

The next meeting is Sept. 28 at **6:30 p.m.** See article for details.

Historical CARC

This article was printed in the December 27, 1972 edition of the Cary News. The interview was conducted by Jo Helen Woodie in the home of Mike Smith, WB4WQG, (SK) with Bill McMurray, K4SG, present. Mike was an avid Field Day operator with Bill keeping the logs while Mike made the contacts. In time, both Mike and Bill were awarded life memberships in the Cary Amateur Radio Club. If this prompts any remembrances of Mike, or any other former CARC member, forward them to the editor for a follow-up in a future Feedline.

Caryite Visits the World From His Wheel Chair. by Jo Helen Woodie

This is the time of year to wish everyone a 55, but the time is always right to send 88 to a Y L.

These letters and numbers, puzzling to the majority of Cary News readers, are no mystery to radio hams.

Mike Smith, one of Cary's newest ham operators, translates the codes; 55 means Merry Christmas, 88 is Love and Kisses, and Y L means, girl, young lady. The son of Mr. and Mrs. Claude Smith of 1500 Cary-Macedonia Road, Mike received his general operator license a few weeks ago, one year after getting his novice license. He explained that a speed of five words per minute in International Morse Code is required for the first, and it must be brought to thirteen words per minute for the General Operator's license. The novice test was taken in Winston Salem and the final examination in Norfolk, Virginia.

"Ham radio is the only hobby that requires a federal license, and Mike is the only person I know who did not make a single mistake during his sending period," commented Bill McMurray, who is responsible for Mike's current interest.

Mike's accomplishment is the more outstanding considering that he has muscular dystrophy, has been confined to a wheel chair for the past twelve years, and can only move his fingers to operate the set. McMurray, owner of Radio Communications in Cary, is a radio man from way back. The Rutherford County native came to this area in 1956 to attend NCSU (then State College) after his discharge from the Air Force.

Two-way radio communication was a hobby with the electronic engineering student, but it grew to such proportions that upon graduation he has job cut out for him. The hobby became his livelihood, the installation and maintenance of professional two-way communications systems.

McMurray, a former engineer for WNAO, WKIX radios and WNAO TV, the channel 28 of long ago, used to stay with Mike's grandparents in Greensboro where he worked at a radio station before his military hitch.

Unlike McMurray, to Mike, radio operating is a new love. Loaned some books on radio communications a few years ago, he barely looked through them, never fully reading any. Then, while in Boys Scouts where he attained the Eagle Rank, Mike learned the Morse Code. The material in the books and the knowledge of the code were stored in the back of his mind and temporarily forgotten, until McMurray told Mike about a code class being given by the Raleigh Amateur Radio Society and encouraged him to attend.

Once bitten by the bug, Mike went from his first \$100 crystal-controlled set to the Collins "rig" he now uses, KWM-2, a much more sophisticated VFO transmitter-receiver with more power and clearer reception.

The new set was bought with Mike's own savings. It took his almost two years to economize enough from his wages for the big expenditure. Mike keeps the control cards for his father's firm Cast-A-Stone, an architectural pre-cast panel's manufacturer; it is a bookkeeping of sorts where job work hours are recorded and man-hours can be predicted for future jobs.

Mike said that McMurray installed the antenna, put together the set, and helped him to master its operation. He also took Mike to classes and accompanied him to take his tests with the Federal Communication Commission.

Asked the difference between CB Radio and Ham Radio, Mike explained that in CB one uses vocal communication while hams use both voice and Morse code.

Mike has established contact with 4-5 states and is shooting for the award given all radio hams who manage to contact all fifty states.

"It's a chance thing," he explained. "It is not like making a phone call or directing radio contact to a certain place. You turn the set on a band, call out identifying yourself, and maybe someone will answer, maybe not. Sometimes there are a lot of people on the air, other times no one."

"You can also direct your calls after establishing initial contact; after talking to someone for the first time it is customary to exchange cards through the mail.

Mike has a file box full of cards from all over the world; of his several contacts abroad, the farthest being in New Zealand.

Asked whether his hobby had a practical application, he nodded in affirmative and cited as a recent example a call from a John Sherwood, who is in the Canal Zone, with a message to his wife who was visiting in Cary. Sometimes radio-hams establish communication when telephone calls do not get through.

McMurray explained that the greatest service rendered by radio amateurs is during natural catastrophes such as floods, fires, or hurricanes: "When telephone and power lines are down, radio is the only means of communication. Battery-operated sets are all people have at these times to send for help."

"But the principal value of amateur radio operation", he continued, "is that they have one of the nicest portions of the radio spectrum, one that everyone wants. In time of national emergency, such as in time of war, the government can take over our frequency in a matter of minutes."

Cary Radio Club, of which Mike and McMurray are members, hopes to be able to relay messages to and from Cary High School Band members while they are in California, but arrangements are not yet completed.

Mike, who graduated from high school at the Wake County Cerebral Palsy Rehabilitation Center, is a young man of many interests and has devoted much of his energy to scouting. In order to earn the ranks some modifications had to be worked out in the requirements, and he smiles recalling how his father had to push him five miles in a wheel chair. "I guess I was the only one who wasn't tired at the end, and father was probably the most tired of them all..."

A philatelist and numismatic, Mike minimizes the importance of his stamp and coin collections and considers both very limited; he is being modest. Also interested in ceramics, Mike has made several beautiful pieces, including a complete Nativity scene which he gave to his church.

My pet hobby now is to get on the radio as often as I can." said Mike.

McMurray said that besides using the international Morse code, ham radios also have an international "Q" code which breaks language barriers. "For instance", he cited, QTH ? means "what is your location?" in any language, and QSA asks about the quality of the reception. Then there are the numbers, like 73 meaning "Best Regards Y and even "I love you" can be abbreviated to 38."

But, since the code is rather limited, Mike may be considering taking foreign languages next That's not an easy challenge, but if anyone can meet it successfully, William M. (Mike) Smith, Cary's newest radio ham, certainly can.

Mike bid the reporter farewell and turned back to his radio set, but not before wishing everyone a 55 and sending 88 to all Y Ls

Fox Hunts! Bunny Hunts!! T-Hunts!!!

Whatever you prefer to call hidden transmitter hunts, one thing's for sure, they all mean the same thing: FUN! CARC is planning to enjoy one of these activities during our regular club meeting on September 28, 2000. This hunt will be very similar to the one held a year ago when Charles, KE4CDI and Jeff NX9T wound up stumbling across the "fox" first. So, guess what? They are the ones "hiding" this time. Come out and play! Plans are to meet at 6:30pm in the church parking lot. Come a few minutes earlier if you can and partake in some pre-hunt socializing. You know, "my antenna beamwidth is narrower than yours" or "my attenuator has 1 db more reduction ability than yours"...blah blah blah...Anyway...the "Fox" will start transmitting at approximately 6:45. This hunt will be primarily a mileage based hunt. That means the person/team with the least amount of mileage on their odometer will be declared victorious. If a tie results the first person/team to find the fox will be the winner(s).

The check in process will begin at 6:35. This will include confirming teams, odometer readings, and any last minute instructions from the fox team. This may include transmitter information (wattage, transmission cycles, antenna(s)etc...), geographical borders, etc...

This is a special event with CARC and we hope that you all can come out. Obviously directional antennas are helpful and a signal attenuator can't hurt...BUT....many have been successful with merely an HT doing "ye ole body fade" approach which can be taught to you in about 15 seconds. Don't let a lack of equipment stop you from enjoying this experience. There are many practical applications for the skills associated with fox hunting. If you haven't been out on a hunt yet...NOW is the time! If it's been a while....NOW is the time. If you're an old seasoned "pro"...NOW is the time to come out and possibly introduce a newcomer to this aspect of the hobby.

If you have any questions, feel free to contact Charles, KE4CDI or Jeff NX9T.

Fox Hunt Addendum I

Experienced hunters know anyone can get close to the fox, but it's the last 100 yards that separate the serious hunters from the rest of the pack. To help you zero in on the peskiest of transmitters, ALLTRONICS, www.alltronics.com, 408 943-9773, in San Jose has an RF Field Strength Meter Kit (\$29.00) that detects RF in the 100KHz to 500KHz range at low levels. The circuit has an adjustable attenuator to handle high and low power levels. The kit includes an etched and drilled circuit board and all components (except a 9 volt battery) including a case, antenna, and attractive analog meter.

Fox Hunt Addendum II

If anyone would like to use the "quadmobile", complete with the Carolina Crow Catcher, give me a call to arrange a vehicle swap. I have a class at 6:00 and will not be able to hunt. KM4LB

What Can I Do?

Amateur Radio is about three things. First it is about communications. Second it is about fun. Third it is about public service. Everyone in amateur radio offers something unique to contribute to the hobby. When we describe amateur radio to our friends, we can describe it not as a hobby, but as a group of hobbies centered around camaraderie and communications. Few of us have the time or interest to participate in all facets of the hobby, but we have a few favorite activities that we concentrate on which change from time to time. When we come together, we learn about the other parts of the hobbies from our friends who have different interests. The Cary club has had the good fortune to have members interested in most areas, even though we are small. Naming each activity brings a different group of members to mind. I list these in no particular

order and I know that I am leaving some out: Public service, ARES, Skywarn, DX, Traffic Handling, Satellite, VHF, CW, RTTY, Slow Scan/Fast Scan, Packet, Contesting, Ragchewing, UHF, Moonbounce, Foxhunting, Elmering, SAREX, Hamfesting, and all of those things that I left out.

We are a small group with many different amateur radio interests. Not surprisingly, we also have non-amateur related talents as well. There is something unique that each individual can contribute to the Cary Amateur Radio Club. Don't wait to be asked. Volunteer! If you have a particular talent or area in which you would like to contribute, tell an officer. If you would like to do anything that is needed, speak up and make your willingness known. If on the other hand, you have an idea that you think would be a "neat idea" of a club activity or project, bring that forward, too. If you are not able to implement it, there may be someone who can. If you volunteer to do something and need help, there are quite a few members waiting to be asked.

Bottom line is don't be shy about volunteering, giving out your ideas, or asking for help. Start by writing a short article for Feedline and contributing it to your editor each month. By reading this article, you can see that it takes nothing but an idea of something to say. I plan to try to contribute a "this-n-that" type column each month. That's not what I want to call it since it's not a unique name, so if you have a good idea for a name for my column, let me know (I'm doing as I say and asking for help.) I would love to see our editor have so many contributions that he can reject MY column for the month due to lack of space and due to having your columns to take its place!! Some ideas for columns include a column of "Heard on .39" with tidbits of information about our members (formerly contributed by N4UTT). It would also be interesting to read an article about your personal experiences in one of the above activities. We can read about the activities in general terms, but tell us about your experience. Write about how you got your start in amateur radio. Contribute any items of local interest. If you can spend 5 minutes ragchewing on CW, Phone, or VHF, you have something interesting to say that we have not yet heard.

A second point is if you have a neat idea that you cannot implement on your own and you need help, ask. If nobody speaks up and says yes, identify a specific member who you think would be good to help and ask that person. Chances are, you will get a yes answer. I know people who have heard a general request go out and said nothing, but they whispered to me, "I could do that if they asked me."

Until next month (unless there is a lack of space next month), WA4AKB

Retractions and Corrections to the August Feedline.

According too Alf, KQ4FP, credit for increasing the club's membership goes to Ed, AB4S who spotted the technique being used at the Durham hamfest, not JARS. Despair not tho, JARS does take membership applications during JARSfest.

Alf asked me to thank all those who helped sign all the new members up. He couldn't come up with a complete list of names, and not wanting to offend anyone by omission, settled for this broadcast thank you. Alf blames his affliction with "half-timers" for the lost names and call signs. Again, thanks to all ticket sales volunteers.

Virginia Beach Hamfest

Plan a wonderful Family Weekend on Saturday & Sunday, September 23-24 at Virginia Beach. The opportunities are many, but you should focus on: THE 25TH ANNUAL VIRGINIA BEACH HAMFEST -VIRGINIA BEACH PAVILION, DOORS OPEN AT 9:00AM.

Tickets are \$5 in advance, \$6 at the gate. Check our website at www.vbhamfest.com

Come and talk with the representatives of Major Manufacturers. They will answer all your questions about their newest equipment and older as well.

There will be plenty of Tailgaters with Used Equipment Bargains, and all sorts of Parts Suppliers and related items.

The Exam Session will commence on Saturday at 2:30 PM promptly. If you need to take an exam, you MUST pre-register with Ed at (757) 898-3774 or by email at w4rtz@juno.com Please give your name and your Objective for the day. You will pay \$6.65. You MUST bring your Original License & Photocopy, any CSCEs with Photocopy. Two (2) IDs are required, one with a photo. New Form 605 will be supplied at check-in. Announcements and Signs will tell you how to get to the Exam Room.

ALSO, PLAN TO TAKE THE FAMILY TO WATCH THE BLUE ANGELS IN THEIR WORLD-CLASS AEROBATICS AT OCEANA NAVAL STATION THAT WEEKEND.

Do you have a friend that is interested in joining our Amateur Radio "family"? Bring them along!

Swapfest Committee Minutes

Alf Johnson, KQ4FP

On September 7th the CARC Swapfest Site Committee met to discuss the various suggestions we have received from members regarding potential sites for Swapfest 2001. Bill, WA4ONO. CARC President was also present. Unfortunately the most promising locations, especially those at the Fairgrounds, were not available for the traditional date of the Cary Swapfest. Options such as cutting costs at the site we now occupy, which appear do-able, require further research.

The importance of the role of all the Club's members in this process was discussed. I have been asked by the Committee to request *all* club members (both new and old) to continue to look for promising sites to hold Swapfest 2001 on its usual date. Moving the location is going to be disastrous enough without also having to move its date. If you or your neighbors or anyone you know has any suggestions about where we might hold Swapfest 2001, I want to hear from you.

We have plenty of time to do research, as our deadline is in January (which is the deadline for reserving our present site), but with the Thanksgiving and Christmas holidays in the months of November and December, it is urgent that you continue to search out sites which are large enough for our Swapfest, have parking, and some place to hold VE exams. I thank you for any suggestions you can provide. Please email me at KQ4FP@ARRL.NET and I will forward your suggestion to all members of the committee. Despite all, we remain confident that we will have several sites to bring before the membership for consideration. Whether we will have the BEST option depends on how well you beat the bushes! (The previous statement is not subject to the equal time doctrine. ed.) 73, Alf KQ4FP.

Solar Update

Solar shaman Tad Cook, K7VVV, Seattle, Washington, reports: Solar flux and sunspot numbers were up over the past week. Average solar flux was up more than 17 points, and average sunspot numbers rose more than 40 compared to the previous week. The peak in activity didn't exactly coincide for the two indices, with sunspot numbers first reaching the peak at 214 early in the week.

So when will this solar cycle peak? NOAA has some new projections. If you look at <http://www.sec.noaa.gov/weekly/pdf/prf1305.pdf>, it shows smoothed sunspot numbers peaking in December 2000 at 140. The predicted progression for smoothed sunspot numbers for August 2000 through June 2001 is 136, 137, 138, 139, 140, 139, 138, 139, 138, 137 and 136. A similar table for smoothed 10.7 cm solar flux shows the predicted peak around March, 2001 at 189.

All this is good news for hams hoping for a further peak in solar activity. The best is yet to come, and we can look forward to interesting activity this fall and next spring.

For this week, projections show solar flux peaking around now and then dipping down to a short term minimum around September 21, with the next peak around October 5.

Sunspot numbers for August 31 through September 6 were 214, 195, 177, 181, 169, 144 and 150, with a mean of 175.7. The 10.7 cm flux was 162.9, 157.7, 154, 154.1, 170.8, 180.2 and 178.7, with a mean of 165.5. The estimated planetary A indices were 15, 17, 23, 9, 14, 8 and 11 with a mean of 13.9.

Phased Dipoles for Field Day

by B Smith KO4PY and P Stroud AA4XX

At ARRL Field Day and ARCI Field Day this year, we used simplified versions of Peter Anderson's continuous phase control system to drive wire dipole arrays on 40 and 80 meters. (Verticals with Continuous Phase Control, ARRL Antenna Compendium, vol 3, p 37). In addition to rotatable beams for 10, 15 and 20 meters, we used phased pairs of dipoles propagating north/south (N/S) on 80 and 40 meters. This allowed us to instantly switch the pattern front to back, up and down the east coast, with about 20 db of F/B on 40 meters. All of the dipoles were about 65 feet up. Since they are only 2 elements in each case, suspension did not present any significant problems.

We used three set-ups: A "parasitic wirebeam" (two equal-length dipoles, parallel to each other, with only one dipole driven) which provides a bi-directional broadside radiation pattern with modest gain and slight F/B ratio. A "dipole with director" array used a conventional driven dipole element and a parasitic director 6% longer than the driven element. This provides for a unidirectional radiation pattern with good gain and F/B ratio. Our "phased wirebeam" is physically identical to the parasitic wirebeam, but with both elements driven. The 40-meter version uses 25 foot spacing between the dipoles and are fed with 130 degree phase difference to provide good gain and F/B ratio.

Models

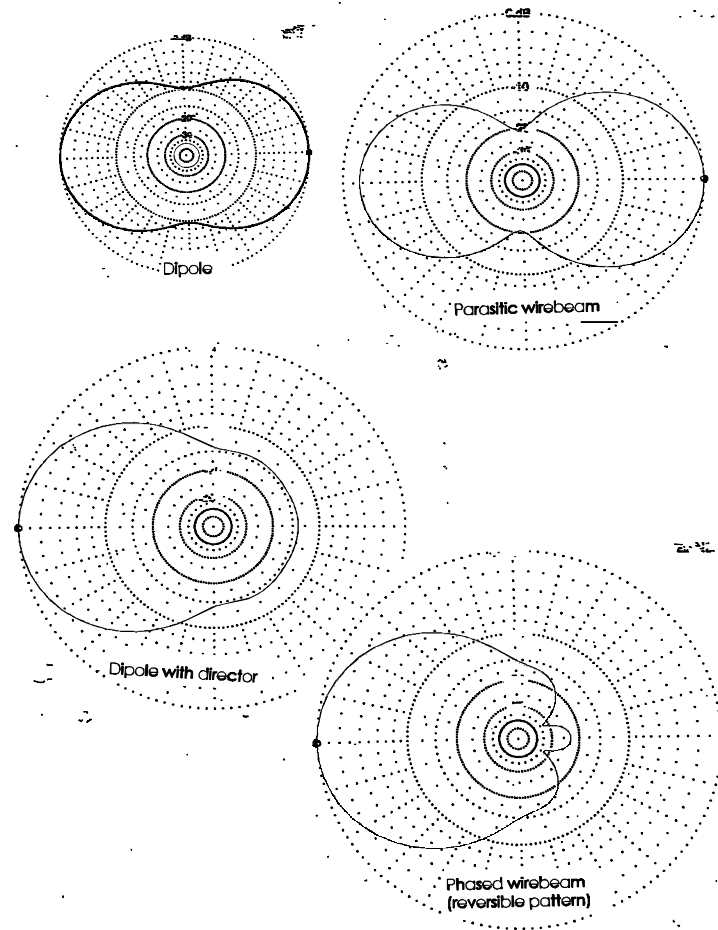
EZNEC predicted the following performance.

Table I - 40 meters	Gain (dbd)	+3 db beam width	F/B (db)
Dipole (one element)	0	88	0
Parasitic wirebeam	2.7	67	2
Dipole with director	3.5	77	14
Phased wirebeam	3.9	78	23

The 80-meter phased wirebeam consists of two identical dipole elements separated by 50 feet, with 150 degree phasing. Due to the low electrical height of the 80-meter antenna, there is a compromise between gain and F/B. Greater spacing and lower phase angles can be used give better F/B ratios but slightly lower gain. High F/B ratio can be an asset when setting up and optimizing the system by ear in the field. If a 'scope is used for setting the phase angle, on-the-air listening for the backside null is not so critical for optimization. It is possible to use other arrangements with wider spacing of the dipole elements and phase angles around 105 degrees to get F/B ratios of over 20 db at reasonable heights.

Table II - 80 meters	Gain (dbd)	+3 db beam width	F/B (db)
Dipole (one element)	0	**	0
Parasitic wirebeam	3.1	89	6
Dipole with director	2.5	91	9
Phased wirebeam	3.5	85	13

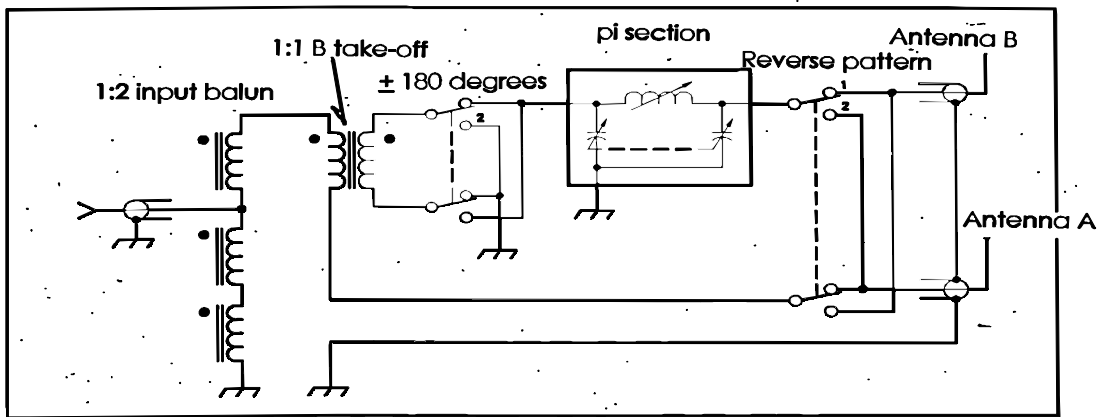
Figure 1: Predicted patterns for 40 meters. Relative size indicates gain.



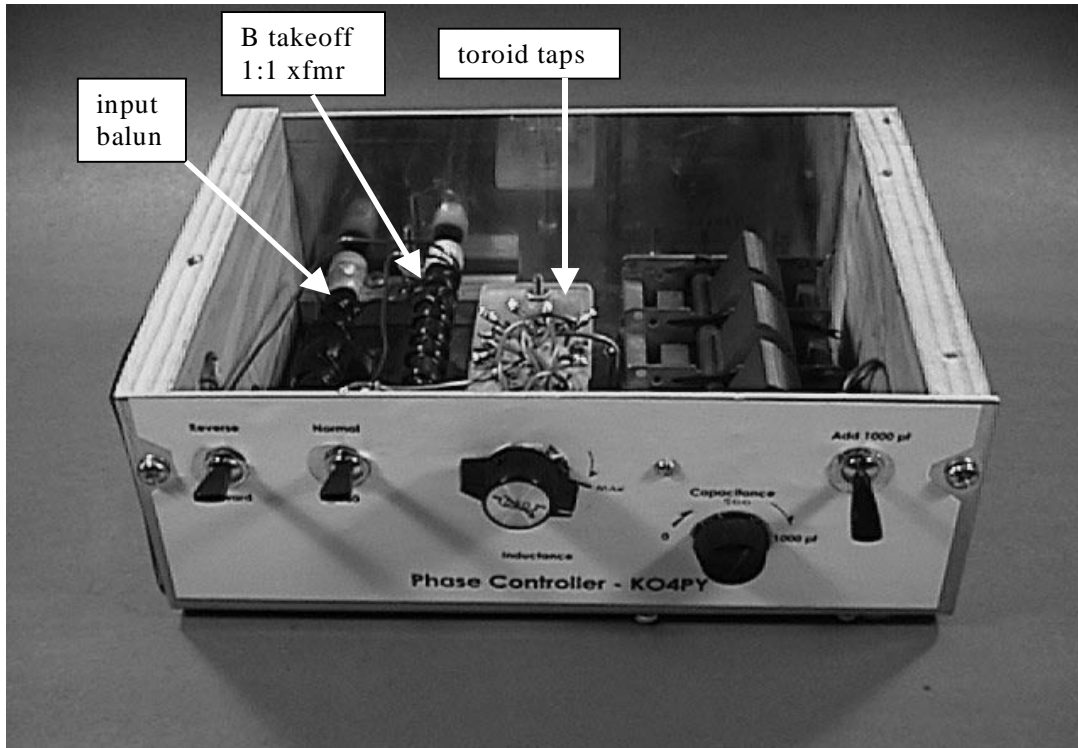
We previously used phased wirebeam arrays to good advantage on higher bands for various other QRP events like the ARCI QSO parties and Spartan Sprints.

Continuous phase control

We used a simplified version of Anderson's phase control, where one antenna is fed from the source and the other is fed in series through a LC pi section causing a phase shift. Output A has the same phase as the source, but output B is shifted. The basic circuit and junkbox fabrication are shown below:



The pi-section toroids are under plastic tap support. Input balun and takeoff transformer are wound on Amidon R61-050-750 rods.



To simplify the phase controller, we used identical resonant dipole antennas and identical feedlines to allow for very simple switching as shown above to reverse the pattern instantly from F/B. Phase can be set with an oscilloscope, or by ear (set the controller to give maximum F/B, or listen for the best backside null of a signal). If using a 'scope, the LC values are set up give the desired phase difference with equal amplitudes for the two outputs. For this testing, it is convenient to use an SWR analyzer as a signal generator, two $\frac{1}{4}$ watt resistors for dummy loads, and a dual-trace oscilloscope to observe the phase. The tune up "tweaking" can be done by on-the-air listening for the backside null if no scope is available.

It is possible to get the same phase shift with different combinations of LC values, but generally one set of values will give more equal output amplitudes, and a better 50 ohm match. Direct adjustment of the LC values gives from 0 degrees to well over 90 degrees of phase difference. Other phasing differences are easily accomplished by switching system as explained below. There is a learning curve as to how to set up the controller (L, C, switching), but once set for a given band, it is not necessary to adjust for within-band frequency changes. As the feedpoint phase angle increases, one dipole generally will increase in resistance and the other will decrease. In addition, one develops a $+j$ reactance component and the other develops a $-j$ reactance component. But the series arrangement for driving the two antennas seems to work well with 50 ohm input sources, as the two effects offset each other to some extent.

In addition to LC adjustments, two switches ("reverse" and " ± 180 ") enable full 360 degree phase control. The "reverse" switch simply changes the A and B antenna connections. If the antennas and the feedlines are identical, then the pattern will reverse. The " ± 180 " switch adds (or subtracts) 180 degrees to the phase shift of output B only. This increases the possible ranges of shifts, but does not reverse the pattern.

Desired Shift	"Reverse" Switch	"±180" Switch	Capacitor Value	Shift Range Produced As Capacitance Increases
0 to 90	NORM	ZERO	0 to 1000 pf	0 to 90 degrees
180 to 270	NORM	ADD 180	0 to 1000 pf	180 to 270 degrees
270 to 360	REV	ZERO	0 to 1000 pf	0 to -90 degrees
90 to 180	REV	ADD 180	0 to 1000 pf	180 to 90 degrees

As to LC adjustments, capacitance has the greatest effect on phase change. A dual-section ganged air variable in the 0 to 1000 pf range is entirely sufficient to go from 0 degrees to well over 90 degrees of phase shift on all bands, with proper inductance. Different inductance values are required to keep equal amplitudes at the outputs. Our controllers (typical) have dual homebrew 15 turn 2.8 mh inductors on T80-6 toroids with 12 taps.

Of course, it is often possible to go well beyond the 0 to 90 degree shift range by selecting the proper LC values, without using any switching. But even if the LC network can not produce the desired shift directly, switching can produce the desired result.

Results

The field results were satisfyingly close to the model results. The 40 meter 2 element phased wirebeam was an outstanding performer with clearly 3 S-units of F/B. Based on the results and reports received, its gain also left little to be desired.

Running 5 watts QRP into wirebeams, we snagged about 375 search and pounce (S&P) QSO's on 40 meters in 17 operating hours with this set-up. As expected from the models, the 80-meter set-up we used at field day did not have as much F/B discrimination. Only 1 S-unit or less of F/B was noted. However, the wirebeam performed very well on 80 meters, with 112 QRP S&P QSO's in just over 5 hours of 80-meter operation.

So, in practice, each of these low-band wirebeam arrangements produced a respectable results of about 22 QRP S&P QSO's per hour, compared to a rate of about 25 with multi-element rotatable beams for 15 and 20 meters.

On-air experiences in other events, like the Spartan Sprints and the ARCI QSO parties, have shown outstanding F/B performance of 3 or more S-units for both transmitting and receiving on 7 mhz and higher frequencies.

Conclusion

Models of phased wirebeams on low bands show 3-4 db gain over a dipole, and their performance in practice is outstanding. They have very effective F/B on 40 meters and higher bands, where the antennas are sufficiently high, with 3 S-units of F/B for QRN/QRM rejection. Phased wirebeams are quite easy to set up and operate, and the pattern is instantly reversible F/B. A simple continuous phase control unit built from common junkbox parts can be used for all bands.

Acknowledgement

Thanks to the entire field day team and especially Jim Price N3QYE for helping construct and erect the antennas used for this test.

Mystery Shack



August's Shack

Many CARC members have visited my shack...just not this version!

New, freestanding, cantilevered shelves, wallpaper, and a paint job wiped all vestiges of the old haunt. The CW Sendin' machine was the clue.....not many of them around!

KM4LB

September's Entry



Mystery Shack Equipment

MFJ 949E Versatuner 2
MFJ 851B meter (not in use)
MFJ Econokeyer 2
IC2AT connected to MFJ 1270
TNC
Kenwood TM261 2-meter HT
Globe and Pigs
Kenwood MC-50 mic. (not in use)
Kenwood VFO 520S (Ext. VFO)
Kenwood TS 520
Alinco ELC 230G 2M Amp for HT
Astron 20-Amp supply

Contact KM4LB with your guess.
klimala@mindspring.com

If you would like your shack featured in *Mystery Shack* contact Ed, AB4S, or submit picture files to the editor along with a text file describing the equipment.

Feedline

Feedline is a member-supported publication of the Cary Amateur Radio Club and is published monthly. Deadline for submissions is the second Thursday of the month. Editor, Tom Klimala, KM4LB, 1545 Seabrook Ave. Cary, NC 27511 klimala@mindspring.com