

# ATCO NEWSLETTER

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VOLUME 11 NUMBER 2

APRIL 1994

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*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.*

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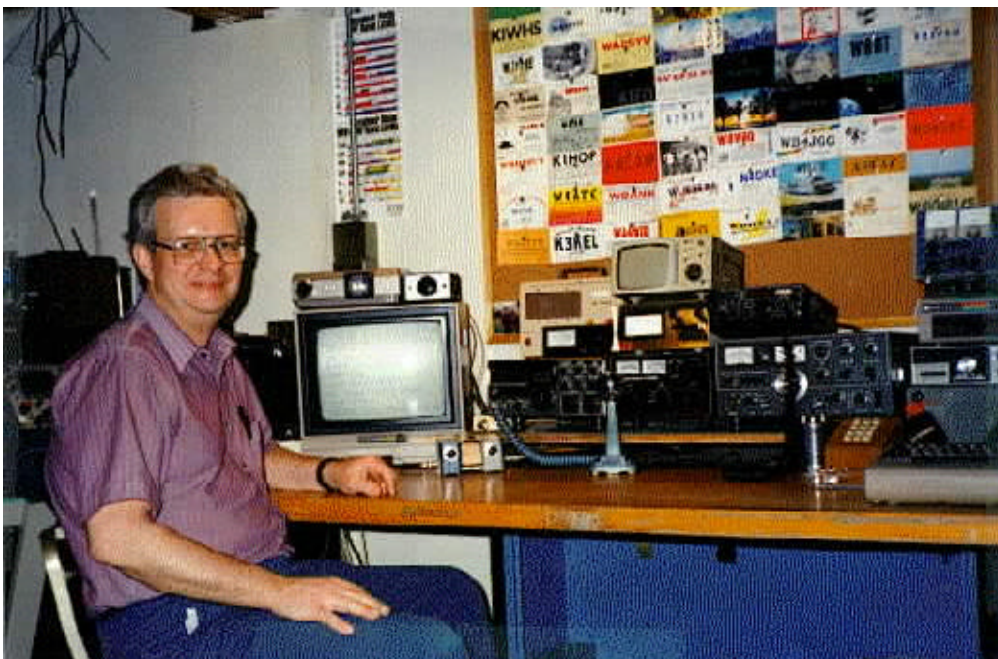
## **ATV REPEATER UPDATE**

The ATV repeater has been operational for about 5 months now and is still working OK. Some improvements are being made as well as minor repairs to existing equipment are being done. Be patient...the sound will probably be fixed by the time that you read this! More details inside.

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## **ATCO HAM IN THE SPOTLIGHT**

This month the wheel of fortune stops at Dale Elshoff WB8CJW. Dale has made a significant contribution of his time and expertise toward the repeater construction. In fact, I'm told that it's a good thing that he doesn't have any sleeping facilities in his hamshack. Otherwise he might be tempted to sleep there so he can get a first shot at DX during some early morning band openings. Seriously, I'm impressed at his courage to help install our repeater antennas.



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## KEN & BILL GIVE ATCO DEMONSTRATION TALK TO CARA

On March third Ken WA8RUT and Bill W8DMR gave a talk and demonstration of ATCO activity at the CARA (Columbus Amateur Radio Association) meeting. Ken did the major part of the talk which included our past, present and future planned activities with the ATV repeater assisted by Bill Parker on "the slide machine". Approximately 35 people were in attendance which, in my opinion, were very impressed and interested in our activity. The only exception occurred when Ken completed the talk and asked if there were any questions. The first question was "Are they going to have any bus transportation at the Dayton hamfest?" Well, almost everyone was interested in ATCO activity!!! At the end of the 45 minute talk, Ken and Bill showed everyone a first hand look at the repeater with a monitor on the front table. Although the sets' only antenna was rabbit ears, the signal was quite good. Our hats are off to Ken and Bill for going out of their way to promote ATCO activity.

The picture at the right was taken that evening while Ken and Bill are "doing their stuff". They're describing a simple commercial yagi antenna typical of what is required for ATV operation in Columbus.

I wonder if Bill is describing the feed mechanism of the antenna or simply telling Ken where the signal enters.

It looks like a good place to fill in your own caption. Any suggestions?

Art...WA8RMC



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## UPCOMING ATCO ACTIVITIES

The four club trustees (Ken WA8RUT, Rick WA3DTO Fred K8JGY and myself) got together (with some beer) the other day to discuss the club direction. Many thoughts were voiced as activities but we settled on a couple for now (Fresh ideas from anyone are most welcome.) First, we felt that our existing get together once a year (Fall Event) was not enough. If you read the previous page, you know that we are planning a "Spring Event" also. This seems like a good time being that it is after Dayton and into mild weather. Lets get together at that time to discuss it and decide if we want to continue. Carrying that thought one step further, we talked about a "Summer Event". Although not cast in stone, maybe it would be a good idea to have it in July at the Columbus hamfest. We could possibly have our own booth/meeting place and hopefully an antenna party at the same time. There's plenty of room at the Aladdin Shrine temple for a combined activity. Of course we must contact the sponsors of that event to see if they want us. Who knows, maybe we'll be larger than Dayton someday. If this sounds good, lets talk it up at the Spring Event. See you there.

Art...WA8RMC

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## REPEATER ACTIVITY ..... from my workbench

Well, Christmas is a done deal...the lights are down and the car still isn't fixed. How's that for a rounded out burst of activity? Now that (I hope) winter is finished, all of us will turn our attention toward the activities of the warmer season. Let's see now...what is the first ham activity that you can think of for the upcoming good weather? Right! Its antenna weather coming up. Good timing too. This issue should give you some ideas toward improving your incoming signal. Its also time to be focusing on improved repeater incoming signals too. How is that for a good intro?

One of the first activities that Ken and I plan to do is install the repeater receiver and antenna on Channel 10's tower. We have permission to put the antenna at the 400 foot level on their tower. Since coax is already run, all we have to do is install the receive antenna and preamp and connect it to the existing Belden 9913 down to the control unit at the base. A 910 Mhz antenna will be installed at about the 50 foot level to link the signal to the downtown repeater. Hopefully then all local ATVers will be able to access the repeater with P5 signals.

The next project (well it has been an ongoing one since the first of the year) is to complete and install the airport radar link. I finally got written approval from the company that controls the signal (Kavouras Inc) to allow us to retransmit the radar signal. They were very receptive to our initial idea but to get them to put it in writing took more effort. In exchange for our free use of the signal I promised to promote their service as much as I could. Well, here's the start. Next the control unit and transmitter has to be finished. It is about 90% complete but it seems that the closer to the end I get, the longer it takes. There's got to be a Murphy Law involved in this somewhere! A significant step toward link 910 Mhz transmitter construction was to determine the sufficient power level required to maintain P5 communications. Bill Parker W8DMR set me straight on the proper formula to use and to my surprise I didn't have enough power. Now, at this point I pondered the options...move Port Columbus closer to downtown? No.....that won't do. More gain to the downtown antenna? Well, maybe but I need another 12DB. The existing antenna has about 6-7DB gain. Since I don't know how to build an 18-19DB omnidirectional antenna, the only thing left is more power at the airport end. I found a "linear" Motorola brick that takes 100mw in and outputs about 8-9 watts. This should do the trick. All well and good so far but after I received the brick I found pin 1 (RF input) broken. It's back to the supplier for a replacement and not back to me as of this writing. I promise a construction article about this when I'm finished. This should be a low cost way to get into the 6-7 watt range for 900Mhz AM ATV. More later.

Ken and I went down to the repeater a couple of weeks ago to touch up the sound calibration. The 4.5Mhz subcarrier was far enough off to make it difficult to copy the audio. We made it better but some objectional hiss remains. We didn't intend for the trip to be a fix all mission so more improvements are to come. Sometime in the near future we want to pull the whole unit for some off site repackaging and major refinements. We found that equipment built onto a horizontal plate with a vertical front panel looks real good but is **very** difficult to service. Let this be a strong message to all of those contemplating construction of a new repeater. Build it so all controls are accessible in the rack or whatever you mount it in. **ALL HAM BUILT EQUIPMENT NEEDS ADJUSTMENTS.**

That's all for now...I think I've rambled on long enough. Besides the page is almost full. I've got to leave room for other topics.

Art...WA8RMC

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## ATCO IS NOW INCORPORATED

I want to inform you that we have recieved back the papers to become a non profit corporation. This was done for a number of reasons which include liability limitations. We are also getting to a size that could save postage if we have corporate status. This will require careful control of our records and form requirements to the State but as we grow this will become more necessary. It's easier to get acquainted with the system while we are still relatively small so it will be second nature when we become larger. Rick (WA3DTO) has agreed to become our "statutory agent" which basically means that he will be the single contact the State of Ohio wants for all correspondence with them. Congratulations, Rick, our communication channel is in good hands. Our official title is: "Amateur Television In Central Ohio Inc.

Art...WA8RMC

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## A 439MHZ 48 ELEMENT COLINEAR ANTENNA FOR THE PUREST...WELL ALMOST!

Let's try to break away from repeater thinking for just a little while. I promise you that if I could convince everyone to build one of these antennas, we wouldn't need repeaters! Well not quite, but this antenna speaks quite well for itself. Yes, it does take up more space on the mast than many others but if you have the room to spare you'll find that the construction effort is well worth the time. The antenna is basically 12 sets of 1/2 wave driven elements with reflectors all fed in phase (driven in parallel). Since each set of dipoles has a feed impedance of around 1200 ohms, the parallel combination equals about 100 ohms which is easy to match to a 50 ohm transmission line as shown below. I highly recommend this antenna for ATV work.

Its main features are high gain (16dbd), easy to construct with readily available materials, no special high tech tools to build it and it is **very** tolerant of sloppy construction practices. In fact, if some dimensions are staggered just a little (don't get carried away) the gain sacrifice is very slight but the bandwidth is enhanced significantly. Additionally, because it is a very low Q antenna, its natural bandwidth is much greater than any yagi and the low SWR during rainy conditions is tolerable (yagis are only fair weather antennas). I've built a number of these antennas and can speak with experience. I used to have 2 of them (96 elements) one over the other for over 10 years working great till the plastic became too brittle and started breaking with the weight of the birds.

Construction is straightforward and I feel self explanatory in the following figures. The feed point is around 90 to 100 ohms (measured) which lends itself to a 2:1 balun for 50 ohm transmission line applications. Or if you build two and center feed the combination, all that is needed is a balance to unbalance stub (Pawsey stub) to directly feed the 50 ohm antenna to a 50 ohm transmission line. Be sure to follow the connections for the phasing harness correctly because this is where most errors occur. If somewhere in the construction the phasing harness gets miswired, usually the antenna pattern main lobe has a big notch in it. The overall design of this antenna is not new but I believe that the construction technique is novel in as much as the antenna elements are supported at the low voltage points achieving low loss and resulting in higher gain for a longer time than would normally be realized with conventional commercial methods.

The dimensions shown are proper for a center frequency of about 435Mhz with more than a  $\pm 6$ Mhz 3DB bandwidth. At 435Mhz I've measured the gain to be 16.5DB referenced to a dipole. This represents a good choice for 439Mhz ATV simplex activity while still maintaining good gain for ATV repeater receive activity on 427Mhz. Trying to get any yagi to perform **this** task would be a never ending frustrating chore.

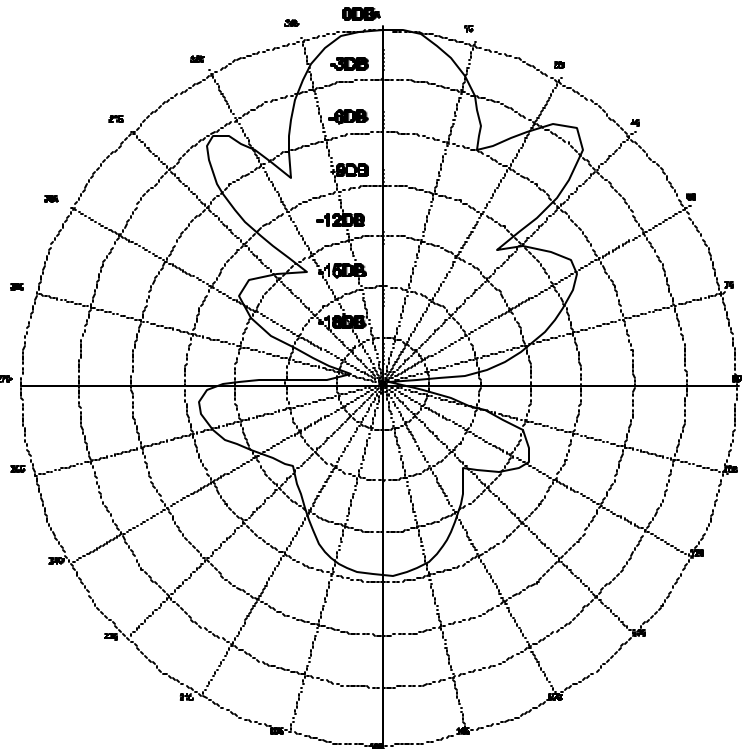
The figure to the right is the actual plotted pattern of the antenna. Note the rather broad front lobe. This is good because it allows non critical antenna positioning. However, the front to back ratio is not as good as a yagi so if your main goal is to attenuate signals at the back, it's not the antenna for you.

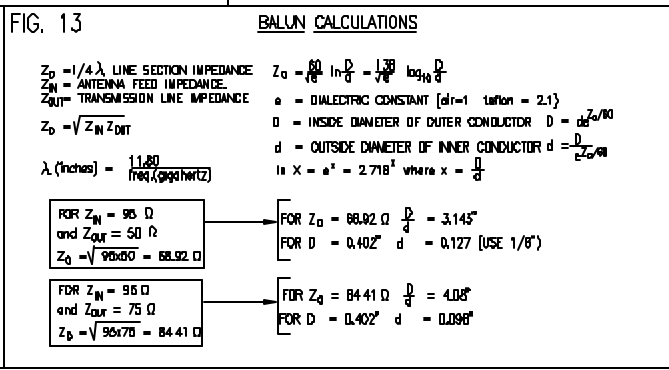
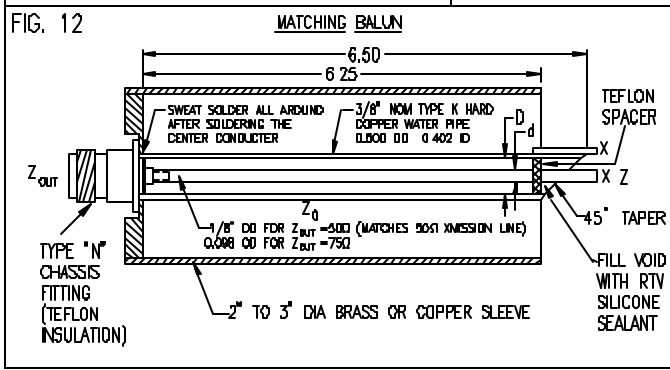
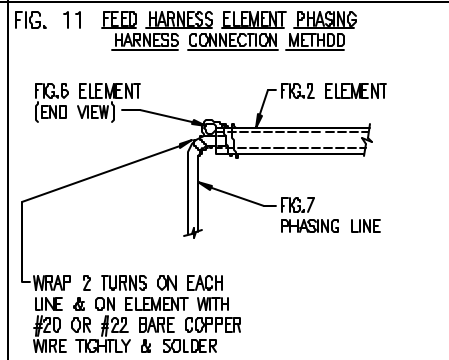
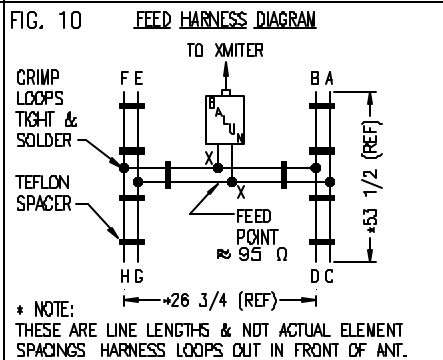
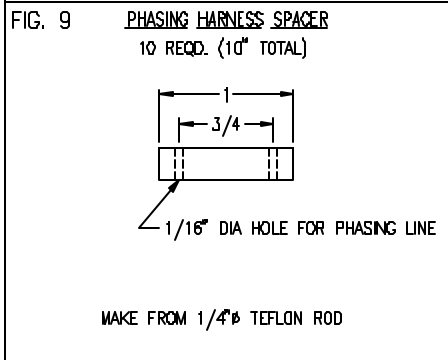
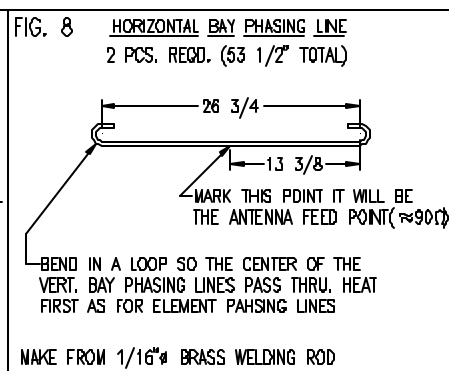
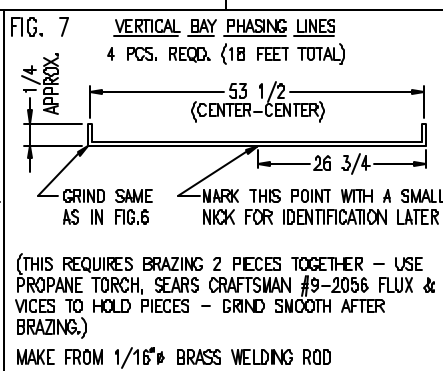
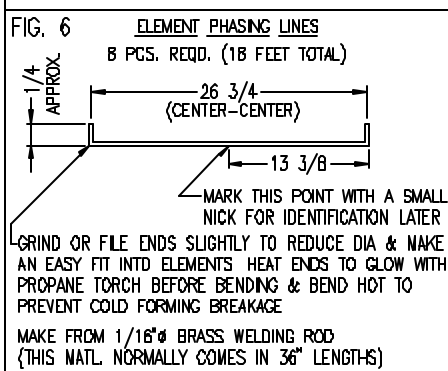
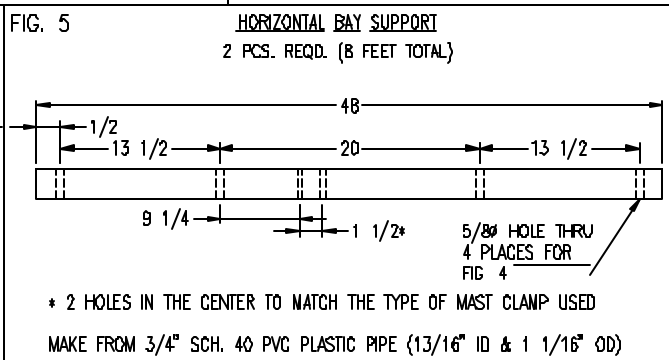
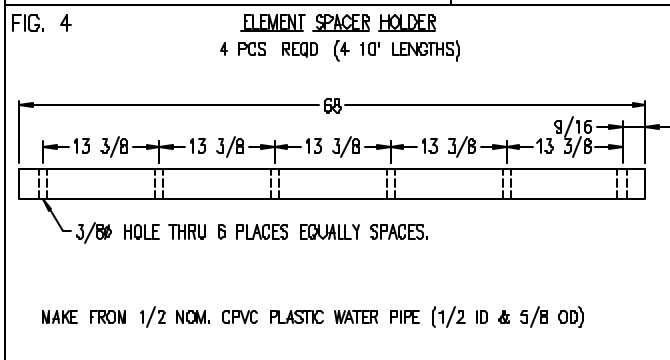
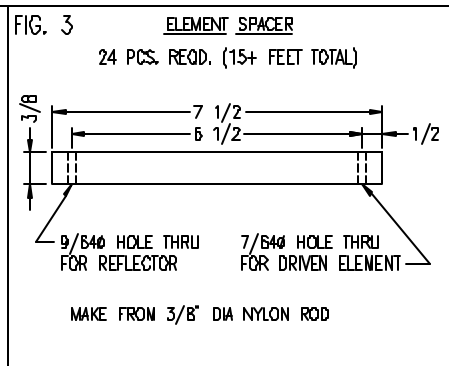
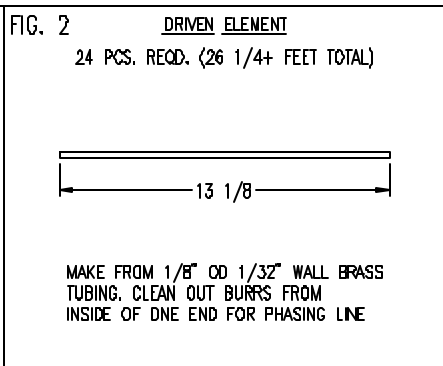
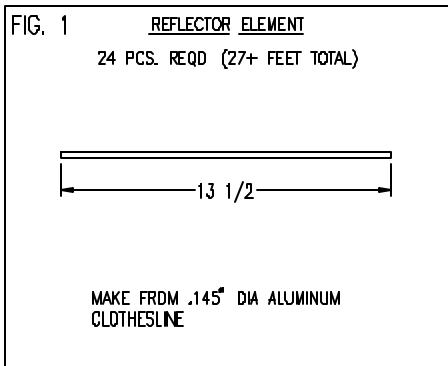
On the following two pages the complete construction details are outlined. The first page shows an isometric view of the completed antenna without the feed harness for simplicity. The feed harness connects to the points indicated with the coax feed in the center of the harness.

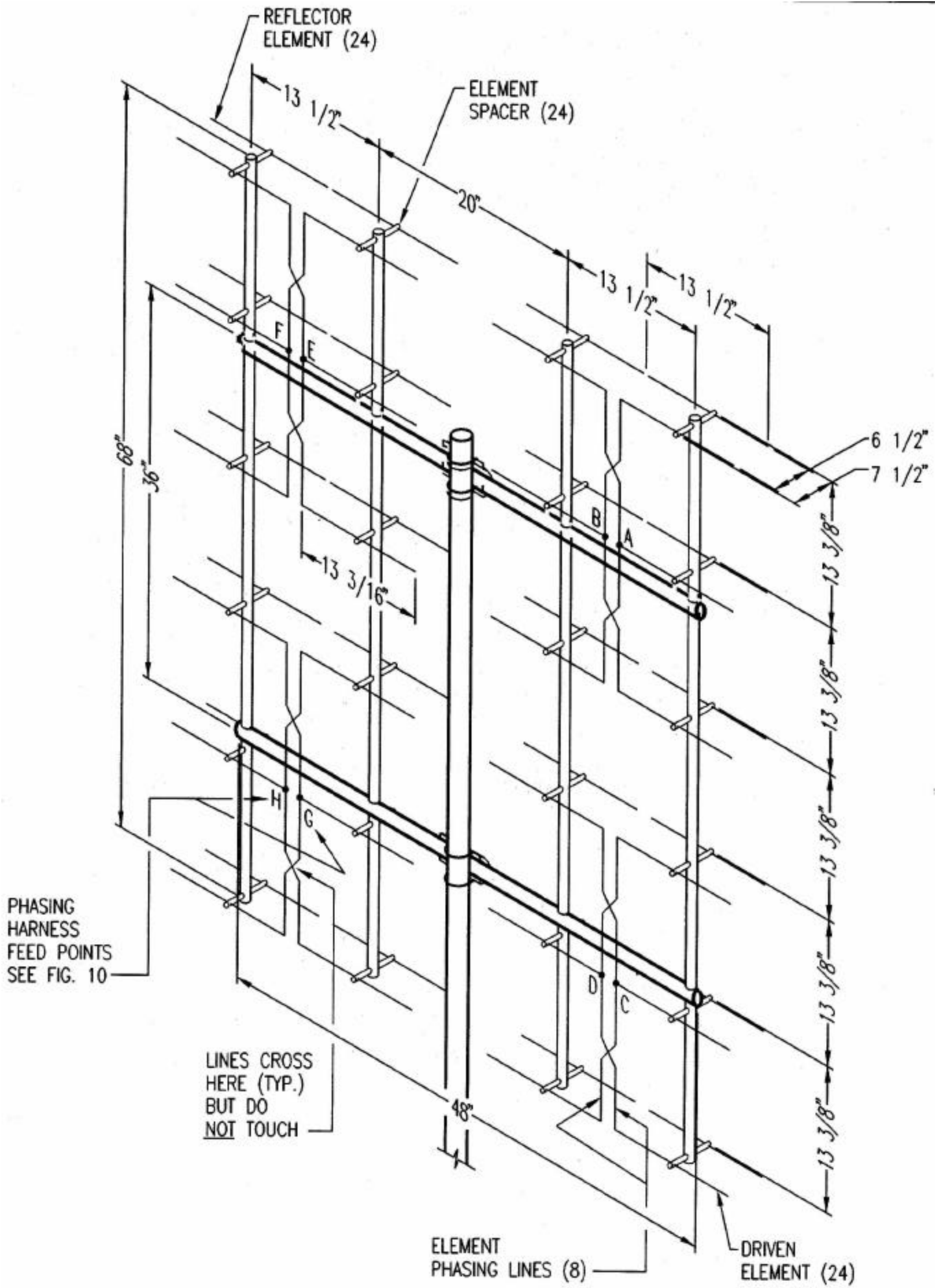
The next page details the individual component parts that go into the completed design.

Happy building!!!

Art...WA8RMC







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## HAMFEST CALENDAR

The only hamfest that I know of before the next Newsletter is published is the Dayton Hamvention on April 29, 30 and May 1. If you go to Dayton, Don't miss Bill Parker's (W8DMR) talk about "Radio waves faster than the speed of light" on Saturday morning. Also Bill and Ken (WA8RUT) will talk about the Columbus repeater on Friday. Saturday, after Bill's talk, I'm told that 1 or more of NASA's astronauts will be available for discussions. Don't miss any of this. It will prove to be very interesting.

I'm told that Henry Ruh from ATVQ magazine will not be able to attend Dayton this year because of his work schedule. Since he always hosted the ATV get together at the Holiday Inn, I haven't heard if there will be any this year. If not, that's too bad for I always had a great time. If anyone has up to date info, pass it along.

Art...WA8RMC

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## SPACE SHUTTLE UPDATE- WHAT IS SAREX?

SAREX is the Shuttle Amateur Radio Experiment. With the help of Amateur Radio clubs and ham radio operators, astronauts speak over the ham airwaves, while in orbit, directly with large groups of students showing teachers, parents and communities how Amateur Radio energizes youngsters about science, technology, and learning. NASA's intent in making astronauts available for SAREX operations is to involve the largest possible numbers of people, particularly youngsters, in technology and the US space program with the help of Amateur Radio.

The American Radio Relay League (ARRL) and The Radio Amateur Satellite Corporation (AMSAT) co-sponsor these exciting experiments, with AMSAT heading up technical operations. Hundreds of Amateur Radio Operators work behind the scenes, including those from NASA's Amateur Radio clubs at the Johnson Space Center and Goddard Space Flight Center. The ARRL takes the lead with information and educational support. The ARRL Educational Activities Department (EAD) and NASA HQ create lesson plans for teachers.

During a shuttle mission with SAREX, news and Astronaut retransmissions are on these amateur radio stations:

**Goddard Amateur Radio Club**, WA3NAN(Greenbelt, Md) at 3.86, 7.185, 14.295, 21.395, 28.65 & 147.45 MHz.

**Johnson Space Center Amateur Radio Club**, W5RRR(Houston Tx) at 3.850, 7.227, 14.280, 21.350, 28.400 and 146.64 MHz.

**ARRL (Newington, CT) Amateur Radio Station**, W1AW, news bulletins (9:45 PM, 12:45 AM EST) at 1.818, 3.5815, 7.0475, 14.0475, 18.0975, 21.0675, 28.0675, and 147.555 MHz.

In orbit all SAREX operations will be conducted in the 2 meter FM band on the following frequencies:

**Voice- Uplinks:** 144.70, 144.75, and 144.80 MHz.      **Downlinks:** 145.55 MHz.

**Packet- Uplinks:** 144.49MHz.      **Downlinks:** 145.55 MHz.

The next Space Shuttle mission is Flight STS-59 and is scheduled for a Friday April 8, 1994 launch. It will be the shuttle "Endeavour", SAREX **will** be on board, duration will be 9 days and it will be occupied by 6 astronauts including ham operators Linda Godwin N5RAX and Jay Apt N5QWL.

Perry...WB8OTH

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## IN MEMORY OF WARREN KA8GZQ

It is with extreme sadness that we report the passing of Warren Duemmel KB8GZQ. Warren had been active in ATV for many years and was an early pioneer of ham radio. Warren was the editor of this newsletter before I started publishing it a year and a half ago.

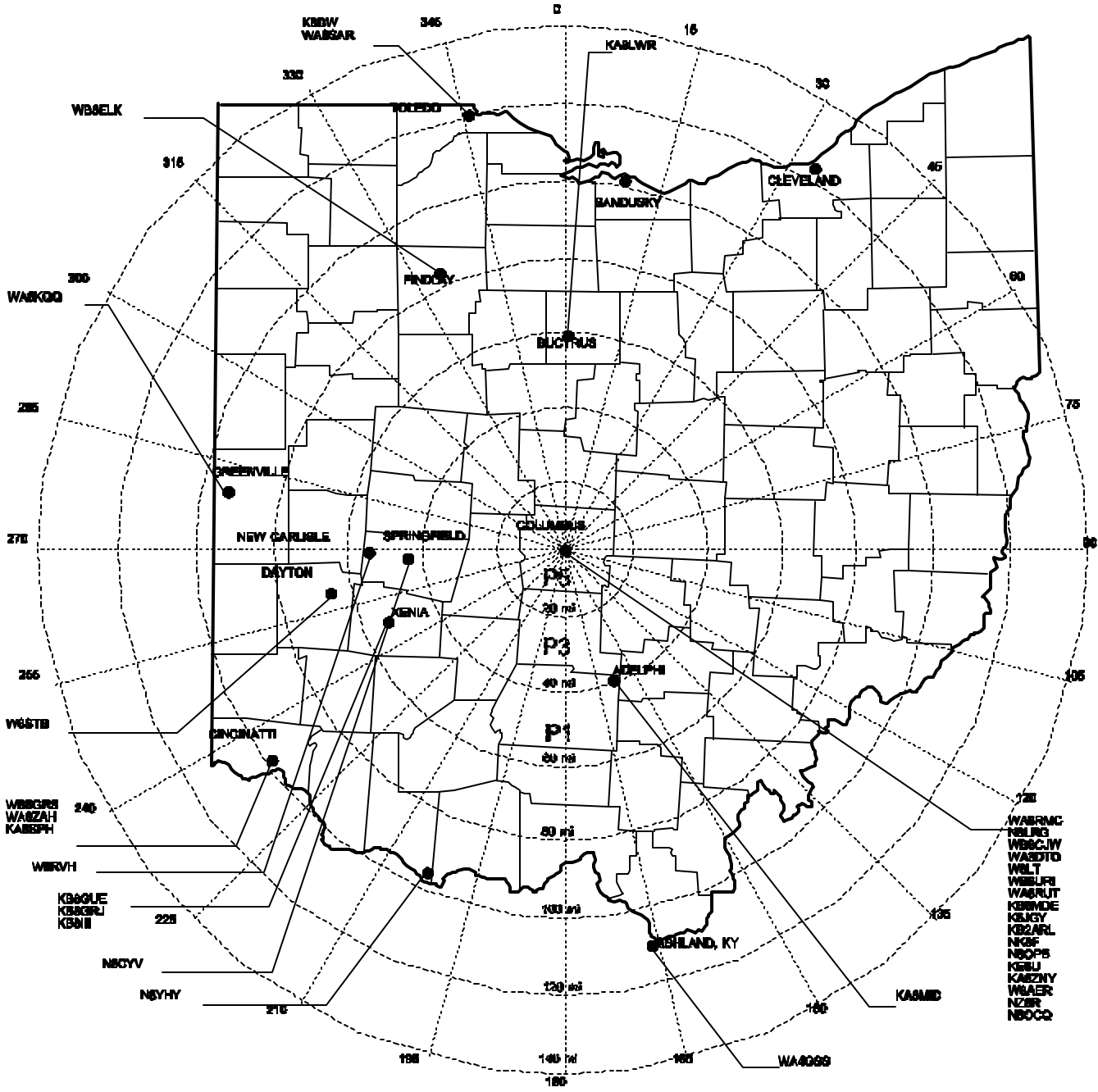
Warren's wife writes:

"ATCO Club Members, My thanks to each club member for the lovely flowers you sent in remembrance of my great husband, Warren Duemmel. He certainly enjoyed his association with all of you. Thanks again and best wishes. Maxine Duemmel" (N8TUU).

We'll all miss Warren.

# ATV LOCATOR MAP

Below is an Ohio map complete with counties, main cities, beam heading (from Columbus) and all of the hams that I know of that have had video on the air recently. Please report to me anyone that you know of that has had video on and you have seen recently. If video is not reported for a given individual in about a year, I will remove that one from the map. Let's see if we can make Ohio near the top for ATV activity. I've corrected portions of the map and added 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.







**DIRECTIONS TO THE ATCO SPRING EVENT;**

From I-70 either EAST or WEST Bound:

Take Route 315 (runs north and south and is just west of Columbus) and head NORTH. Get off at the Ackerman Road Exit and turn RIGHT on to Ackerman Road. Turn LEFT just beyond the first traffic light at the ATCO sign.

From I-71 traveling NORTH bound toward Columbus:

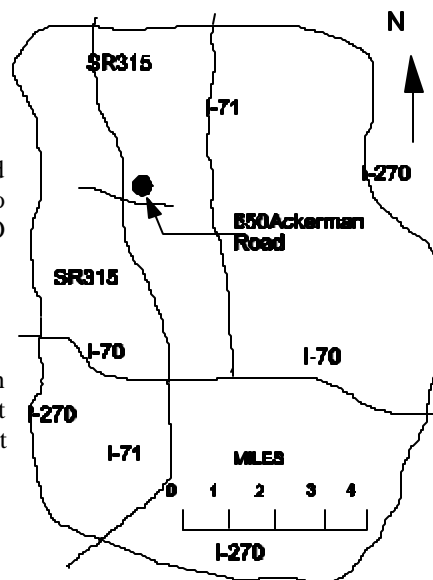
While traveling north on I-71, watch for the split to Route 315 just south of Columbus. Take 315 and head NORTH to the Ackerman Road Exit. Get off at this exit and turn RIGHT on to Ackerman Road. Turn LEFT just beyond the first traffic light at the ATCO sign.

From I-71 traveling SOUTH bound toward Columbus:

THESE DIRECTIONS ONLY WORK IF YOU ARE "NORTH" OF THE I-270 LOOP.

Take I-71 SOUTH to the I-270 Bypass Loop and head WEST on I-270.

At the Route 315 Exit, turn LEFT and head SOUTH on Route 315. Get off at the Ackerman Road Exit and turn LEFT. Proceed through one traffic light and turn LEFT at the ATCO sign.



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### 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 1<sup>ST</sup> to December 31<sup>ST</sup>. 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.

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### 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

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COMMENTS

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ANNUAL DUES PAYMENT OF \$10.00 ENCLOSED CHECK        CASH      
Make check payable to Martha Yost (for Fred Yost-ATCO treasurer) & mail to:

Fred Yost K8JGY  
330 Dellfield Way  
Gahanna, Ohio

43230

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### ATCO FINANCIAL STATEMENT

CASH BALANCE (as of 1/1/94).....	\$ 784.40
RECEIPTS (dues).....	\$120.00
OTHER INCOME .....	\$0.00
EXPENDITURES (postage for Jan newsletter).....	\$15.95
(incorporation costs).....	\$25.00
(film & processing).....	\$25.37
BALANCE (as of 4/8/94).....	\$838.08

## ATCO MEMBERS AS OF 01 APRIL 1994

K8AEH 866-1399	Wilbur Wollerman	1672 Rosehill Road	Reynoldsburg	Ohio	43068	
W8AER	Dave Sears	1678 Kaiser Dr	Reynoldsburg	Ohio	43068	861-0904
AH2AR	David Pelaez	4872 Trailside Court	Huber Heights	Ohio	45424	
KB2ARL	Dave DiGiuseppe	391-3A Directory Dr	Columbus	Ohio	43213	
WB4BBF	Randall Hash	212 Long Street	Bluefield	Virginia	24605	
WB8BIY	Robert Shaw	82 Troy Court	Westerville	Ohio	43081	
WB8CJW	Dale Elshoff	8904 Winoak Pl	Powell	Ohio	43065	766-5823
N8CYV	Blaire Standley	721 West North St	Springfield	Ohio	45504	
WA3DTO	Rick White	5314 Grosbeak Glen	Orient	Ohio	43146	877-0652
WB8DZW 6033	Roger McEldowney	5420 Madison St	Hilliard	Ohio	43026	876-
W8EHW	Foster Warren	124 East Clark St	No. Hampton	Ohio	45349	
WD8EMS	Lee Coyle	7495 Lithopolis Road	Groveport	Ohio	43125	836-1547
WA8EOY	Jonh Schlaechter	3199 Lewis Rd	Columbus	Ohio	43207	491-4470
KA8ERS	Rick Shepherd	3296 Karl Road	Columbus	Ohio	43224	263-7785
KB8EWX	Cris Bauer	6227 Arapahoe Pl	Dublin	Ohio	43017	761-3567
NK8F 5354	Rich Budd	734 Hager Court	Gahanna	Ohio	43230	471-
N8FFO	Edward Hauff	2716 Columbus Ave	Columbus	Ohio	43209	253-5794
KB9FO	Henry Ruh	1545 Lee St Suite 73	Des Plaines	Illinois	60018	
WA4GSS	Ron Curry	229 West Green Hill Rd	Ashland	Ky.	41101	
KB8GZO	Jason Pelaez	4872 Trailside Court	Huber Heights	Ohio	45424	
K8HRR	Ira Bickham	260 Tiki Dr	Merritt Island	Florida	32953	
N0IKJ 5354	Ruth Budd	734 Hager Court	Gahanna	Ohio	43230	471-
K8JGY 475-6484	Fred Yost	330 Dellfield Way	Gahanna	Ohio	43230	
N8KCB	Chris Morris	3181 Gerbert Rd	Columbus	Ohio	43224	261-8583
WA8KQQ	Dale Waymire	225 Riffle Ave	Greenville	Ohio	45331	
WB8LGA 419-864-7224	Chuck Beener	2548 State Route 61	Marengo	Ohio	43334	1-
N8LRG	Phillip Humphries	3226 Deerpath Drive	Grove City	Ohio	43123-4100	
WD8LXX	Rob Peebles	PO Box 1334	Dublin	Ohio	43017	
N8MCQ 9365	John Unverzagt	159 Chapelfield Road	Gahanna	Ohio	43230	475-
KA8MID	Bill Dean	PO Box 458	Adelphi	Ohio	43101	
KB8MDE	Shaun Miller	3469 Oakcrest Rd	Columbus	Ohio	43232	238-0918
WD8OBT 9807	Tom Camm	1634 Dundee Court	Columbus	Ohio	43227	860-
N8OCQ	Robert Hodge	3689 Hollowcrest	Columbus	Ohio	43223	875-7067
N8OOY	Cheryl Taft	386 Cherry Street	Groveport	Ohio	43125	836-3519
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	
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	Ken Morris	3181 Gerbert Rd	Columbus	Ohio	43224	261-8583
W8RVH	Richard Goode	9391 Ballentine Rd	New Carlisle	Ohio	45334	
WD8RXX	John Perone	3477 Africa Road	Galina	Ohio	43021	
WA8SAR	Gary Obee	3691 Chamberlain	Lambertville	Mich	48144	
N8SFC	Larry Campbell	5483 Wescott Dr	Columbus	Ohio	43228	
WA8TTE	Phil Morrison	154 Llewellyn Ave	Westerville	Ohio	43081	
N8TUU 5986	Maxine Duemmel	3488 Darbyshire Dr	Hilliard	Ohio	43206	876-
W8TV 888-8150	Bob Dye	6118 Sedgwick Rd	Columbus	Ohio	43235	
KE8U	John Greene	7585 Central College Rd	New Albany	Ohio	43054	855-1475
WB8URI 873-4402	William Heiden	4435 Kaufman Rd	Plain City	Ohio	43064	1-

WB8VJD	Rick Morris	3830 Doyle Street	Toledo	Ohio	43608		261-8583
W8WAU	Jake Fuller	PO Box 117	No. Hampton	Ohio	45349		
KA8WGX	Martha Yost	330 Dellfield Way	Gahanna		Ohio	43230	475-
6484							
KA8ZNY	Tom 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

29c  
postage  
here

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**FIRST CLASS MAIL**

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**SPRING IS HERE, FOLKS!!!  
DID YOU DO THOSE WINTER CHORES?  
OH WELL, NOW ITS TIME TO THINK ABOUT TWO MAIN SUBJECTS...  
DAYTON HAMVENTION AND ANTENNA CONSTRUCTION.**

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