

QRZ NEWS

A MONTHLY PUBLICATION OF
SOUTHERN PENNSYLVANIA AMATEUR RADIO CLUB, INC
PO BOX 1033 - LANCASTER, PA 17608-1033

(Founded June 1960)

AN AFFILIATED SPECIAL SERVICE CLUB OF THE ARRL, INC.

"Public Service through Communication"

Website: www.K3IR.org

Email address: k3ir@arrl.net

Repeaters: 145.230 - 449.975 - Packet 145.030 - ATV 923.250, FN10se

April 2010

President's Message

Last Sunday, April 18, was a.... (OK how many of you remember Pete Wambach?) "beautiful day in central PA." Pete always opened his radio show with those words, even if it was a terrible day. Well the 18th was a beautiful day for a number of reasons. Yes the weather was nice but even better was the fact that a number of Amateurs got to play with our radio and put the best face of Ham radio forward.

You see, Sunday was the annual MS walk in Lancaster. Thanks to the hard work of Rick, N3SWJ some amateurs from SPARC and the Red Rose Repeater Association were privileged to provide communications support for the walk. I was stationed at the corner of Race and Buchanan, next to Buchanan Park. It was a great couple hours of people watching, greeting walkers, making sure walkers made the turn instead of going straight up Race Street, and humbly accepting the thanks many offered for coming out to help make the event safer.

Every year I can be sure two things will happen. About a dozen people will stop to ask what is going on and a motorist will stop for directions. The first question is easy but that second one is often difficult for me. You see, I am a Lancaster Countian by address only. 4319 Snavely Road,

Elizabethtown happens to be in Dauphin County so I only occasionally pass through the city of Lancaster. This year I was able to be of help because the lady who stopped was looking for Route 30 east. I may have sent her the long way around but it seemed to me that eliminating as many turns as possible was the prudent way to go.

Another situation arose that made me stop to think. A lady came up to me and noticed the Amateur Radio Communications vest I was wearing and said that she has always been interested in becoming a Ham. I was wishing I had something to hand her which

Table of Contents

President's Message	Page 1
March Meeting Highlights	Page 2
Field Day 2010	Page 3
Recycle Program	Page 3
Coming Events	Page 4
Editor's Notes	Page 5
ARRL Tour	Page 5
ARES/RACES Information	Page 7
SPARC Officers, Nets, Etc.	Page 7
QRZ News Publication	Page 8
Arecibo 432MHz EME Report	Page 8
Parabolic Antenna Calculations II	Page 9
Azimuth & Distance Calculations	Page 10
Microwave Activation Challenge	Page 13
Beacons...Why Have Them	Page 14
Microwave Beacon Update	Page 15
SPARC Site Horizon View	Page 16

would give contact information for the area Clubs. I did tell her that Red Rose and SPARC members were assisting with the walk and urged her to look us up. I hope her memory is better than mine.

I would again like to thank Rick for coordinating this effort. I also want to thank the wives of the following Hams for allowing their boys to come out and play.

Vern, N3VK
Conrad, WB3DQD
George, W3FEY
Jon, K3QF
Dave, N3LOM
Gerry, KB3SSZ
Mike, N3XPD
Mark, KB3NCJ
And yours truly, WA3FFK

One spark member, who will remain nameless, must have been bad because he wasn't allowed to come along. In addition I think there was one more RRRA member there but I don't have his name on my list. If I did miss someone please accept my apology.

73s,
Harry Bauder, WA3FFK

**MINUTES OF THE MARCH 2010
MEETING OF THE
SOUTHERN PENNSYLVANIA
AMATEUR RADIO CLUB
(SPARC)**

Held Wednesday, March 17, 2010 at 7 PM
at the Rapho Township Municipal Building

The following members and guests were present:

Paul Herr, KD8WY
George Gadbois, W3FEY
Jerry Wilson, KB3GNB

Ted Freedman, K3KSA
Dave Sarraf, N3NDJ
Harry Bauder, WA3FFK
Steve Hass, KB3SJU
Mike Warner, N3XPD
Jim Silvius, KW3E
Jon Rudy, K3QF
Gerry Wagner, KB3SSJ
Dan Milligan, KA3KHR
Richard Hess, KB3LOJ

The meeting was called to order at 7:00 PM
by Harry Bauder.

Jon Rudy gave the technical presentation on the upcoming Field Day Exercise. A few highlights from Jon's slides and talk include:

- The start time depends on the amount of prior setup. If we set up on Friday then we need to start later on Saturday.
- We will be using individual logging computers; logs will be collated by Jon later after the event. This should not result in much duplication, since the logging computers will likely be segregated by band. Suitable software includes N1MM, Logger 32, CT, or Ham Radio Deluxe.
- We want to get some multipliers and will be running on battery power and on generator power. We would also like to have a satellite station set up. This will take practice with the equipment before the event and plotting of the available passes on the day of the event.
- Consider inviting Boy Scout troops (or other interested organizations), and a public official such as Jere Swarr.
- Publicity to include press releases in the Elizabethtown and Manheim merchandisers and in the Lancaster newspapers.
- Based on a recent communication with our liability insurance carrier, we cannot

have alcohol at the event. Signs will be posted.

The business portion of the meeting started at 7:55 PM with a round robin introduction by name and call. Harry had several announcements, including

- The meeting dates will change to the 2nd Tuesday (BOD) and 4th Tuesday (General Membership) of each month. This will require a change to SPARC's bylaws; we are reviewing them for other possible changes and will present the recommendations as a package to the membership for discussion and vote.
- The prior BOD meeting minutes were read and discussed. On a motion by Paul Herr and a second by Gerry Wagner they were accepted as presented.
- April 3 is a work day. This includes an Adopt-A-Highway cleanup. Start time 9:00 am.
- Future presentations include an ARRL video of a DXpedition to Peter I Island in April and a presentation by Chris Patterson in May.
- Ted presented the Treasurer's Report. On a motion by Gerry Wagner and a second by Paul Herr it was accepted pending review by the audit committee.
- Due to the change in meeting day we agreed to move the club net to Tuesday at 9:00 PM starting on April 6th.

Respectfully submitted,
Dave Sarraf, N3NDJ
SPARC Secretary

A Day in the Field

The following Field Day needs will be discussed at the March club meeting. If you can help anywhere, but cannot attend the meeting, please contact Jon directly.

A. Logistics; food, awnings/tents, outhouse supplies

B. Equipment/Antennas; power, radios, antennas, masts, cables/connectors, logging computers and interfaces

C. Operations; operator schedule, modes, satellite tracking schedule

D. Publicity; photographic documentation, writer for the newsletter, contact media, provide greeting/explanations for newcomers

Jon Rudy – [K3QF](http://www.k3qf.com)
SPARC Field Day Coordinator

Recycle Program

Recycling is not restricted to club members. Help SPARC and help a green initiative. Aluminum cans are easy to collect and they bring a good price. Recycled paper prices are up a little.

Recycling is an important part of the income required to keep the club operational. All recycling revenue is now being applied directly to the SPARC site mortgage.

Please take recyclables to Dave Payne's mini recycling center at 1373 Malleable Rd, Columbia or to a SPARC club meeting.

The SPARC super heavy duty pickup truck previously used for transporting recycled paper is now for sale. If you know anyone who might be

interested, contact Dave Payne,
N3LOM.

Coming Events

Tuesday 27 April 2010 7:PM SPARC membership meeting at the Rapho Twp. Municipal Building, 971 N. Colebrook Rd., Rapho Twp.

Mike Wagner, N3XPD, will present a report on the Peter I Island DXpedition. This is an ARRL produced program. Everyone interested in Amateur Radio is invited.

Astronomy Enthusiasts of Lancaster County (<http://aelc.us>)

Saturday, May 8 – Robert Naeye Talk

Mark your calendars, the details are set. Bob Naeye will give a talk for the AELC and the general public on **May 8 at 1 p.m.** Please help us in spreading the word. I'm planning on having some flyers available for our next meeting. The topic will be Hubble's Greatest Achievements.

Ed note: Bob Naeye is Editor of Sky & Telescope magazine.

Tuesday 25 May 2010 7:PM SPARC membership meeting at the Rapho Twp. Municipal Building, 971 N. Colebrook Rd., Rapho Twp.

Chris Patterson, W3CMP, will present a report on his 2009 6m DXpedition to 8R1DB. This is a very timely topic as the 6m Es season will be in full swing. Come and get operating tips from an expert.

Everyone interested in Amateur Radio is invited.

June 12-14UTC ARRL June VHF QSO Party

Tuesday 22 June 2010 7:PM SPARC membership meeting at the Rapho Twp. Municipal Building, 971 N. Colebrook Rd., Rapho Twp.

Jon Rudy will finalize Field Day plans for the weekend. Everyone interested in Field Day is invited to attend.

Tuesday, 22 June 2010 Peach Bottom drill. Contact Walt, K3DQB for details.
navmars@vfd.net

Saturday/Sunday, 26-27 June 2010 ARRL Field Day

See Jon Rudy's Field Day column for details

Tuesday, 6 July 2010 1100UTC Earth at aphelion, 94,508,351 miles from the Sun. Approximate peak of the Summer Es season.

Saturday/Sunday, 24-25 July 2010 MS BIKE – Lancaster contact Dick, WA3USG
wa3usg@verizon.net for details.

Monday-Sunday 20-26 September 2010 Wide Vigilance III drill. No details available at this time. Expect the early part to be table top exercises with any Amateur participation probably at the end of the week.

See the November 2008 QRZ News for a report on Wide Vigilance II.
http://www.k3ir.org/QRZ_News/QRZ_News_November_2008.pdf

Editor's Notes

The Summer Es season is showing some life as I write this on the 21st of April. Dust off your 6m SSB/CW gear for the great DX coming in late May through July.

Polarization is rotated somewhat traveling through the ionosphere, but you will do best with horizontal polarization.

The latest ARRL newsletter reports no sunspots for the first time since early December. The good news is that Es does not require sunspots to provide some propagation excitement.

Elsewhere in this issue, there is an article on updates to the MWL (MicroWave Lunch group) beacons at Red Lion. We have had several discussions on restoring and/or adding to the 10GHz beacons in this area.

We would like input from anyone in the area interested in getting on 10GHz or improving existing stations. For example, would there be interest in an answer back beacon that reports your received signal strength? Is there some area that is just crying for a 10GHz beacon of any kind? See John Jaminet's article on why beacons for more details.

73, George, W3FEY

ARRL Tour

By Harry Bauder, 'WA3FFK

At 6:00 AM on March 11 four members of SPARC, Mike N3XPD, Conrad WB3DQD, Harry WA3FFK, and Gerry WB3SSZ assembled at Gerry's home. We boarded Gerry's Limo for the 1 ½ or so hour drive to the Warminster Senior Center which happens to be the Warminster Amateur

Radio Club's headquarters. Once there we boarded a very nice bus for the 4 hour trip to Newington, Connecticut. On board, in addition to the 4 SPARC members, were 24 WARC members and 2 from the RF Hill Radio Club.

After a quick rest stop at the Montville Rest across the Tappan Zee Bridge into New York then on to Connecticut. We stopped for lunch at a shopping center near Newington. After lunch it was on to Mecca!

Upon exiting the bus we did our best Japanese tourist imitation by taking multiple pictures of everything from the impressive antenna farm to the iconic W1AW building and the less photographed headquarters building.



Photo by Gerry, KB3SSZ

It takes a long time for 30 people to sign in and fill out a name tag but we finally got that taken care of and the tour began. Our rather large group was split in half, a task which went better than I expected. The four Sparcies (my wife's term) all managed to get into a group led by ARRL Test Engineer Bob Allison, WB1GCM. We toured the Headquarters Building first. This two story building, completed in the late 1960s is located behind the world famous 1938 W1AW building. The hallways were filled with pictures and displays from the history of ARRL. Of particular interest to me was the RF shielded product test lab. The rather

small room was filled with exotic test equipment and some home brew test fixtures. A \$1.00 23 channel CB set was among the equipment – used to see if linear amps really notch the 11 meter band. Bob told us that once the door is closed he can test an HF receiver with no interference from the outside world, even when W1AW is transmitting bulletins of 5 HF bands at 1000 watts each!

Along the way we met some of the staff of the ARRL. It was interesting to see how the various publications come together and how much of the business of the organization is conducted. I never really gave much thought to what goes on there.



Photo by Gerry, KB3SSZ

Did you realize that in addition to W1AW there is also an employees' station located in HQ? The call sign is W1HQ, or employees may use their own call signs. No, employees may not operate while they are "on the clock".

After about two hours we traded places with the other group and proceeded to W1AW. Just inside the back door are some historic displays. A vintage receiver and transmitter donated to the league by Joe Walsh, guitarist for The Eagles, are set up on Hiram Percy Maxim's roll top desk. Also displayed was Hiram's spark transmitter.

There are four operating positions available in the building. Mike, Gerry and I were content to just stare wide eyed at the impressive equipment. Conrad did get a chance to operate as W1AW. In this building you are required to ID as W1AW, you may not use your own call.

At the assigned time most of us boarded the bus for the return trip. This part did not go as smoothly as part of the group was reluctant to leave W1AW and some were still trying to get that perfect picture. Finally we all got aboard and started back to Warminster. The return trip seemed much longer than the trip north but we made it back to the Senior Center before 9:00 and piled into the Wagner Shuttle for the drive back to Mt. Joy.

It was a long day, but one that I enjoyed. I think we all learned something from the trip. One thing that Mike learned is that bus travel is not for him!

73, Harry, WA3FFK



Photo by Gerry, KB3SSZ

ARES/RACES



As part of the SPARC commitment to emergency communications, the SPARC repeater system is maintained as available for linking with other area repeaters.

Lancaster County RACES VHF Net is held on the first Tuesday of the month at 2030 hours local time. Presently being held on the 145.310 MHz repeater.

The Lancaster County primary ARES/RACES repeater is on 145.310 MHz with minus offset and 118.8 PL.

Combined York County Amateur and ARES/RACES NET convenes at 8:30 PM (2030) Mondays on 146.97.

Pennsylvania RACES HF Nets are held at 3993.5 kHz LSB on all Sundays except holidays.

The statewide net is on the first Sunday of the month at 0800 hours local time.

The Central Area (including Lancaster County) net is at 08:30 local time.

SPARC Nets

Note the new time for the SPARC net.

SPARC holds nets on the 2nd, 3rd, 4th, and 5th Tuesday (every Tuesday except the first) at 2100 local time on 145.230 MHz minus offset and a PL of 118.8. The 449.975MHz repeater is linked to the 2m repeater for the net.

Club Officers

President Harry Bauder – [WA3FFK](#)
Vice-President: George Gadbois – [W3FEY](#)
Secretary - Dave Sarraf. - [N3NDJ](#)
Treasurer - Ted Freedman - [K3KSA](#)
Repeater Trustee - Dave Payne - [N3LOM](#)
Past President - Mike Warner – [N3XPD](#)

Board of Directors - Jim Silvius – [KW3E](#)

Nearby Nets of Local Interest

York County Sponsored Nets:

Combined York County Amateur and ARES/RACES NET convenes at 8:30 PM (2030) Monday on 146.97.

Tuesday Nets (Note new schedule for Technical Net)

Elmer/DIGITAL NET -- Tuesday, 8 PM on the York 146.97 Repeater --
The first 15 minutes or so will be open to questions. DIGITAL Communications testing will continue after that.

Friday Digital Net

Friday evenings starting at 8 PM on the 146.610 (PL:131.8 Hz) EARS repeater on Ephrata Mountain.

This is an excellent Digital net called by Bob, AB3GF. Check in is by digital, BPSK125. It is an informal, well run net with plenty of Digital transmissions along with discussion by voice.

NTS-EPA

AA3RG and Echolink Traffic Net" (EAETN) meets every Thursday at 8:00pm on AA3RG-R 146.640(-) Tone 82.5 both Echo Link and 2m radio check ins welcome. No previous experience needed. Just perfect for new hams on 2m or EL on AA3RG-R CONFERENCE.

Please join in and let others know about it as well.

73 -Scott N3SW EPA STM

Delaware Co. Mobile Sixers Net Schedule
Sunday 2000 50.550 MHz USB

PACKRAT MONDAY NIGHT NETS TIME FREQUENCY NET CONTROL

7:30 PM 50.145 MHz K3EOD FM29II
8:00 PM 144.150 MHz N3ITT FN20kl
8:30 PM 222.125 MHz K3TUF FN10we
8:30 PM 224.58R MHz W3GXB FN20jm
9:00 PM 432.110 MHz WA3EHD FN20kd
9:30 PM 1296.100 MHz W2SJ FM29LW

10:00 PM 903.125 MHz W2SJ FM29LW

Visit the Mt Airy VHF Radio Club at: www.packratvhf.com or www.w3ccx.com

2M Northeast SSB Net Mon – Fri, 0700 check on 144.200MHz for possible DX openings. 0730 – 0830 net on 144.176MHz. This is a very long running net that runs from NJ up the coast to CT and beyond.

QRZ News Publication

QRZ News is published monthly on the second Tuesday of each month, two weeks before the monthly meeting. Deadline for article submission is the second Monday of each month. If a large amount of editing is required, earlier submission is requested.

We operate on an exchange basis with other non-commercial publications. Articles printed in QRZ News may be reprinted in a not for profit publication provided proper credit is given. Reprinted articles require permission from the original source.

QRZ News is archived at http://www.k3ir.org/QRZ_News.html. Documents are in PDF format.

Dave Payne, N3LOM, recently found a paper copy of the first quarter 1999 issue of QRZ News. This is the oldest copy of QRZ News in the archive. The next oldest copies are from 2001.

Arecibo 432MHz EME Report

By Joe Taylor, K1JT

Hello to all,

I'm home again, but not yet unpacked and re-organized...

Many thanks to all stations we worked from KP4AO -- and our apologies to the many more who called without completing a QSO. The Arecibo telescope's short moon windows were frustrating for all, ourselves included.

The "wall" of stations calling was simply

incredible. A rough estimate suggests that we may have worked something like 20% of the callers potentially workable on SSB, 10% of those workable on CW, and only a few percent of those workable on JT65. I guess we'll have to do it again, in due course...

From memory: our log shows nearly 240 completed QSOs with some 57 DXCC entities, in a total of 8 operating hours. Later, when I have the log in front of me and get caught up at home, I'll be able to report breakdowns of SSB, CW, and JT65B QSOs and say something about the QSO rates in each mode.

We made recordings of the whole 432 MHz EME sub-band for most of the time KP4AO was on the air. In due course it will be possible to "tune the band" carefully, many times, picking out callsigns. If/when this is done, I'll be happy to post a list of received callsigns.

Here's a request for all:

1. If you worked us with a setup significantly smaller than is normally required for EME, please send me a short note describing your antenna, receiver, and Tx power.
2. If you copied us with a small setup, please send me details on your antenna and receiver.

I know we worked and were heard by some pretty small setups, and I'd like to document some of them for a write-up in QST.

Many thanks, and see you on the moon!

-- 73, Joe, K1JT

Members of the Arecibo Observatory

Amateur Radio Club who constructed and operated the KP4AO station for this event:

Angel, WP3R
Pedro, NP4A
Angel, WP4G
Jim, WA3FET
Joe, K1JT

Additional guest operator: Pat, AA6EG

Further Arcibo Details

Sent Thursday, April 22, 2010 9:58 AM

Many thanks to all who sent reports of small antennas used to copy KP4AO, and QRP systems used to work us.

In case you haven't seen them, be sure to check out the OK1TEH reception of KP4AO in JT65B with a "rubber ducky" antenna at

http://ok1teh.nagano.cz/emepic/kp4ao_at_ok1teh_eme.png

and also the AF1T/W1MKY "pickle dipole" at the end of the excellent video at

<http://www.youtube.com/watch?v=ZutOfYLPIMY>

As I mentioned here before, we made recordings of the whole 432 MHz EME sub-band for much of the time KP4AO was on the air. With appropriate software (e.g., SpectraVue or Linrad) it's possible to "tune the band" in these recordings, picking out callsigns. I spent an hour doing this, last evening. Here's a sorted list of the CW calls I scribbled down as I listened:

9A5SG 9H1BT AE6EQ DF1HF DF1VB
DF3RL DJ1RPL DJ5BV DJ8MS DK2ZF
DK7AN DK9TF

DL3HXS DL5RDI DL6SH DL7FF E73O
F2CT F5SE/P F6BCU G3LQR HB9BZA
IK1HWG IK6EIW
K1DS K1DY K2TXB K4RTS K6AAW
K6TSK K7NT K7XC K7XQ KB8U KE7L
KH7Y KL7HFQ LA0BY
LU1C N2NQi N4SCS N8OL NA6MF
OH3HLJ OH6NVQ OK1VVT OK1YK
OK2GMO OK2UYZ OM5CM
ON5OF PA2CHR PA3DOL RW6AG SF6X
SM7GEP SP3YDE SP6ITF UR6IWZ
UT5CW UT5JCW
VE2JWH W1FKF W1MKY W2CNS W3EP
W3KWH W3SZ W4DEX W7CS W7IY
WA2ODO WA3DRC WA3XX
WA9KRT WB2SIH WB6JZY WW1M
YL2HA YL2OK YT2RA

No double-checking has been done, and almost surely there are mistakes or typos in this hastily-assembled list. But you get the idea...

I probably will not have time to do more of this in the next week or so. If anyone else is interested in listening to our recordings, perhaps to see if your signal is there, let me know and I will post them for public access. Fair warning: the files are *big*, about 1 GB each. And you'll need to know how (or learn how) to use SpectraVue, Linrad, or another such program.

-- 73, Joe, K1JT

Parabolic Antenna Calculations II

Revised Round Parabolic Antenna EXCEL by W3HMS/K4ITO

Thanks to Jean-Louis, F6ABX, we have an additional column called "Beam Width at -3 dB" on the right hand side of the EXCEL calculation spreadsheet. J-L not only suggested it, he

programmed it in place, with our many thanks indeed!!

The calculation spreadsheet is available on the SPARC website at http://www.k3ir.org/SPARC_Software.html.

73, John, W3HMS, 19 Apr 2010

Azimuth & Distance Between Radio Sites

By James L. Ibaugh, AA3C

While listening to a QSO on a very distant VHF repeater via Echo Link, the gist of the conversation was how to find the direction and distance between two ham radio DX sites. They were planning a DXpedition with UHF and 10 GHZ equipment. Pointing QRP 10 GHZ dish antennas on DX sites is never easy. It's not easy at the home QTH either, especially on a very small budget operation.

Basic equipment needed for the mission of finding direction and distance.

If you don't have a GPS unit, the next best things are a magnetic compass and a good set of maps with longitude and latitude calibrations on the edges. On good maps, there is information about magnetic declination, the difference between true north and magnetic north. It will vary from location to location, therefore, from map to map. Magnetic North is 11°30'0" west of TRUE NORTH at my zip code.(3/16/2010) <http://www.ngdc.noaa.gov/geomagmodels/Declination.jsp> U.S.Gov. A five function pocket calculator: add, subtract,

multiply, divide and SQRT. I got my 5F solar powered calculator with a plastic case at the local dollar store for \$3.95 about nine years ago and it still works, no batteries to go flat. Big slide rules are also good for this job. I used one when I was was a sergeant in the USAF. Basic information needed for the mission of finding direction and distance.

Latitude lines run east-west. Longitude lines run north-south. Degrees of latitude and longitude can be further subdivided into minutes and seconds; there are 60 minutes (') per degree, and 60 seconds (") per minute. This form, D° M' S" is called sexagesimal coordinates. Degrees can be expressed as a decimal. Another way to look at the above relationships is that each degree has 3,600 seconds in it. Convert the minutes (') into seconds (") then add all the seconds together and divide by 3,600 and you should have a decimalized degree.

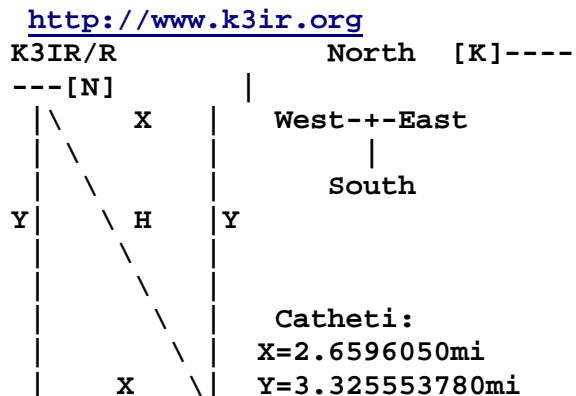
www.QRZ.com raw data source.
K3IR = 40.167800°N, -76.454800°W
AA3C = 40.091448°N, -76.416255°W
<http://www.csgnetwork.com/gpsdistcalc.html> Where "there is ONLY a degree designation. (DDD.DDDD) A maximum of 4 decimal places is adequate." I like and use only decimal expressions because of their ease of calculator and computer entry. A degree of latitude is approximately ~69 miles all the way to the North Pole (90°N) and down the other side. A degree of longitude varies in size. At the equator, it is approximately ~69 miles, the same size as a degree of latitude. The longitude degree size gradually

decreases to zero as the meridians converge at the poles. At 40° N the size is reduced to 43.555555mi/69mi or 63.1% of their size at the equator. This is what makes the azimuth math so tricky and Scalene Geometry Math so handy. A degree of longitude is ~69 mi at the equator (0°lat.) and ~49 mi at a latitude of 45°N, so a change of 20 miles[69mi-49mi] in 45°. So our QTH at 40.091448°N, with 40°/45°= 0.8888888888888889 and 49mi * 0.8888888888888889 = 43.55555555555556 mi per degree of longitude at AA3C & N3CXY's QTH. Looking at the diagram below, the longitude measurement is in the X axis; the horizontal distance between north-south longitude lines.

Latitude line to line distances do not change from the equator to the North Pole; 69mi per each degree. Latitude can be diagrammed in the vertical Y axis; the vertical distance between lines.

(Y)K3IR-AA3C: 40.167800°-
 40.091448°=0.076352°*43.55555555
 mi= 3.3255537806mi = Y
 (X)K3IR-AA3C:76.45480°-
 76.416255°=0.038545°*~69.0=
 2.659605mi = X

Diagram not to scale.
 Courier New type font needed.
 <K3IR/R> 40.167800°N -76.45480°W
 ("LATEST MEASUREMENTS"!.....
 It moves?).... ..



+-----[A]
 AA3C's QTH
 <AA3C> 40.091448°N -76.416255°W

AA3C & N3CXY's QTH(X)is
 2.659650 miles east of K3IR's
 longitude and SPARC's K3IR/R QTH
 is 3.32555378mi (Y) miles north
 of the AA3C QTH latitude.

Pythagorean Theorem

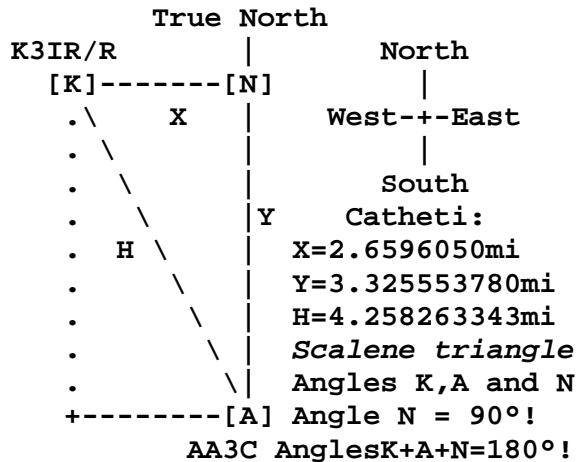
c = SQRT [(a^2)+(b^2)] ::A^2=2*2
 H = SQRT [(X^2)+(Y^2)] = SQRT
 (7.073498756025+11.05930794367229)=
 H = SQRT (18.13280669969729)
 H = 4.25826334315966 miles.

Conclusion for distance:

Betwixt AA3C & K3IR/R is 4 1/4
 miles. OK, so it's 4 miles 1363
 feet and ~7.5654 inches!

Scalene Geometry: AZIMUTH

Diagram not to scale.



Scalene Geometry Math.

A scalene triangle has no equal catheti (sides) and no equal angles. If X = Y, then angles A=45° and K=45°, obviously this is not a scalene triangle, but the scalene math still works. Since the angles A and K share a part of 90° in proportion to their opposite sides X and Y respectively. Larger opposite sides yield larger angles proportionally.

Angles A + K must add up to 90°
 Angles A+K+N must add up to 180°
 X+Y = 5.98515878 divide factor,
 X/X+Y = 0.444366657220078=
 44.436665...%
 Y/X+Y = 0.555633342779922=
 55.563334...%
 A = 90°*0.444366657220078=
 Angle A = 39.99299914980702°
 K = 90°*0.555633342779922=
 Angle K = 50.00700085019298°
 Proof: A + K = 90.0000° wow!
 A very good proof.

Conclusion for azimuth:

From AA3C's QTH the azimuth of K3IR is slightly west of north or 360°-39.99°= 320.01° True. The reciprocal azimuth from K3IR to AA3C's QTH is south-east, 320.01°-180° = 140.01° True.

<http://www.es.flinders.edu.au/~mattom/Utilities/distance.html>

Online Calculator [Definitely Scalene!]"Plain Sailing Method", PSM since Pythagoras's times BC. "This calculator determines the distance between two positions on the earth's surface, using the 'plain sailing' method, which connects the two points by a straight line. (This method should therefore not be used for large distances, or the straight line will go through the earth's interior.)...." AOK method for VHF and UHF radio distances. Trigonometric methods may be a little more accurate but much more difficult: $\sin A = X/H$ or $\cos A = Y/H$. www.csgnetwork.com Another more accurate formula: $D = \text{RadiusEarth} * \text{ACOS}(\text{COS}(\text{RADIANS}(90 - (\text{Lat1} * 24))) * \text{COS}(\text{RADIANS}(90 - (\text{Lat2} * 24))) + \text{SIN}(\text{RADIANS}(90 - (\text{Lat1} * 24))) * \text{SIN}(\text{RADIANS}(90 - (\text{Lat2} * 24)))) * \text{COS}(\text{RADIANS}(24 * (\text{Long1} - \text{Long2}))))$

SNAP QUIZ: What is the length of a sexagesimal longitude coordinate second at latitude of 90.000 degrees true north?

Your Mission: Scalene Math

Now it's your turn. Pick up a set of coordinates (not too large a distance) from two other ham radio call sign searches via www.QRZ.com. Select station details. Subtract the longitudes and the latitudes. Use a little math, to calculate the X and Y variables. Then use Pythagorean Theorem to get the Hypotenuse or H variable which is the distance part of your mission. You have your variables and formulas to do the Scalene Planar Geometry Math for the azimuth part of your mission. If you get a good proof, you are a Master of Scalene Planar Mathematics. Tally ho!

AA3C's Closing Comment:

Notice that Scalene Math can be done with only five math functions. You don't even need a calculator or a computer. It works with pencil and paper as long as you can remember how to do 'SquareRoot' by hand.

No sine/cosine/tan/anti-logs type math operation needed with this very old method that was used long before trigonometry was invented. Maybe Christopher Columbus used Scalene Math to discover America! Do you think the Egyptians might have used Scalene Geometry to build the pyramids?

73's de AA3C - Jim (USAF vet)
AA3C@ARRL.NET AA3C@AMSAT.ORG
 .-.-. .-.-.

Microwave Activation Challenge

By John Jaminet, W3HMS

Are you interested in getting on the microwave bands? Here is a low cost way to get started with some free equipment support. Only the equipment is free. You must do the work. See the following formal challenge document for details.

Become Active on 10 GHz at very minimal cost

1. **Background.** 10 Ghz operators want to see other amateur radio operators join them. To make that possible, I propose to give the following equipment to the contest winner(s) as defined below. This equipment is first rate in all respects and I have made some fine contests with each unit:

A. Kuhne Electronics 10 GHz transverter 250 mw output, dish, feed, tripod...needs some cables, batteries and 2m all- band IF. VDC is 12.6 at abt 2 amps. Documentation to be provided.

B. Kuhne Electronics 10 GHz transverter, 2 watt amplifier, 32 in round dish which needs some work, feed, tripod...rig needs some work for portable mounting....to use needs batteries, some cables, and 2m all -band IF. VDC is 12.6 at abt 8 amps. Documentation to be provided. If purchased new, each rig would cost about \$1,000.

2. **Purpose.** The purpose of this offer is to stimulate curiosity, thinking, initiative, creativity, planning, tenacity, and a real love for amateur radio. This offer is extended to any licensed ham living per license address

within a 60 mile radius of the state capital building in Harrisburg. I know that a least a two- person team is critical to success, therefore, the 2 or more names will be specified.

3. **QSO.** I expect to make a QSO on 10 Ghz with the winner(s) using the equipment and a normal modulation mode at a distance greater than 5 miles in portable mode within one year of taking possession. The equipment will be considered on loan as title will pass after the QSO is made. Initial equipment transfer will occur in Mechanicsburg, PA at a time and place of mutual agreement. As the expression of initiative is a goal of this project, the response to this offer may be discussed with anyone in the world **except me.**

4. **Applications.** Your application/request will be reviewed by a panel of technically competent and experienced amateurs with a view to selecting the team or institution with the highest probability of success; final decisions will be made by me. Requests will not be returned. The winner(s) will be notified. Institutions are considered to be educational in nature with an amateur club and/or a technical environment with a faculty member serving as leader. Conventional radio clubs do not qualify. Equipment resale in under 5 years voids the purpose of this offer.

5. **Equipment Winner.** The winner(s) will mail a paper hand signed and postmarked no later than 1 July 2010 to my QRZ address giving their full name, call letters, mail address, and phone number. The same data will be supplied for each team member.

6. **Focus of Application.** The paper will stress the reasons for wanting the equipment and state in no less than 12 key steps the

actions to be taken to make the equipment fully operational in portable mode to make the QSO described above.

John Jaminet, W3HMS

Beacons.....Why Have Them?

By John Jaminet, W3HMS

You have just finished your new QRP CW/SSB transceiver for 7 Mhz and you want to test it. So you hook up an antenna and hear nothing but atmospheric noise. You just know that something is wrong for 40 meters is ALWAYS occupied...well isn't it? Yes, with rare exceptions you can depend on 40 m. to have some activity. Ok, it is back to the bench to fix the problem.

Now the scenario is "You have just finished your new CW/SSB transceiver for 1296 Mhz and you want to test it". So you listen to 1296.1 MHz for activity as your Editor told you there was activity there and you hear nothing. So you trouble shoot for the next two weeks same scenario as the frustration mounts and your bar bill climbs as you hear nothing! Then one Monday about 2145 local W3FEY's signal damages your S meter while George is talking with me. The answer of course is 1296 MHz is busy ...sometimes!! Is there a better way in the VHF and up bands? Yes, of course there is and it is, not surprisingly, a beacon.

A beacon is an unattended transmitter operating on a single frequency, often on a high hill or tower usually with an omni-directional antenna 24/7. Our 1296.255 MHz beacon uses telemetry so we can copy in Morse Code the beacon temperature, bus voltage, blower on/off, and outside temperature and record same in an EXCEL spreadsheet that converts the values to

"people info". This beacon uses a horizontally polarized antenna as that is what weak signal operators use. We also operate beacons at 2401 MHz with circular polarization for satellite operators and 5760.215 MHz at with a horizontally polarized omni-directional antenna. The power output for the first two is about 1-1.5 watts and 5760 MHz is 200 mw.

Beacons Part 2

As John W3HMS mentioned in the previous article *Beacons ..Why Have Them?* Part 1, I will try to explain in Part 2 a bit about the Telemetry (TLM) contained in the Beacons signal.

The Beacons signal is CW , decoded will look something like this;

'w3hms/bcn w3hms/bcn fm19qv fm19qv qsl to w3fey@verizon.net 060 040 187 011 (Then aprox. 10sec of Key Down Carrier.)'

Then it repeats..... To make any sense of the 12 Numbers it is easier to have the spreadsheet designed to display the values assigned to these numbers by the A/D converter on the keyer board. ie; In the above message the first three numbers are the Power supply Voltage = 13.235DCV, the next three numbers are the temperature of the electronics = 80°F. The next three numbers are the RF Power output of the 2401MHZ beacon = 1.15W. The last three numbers are the outside temp. = 22°F.

This description is for the 1296 and 2401 MHZ beacons, the 5760 MHZ beacon ID Message is similar. All beacons are in the same weatherproof box.

If you would like more info regarding

our beacon messages or a copy of the spreadsheet to decode the TLM, contact me. We are always interested in signal and TLM reports from your location.

Charlie K3VDB

See http://www.k3ir.org/SPARC_Software.html for a recent copy of the Excel spreadsheet for the 1296 and 2401 beacons. There are almost no reports for the 5760 beacon. Your reports are eagerly awaited.

Microwave Beacon Update



After being off the air for maintenance and hardware updates for several months, the MWL sponsored beacons were reinstalled on the Red Lion tower with generous assistance from Ron KA3CNT.

The call sign has been changed to W3HMS and QSL information is included in the transmitted message. We are very interested in signal reports for reception since the update. Copying the telemetry is a plus. So far the most distant report has come from Doug Moser, WA2LTM, in Cranbury, NJ.

Frequency MHz	Grid	Power Out mw	Antenna Type	Polarization	Altitude ASL Ft..
1296.255	FM19qv	1500	Alford Slot	Horizontal	1130
2401.00	FM19qv	1100	Lindenblad	RHCP	1130
5760.21	FM19qv	210	8 slot	Horizontal	1130
10368.90	FN10ni	Off the air			1300

23cm BEACONS LIST by WZ1V (Abbreviated to local area)

1296.054 W3APL FM19ne MD Laurel 8W to slot @ 120'
 1296.062 WD4GSM EM86qv VA Wise 5 Watts to Alford slot 4200' asl.
 1296.187 NO2G FN21rd NJ Hardyston 100mw. - Hamburg Mtn.

1296.200 WA4PGI FM07 VA 5 Watts to Alford slot
1296.223 K3LNZ FM09gg MD Backbone Mtn 5W to 4 Little Wheels
1296.244 W3CCX FM29jw PA Philadelphia 5W to Alford slot @ 435'
1296.255 W3HMS FM19qv PA Red Lion 1.5W to Alford slot hor. @ 1130' asl
1296.280 N4MW FM17kn VA New Kent 6W to yagi @ 30 deg, freq. is GPS-locked.
1296.300 K2DLL FN23xc NY Providence 40W ERP stacked W6OAL MiniWheels



Looking North K3IR club site, 1715 Breneman Road, Rapho Twp. Lat. 40.16700, Long. 76.45480, 600' ASL, FN10se