ATCO NEWSLETTER

VOLUME 4 NUMBER 3 JULY 1987

WE'RE HAVING A GET-TOGETHER!

Nearly two years have gone by since the last time we had a group meeting. We think you will be glad to know that there is a special event planned for September.

A special mailing giving the details will be sent to you around the middle of August - watch for it!

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INSIDE THE ATCO NEWSLETTER

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The ATCO Newsletter is the official publication of a group of television amateurs known as "AMATEUR TELEVISION IN CENTRAL OHIO" and is published in January, April, July, and October.

Membership in ATCO is open to any FCC licensed radio amateur who has an interest in amateur television.

DOES ATCO NEED ACTIVITIES AND/OR PROJECTS?

(The following suggestions for ATCO activities and projects were received from Bill, W8DMR, and are presented for your consideration and possible implementation. - Editor)

Recently, we resumed publication of the ATCO Newsletter on a quarterly basis, and the ATCO Tuesday Night Net continues to meet regularly. Plans are now being made for us to have a social gathering in September.

Possible projects and activities are discussed below in order to find out if there is an interest among the majority of our members to become involved in any or all of these items.

1. AN ANTENNA MEASURING PARTY. Similar to the antenna measuring/testing held in the summer of 1985 at the QTH of Chuck, WB8LGA, using his Computer Plotting Program and equipment. Antenna gain and pattern plots are made on 439.25 MHz. This would be a half day affair with refreshments. A suggestion has been offered that measurements be made at 1.26 GHz.

2. HIDDEN ATV TRANSMITTER (FOX HUNT). A few of us with mobile ATV receivers and antennas (with three or four members riding in each car) would try to locate a low powered ATV transmitter on 439.25 MHz. Directional antennas are required, of course. Audio coordination would be on 147.45 MHz. Each team needs a driver, a navigator/communicator, and a person to hold and rotate a three to five element beam antenna.

3. A SERIES OF TECHNICAL PRESENTATIONS. These could include the following: detailed information on articles appearing in the ATCO Newsletter and/or demonstrations of the equipment described; and selected subjects such as antennas, SWR, video modulation, sync to video ratio, pulse techniques, FM vs AM ATV, etc.

4. RESURRECTION OF THE ATCO ATV REPEATER. Currently in storage at the QTH of WB8LGA, the repeater needs to be checked-out, some modification made, and then installed at a site selected by ATCO members. A determination of what ATCO owns and what equipment WB8LGA desires to donate or sell should be made.

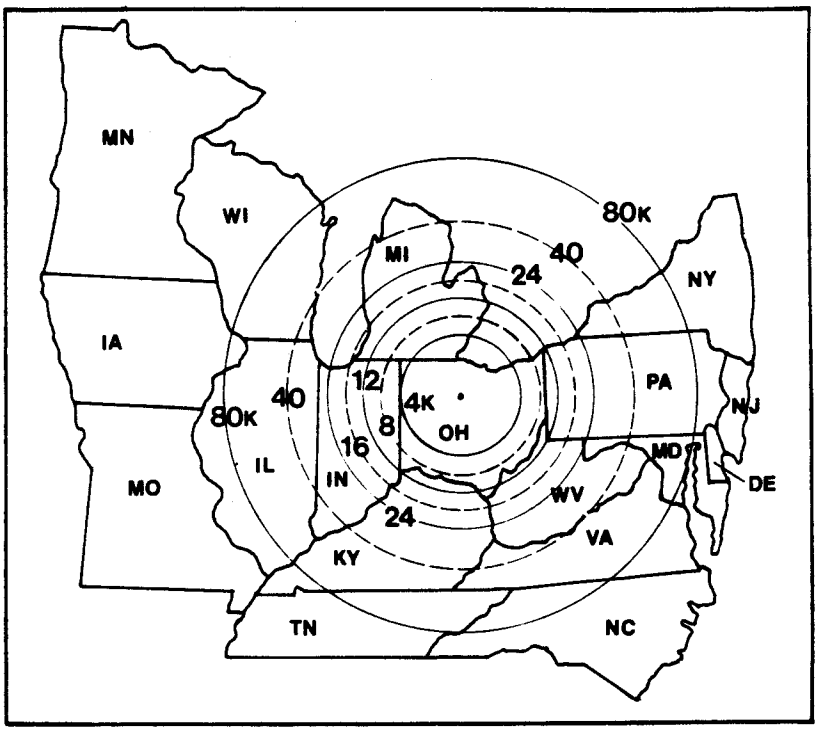
5. SUPPORT OF ATV SPECIAL EVENTS. Special events such as launching a balloon to a height of 50 to 100 thousand feet with an ATV transmitter aboard by Bill, WB8ELK, could very well use the assistance of our members. Help could be given in tracking and recovery operations as well as technical collaboration.

6. PUBLIC SERVICE. This is an area of ATV support that might well be given consideration and study by amateur television operators. Sponsors of public events such as parades and marathon runs, for instance, in all likelihood would benefit from TV pictures beamed from strategic locations. How about an ATCO ATV presence at the 1992 celebration of the 500th Anniversary of Columbus's Discovery of America right here in our city?

(Your comments should be directed to Bill, W8DMR. - Editor)

WB8ELK ATV BALLOON LAUNCH

Keep your eyes on your ATV screen Saturday 11 July 1987 (Sunday 12 July, if for any reason the Saturday flight is postponed) for video from a free flight balloon. Bill, WB8ELK, plans to send a 439.25 MHz 1-watt KPA5 transmitter skyward between nine and ten a.m. from Findlay. On board with the ATV transmitter, Bill will have a black and white TV camera focused at infinity and a 100 mW 2-meter FM transmitter. The 2-meter rig will send back telemetry altitude data from a digital sensor. A TV 4.5 MHz subcarrier will rebroadcast signals received on 144.34 MHz. To assist in retrieving the gear, a parachute release system triggered by a touch tone command on the 220 MHz band is planned. The 439.25 MHz ATV transmitting antenna will be vertically polarized.



TV signals from the balloon will have a maximum range as indicated by the concentric circles on the above map. The circles are numbered in thousands of feet for each altitude, and existing wind velocity at launch time will shift or move the circles' center accordingly. The balloon's landing point is yet to be determined. (Submitted by Bill, W8DMR, for Bill, WB8ELK.)

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ATV LAND MOBILE STYLE

Did you view the land mobile operation during the ATCO Net on Tuesday 19 May 1987? That's the night Bill, WB8URI, and Tom, KA8ZNY, were ATVing from Tom's van. It all started in front of WB8DMR's house and wound up at the intersection of route 674 and Lithopolis Road. Signal reports ranged from P2 to P5 with KA8GZQ the most distant contact. Their equipment consisted of the following: P.C. Electronics exciter; Mirage D1010 amplifier; Sharp VCR with live video and recorded computer programs; Radio Shack converter with a GaAs FET preamp; homebrew Squalo antenna; and a nine inch black and white TV. Bill said, "The best P reports were received after I remembered to plug in the antenna."

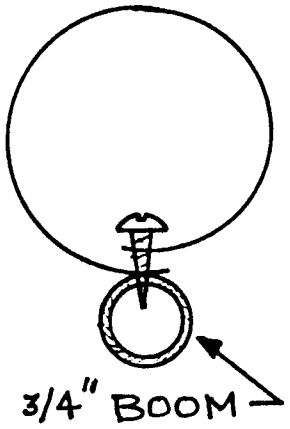
25-ELEMENT 1.26 GHz LOOP YAGI ANTENNA FOR ATV

Shown below are the lengths, spacing, and hole requirements for the 25-element 1.26 GHz loop Yagi ATV antenna. The loops are essentially one wavelength in circumference; the reflectors are about five percent longer; the directors are approximately five to seven percent shorter. When end mounted, the antenna has nearly 17 dB's of gain with a boom length of about 6.5 feet.

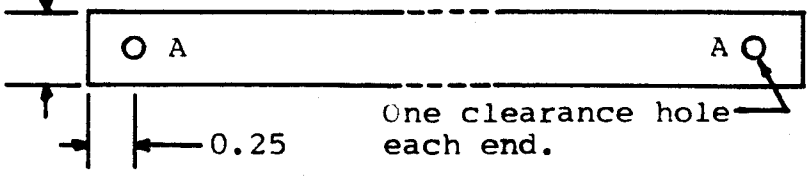
Table 1
Loop Length and Spacing

ELEMENT	LENGTH	SPACING	HOLE SIZE
Reflector 2	10.23	0.00	A
Reflector 1	10.23	3.10	A
Driven Loop	9.27	4.05	B,B,C
Director 1	8.81	5.17	A
Director 2	8.81	6.00	A
Director 3	8.81	7.78	A
Director 4	8.81	9.56	A
Director 5	8.81	10.81	A
Director 6	8.81	13.12	A
Director 7-11	8.55	3.56	A
Director 12-21	8.25	3.56	A

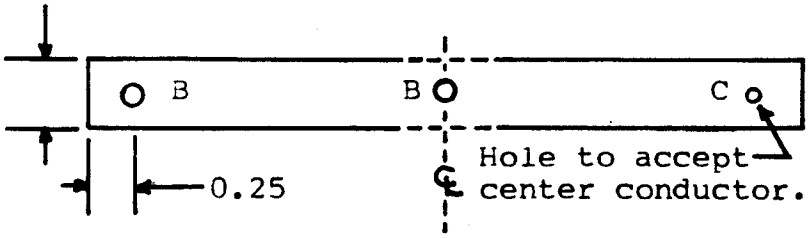
Hole Code: A = Clearance for screw used, 2 per element.
B = Rigid coax outer dia., 2 each.
C = Center conductor wire size, 1 each.

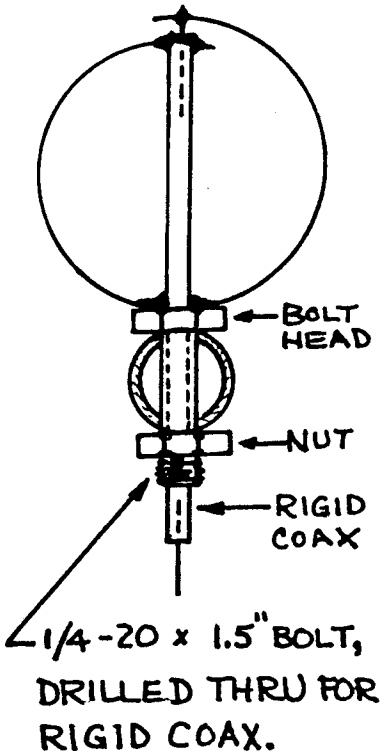


0.25 Reflect. & Direct. Hole Location



0.25 Driven Element Hole Location





The loops are made of brass or copper stock which permits soldering the overlap together. Metal guage from 0.025 to 0.062 is satisfactory. Coat the loops with clear lacquer to delay oxidation.

Boom mount a down-converter behind the last reflector. With an i-f of 45-175 MHz, RG-58/59 will work. Another antenna for

(continued on page 8)

1.26 GHz ATV REPORT

(The following article was written from information submitted by Ron, N8DUK. - Editor.)

On 3 June 1987, Ron, N8DUK, successfully transmitted video with color and 4.5 sound subcarrier on 1.26 GHz. His transmitting frequency was 1262 MHz; Bill, WB8URI was on the receiving end. The distance between the two stations is approximately 26 air miles. With a power of four to six watts, Bill gave Ron a P1 report with intermittent color. WB8URI made a VCR recording of Ron's video and transmitted it to N8DUK on 439.25 MHz.

A two-way contact with Bill, W8DMR, was made on 9 June. The signal reports from both stations on this occasion were P4 with excellent color and 4.5 MHz sound subcarrier. Ron's power was the same as that used on 3 June, and the distance is estimated at about six air miles.

At the present time, Ron's 1.26 GHz equipment consists of an ICOM 1271A all mode base station with the ICOM TV-1200 video converter. Antennas are a Down-East microwave 45-element loop Yagi at 36 feet and stacked Tonna 23-element F9FT's at 37 feet. Both antennas are horizontally polarized using 100 feet of Belden feed line.

In the immediate future, Ron is planning to use an ICOM GaAs FET mast mounted receive preamplifier and some type of amplification for DX or just across town. He is now looking for a transistor type 50 to 75 watt linear but is having no luck in locating one. A linear with 35 watts rf out has been found, but Ron is not sure he wants to acquire it. If he doesn't find the 50 to 75 watt linear soon, a Hi-Spec 125 watt, 1296 MHz, two tube radial mode cavity type linear that he already possesses will be utilized. Although this amplifier is actually manufactured for SSB, it can be used at a reduced rf output with a 50 percent duty cycle time.

Ron finds ATV on 1.26 GHz an exciting mode of operation and intends to keep us informed as to his progress.

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OUR CONTRIBUTORS

Thanks to the following for contributing to this issue of the ATCO Newsletter:

Bill, W8DMR, for submitting three articles - "Does ATCO Need Activities and/or Projects," "25-element 1.26 GHz Loop Yagi Antenna for ATV," and "Methods for Changing Antenna Polarization"; Bill, WB8ELK, "New Heights for ATV"; Bill, W8FRQ, for his "Arithmeticker"; Ron, N8DUK, "1.26 GHz ATV Report"; Perry, WB8OTH, for information about Salyut-7; and Bill, WB8URI, "ATV Land Mobile Style."

NEW HEIGHTS FOR ATV

(The following article was written from information submitted by Bill, WB8ELK. - Editor.)

For the past two years, Bill, WB8ELK, and Mel, KA8LWR, have been flying around the midwest stirring up ATV activity. At 10000 feet the line of sight is well over 100 miles, so only a very simple ATV station is needed. The antenna being used is nothing more than a Larsen magnetic mount mobile whip trimmed for 439.25 MHz. High power is not required since their video has been seen at P4+ for more than 100 miles away using five watts.

The biggest obstacle to successfully transmit from the air was to find a way to provide omni horizontal polarization. Mel's original solution was to bank the plane at 90 degrees. While this was effective, it tended to make their faces appear slightly green on the screen. Finally, the whip antenna was mounted at a 45 degree angle, and this proved to work quite well no matter what polarization is used at the receiving end.

Of course, the real fun begins when a portable TV and VCR are taken aloft. The two ATVers have made contacts with dozens of stations in several states using this kind of a setup. By recording stations, the air mobile contact can be retransmitted as a sort of delayed action ATV repeater. In this way, they have linked up stations over 200 miles apart. Are there any volunteers to be the first to fly an ATV repeater?"

As more and more amateurs get involved with aeronautical mobile TV, regular two-way air-to-air contacts can become a reality. Last March, Bill and Mel made a two-way contact while flying near Bucyrus with a plane in the air over Cleveland.

Bill reports that many unusual ways have been considered to get ATV in the air. Several hams have put transmitters in their model airplanes, and one avid amateur is planning to go skydiver TV mobile. Hot-air balloons have been used with great success, too.

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HAVE YOU SEEN SALYUT-7 YET?

The Russian Space Lab will be visible to the naked eye three nights during July. If the skies are clear, let your eyes adapt to the darkness about ten minutes before the time (EDST) on the dates listed.

Wednesday 1 July, 10:00-10:03 p.m., from SW to NE at 30-70 degs.
Thursday 16 July, 10:32-10:35 p.m., from NW to SE at 35-90 degs.
Saturday 18 July, 9:32-9:35 p.m., from NE to SW at 32-65 degs.

Let's hope for good viewing weather! (Information received from Perry, WB8OTH.)

METHODS FOR CHANGING ANTENNA POLARIZATION

There are several methods for changing antenna polarization. Four of the possibilities are described below.

METHOD ONE - Two Separate Antennas (Electrical method):

One antenna mounted for V polarization, one mounted for H polarization, or a coaxial relay located either on the mast or inside the ham station.

METHOD TWO - One Antenna (Mechanical method):

Mechanically rotate the antenna 90 degrees to obtain H or V polarization. A second rotator system in addition to the typical azimuth rotator is used. Approximately 15 seconds is required for each polarization change. A multiwire cable (5-8 wires) must rotate around the azimuth rotator.

METHOD THREE - One Antenna (Electical method):

Using an antenna that can accept both H and V polarization - not circular polarization. For example, two Yagi antennas on one boom with the elements at right angles. Feed line requirements would be the same as in Method One.

METHOD FOUR - One Antenna (Electronic method, 90 degree phase shift):

Using an antenna that can accept both H and V polarization (circular polarization) with one feed line. This method has some faults. The polarization not being used contributes whatever noise that exists in that axis. When transmitting, the polarization not being used transmits 50 percent of the available power in the unused axis. In receive mode, this amounts to 3 dB's more noise and when transmitting, 3 dB's less power. Thus, a 6 dB system degradation occurs.

Method Two requires some type of a rotor mounting plate to permit polarization rotation. For this purpose, a bracket for mounting a U-100 (U-110) rotor horizontally on the antenna mast can be made with the antenna support (cradle) inserted through the rotor. The J-Beam antenna comes with a cradle.

The rotor control box contains a phase shifting nonpolarized motor capacitor. It is, therefore, important that this capacitor be nearly new and not several years old.

Some installations may require a counterweight for rotation to occur. The counterweight will cause the time of rotation to be nearly equal when changing polarization.

Finally, care must be taken to establish when 90 degrees of rotation is completed. A full 360 degrees of rotation may likely cause damage. (Prepared and submitted by Bill, W8DMR.)

25-ELEMENT 1.26 GHz LOOP YAGI ANTENNA FOR ATV

(continued from page 4)

transmit eliminates an expensive rf relay and associated connector losses.

To obtain about 3 dB more gain, lengthen the boom to 12 feet and add 21 more directors spaced 3.56 inches. However, end mounting the longer boom is impractical. (Prepared and submitted by Bill, W8DMR.)

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ARITHMETICKER

A ham TV transmitter operator runs 100 watts with an rf transmission line current of 1.414 amps. If he increased his power to one kilowatt, what would be his rf transmission line current ?

A. 5.656 B. 2.828 C. 4.472 D. 3.579

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SOLUTION TO APRIL ARITHMETICKER

If you chose C. 10739, you were correct. 525 lines are scanned in 1/30 second on a 12 inch wide TV picture tube. 525 x 30 = 15750 lines per second, and since raster is one foot wide, 15750 x 1 = 15750 feet per second. Thus: 15750 x 60 seconds x 60 minutes / 5280 (feet in one mile) = 10738.636 miles per hour.

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ATV NEWS ITEMS OF INTEREST

By Bill, W8DMR

DAYTON ATV REPEATER - The receiving antenna for the DARA repeater is vertically polarized! The video modulation appears to be much improved on repeated signals. The repeater still does not repeat color signals very well. The 4.5 MHz audio is good.

H/V ANTENNA USAGE - Several operators have observed while working crossed polarized that the side lobes normally experienced are essentially nonexistent, including the 30 dB signal loss.

1.2 GHz ATV EQUIPMENT - The following stations have acquired some capability for operation on this band: W8DMR; N8DUK; WB8ELK; WA8EOY; WB8OTH; WA8RUT; WB8UGV; WB8URI; K8YAH; and KA8ZNY. Who did we miss?

ATV AIRPLANE FLIGHTS - A plane flying between Akron-Canton and Bloomington, Illinois, on Friday evening and Sunday morning during July through September will attempt two-way ATV contacts each day from an altitude of approximately 12500 feet. The audio link will be on 144.34 MHz, and the pilot's name and call letters are Jim, WA8VWY.

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LETTER TO THE EDITOR

Intention is Reversed - The timing of the mailing of the April issue of the ATCO Newsletter was exceptional. It arrived on April Fools' Day. It was thought the "Broom Stick Antenna" might conceivably fool someone...but it did not! It was not intended for the publication of the correct solution to the slow clock "Arithmeticker" to fool anyone...but it did!

Bill, W8FRQ

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K8YAH Ronald Vanke
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ATCO FINANCIAL STATEMENT

CASH BALANCE:
As of 31 March 1987.....$185.24

RECEIPTS:
Dues..... 40.00

EXPENDITURES:
Printing charges for April 1987 ATCO Newsletter..... 29.54
50 postage stamps @.22 each..... 11.00
Misc. costs incidental to publication of newsletter.. 5.37
Total.....$ 45.91

SUMMARY:
Cash Balance as of 31 March 1987.....$185.24
Receipts..... 40.00
Expenditures..... -45.91
Balance as of 26 June 1987.....$179.33

POSTAGE STAMP INVENTORY:
Stamps on hand as of 31 March 1987..... 53
Stamps purchased 9 June 1987..... 50
Stamps used..... -29
Stamps on hand as of 26 June 1987..... 74

The above financial report was prepared as of 26 June 1987 by Warren G. Duemmel, KA8GZQ, Acting ATCO Treasurer.

Editor: Warren, KA8GZO

FIRST CLASS MAIL

ATCO NEWSLETTER
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WB8ELK

ATV

BALLOON

LAUNCH

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SEE PAGE 3
FOR DETAILS