF.html	California ATV home page
http://www.ladas.com/ATN	Amateur Television Network in Central and Southern California
http://www.mindspring.com/~rwf/aatn1.htm	Atlanta, Georgia ATV home page
http://calvin.ksc.nasa.gov:1080/lisats.html	NASA ATV home page
http://www.stevens.com/HATS/home.html	Houston Texas ATV home page
http://geopages.com/SiliconValley/1242/wb7fid.html	Salt Lake City Utah ATV home page
http://www.prostar.com/~Richard.Keller/ham-tv.html	Washington ATV home page
http://www.arrl.org	ARRL home page (not much now but they're new to the net)
http://www.hayden.edu/Guests/AATV	Phoenix Arizona Amateurs
http://citynight.com/atv	San Francisco California ATV
http://www.njln.net/~magliaco/atv.html	Brookdale ARC in Lincroft New Jersey

The following address is helpful in searching for many different topics on the Internet. I have found it to be a very powerful search engine especially for ham radio and television topics. At any point when logged onto the Internet, type the following:

http://www.yahoo.com/Entertainment/television/Amateur_television for a listing of the available ATV home pages.

(The address of <http://www.yahoo.com> is the table of contents pointer for a vast variety of topics).

HIGH LEVEL MODULATOR FOR ATV

It started out to be a routine change of the tube in my 4CX250 ATV transmitter. The output was very low and after over ten years of faithful operation, I wasn't too disappointed that it needed replacement. However, when I installed a **brand new** one in place of the one I believe I bought at a hamfest for under ten bucks, things didn't work quite right. Instability, oscillations and poor video reproduction were among a few of my surprises. At that point it seemed natural to blame the video modulator but from where I sit now, for the life of me, I can't figure out how I came to that conclusion!

My existing video modulator was built by myself in the sixties from a circuit design by Mike Talent. This circuit seemed to perform well till I converted from black and white to color. Then I realized that to transmit color I needed to include the color burst too. The poor video response (about 2 MHz) was responsible so I cobbled up the circuit and with the help of negative feedback, I was able to boost it enough to be acceptable. While I had the transmitter apart that seemed to be a good time to redesign it. Here goes!

The circuit shown on the following page is very similar to the original which is basically a good design. My circuit improves the gain, video response and the range of adjustment, allowing a wider variety of tube parameters to be accommodated. DC coupling is desirable throughout but some times it is not feasible. AC coupling was used on the input stage because the video comes from a remote source with grounds that may differ from this one. A video op-amp with current feedback was chosen for the first stage to keep it simple while maintaining a wide bandwidth at high gain. A gain of ten was selected because that was the practical limit in that device and that much was needed to allow low gain operation of the following transistor stages. The feedback resistors R1 and R2 must not only must maintain a ratio of 10:1 for a gain of 10 ($R1/R2=1000/100=10$) but also must be low value units (below 1K ohms) to maintain wide bandwidth characteristics. Since this op-amp has a maximum voltage rating of 25 volts, a voltage divider and filter was used derived from the -150 volt main supply as shown in the schematic. The video output from the op-amp is then DC coupled the next stage.

The next stage is a simple transistor circuit. A PNP transistor is needed here to perform the required DC level shift. This circuit is sensitive to stray capacitance so it is imperative that leads be kept short to preserve the bandwidth. Some stray capacitance is unavoidable, however, so some high frequency peaking is usually required. The 33pf capacitor across the 1k emitter resistor restores the slight high frequency rolloff to a flat condition to out past 6 MHz but the value may change with various circuit layouts. I recommend the user check the color burst amplitude of the transmitted and detected video at the transmitter output and select a value to provide the correct amplitude (see my line sampler circuit in the April 1995 issue of ATCO newsletter). This transistor has a gain of 3.3 which is determined by the ratio of the collector and emitter resistors. The inverted video signal at the collector is then passed to an emitter follower buffer transistor (unity gain) to prevent collector loading and loss of high frequency signals by the next circuit.

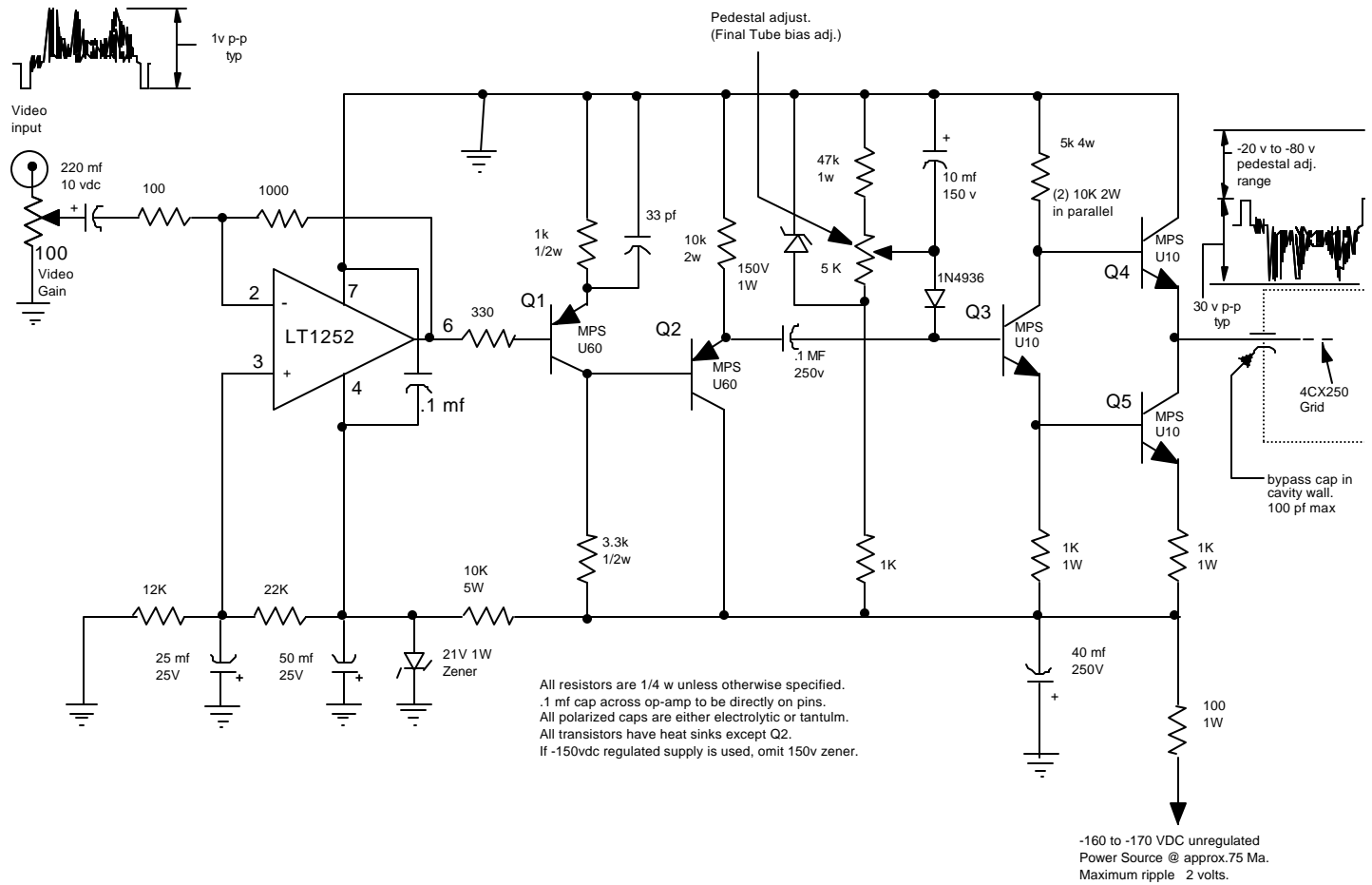
The input network of Q3 is a variable DC bias adjustment to set the DC operating point of the output and control the 4CX250 tube bias commonly referred to as the pedestal adjustment. The video has to be AC coupled at this point so it will "ride on top of" the DC bias. **IMPORTANT.** The diode in this circuit must be a fast switching type. Use a 1N4936 or similar. A standard 1N4004 will not be fast enough to follow the video properly. This transistor circuit has a gain of 5 ($5000/1000$) which is higher than required for the signal but needed to allow the DC portion of the output to be adjusted to within 25 volts of the power supply (-125 volts). This transistor also serves as the differential driver for the following two transistors.

The output transistor complementary pair Q4 and Q5 works quite well to drive the 4CX250 grid because it is a very low impedance circuit capable of driving high capacitance without bandwidth degradation. It accomplishes this because it is essentially an active driver for both positive as well as negative going signals. This is unlike Q1 which is only active in the ground driven direction and passive in the power supply direction (pulled to -150 volts by the 3.3k resistor).

The overall frequency response of the total circuit is essentially flat from about 20 Hz to over 4.5 MHz where rolloff starts. Useable bandwidth is beyond 8 MHz where it is only about 3 dB down at 6 MHz. I have noticed some small phase distortion starting at around 4 MHz but is not serious. After I have more time to *play with it*, maybe it can be improved upon. I'll publish improvements in future issues. Now that I mention improvements, I need to investigate the elimination of Q1 and Q2 and feed the op-amp output directly to Q3. There is actually just enough gain available to do this but didn't as yet because I don't know how much surplus gain is needed to accommodate other 4CX250 tubes.

The power supply is nothing special and does not have to be regulated. Almost anything that will source 160 to 170 volts at 75 Ma will do. Be sure that the overall ripple is less than about 1/2 volt p-p or it might show up in the video. If the builder wants to go as far as using an electronically regulated power supply, the zener across the pedestal pot can be omitted.

General comments: All transistors except the PNP buffer stage must have heat sinks. All transistors must have a gain bandwidth product of at least 40 MHz to function ideally and must have emitter/collector voltage ratings of at least 300 volts for reliability. I selected Motorola MPSU60 PNP and Motorola MPSU10 NPN units which turn out to be complementary pair devices used primarily in the RGB output stages of color television receivers. Also, they are plastic units with a tab for easy heat sinking. **CAUTION.** The tab is electrically connected to the collector necessitating the use of insulating washers! The Amplifier will supply at least 50 volts P-P video from a 1/2 volt P-P video input which is more than required for the 4CX250 tube. Mine needed about 25 volts P-P with about a -75 volt DC bias. Overall bandwidth exceeded 6 MHz which is more than broadcast requirements! The Linear Technology #LT1252 video op-amp is available from DigiKey for about \$4.00. Happy building!!!



Oh by the way, after I built this I found that my real trouble with the 4CX250 amplifier was bad finger stock on the grid cavity cover and an under coupled output loop. Both are fixed now and the amplifier is working fine. It outputs about 50 watts average with 150 watts at the sync tip. I'm using 1500 volts @ about 150 Ma on the plate.

ATV BALLOON LAUNCH WAS SUCCESS AFTER ALL!

Many of us knew that Ron WA4GSS had made a balloon launch on November 4, 1995 and failed to recover it. Lost for all we knew. If so, that would have been a huge setback for not only would the equipment and thousands of dollars been lost but many hours of construction also. I was very happy to find out he finally got it back. Here is what Ron has to say about that day...WA8RMC.

I had tested the GPS receiver and TNC for almost a week prior to the launch to get everyone's packet ready. We had trouble seeing the balloon icon on the APRS map so we worked many days to figure that one out. Due to the 10 meter beacon interference with the rest of the equipment, it was left off the package. My goal was to test the GPS receiver and the pico packet TNC along with the High Technology MCM4 micro computer with the video overlay board which all worked. However, we missed checking to see if the 2 meter beacon was turned on. It wasn't.

The balloon launch lasted a little over two hours and because of the jet stream it out ran our chase teams. The chase team had tracked the balloon payload to within 10 miles of the actual landing site during the decent. With no tracking beacons to DF and many hams looking for two days straight in sub zero temperatures, it looked like I had lost the package forever. The following Sunday morning I got a call from a ham who said that the balloon package was found near Victor, W. Va. by a non ham while hunting on Saturday. Jim Rice KD4HPQ (launch engineer) and I went to pick up the package. It was like a family reunion. All the depression of the previous week was now gone. No more could of's or would of's but just lots of smiles.

I am planning to have three balloon launches in 1996. I have to figure out how to finance them as I spent way too much money last year out of my own pocket. I will warn you that balloon launches are habit forming and lots of fun".

Ron told me that because the 2 meter beacon wasn't on, tracking was difficult. Also, the 10 meter beacon being left off of the package was the reason they couldn't find it after landing. It was crucial because the radiated signal could have been detected even though the balloon landed in a gully and well below the horizon. I'm sure that it will be **included** on future missions.

To illustrate the complexity of this package Ron reports that the following equipment was on board:

4 watt ATV transmitter @ 439.25 Mhz

Micro Computer Concepts controller

Pacomm Pico Packet TNC with second port option

VHF Engineering 2 meter transmitter @ 145.79 MHz

High Technology video overlay board

Dipole antennas for other equipment

10 meter CW trans. (left off of package due to QRM to ATV equip)

CCD color camera

Trimble GPS rec. with RS232 option and optional antenna

Radio Shack scanner receiver

High Technology MCM\$ computer

Big Wheel ATV antenna

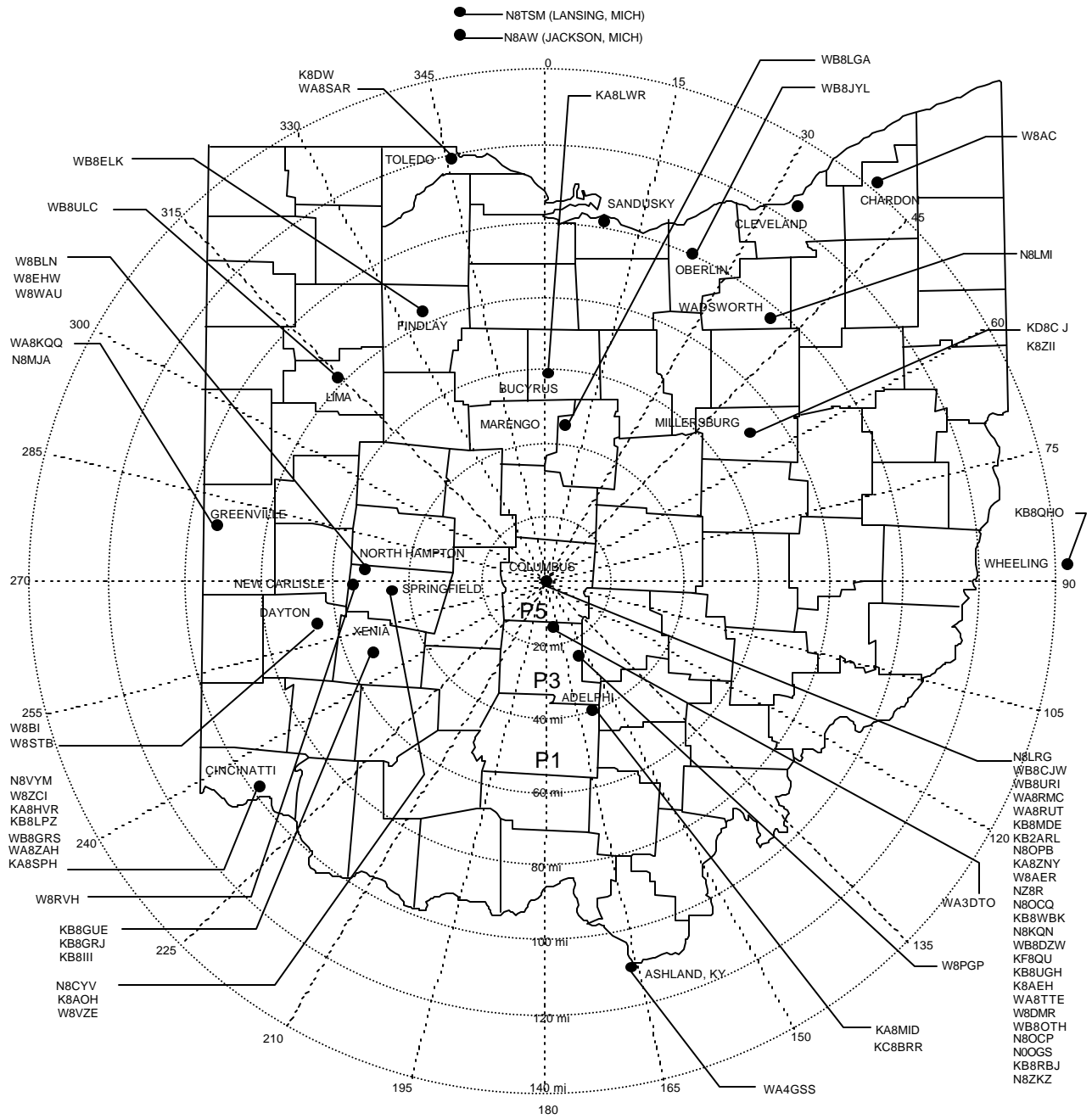
2 meter beacon transmitter @ 144.007 (not turned on)



Ron...WA4GSS

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. It also contains mile circles & 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 1250.25 MHz FM modulation
vestigial sideband filter in output line of 427.25 & 1250.25 transmitter
Power - 40 watts average 80 watts sync tip (427.25) 15 watts (1250.25)
Link transmitter - 1 watt NFM 5khz audio (446.350 MHz)

Transmit antenna: 427.25 MHz - Dual slot horizontally polarized 7 dbd gain major lobe west
1250.25 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 with FM subcarrier audio
910.25 MHz for A5 video link data from remote sites
920.25 MHz for F5 video general purpose input (disabled at this time)
1280.25 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
910.25/920.25 MHz - Vert. polar. dB Products 10 dbd gain
1280.25 MHz - Horiz. polar. single slot 3 dbd gain major lobe west.

		<u>UP</u>	<u>DOWN</u>
Input control:	Major Touch tones:		
	beacon (10 min)	*439	*22
	regional weather radar	697	#
	*Local 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	#
	* inactive at this time		
Remote sites:	*Local radar		(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 5 watts)

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 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 _____
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 (10/15/95).....	\$ 984.09
RECEIPTS (dues).....	\$122.50
OTHER INCOME (bank interest).....	\$ 6.99
EXPENDITURES(film and processing).....	\$(7.62)
(Fall Event food).....	\$(180.01)
(postage) (\$.32 x 60).....	\$(19.20)
BALANCE (1/10/96).....	\$896.75

ATCO MEMBERS AS OF 10 JANUARY 1996

K8AEH	Wilbur Wollerman	1672 Rosehill Road	Reynoldsburg	Ohio	43068	866-1399
W8AER	Dave Sears	1678 Kaiser Dr	Reynoldsburg	Ohio	43068	861-0904
K8AOH	Charley Tucker	4546 Laredo Street	Springfield	Ohio	45503	513-390-0693
WB4BBF	Randall Hash	212 Long Street	Bluefield	Va.	24605	
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
N8FFO	Edward Hauff	1001 Parkview Blvd Apt 330	Columbus	Ohio	43219-2273	253-5794
KA8HAK	Jim Reese	1106 Tonawanda Ave	Akron	Ohio	44305	
N8KQN	Ted Post	1267 Richter Rd	Columbus	Ohio	43223	276-1820
WA8KQQ	Dale Waymire	225 Riffle Ave	Greenville	Ohio	45331	513-548-2492
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
KA8MID	Bill Dean	PO Box 458	Adelphi	Ohio	43101	614-655-2454
KB8MDE/N8ZTL	Shaun Miller/Greg MacCartney	3469 Oakcrest Rd	Columbus	Ohio	43232	238-0918
W8MTJ	George Hoadley	956 Miller Ave	Newark	Ohio	43055	614-522-5069
WD8OBT	Tom Camm	1634 Dundee Court	Columbus	Ohio	43227	860-9807
N8OCP	John O'Bryant	3139 ElPaso Drive	Columbus	Ohio	43227	274-5410
N8OCQ	Robert Hodge	3689 Hollowcrest	Columbus	Ohio	43223	875-7067
N8OPB	Chris Huhn	146 South Hague Ave	Columbus	Ohio	43204	
W6ORG	Tom O'Hara	2522 Paxson Lane	Arcadia	Cal	91007-8537	818-447-4565
WB8OTH	Perry Yantis	1850 Lisle Ave	Obetz	Ohio	43207	491-1498
KE8PN	James Easley	1507 Michigan Ave	Columbus	Ohio	43201	
W8PGP,WD8BGG	Richard, Roger 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	761 Standpipe Road	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	
KG8SN	Paul Ernst	67 Richards Road	Columbus	Ohio	43214	267-5758
W8STB	John Hey	894 Cherry Blossom Dr	West Carrolton	Ohio	45449	
KB8TRP	Tom Flanagan	1751 N. Eastfield Dr	Columbus	Ohio	43223	272-5784
WA8TTE	Phil Morrison	154 Llewellyn Ave	Westerville	Ohio	43081	
KE8U	John Greene	PO Box 64	Presque Isle	Wi	54557	
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
KB8UU	Bill Rose	2685 Kropp Road	Grove City	Ohio	43123	
WB8VJD	Rick Morris	203 Merton Street	Holland	Ohio	43528	
W8WAU	Jake Fuller	PO Box 117	No. Hampton	Ohio	45349	
KB8WBK	David Hunter	45 Sheppard Dr	Pataskala	Ohio	43062	927-3883
KB8YMN	Mark Griggs	2160 Autumn Place	Columbus	Ohio	43223	272-8266
KA8ZNY,N8OOY	Tom & Cheryl Taft	386 Cherry Street	Groveport	Ohio	43125	836-3519

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

FIRST CLASS MAIL

**DON'T FORGET OUR NET AT 9:00 PM ON TUESDAY NIGHT ON 147.45 MHZ
ITS DUES TIME GUYS! HELP US OUT BY SENDING IN YOUR \$10 DUES NOW. THANKS!**
