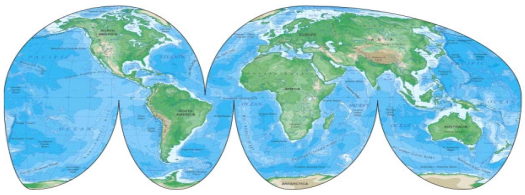
MOUNT VERNON AMATEUR RADIO CLUB

C  Q

February 2006 Newsletter

MEETINGS SECOND MONDAY OF THE MONTH AT THE RED CROSS ANNEX BUILDING,
300 N MULBERRY ST, MT. VERNON, OHIO
REPEATER FREQUENCIES: 146.790 (-) K8EEN /R 444.750 (+) KC8YED /R 53.790 (-) WA8YRS/R
SUNDAY NIGHT ARES NET AT 8:00 P.M ON THE K8EEN REPEATER OPEN TO ALL

K4AWO, Silent Key

Most readers have already heard the sad news that club member and Amateur Extra, David Rankin K4AWO, had passed away.

David was 61 and had long been an amateur radio operator. He died at his daughter's home in San Diego after loosing his battle with cancer.

David, who was born in Cuba, was a retired physician who had long struggled with Muscular Sclerosis. Neither the cancer nor the MS slowed him down. He remained active in the community, church, his singing group and ham radio right up to the very end.

David was an inspiration. He was always cheerful, helpful, hopeful and full of life. He will be missed by many.

Mike, KC8YLD

From The Editor

Just a reminder (which may appear often in this edition) that our **February Club meeting will be at Ryan's Steak House on Coshocton Road in Mt. Vernon starting at 6pm.** After paying for your dinner inform your server that you are with the Mt. Vernon ARC group meeting in the banquet room.

I have been trying to find room for an article on the AO-51 Satellite for several months now. It appears in this issue. I also ran across some interesting short topics that may be of interest to club members. In this issue readers will also find perhaps my last article on antennas. I know it is not likely that anyone (other than me) will ever try these antennas. I hope that the articles provide some entertaining reading and show what a little creative thinking can do to help solve antenna issues. Wire antennas are fun to play with and cheap to put together.

Mike, KC8YLD, and I have been trading information on web pages we find while surfing the web. Here are a few of the better ones we have found:

http://www.tech-systems-labs.com/index.html

http://www.tech-systems-labs.com/books.htm

http://www.tech-systems-labs.com/freesoftware.htm

http://icomamerica.com/amateur/video/default.asp

http://www.geocities.com/soldersmoke/

Enjoy the Newsletter.
Don, WA8YRS

ComPIOnents, February 2006
By Mike McCardel, KC8YLD

Last month, I mentioned one of my New Years resolutions was to join the OSSBN Traffic Net and that another was to promote amateur radio. Well, I did indeed join the Ohio Single

Side Band Net, and so far the experience has been a good one. To join the net one must send a radiogram giving your contact information. The net control the day I did this was Dave Patton, KC8UTL from Apple Valley. Also members of the net include Tony Spiegel, KC8UR, from Mount Vernon and MVARC member Earl Paazig N8KBR form Frazeysburg. Another of the net controls is KA8FCC, Don Frazer, formerly of Mount Vernon and a past member of the MVARC. He sends his good will and hopes to join us at a meeting or on the net sometime. Ham radio is certainly a small world!

I want to share some stories about a couple messages I have sent. One is the small world type. I sent a greeting to my sister in Bellaire, OH. Since she celebrates her birthday and anniversary three days after Christmas I rolled a Happy everything into her radiogram. N8DBY, Paul Scott, from Belmont, OH picked up my message for delivery. As it turns out he is a close friend of my sister's husband and had a fun time delivering the message. Then I recently sent a radiogram to the second graders at the North Carolina elementary school where my daughter is the librarian-media specialist. She sparked the idea, because she had just finished reading a children's book, "Mr. Crumb's Secret" to them. "Mr. Crumb's Secret" is the story of a little mouse's neighbor, Mr. Crumb. It turns out Mr. Crumb's secret was he was studying for and eventually passed his Amateur Radio license test. So, I guess I got started on my promoting amateur radio resolution as well. My daughter is hoping to get some local hams to give her school a demo as a follow-up. I hope I can get on the air when they do this

---

Want to have some fun and offer a great service to local and regional EmComm as well? How about some Repeater Hopping? DEC Jay Bookwalter, KC8GNL, is asking that all amateur operators, who are interested, to check in to any net in the 6th district that they can reach with their equipment. To aid in this he has published a list nets within District 6. Jay suggests that you "…try and check in with the different nets and not "'just in & out' but stick around and give your comments. This is a good way to see how far you can reach with your equipment and lets you get to know some of the people in the other counties." Following is that list of Nets, their times, days, and frequencies. Note the **NEW** Northern Simplex Net, 4th Sundays at 4:30pm, local, on 146.430. This should be a good challenge for anyone from here

Ohio Section District 6 (and more) Net Schedules

Central Ohio Traffic Net (COTN) – Daily at 7:15pm on 147.240 (K8DRE, Capital City Repeater Assoc. Worthington)

Burning River Traffic Net – Daily at 9:30PM on 147.150 (Cleveland and North Central Ohio)

Ashland ----- Club net Tuesday night at 7:30PM on 147.105 (71.9pl) [except 2nd Tuesday which is club meeting night.]

Crawford ---- Galion ARC – Tuesday nights at 8PM on 146.850 (71.9pl)

Holmes ------ Tuesday night "watch net" at 9PM on 146.670 (71.9pl)

Hancock ---- Wednesday Night at 8PM on linked 147.150 (88.5pl) & 444.150

Marion ------ Wednesday nights at 8PM on 146.300 (71.9PL) *If repeater is Down use 146.460 simplex*

Richland ---- Wednesday Nights at 9PM on 146.940 (71.9 pl)

Wayne ------- Wednesday night at 9PM on 147.210 (71.9pl)

SKYWARN – Wednesday Nights at 9 PM on 52.68 (open ***only*** to registered BackBone operators) But feel free to listen in.

Ashland ----- ARES net Thursday night at 7:30PM on 147.105 (71.9pl)

Huron ------- Sunday Nights at 6:30PM on 146.865 (110.9pl)

Wyandot ----- Sunday night at 7PM on 147.210 (107.2pl)

Knox --------- Sunday Night at 8PM on 146.790 (71.9pl) *If repeater is Down use 146.790 simplex*

Seneca ------- Sunday Nights at 8PM on 145.450 (107.2pl)

SSTV NET – Sundays Nights at 8PM on 145.230 (NO PL)

Morrow ----- Sunday night at 9PM on 146.775 (71.9pl)

Crawford ---- B.A.R.C. – Sundays at 9PM on 147.165 (88.5 pl)

NEW -- **Northern Ohio Simplex Net** – 4th Sunday Each Month at 4:30PM on 146.430. – They will use relay stations for the distant stations on this net, so please give it a try. It will originate from Tiffin with Karl Erbland K8ARL as net control.

NOTE: District 6 is made up of Ashland, Crawford, Hancock, Homes, Knox, Marion, Monroe, Richland, Wayne, and Wyandot Counties.

I want to comment on how interesting and fun the 'Show and Tell' was at last January's meeting. I hope it is something we will repeat often. Barry Butz, N8PPF, brought in the push to talk knob from a WWII PF47 Fighter plane, his father's souvenir from his flying days. Jeff Butz, N8SMT, demonstrated his Diamond K9000 automatic mobile antenna lifter. Don Russell, WA8YRS, demonstrated Digipan used for receiving PSK31 and other digital formats through his computer. 'Doc' Helzer, AA8WP, demonstrated his singing magnets and anecdotally added that he just stored them in his pocket and now his credit cards won't work. Jim Harris, K8IH, demonstrated his all purpose (home brew kit) transistor/component analyzer. I demonstrated an Anderson Power Pole connector. I found this part of the meeting quite educational.

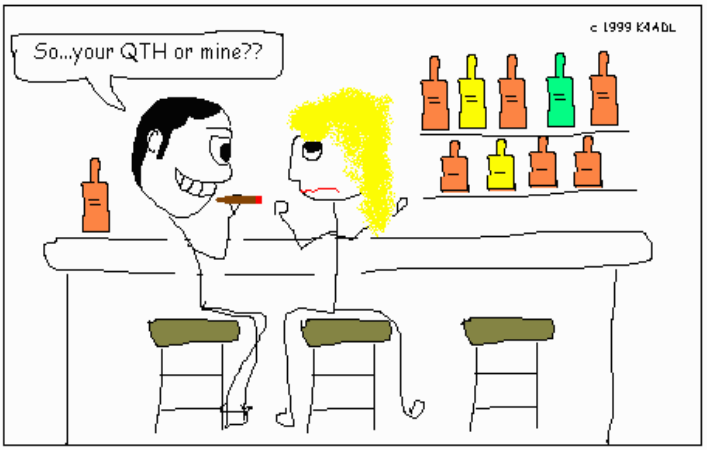
February's meeting will be held at **Ryan's banquet room on the 13th at 6pm**. Meetings will resume at the Red Cross Annex on 300 N Mulberry St, Mount Vernon, 7pm March 13. In upcoming meetings look for the antenna-tuning clinic in March (bring your antennas to tune), Skywarn training at the April meeting, and another show and tell later in the Spring. For any meeting, bring a friend. There is always time to just shoot the breeze after the meeting as well. The Red Cross Annex is comfortable and we have never been under pressure to get out.

In her FEBRUARY OHIO SECTION NEWS online letter, Affiliated Clubs Coordinator, Joanne Solak, KJ3O, plugged MVARC's regular meeting place and time, specifically mentioning new Secretary, Jeff Butz, N8SMT as our contact. Thanks Joanne for noticing us.

Have an anecdote, humorous story, technical information, how-to description, have a picture of you shack or antenna farm, or know of some news, accolades or happiness that you or a fellow ham have experienced? Why not submit it to be published in the Newsletter. Don, WA8YRS, would like to see more news on local hams. Just e-mail to Don at wa8yrs@arrl.net or to myself at kc8yld@arrl.net. It's that easy.

Until next month, Get on the Air! I hope to hear you on down the log!

73
de KC8YLD, EMike McCardel



WHY HAROLD RARELY GETS LUCKY AT THE SINGLES BAR

FCC INVITES COMMENTS ON LEAGUE'S "REGULATION BY BANDWIDTH" PETITION
(From the ARRL letter)

Comments are due by Monday, February 6, on the ARRL's Petition for Rule Making that asks the FCC to regulate the amateur bands by necessary bandwidth rather than by mode. The petition, designated as RM-11306, recommends what the ARRL calls "a shift in regulatory philosophy" to encourage and enable development and refinement of digital techniques and advanced technologies.

"This petition seeks for the Amateur Radio Service the

flexibility to experiment with new digital transmission methods and types to be developed in the future while permitting present operating modes to continue to be used for as long as there are radio amateurs who wish to use them," the League said in its petition, filed November 14. The ARRL says the changes it suggests also will update the FCC's rules and eliminate the need for "cumbersome procedures" to determine whether a new digital mode is legal under Part 97.

The next step in this proceeding would be either a Notice of Proposed Rule Making (NPRM) or a dismissal of the League's petition. An NPRM would kick off a further round of formal comments. For the rules to take effect, the FCC would have to issue a Report and Order putting the changes into place and setting an effective date.

The ARRL is asking the FCC to replace the table at §97.305(c) with a new one that segments bands by necessary bandwidths ranging from 200 Hz to 100 kHz. Unaffected by the ARRL's recommendations, if they're adopted, would be 160 and 60 meters. Other bands below 29 MHz would be segmented into subbands allowing maximum emission bandwidths of 200 or 500 Hz or 3.5 kHz, with an exception for AM phone.

* 200 Hz would permit CW "at all speeds that human operators can decode" as well as PSK31.

* 500-Hz bandwidth would accommodate RTTY and data modes and possibly some new image modes.

* 2.8 kHz would remain the bandwidth for 60-meter operation on USB.

* 3.5 kHz would accommodate SSB and digital telephony, image, high-speed data and multimedia.

* 9 kHz is the ARRL's recommendation for double-sideband AM.

* 16 kHz is "a reasonable compromise bandwidth" to continue to permit analog FM voice, data, digital voice and multimedia at 29.0 to 29.7 MHz.

* 100 kHz, now permitted for RTTY and data in bands above 420 MHz, should be allowed starting at 50 MHz, with the exception of 50.0-50.3 MHz and 144.0-144.3 MHz to allow digital multimedia and high-speed meteor scatter work.

The ARRL says the Part 97 changes it's proposing constitute a balance "between the need to encourage wider bandwidth, faster digital communications and the need to reasonably accommodate all users in crowded bands." Conceding that its regulation-by-bandwidth regime would place increased responsibility on the amateur community to establish workable, accepted band plans, the League has expressed confidence that such an effort would be successful.

ARRL CEO David Sumner, K1ZZ, has discussed the subject of regulating by bandwidth in three "It Seems to Us . . ." QST editorials: "Regulation by Bandwidth" in September 2004, "Narrowing the Bandwidth Issues" in April 2005 and "Self Regulation" in October 2005.

"This petition does not favor one mode at the expense of another," the ARRL concluded in urging FCC adoption. "It merely allows expansion of the repertoire of options that amateurs may pursue compatibly."

A copy of the ARRL petition is on the ARRL Web site http://www.arrl.org/announce/regulatory/bandwidth/Bandwidth-Minute-64-Petit ion-FINAL.pdf

Comment via the FCC's Electronic Comment Filing System (ECFS) <http://www.fcc.gov/cgb/ecfs/>. Under "ECFS Main Links" on the right-hand side of the screen, click on "Submit a Filing" to file comments. To view others' comments, click on "Search for Filed Comments." In either case, type "RM-11306" in the "Proceeding" field using capital letters and including the hyphen (but not the quotation marks).

MVARC

Mt. Vernon Amateur Radio Club
Minutes for the January 9, 2006 Meeting

Attendees:

1. Don Bunner, KB8PO
2. Jeff Butz, N8SMT
3. Barry Butz, N8PPF
4. Jim Harris, KI8H
5. Dick Huggins, WD8QHY
6. Robert McBride, Sr.
7. E. Mike McCardel, KC8YLD
8. Don Russell, WA8YRS

Meeting called to order by Vice President Don Russell, WA8YRS, at 7:05 pm local time.

Don gave the Treasurer's Report:

$ 784.27 in the Checking Account
$ 362.00 in the Savings Account
$ 623.68 in the Repeater Fund
$1769.95 Total

Bob Bruff, N8PCE, has since bought a roll of stamps so the total is less $39.00.

Old Business:

Election of the Board of Directors:

Don, WA8YRS brought a copy of the club's Constitution or By Laws and read from the parts concerning the election of trustees. It was pointed out that the only reason to have a Board of Directors is to maintain our status as a non-profit organization. This status is necessary when we buy equipment, materials and supplies. The last Board of Directors' election was so long ago that all terms have expired. Don, WA8YRS stated that a minimum of 3 directors constituted the board serving either a one or two year term initially and for succeeding two-year terms. He then asked if there were any volunteers.

The following members Volunteered:

Barry Butz:	N8PPF	for 2 years
Don Bunner:	KB8QPO	for 1 year
Dick, Huggins:	WD8QHY	for 2 years

Jeff, N8SMT moved that the volunteers be accepted as our board of directors.

Barry, N8PPF, seconded the motion.

The motion was passed by unanimous voice vote.

Bob Mc Bride, N8QPM explained that there was a problem with the repeater during the previous Sunday's net. And he wanted to advise what to do during the net when the repeater is down. He explained that we should use the repeater's output frequency of 146.79 simplex and if that frequency is not available, we should use 146.52.

Don, WA8YRS, stated that Cathy of the Red Cross asked us if we wanted to sponsor a blood drive. Don did not feel we would be very useful in that endeavor and we will be quite involved in their communication venture (i.e.: their antenna project). Mike, KC8YLD, made a motion for the club not to sponsor a blood drive. Bob, N8QPM seconded the motion and it was passed.

We have a new member. Jim Harris, KI8H from Homer, Ohio joined the club this evening.

Mike, KC8YLD, gave a report on the Red Cross antenna project. He said Dave of the Red Cross is ready to get started on the project so the ball is now in his court. Mike talked to Steve Dick, KC8YED, he will get together with Dave and determine the frequencies used by the Red Cross and the type of equipment needed, including both Red Cross and Ham needs. This may include a trip to Columbus to inspect the Red Cross facility there. There is a possibility that money could be obtained for this from the EMA. Mike said that Dave would very much like to see the club use the Knox County Red Cross site for its Field Day activities.

Mike, KC8YLD, gave a report on the medical condition on Dave Rankin, K4AWO. Dave's spirits are good and he would love to receive radiograms from club members. Please refer to previous newsletters for Dave's website.

New Business:

No new business presented at the meeting since the club President, Ruben Clark, KB2SAI was not present.

Meeting Concluded at 7:49 PM.

SHOW and TELL

Doc, AA8WP demonstrated some funny oval shaped magnets that just drive cats bonkers by their buzzing sounds when thrown in the air.

Barry, N8PPF showed his father's PTT switch from a P-47 fighter-bomber that he acquired during World War II where he was a Radio Mechanic. Barry also shared some photos of his father during the war and of the P-47.

Jeff, N8SMT demonstrated a Diamond K9000 RM electric raise/lower mobile antenna mount.

Jim, KI8H shared his semi-conductor tester/identifier that he built from a kit made by M^3 (M cubed).

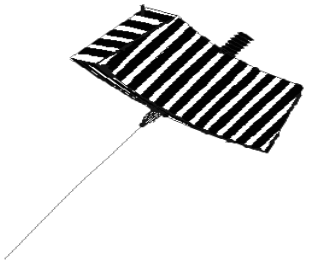
Mike, KC8YLD demonstrated the new Anderson Power Pole connectors that are becoming the new standard connector.

Don, WA8YRS demonstrated the "Digipan" PSK 31 software that decodes and transmits the PSK 31 digital signals.

A good time was had by all.

Respectfully submitted
Jeff Butz, N8SMT

The Satellite Beacon
By Emily Clarke W0EEC
VP, Project OSCAR and
AMSAT Area Coordinator



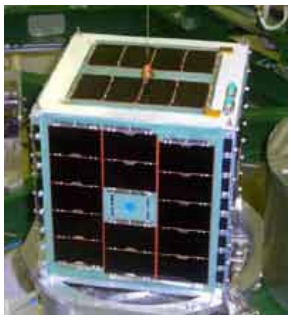
So You Want to Work AO-51?

AMSAT-OSCAR-51 is the newest satellite launched by AMSAT. It is the strongest satellite in the sky other than the ISS, and is one of the most complex satellites currently in operation. It has many subsystems and as some have said, "it has something for everyone" including simultaneous voice and packet operations. In this article I'll focus on making a voice contact.

Launch and Checkout

AO-51 was launched from the Baikonour Cosmodrome in Kazakhstan on June 29, 2004 and was inserted into a sun

synchronous orbit which allows it to be over the same geographical location basically the same time every day. For us in North America, this happens in approximately 11am for the descending (north to south) pass, and late evening (11pm) for the ascending pass. It underwent testing for 30 days after launch, and was turned over to amateur access on July 30th.



When AO-51 was first turned on it's first over the East Coast it was estimated that over 500 amateurs attempted to use the satellite. Three reported having QSOs, while the other 497 were left scratching their heads. When the satellite passed over central North America 80 minutes later, those 500 stations were joined by another 500 from the west coast. Two stations reported having QSOs. At 30 minutes past midnight AO-51 showed up out over the Pacific ocean. Estimates are that 200 people on the west coast stayed up, and about 8 QSOs took place. I was one of the lucky ones

.

So what happened?

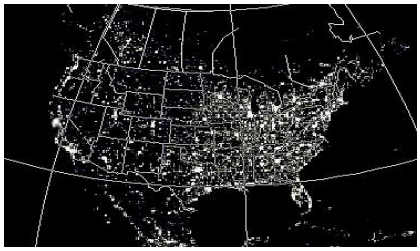
AO-51 is a low earth orbit satellite (LEO) mode J-FM (V/U) voice repeater, the same as launching your local repeater in orbit, except for one very significant difference. Instead of having a range of 50 or so miles, it can be accessible to the entire country at one time. While this may sound beneficial at first, the results can be disastrous. If you've ever heard a double on your local repeater when the net control calls for check-ins, think of the results when 500 stations suddenly try to check in to the same repeater at the same time. It's a pileup. Quite a lot of the pileup results from people who have never heard a satellite before but key up to "just to make sure it's there". There are also those who can hear it, but don't have on the required 67Hz PL tone. Although AO-51 will not repeat those signals, they can jam weaker signals and prevent them from getting through. Lastly an FM repeater is not designed to handle that many simultaneous signals, so they double, triple and… well, you can see the results are predictable.

How Will I Ever Get In?

The good news is that in the weeks following activation of AO-51 the load has lightened and it's easier to get it if you plan ahead and avoid the pileups. Many people are able to work Echo successfully and I have consistently been able to get in at 5 watts with both an Arrow antenna and a ½ wave whip. Aruni VE4WMK who is 10 years old uses an HT with an Arrow and is very successful following using very simple techniques that I posted in article on the AMSAT website entitled "12 Suggestions for Handheld Transceiver Users". Here are some of the basic

1) **Listen First**. If you can't hear other stations, you can't work them. AO-51 is very strong (only the ISS is stronger) so almost everyone can hear it on a good HT with a good whip antenna, the dual-band Arrow yagi or the dual band Elk log periodic that are sold at most flea markets in the area.
2) **Keep your squelch off**. Although Echo is strong, it's not strong enough to break your squelch in most cases.
3) **Make sure you have your PL tone set to 67hz**. Like most repeaters, even if you get a chance to get in, you won't without the PL tone set. Don't try to use tone squelch either, as Echo does not transmit a 67Hz PL tone back on it's downlink.
4) **Don't use a vertical antenna**. Whips and ground plane antennas should be tilted so that the vertical is 90 degrees off the elevation of the satellite.
5) **Know where the satellite is**. Keep a tracking program nearby where you can reference it. If you are handheld outside, use a handheld computer running PocketSat or PetitTrack to reference the satellite's position.
6) **Use Dual Headphones!** I can't stress this enough. Your brain is the best DSP there is, and if you only hear the signal through one ear, your brain can't filter out the noise nor can it react quickly to call signs.

How Should I Prepare?



When you decide to work AO-51 for the first time, some preparatory steps will help.

1 Visit the AMSAT website and visit the Echo Project page to make sure you have the correct frequencies. The AMSAT website also has online pass predictions in the Tools section which will calculate the passes for your location.
2 Try listening on one pass nearby (over 30 degrees of elevation) and see how well you are receiving. If you can't hear the satellite, you may need to improve your receive antennas.
3 Try to arrange a sked with another station. It's easier to make a contact with someone who is experienced on the satellites than cold calling. That contact can also help you determine how well your signal is doing.
4 Plan on working a pass away from populated areas (see the map - white spots are high density population areas.) If you can work to the north or west or over the ocean, your results will be better because statistically there are fewer people.

Most of all, don't get discouraged. AO-51 is reprogrammable from the ground and they have made some improvements to it

already. For example, initially the power was set to 330mw, then 500mw and now is set for 1W. AO-51 can operate up to 7 watts, but it is unlikely they will increase power over 2W since most stations now receive AO-51 full quieting.

Echo Frequencies
The following are the announced frequencies for AO-51:

Voice Uplink:	145.920 MHz FM (PL - 67Hz) 1268.700 MHz FM (PL -
Packet Uplink:	145.860 MHz 9600 bps, AX.25
Voice Uplink:	145.920 MHz FM (PL - 67Hz) 1268.700 MHz FM (PL -
Packet Uplink:	145.860 MHz 9600 bps, AX.25
Voice Downlink:	435.300 MHz FM
Packet Downlink:	435.150 MHz 9600 bps, AX.25

Website References
AMSAT – *http://www.amsat.org*, The Echo Project Page - *http://www.amsat.org/amsat-new/echo/*, 12 Suggestions for HT Users - *http://www.amsat.org/amsat-new/echo/EchoHT.php*, Online Pass Predictions - *http://www.amsat.org/amsat-new/tools/predict/*
So best of luck and CU on the Birds! 73, *Emily*

Is a low SWR really the best?
From The Kentucky Amateur Radio News Service
By GENE FERGUSON, W4FWG
Contributing Writer

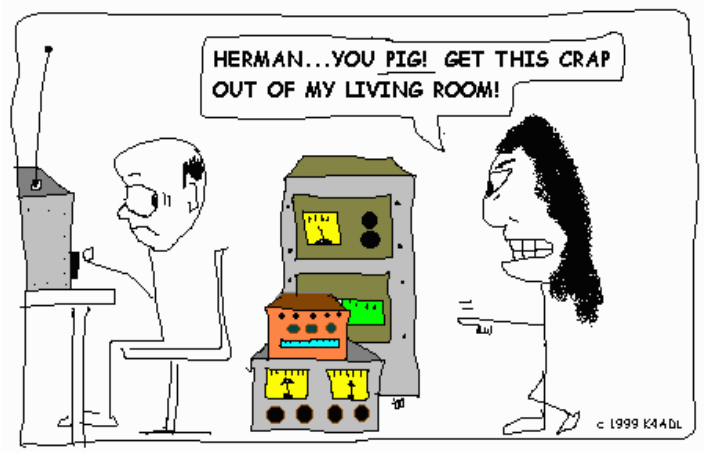
Have you, or anyone you know, replaced a transmission or feed line, or even an antenna with a new feed line; then found that the SWR was reading higher than before, leading to the assumption that radiated power was lost by installing the new antenna system components? Is the lowest attainable SWR always the most desired? Would the antenna system with the lowest SWR be the better system?

If one replaces a transmission line, say, replaced an RG-58 lead with RG-8, or a complete new antenna system complete with new feed line, and finds that the SWR reads higher than before, have they lost power? Not necessarily. In fact, this increase in SWR is likely announcing an improvement in antenna's power output.

How can that be? If we consider what is happening, we know that with the old (or high loss) feed line, because of its higher loss, less energy will reach the antenna. With this reduced energy reaching the antenna, we have less energy available when the reflected wave is sent back to the transmitter (or tuner). On the trip back to the transmitter, the reflected energy must travel the high loss line again, giving us, what appears to be, a low SWR reading.

We replace the feed line. We will still have the same amount of RF energy leaving the transmitter. Now with a higher energy reaching the antenna (less loss on the feed line), we have more energy when the reflected wave begins its trip back to the transmitter. The reflected wave will see or feel less loss on its way back, so, not only is the power reaching the antenna greater, so will our SWR reading. Did we make a mistake in our assumption?

A Field Strength meter, properly used, is the only known device to give us an accurate comparative analysis between these two antenna systems, before and after modifications. A good SWR meter is invaluable. However, we just need to analyze what we are seeing.



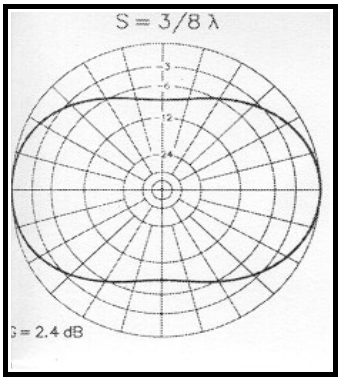
THE REAL ORIGIN OF THE TERM *"HAM RADIO."*

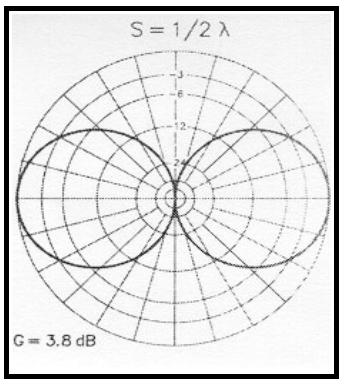
REPEATERS AND STUFF
By Don Russell, WA8YRS

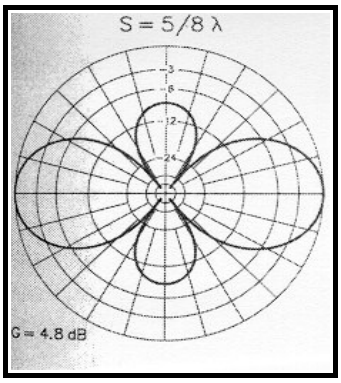
About two years ago I describe a 40 meter vertical antenna phased array that would give good gain on that band. Gain antennas are difficult build on 40 meters. One element of a yagi would be 65 feet long! The boom would be 30 feet minimum! This phased Vertical antenna was being considered at the peak of my interest in contesting. Unfortunately, the building stage of this antenna never came about. Lately, I have been thinking a lot about this antenna system. Not for 40 meters however. Since removing the three element tri-bander from my tower (Read the December 2005 Newsletter), I have been thinking that a Vertical array for 20 meters would be just the thing for a ham without a tower or the financial means to put up a tower and beam antenna for 20 meters. With the Sunspot Cycle on the low side now and for several years to come, 20 meters is the only dependable band open to DX during the day. Yes, 15 meters opens up during the day too, but not always, and it closes earlier in the day than 20 meters does.

So, here is my choice for an economical gain antenna for 20 meters. This antenna will have three vertical elements, each about 16 feet long. If made out of aluminum, each antenna would be self supporting with no guy wires required. These three antennas would be placed in a triangle pattern with a coaxial switch being used to select one individual antenna, or any combination of two of the three antennas. The ground counterpoise would consist of a minimum of 36 radials , 5 feet long for each antenna.

Feeding this triangle array is simple. There are many vertical array designs out there. Many of them try to feed the antennas 90 degrees and 180 degrees out of phase to achieve multiple direction patterns while using just two antennas. The feed switching becomes over complicated. The phasing lines need to be cut exactly to formula, and then pruned. A lot of work! A lot of failures! In my opinion adding a third antenna is a lot less complicated than trying to make two antennas work in four directions. With this three antenna system, you will actually have six directions to work with. The feed system for the three antenna phased array is simply to cut the coax feed to equal lengths for all three antennas. If you need to cut one of the antennas feedline to 20 feet to run it over to the antenna switch box, then make all the antenna feed lines 20 feet. This is called feeding the antennas in phase and requires nothing but a good eye. No formulas to worry about.







Placement of the three antennas are critical to the success of this antenna. Each antenna needs to be equal distance between each other to work properly. There are some choices here though. According to the ARRL Antenna book, two verticals fed in phase has gain broadside to the antennas. The gain depends on the separation of the antennas. The gain patterns to the right were taken from the ARRL Antenna Handbook. 3/8 wavelength would be the minimum distance between antennas for usable gain. This would give 2.4 db gain over a single vertical antenna and a very broad pattern covering much of the broadside of the two antennas. ½ wavelength would be the next step up, giving 3.8 db gain and yet still a fairly broad pattern. 5/8 wavelength would be the last step, giving a whopping 4.8 db gain over a single vertical antenna. This spacing gives a fairly narrow pattern and starts to produce side lobes running along the antenna line. Anything over 5/8 wavelength results in a reduction of gain, so we need not go any further. The choice of spacing should be based on how much room one has, and how much gain one considers enough.

My choice would be the maximum gain of 4.8 db with the 5/8 wavelength spacing. I say this because there will be 6 directions to choose from, filling in the holes the narrow pattern creates. Just make sure the broadsides of the antennas are in directions you wish to work. My second choice would be ½ wavelength spacing. This spacing would more than double your relative power output. A nice option.

While the antenna array works in 6 directions, you only need a switch that will allow three antenna pairs and a single antenna (for omni directional work). The antenna selector will only have four positions. Remember, the antennas radiate broadside to each other with an equal pattern on each side covering two directions at once.

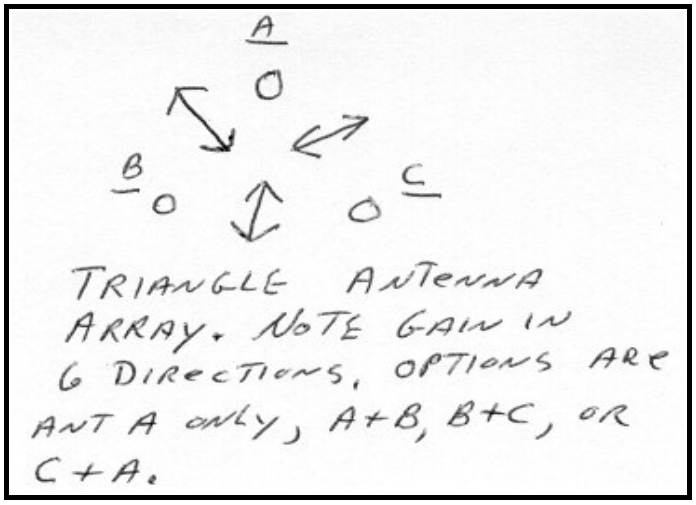
With this simple feed system there is one drawback. Putting two resonate antennas in parallel creates a miss match in the feedline. If Both antennas have an SWR of 1:1, then when they are fed in parallel, the SWR will be 2:1. I have said for years that on HF, one can run as high an SWR as 3:1 or 4:1 without much loss. I still maintain this to be true and would simply use an antenna tuner to keep the transmitter happy. One of the rigs with an internal antenna tuner would be ideal for this. For the purists, coaxial baluns can be made with a 1:2 ratio. This would boost the now 25 ohm mismatch back to 50 ohms and return your system to 1:1 SWR. This is not a construction project. The ARRL Handbook has more on baluns, as does the ARRL Antenna Book. There is also at least one commercial product that will do the job for you. This commercial product lets you select 1 to 3 matched antennas in any combination and maintains the match for you. All you have to do is make sure all three of your coax cables are cut to exactly the same length.

To build the antenna system, the vertical antennas must be kept isolated from the ground. One way to do this is to drive an aluminum tube rod the same diameter as the lower part of the antenna into the ground. Then insert a fiberglass rod into it and mount the antenna on the fiberglass rod. Then you attach the radials to the tube in the ground and to your coax braid. Thin inner conductor of the coax would be attached to the antenna itself. Cut the antenna for minimum SWR.

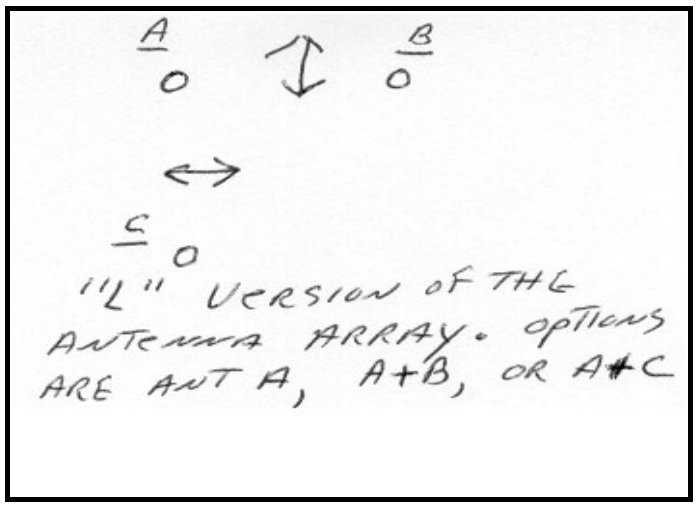
Too cheap to use aluminum? Not a problem. If you have two or three trees lined up correctly, you can use wire for the antenna. Just run rope about 17 feet high from tree to tree and hang the wires from the rope the correct distance apart. If you cannot get the antennas lined up as a triangle, don't sweat it. Using a "L" shaped configuration will still give you a choice of 4 directions. If you are only interested in one direction, all you need is two antennas (or two trees broadside to the direction you wish to work). You can then just attach the antennas to a coaxial "T" fitting. No switches to complicate the matter and you have gain in two directions. Place two antennas broadside to Europe, and you also cover the South Western part of the U.S.A. too.

Two of these antenna lined up broadside to the East and West Coast would make a really good Field Day antenna. I would then go with the ½ wavelength spacing. A bit lower gain, but covers more ground.

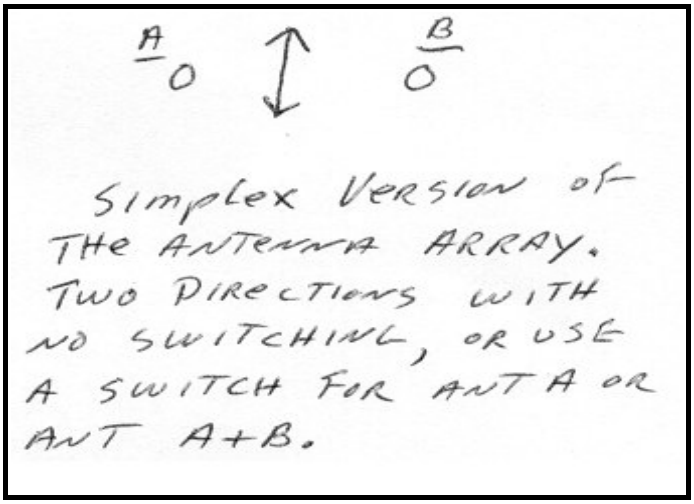
That wraps this one up. Please see my drawings. They should clear up any questions you have. I am always willing to talk antennas at the meetings. So, if you have questions about this antenna, please come to the meeting.



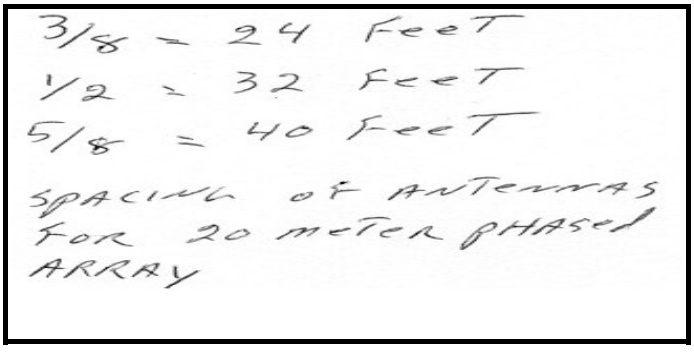
TRIANGLE ANTENNA ARRAY. NOTE GAIN IN 6 DIRECTIONS, OPTIONS ARE ANT A ONLY, A+B, B+C, OR C+A.



"L" VERSION OF THE ANTENNA ARRAY. OPTIONS ARE ANT A, A+B, OR A+C



Simplex Version of the ANTENNA ARRAY. TWO DIRECTIONS WITH NO SWITCHING, OR USE A SWITCH FOR ANT A OR ANT A+B.


3/8 = 24 Feet
1/2 = 32 Feet
5/8 = 40 Feet
SPACING OF ANTENNAS FOR 20 METER PHASED ARRAY

Membership Form

Club dues run from Jan. 1 until Dec. 31 and are collected during the last quarter of the year. You can mail in the dues to the address below or bring them to a meeting. Dues Schedule: $20 regular, $10 for second member in the same family, $10 for over 65 years of age, and $15 for those living outside Knox County.

Mail Dues to: **Mt. Vernon Amateur Radio Club, P.O. Box 372, Mt. Vernon, OH 43050**

Name_____

Call-Sign_____

Street_____

City_____State_____Zip Code_____

Phone Number_____

License Class_____

ARRL Member (Y/N)___ EMail_____

Extra Donation (Optional)_____

Members are entitled to a free MVARC E-Mail address.

Would you like one? No_____Yes_____

If yes please enter password_____

The Mt. Vernon Amateur Radio Newsletter, CQ, is published monthly by the Mt. Vernon Amateur Radio Club.

Editor: Don Russell, WA8YRS

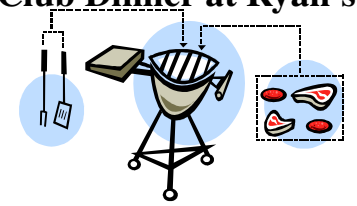
President: Ruben Clarke, KB2SAI
Vice President: Don Russell, WA8YRS
Secretary: Jeff Butz, N8SMT
Treasurer: Bob Bruff, N8PCE

Credits: Clip Art and Cartoons thanks to http://wm8c1.50megs.com/radio_clip_art.htm, http://www.qsl.net/k4adl/, http://pages.prodigy.net/kg0zz/clipart/ham_art3.htm, http://www.arrl.org/,

The ARRL letter is a weekly e-mail publication by the ARRL. You may read the entire ARRL letter by visiting the ARRL Web page at http://www.arrl.org/. Other News from: http://ky4ky.com/fyi.htm

Project OSCAR is a monthly column written for Newsletter Editors. Columns will appear as space permits. You may download all the articles yourself at: http://www.projectoscar.net/beacon.php

Club Dinner at Ryan's



February 13, 2006 at 6:00 P.M.
All Local Hams Are Invited