



November 2022

THE BIG ISLAND HAMGRAM

The newsletter of the Big Island Amateur Radio Club

Got a ham question? Tune in to BIARC Tech Net

The easiest way to get well-thought-out answers to your burning Amateur Radio questions is to tune in to the BIARC Repeater (146.760) at 8 p.m. every Wednesday.

You'll either receive a direct solution to your quandary, or you'll be steered in the right direction by those who've been there before.

The BIARC Tech Net started sometime around early January 2020. Originally conceived to help with getting up to speed on sound card modes, it quickly expanded to include all technical topics. Jim (WH6FQI) and Roy (KH6KU) were the original Net Control Stations, with Gary (WH6EPS) acting as a guest net control for a short time. In months with five Wednesdays, William (NH6ET) would (and still does) act as net control. On those nights, he

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RADIO DIRECTION FINDING

BY LESLIE HHTNER
KOBAD

FOX HUNTING



Built in 2007, KOBAD's 'Model T' RDF system still does the job.



HISTORY

Radio direction finding is probably as old as the art of radio communications. Certainly, since the military began using radio communications, direction finding, or RDF, has played a central role in navigation and signal intelligence. Amateurs use RDF principally for foxhunt contests and for locating the source of illegal or unauthorized transmissions on Amateur Radio Service frequencies.

TRIANGULATION

Triangulation in RDF is a method of locating a radio transmitter by taking multiple LOB (Line Of Bearing) bearings and plotting them on a map. The radio transmitter will be found at the junction of the multiple LOB bearings. Two such bearings are required as a minimum. As additional bearings are taken, the probable location of the transmitter can be more precisely defined, since each individual LOB is subject to any number of sources of error. As the number of LOB bearings increases the effect on the location estimate of each individual error decreases.

DISADVANTAGES OF DOPPLER

- * Switched doppler is susceptible to switching noise which acts as modulation sidebands.
- * The typical vertically polarized doppler system does not
- * work well with horizontally polarized signals.

MY DOPPLER RDF SYSTEM

- * It was really fun to build.
- * It was unique at the time I built and began using it.
- * I have only used my Heath handheld with it. As noted above, performance can be affected by receiver design. I should perhaps experiment with some of my newer Yaesu handhelds to see if it performs better or worse.

Let's take a look.

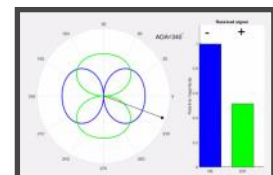


KOBAD demonstrates his homemade system.

Photos by Linda Quarberg, WH6LQ



KOBAD turns to NH6ET for insight into interferometers.



The fun and satisfaction of successful radio direction-finding, or "fox hunting," was the focus of our Oct. 8 program held at the Keaau Community Center and

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A BIT ABOUT DOPPLER RDF SYSTEMS

While doppler systems have a few advantages, they come with several disadvantages. Nevertheless, they are fun to build and experiment with. I have had good results with my doppler system, but surely must acknowledge the disadvantages.

DISADVANTAGES OF DOPPLER

- * Doppler is sensitive to fox frequency. The doppler receiver measures the phase shift from the antenna to the FM demodulator. Any change in receiver system phase shift appears as a substantial directional error.

DISADVANTAGES OF DOPPLER

- * Doppler is sensitive to rotation frequency and FM demodulator distortion.
- * Doppler is sensitive to modulation audio.
- * Doppler antenna patterns are very sensitive to nearby antennas and reflections.

DISADVANTAGES OF DOPPLER

- * A doppler DF can only display the direction of "ONE" transmitter. If there are any other signals (reflections, other transmitters, adjacent channel junk, computer noise, synthesizer spurious signals, harmonics of clock oscillators, ignition noise, images, etc.) the reading will be erroneous. The reason most dopplers have rather large antenna ground planes is to reduce ground bounce.

BIARC Christmas party:

2 p.m. Saturday, Dec. 10, at Keaau CC.
Watch for email with sign-up details.

FOX HUNTING

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shared on Zoom.

President Les Hittner, K0BAD, brought the direction-finding system he built in 2007 and demonstrated its use. With the speed at which technology advances, "it's now a Model T," Les noted, "but it still works."

While fox hunting for fun is the primary interest of hams using such equipment, "if we get good at it," it can come in handy in helping to pinpoint illegal stations, for example, said Les.

Back in Minnesota, Les experienced his "most fun fox hunt" ever. He worked with a ham friend to zero in on a guy who had stolen a radio from the railroad. They found the thief sitting on his porch, transmitting in attempts to contact the railroad. The ham super-sleuths called the cops.

Les asked William Polhemus, NH6ET, to explain the workings of an interferometer.

NH6ET and Gary Schwiter, WH6EPS, discussed and demonstrated SDR, or software-defined radio.

Gary will be setting up a system using the new, second version of the Kraken SDR – a 5-channel, coherent-capable unit. He'll be assembling the 5-antenna system with a RaspberryPi.

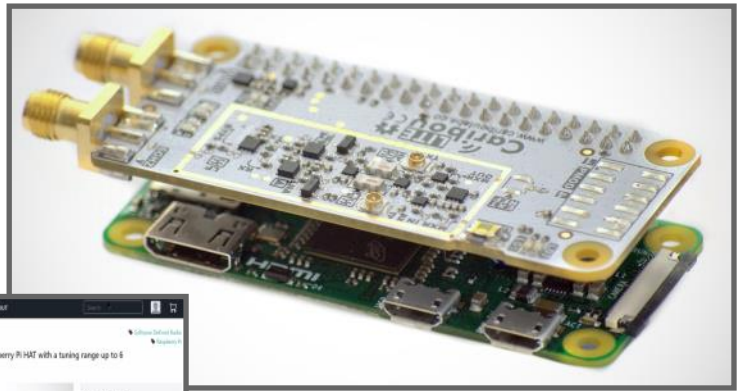
Gary also discussed the dual-antenna CaribouLite RPiHAT, a fully open source dual-channel SDR Raspberry Pi HAT with a tuning range up to 6 GHz.

In other matters at the October session, the November board election and the December Christmas party were discussed.

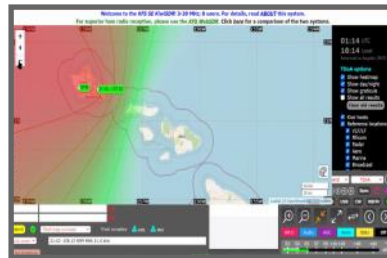
On Saturday, November 12, the twice-a-year membership meeting will be held at 2 p.m. Due to unavailability of a meeting room, it will be exclusively on Zoom. The Zoom connection will be the same as used previously. It will be sent out again by K0BAD on the BIARC Listserv prior to the meeting. The agenda will include voting to fill three board vacancies. Nominations still can be



On the wall: The view from Zoom.



WH6EPS discussed the dual-antenna CaribouLite RPiHAT, a fully open source dual-channel SDR Raspberry Pi HAT with a tuning range up to 6 GHz.



NH6ET and WH6EPS demonstrated SDR, or software-defined radio. EPS will be setting up a system using the new, second version of the Kraken SDR – a 5-channel, coherent-capable unit. He'll be assembling the 5-antenna system with a RaspberryPi.

made up until the time of the election, but three BIARC members have agreed to be on the slate. They are Gary Schwiter, WH6EPS; Joe Rosenbaum, WH6FZH; and Roy Kunishige, KH6KU. For more information, contact NH6ET, chair of the nominating committee.

Our Christmas party will be held, after a two-year gap, at 2 p.m. Saturday, December 10, at the community center. It will be coordinated by Leigh Critchlow, WH6LC. Les noted that for logistical reasons, an advance sign-up system will be employed. Invitations will be sent out via email, with an RSVP deadline.

"This is so we can get a handle on how many members and guests will attend, and what dishes they will be bringing to share at the potluck," explained Les. "So, please respond in a timely manner."

BIARC Tech Net

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would put on a deep dive discussion on the net, and then transition to a Zoom call for a deeper dive on the topic. After some time, he ran out of topic requests, so now he just runs a discussion net like the other Wednesdays. This is something I'm hoping to change.

I believe the net has been a great benefit to our ham community. I have heard many operators state that the tech net has been

very helpful to them as they advance their understanding of the radio arts. Some of the discussions on the net have even turned into programs for the meetings, such as the grounding programs William put on. Participation has waned on the net. One of my goals is to help revive interest and participation in the Tech Net. I urge you, if possible, to join in and help us keep this wonderful resource alive and well.

I am asking for suggestions as to what the membership wants. What

would you like to see a deep dive on? Would you like to learn more about topics such as VNA's (vector network analyzers), digital modes, terms we hear but some of us don't really understand, such as gain and decibels? Is the day and/or time preventing you from joining in? If there is sufficient interest in changing the schedule, we may do that, to accommodate a wider audience. If you have any suggestions, please contact me at my email on qrz.com (joseph.rosenbaum@gmail.com) or on the 146.760 Kulani Cone repeater.

73, Joe, WH6FZH



KOBAD

THE PRESIDENT'S CORNER

Election Day, 2022

By Leslie Hittner, KOBAD

Members of BIARC have two elections this November.

On November 8, we got the opportunity to vote in the National and local political elections.

And a few days later, on Saturday, November 12, you will get the opportunity to vote for new members of the BIARC Executive Board. Our membership meeting will be on Zoom, via the usual connection, due to a meeting room scheduling conflict.

BOTH of these elections are important but I'm going to talk only about the BIARC Executive Board Election.

BIARC's board is called an Executive Board because it is the executive agency for the club. Unlike many non-profits, BIARC does not have an Executive Director.

For BIARC, the Executive Board is the place where the buck stops. This year, three positions will be filled, and the Nominating Committee has three great candidates. Two of those positions were vacated earlier in the year and board-assigned candidates will have the opportunity to be elected to fill the remainder of the term or to run for a new term if that term expired.

Prior to voting, club members will have an opportunity to nominate additional people to the Executive Board. All board members are nominated and elected to At-Large positions on the board. The Executive Board itself will elect Chair, Vice-Chair, Secretary, and Treasurer from its ranks in

January.

Like most organizations, the Executive Director or the Executive Board cannot do all of the work. That is why we have committees. In the case of BIARC, January is an excellent time to join a committee.

BIARC Standing Committees are as follows:

1. Public Service Communications Committee
2. Operating Activities Committee
3. Programs Committee
4. Digital Systems Committee
5. Voice Repeaters Committee
6. Education and Outreach Committee

See you all on Saturday, November 12, on Zoom. I'll resend the connection link via the BIARC Listserv prior to the meeting.

Les, KOBAD

When you shop at Amazon, you can help out a nonprofit

If – like most of us -- you buy stuff on Amazon, you can pick a nonprofit to benefit from your shopping. And it costs you nothing, points out BIARC Vice President Gary Schwiter, WH6EPS. A long list of approved organizations – local, national and international – is posted on AmazonSmile.

“I'm not sure if BIARC could benefit from this under our 501 status or how hard it would be to set up,” he noted. But it is easy to support amateur radio

efforts via AmazonSmile. Gary said he usually chooses an entity related to radio, public broadcasting or animal welfare, and alternates on different years.

In its recent quarterly report to Gary, AmazonSmile verified that the Amateur Radio Safety Foundation Inc, had received \$273.50 as a result of qualify-

ing purchases Gary made between April 1 and June 30.

The upshot is, every little bit helps. So far, AmazonSmile has donated more than \$377 million to U.S. charities and \$422 million to charities worldwide. Bookmark smile.amazon.com to remember how to support a charity when you shop.

Specially trained Ohio hams man tall tower to assist law enforcement at county fair

The Wayne Amateur Radio Club (WARC) manned a 30-foot-tall mobile observational Infrastructure Protection Unit, or SkyWatch tower, at Ohio's Wayne County Fair in September again this year.

Staffed by specially trained amateur radio volunteers, the tower provided 24-hour surveillance, monitoring, and a record of activity on the fairgrounds, including medical emergencies, lost children, and other situations where help may have been needed.

Captain Doug Hunter, KE8JNH, of the Wayne County Sheriff's Office, was impressed with its performance.

Last year, I put in a request for the tower from the Ohio Department of Homeland Security," Hunter said. "After seeing the benefit of having it, I immediately requested the unit for this year's fair."

Positioned near the grandstand, the tower gave volunteers a bird's-eye view of the midway that allows one person to see from the air what four or five people can see from the ground.

The observation deck is equipped with state-of-the-art video equipment that provides situational awareness in places where there are large crowds in attendance.

With an array of pan, tilt, and zoom cameras, the unit provides a 360-degree view of the fair's most vulnerable areas. It is climate controlled and is capable of being self-powered to ensure continuous operation.

Eric Mast, W8ELM, a member of WARC, said that club members who have additional training, apart from their amateur radio licensing exams, take shifts monitoring the crowd.

"Through our training, we understand how to communicate with law enforcement," said Mast.

"We know what they need to hear. If we see a situation that needs their attention, our radio is connected directly to dispatch inside their



Captain Doug Hunter, KE8JNH, Wayne County Sheriff's Office, stands next to the SkyWatch tower at the Wayne County fair.

command center on the fairgrounds. Once we report it, we are out of the loop and law enforcement manages everything from that point."

Captain Hunter added, "As long as this is available to us, we will take advantage of it. If we can utilize something that increases the safety of fairgoers, we will take advantage of that. WARC members donated more than 60 hours of their time, and we are very thankful for them."

-- Thanks to Dan Starcher, Public Communications Specialist for the Wayne County Commissioners Office in Wooster, Ohio, for information contained in this story.

BIARC Executive Board Meeting

October 8, 2022

A Begin Meeting

● Call to Order –

- The meeting was called to order by Board President Leslie Hittner.

● Quorum Call

- President declared we have a quorum. Members not enumerated on recording.

● Secretary's Report and Minutes

- Gary **moved** and Joe **seconded** that the September BIARC Board Minutes be approved as published. Motion **passed**.

● Treasurer's Report

- William **moved** and Jim H. **seconded** that the treasurers report be approved as submitted, subject to audit. Motion **passed**.
- Current paid membership is 63 which is down from the prior year. Gary noted that it tends to go up and down.

B Members Present

- Glenn (AH6EI) was present via Zoom.

C Committee Reports

● Digital Systems verbal report.

- No committee meeting was held in the past month.
- Digital radio (Bullet) was purchased, received, and programmed. It is ready for deployment and testing.

● Education and Outreach

- The report is in the form of the letter sent to the county, regarding the lending library storage space. As of this meeting we have yet to receive a reply.

- Copy of letter is attached

● Operating Activities

- Gary investigated the field day site recommended by Glen (AH6EI) and determined there were too many restrictions and costs with that site. It

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was decided to go with the Golf course site owned by Sean Fendt. Gary will confirm and firm up time and dates with Sean.

- Gary **moved**, Jim **seconded** that \$100 will be approved out of the 2023 budget for winter field day expenses. Motion **passed**.

● Programs

- This month will be Direction Finding, presented by Les.
- November's program will be the Annual Membership meeting.
- December will be the Christmas party.
- Leigh (WH6LC) has volunteered to help with the Christmas party.
- Leigh has requested a sign up sheet and will coordinate dishes people will bring.

● Public Service and Communications

- David Miller has not been contacted yet to become chair of this committee..
- Tony discussed the ARES sets and the need to modify local district set to reflect the capabilities of the amateur operators in the district.
- The Great American Shake up is the next exercise. This a Winlink exercise. USGS wants this to help fill the "Donut Hole". Tony suggest that there is no reason a non Winlink user couldn't pass a report that could be sent by another ham via Winlink.

● Repeater Committee

- No report given during this meeting

D Old Business

- No old business

E New Business

- Nominating committee has 2 of the three nominees needed. Gary and Joe "volunteered".
- William investigated commercial storage options and found them to be cost prohibitive.

There being no further business, Les adjourned the meeting.

Respectfully Submitted,

James R. Huntley, Secretary