



Zero Beat

January 2021

General Meeting
Second Wednesday
7:30 pm On Zoom

2020-12-09 HPARC meeting on Zoom

Meeting opened 7:30pm
 Pledge of Allegiance

15 new or renewed members this month

Presentation by John Teagardin AA8UU on Dart noise floor, propagation, and space weather

Review by Joe of the Sweepstakes performance of the club. Arrl 10 meter contest announced, let John AA8UU know if you intend to operate. Also, for Winter Field Day at the end of January- Let John know if you intend to operate, and we'll use the contest online scoreboard to track club totals.

Looking to spruce up the website, there is a group throwing together ideas, if you have an idea you think would be interesting let Joe know.

New education classes beginning January- General on Mondays, Extra on Tuesdays, and Technicians on Thursdays.

Discussion of merchandise, to assess interest in new merchandise. Some interest.

Discussion of history of DART antenna, going to research replacing it as it is 30 years old and might be a cause of noise on the repeater.

Discussion of public service that happened on the DART in the past (Ted K8NA/Mike W8VPC/Jay, etc)

Mike WD8S gave some more advice about the 10 meter contest coming up this weekend. K8ALH asked if somebody doesn't submit does it count? Mike yes, you are allowed a certain percentage of "unique contacts", and those count even if the other person doesn't submit the log... but if you submit too many of those the system knows you probably made them up.

Rick KB5OO - The public service discussion would be interesting to include in the zero beat. Can somebody write that up? Joe- I'll talk to Ted and Mike.

Club Officers

President Joe Raznik WB2ADX

joeraznik@gmail.com

1st. VP Jim Poehlman K8ABZ

k8abz@arrl.net

2nd. VP Aaron Tobin W8VIP

tobin292@gmail.com

Secretary Reuven Gevaryhu

KB3EHW rgevaryahu@gmail.com

Treasurer Bob Lauer N8REL

rlau6@aol.com

Parliamentarian Marvin Stasak

N8HZM marvstasak@gmail.com

Director Bill Ketel II N8QVS

n8qvs@arrl.net

Steve N8FH - Software called RBdigital through local libraries can get CQ magazine, at least through the Farmington Hills library.

Al K8ALH- Reminds us that Able electronics (St Clair Shores) has a 10% off club discount. Jim K8ABZ was there recently and confirms that they have good inventory and do offer the club discount.

Meeting adjourned at 9:09 pm
Respectfully submitted,
Reuven Gevaryahu
HPARC Secretary

HPARC Nets

HPARC Official Sunday Night 2-meter Phone Net

Every Sunday a 9:00 Pm local time on the DART repeater, 146.64 (PL 1 00), catch up on club news and information, and just to keep in touch. All amateurs are welcome to check in.

ARPSC Thursday Night 2-meter phone net

Every Thursday at 8:00 PM on the W8OAK repeater, 146.90 (PL 100). The Hospital radio check net takes place on the last Thursday each month at 7:30 PM on the W8OAK repeater. <http://www.arpdc.com>

Around Town

HPARC Buddy Breakfast every Saturday at 9:00 AM (or so)

Cozy Cabin Diner, 2129 E. 12 Mile Rd, Warren, MI
Come in early for the socializing. Park in the restaurant parking lot.

Oakland County ARPSC Siren Testing, 1st Saturday at 1:00 PM.

March through November except April. Contact Marsha, N8FE, at n8fe@arrl.net, to be assigned a siren to test.

- WANTED -
GOOD WOMAN WHO CAN COOK, CLEAN AND
CLIMB A TOWER. MUST HAVE COMPLETE
HAM RADIO STATION. SEND PHOTO OF STATION.

Volunteer Positions

Technical Coordinator & W8HP Trustee

Joe Raznik, WB2ADX joeraznik@arrl.net

W8JXU Trustee

Bill Ketel, N8QVS n8qvs@arrl.net

Education/VE Testing

Jerry Begel, W9NPI w9npi@comcast.net

Contest Mentors

Mike Van Buren, WD8S wd8s@arrl.net

Gerry Treas, K8GT k8gt@arrl.net

LoTW Manager

Murray Scott, KE8UM ke8um@arrl.net

Webmaster

David Koch, AA8IK

Zero Beat Newsletter/Public Information Officer

Rick Laird, KB5OO ricklaird1@comcast.net

Meeting Coffee & Donuts

Brenda White, KD8SGB kd8sgb@gmail.com

Sunday Net Net Control Operators

Bob Lauer, N8REL Lee DeRosia, KD8TBC John Little, W8TOY

Banquet June 10, 2020

John Little, W8TOY

HPARC Official Cook

Bill Ketel, N8QVS

Swap and Shop January 19th 2020

Open

Member Meeting Audio Visual Support

Ken Simpson, KE8LIG

HPARC Picnic Chair August 12th 2020

Jay Schwartz, KB8SBI

Holiday Party December 9th 2020

The Board

Club Equipment Inventory

Jim Poehlman, K8ABZ

Lark In The Park

John Teagardin, AA8UU

Field Day June 26-27 2020

John Teagardin, AA8UU Ken Krause, AD8M

Meeting Greater

Edgar Walton, N8LBS

Steve N8FH - Software called RBdigital through local libraries can get CQ magazine, at least through the Farmington Hills library.

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HPARC Secretary

Info about difference between clock time and sunrise time by W3LPL in the DailyDX

The plane between the sun and the Earth is called the ecliptic plane. Its defined as the imaginary plane containing the Earth's orbit around the sun. During the course of a year, the sun's apparent path through the sky lies in this plane. Of course, the Earth stays in the ecliptic plane and the planets also orbit the sun close to the ecliptic.

The intensity and frequency of geomagnetic disturbances -- especially geomagnetic storms -- is strongly affected by the coupling efficiency between the interplanetary magnetic field (IMF) and the Earth's magnetosphere. By far the most important factor is the orientation of the north-south component of the IMF with respect to the Earth's magnetic field. Geomagnetic storms rarely occur when the north-south component of the IMF is not oriented southward. Fortunately the Earth's magnetic field prevents most of the energy of the solar wind -- especially during powerful energetic disturbances such as coronal mass ejections (CMEs) -- from penetrating the Earth's magnetosphere.

But...

When the IMF is oriented southward -- opposite to the Earth's magnetic field -- for an extended period of time CME effects are amplified by conversion of IMF magnetic energy into additional kinetic energy in the solar wind, accelerating and heating the solar wind. Highly energetic solar wind particles then penetrate into the magnetosphere and ionosphere through a complex and only partially understood process called magnetic reconnection.

During the solstice seasons (June, July, December and January) the Earth's 23.4 degree tilt reduces the coupling efficiency between

Earth's magnetic field and the IMF when the IMF is oriented southward, reducing the frequency and intensity of resulting geomagnetic disturbances and geomagnetic storms.

The opposite happens during the equinox seasons (**September, October,** March and April) when the Earth's 23.4 degree tilt **no longer decreases** the coupling efficiency between the Earth's magnetic field and the IMF when the IMF is oriented southward, increasing the frequency and intensity of resulting geomagnetic disturbances and geomagnetic storms.

The Seasonal Distribution of Geomagnetic Disturbances While geomagnetic disturbances and geomagnetic storms are *usually* weaker and less frequent during the solstices, during late June 2015 three consecutive CMEs and a persistent southward oriented IMF caused the second-most severe geomagnetic storm during solar cycle 24

.We wouldn't notice our persistent late sunrises during January if we still used sundials instead of clocks. The error between our clocks and solar time was at its least on December 8-9 and will be at its greatest from February 4-17. The persistent error between our clocks and solar time during January is what makes sunrise occur at its latest from January 3-6 and sunrise will only slowly change until late January because the clock error in increasing almost as fast as the sunrise time.

73
Frank



Earthlings and astronauts chat away, via ham radio



The International Space Station cost more than \$100 billion. A ham radio set can be had for a few hundred bucks.

Perhaps that explains, in part, the appeal of having one of humankind's greatest scientific inventions communicate with Earth via technology that's more than 100 years old. But perhaps there's a simpler explanation for why astronauts and ham radio operators have been talking, and talking, for years.

NASA astronaut Doug Wheelock was just a few weeks into his six-month mission at the space station when feelings of isolation began to set in.

Wheelock would be separated from loved ones, save for communication via an internet phone, email or social media. At times, the stress and tension of serving as the station's commander could be intense.

One night, as he looked out a window at the Earth below, he remembered the space station's ham radio. He figured he'd turn it on—see if anyone was listening.

"Any station, any station, this is the International Space Station," Wheelock said.

A flood of voices jumbled out of the airwaves. Astronauts aboard the space station often speak to students via ham radio, which can also be used in emergencies, but those are scheduled appearances. Some, like Wheelock, spend their limited free time making contact with amateur radio operators around the world.

"It allowed me to ... just reach out to humanity down there," said Wheelock, who interacted with many

operators, known as "hams," during that stay at the space station in 2010. "It became my emotional, and a really visceral, connection to the planet."

The first amateur radio transmission from space dates to 1983, when astronaut Owen Garriott took to the airwaves from the Space Shuttle Columbia. Garriott was a licensed ham who, back on Earth, had used his home equipment in Houston to chat with his father in Oklahoma.

Garriott and fellow astronaut Tony England pushed NASA to allow amateur radio equipment aboard shuttle flights.

"We thought it would be a good encouragement for young people to get interested in science and engineering if they could experience this," said England, who was the second astronaut to use ham radio in space.

An almost-all-volunteer organization called Amateur Radio on the International Space Station, or ARISS, now helps arrange contact between students and astronauts on the space station. Students prepare to ask questions rapid-fire, one after another, into the ham radio microphone for the brief 10-minute window before the space station flies out of range. "We try to think of ourselves as planting seeds and hoping that we get some mighty oaks to grow," said Kenneth G. Ransom, the ISS Ham project coordinator at NASA's Johnson Space Center in Houston.

Typically, about 25 schools throughout the world are chosen each year, said Rosalie White, international secretary treasurer at ARISS.

"Not too many people get to talk to an astronaut," she said. "They get the importance of that." The conversations are a treat for the astronauts as well.

"You're talking to someone and looking right down at where they are," NASA astronaut Ricky Arnold II said.

This was extracted from the PHYS,ORG website. Referral by Jerry Begel, W9NPI

Two antennas met on a roof, fell in love and got married. The ceremony wasn't much, but the reception was excellent.

JUST TRY IT

A VHF Weak Signal Story

by Mike Phipps (K8WU) <qrz@k8wu.me>
Member, Hazel Park Amateur Radio Club

A lot of us have been in this situation: You've had an Amateur Radio license for a while. Maybe it's been a few years and you're just getting back into it. Maybe you've recently upgraded to General or Amateur Extra. You make a few contacts on HF using FT8, CW, PSK31, SSB. You start hanging out on local FM or DMR / D-star / Fusion repeaters, or even use FM simplex... but that's becoming humdrum and you'd really like to try some other modes. However, the antennas are often expensive or hard to build, you don't have the proper lot space or configuration, you don't own an amplifier...



Let me tell you a story about how I learned to get over periods of beginning to stall out and, as the article title states, Just Try It !

Recently, I've been exploring VHF weak signal operations. That means anything on the 6 Meter, 2 Meter, or 1.25 Meter bands working every mode other than FM modulation to explore new horizons. Weak signal work is done in the lower portions of those allocations, as well as in slivers of UHF / SHF / EHF allocations. You'll find a variety of modes and types of propagation including Tropospheric Ducting ("Tropo"), Meteor Scatter, Earth-Moon-Earth (or "Moonbounce"), and even some exotic modes like aircraft scatter. Typically, it's pay to play on these bands / modes; the more power you have and the higher above the ground that your directional high gain Yagi antennas are, the easier it will be to make QSOs.



That doesn't mean that those of us who live on small suburban lots and / or in rental homes where extensive modifications to existing structures is unlikely, or those of us who don't use high power amplifiers, can't partake. Quite the opposite: It may be harder, but it can be done.

I started working VHF weak signal operation using a dual band (2M / 70cm) Tram vertical antenna that I bought for \$50. I had it in place so I could perform net control duties for the two FM repeater-based nets on which I am a net control station (the HPARC net being one of them). Anyone who works VHF weak signal will tell you there are better ways to get on 144 MHz, and I quickly figured that if I wanted to work stations beyond 20 miles of my QTH on SSB or FT8, I was going to need a horizontally-polarized antenna. Thus, in short order, I found on eBay a 2m halo antenna for sale. This antenna is a horizontal loop with a gamma match for 50 ohm coaxial input, and within a few days, I had one up approximately 11 feet (3.3m) on a schedule 40 PVC pipe mast held in place by a patio table.



This improved my station performance a little bit, but the antenna needed to be raised higher if I wanted to extend my radio horizon. After a few months I joined together a few feet of schedule 80 PVC pipe to 20 feet (6.1m) of galvanized steel pipe, which in turn was bolted to the fence in my back yard. The result was that my 2m halo was now 23 feet (7.0m) up from the ground. Did things improve? They sure did. I could regularly reach into southern Ontario, Northern Ohio, Northern Indiana, and even a small swath of Illinois and Pennsylvania when the conditions were just right. Without the added height, these were places that I could only reach when there was an extraordinary opening, such as the one that occurred in September 2020.

I could have settled there, but that was becoming redundant. On VHF weak signal, you often engage in QSO with the same stations. I call it "working the regulars". For example, from Metro Detroit (grid square EN82), calling CQ on FT8 (base QRG: 144.174 MHz) can often get you signal reports from VA3IKE (EN82), WB8VLO (EN81), N8LRG (EN80), W9LTN (EN71), and other stations that spend a lot of time on the band. There's nothing wrong with this at all, and indeed it can be a real, boots-on-the-ground indicator of what band conditions are really like from your QTH. However, as your operating skill become honed in, you may find your coverage area becoming greatly expanded.

There are a few modes of propagation available on the VHF bands including possibilities of working EME and Meteor Scatter. The former I haven't yet gotten around to doing yet until I can acquire the necessary hardware, including a High Power Amplifier, a multielement Yagi or parabolic dish antenna, to get a signal to the Moon and back, but Meteor Scatter is more practical for my situation. However, it wasn't going to happen with a single, solitary halo antenna, no matter what the height was, though I did try it with some rather disappointing non-results. So, what was the next step? Get a multi-element Yagi antenna!

Of course, I could have gone to eBay or DX Engineering to pick one up at a reasonable cost, and that would have been OK. You can often find used or new-old-stock Hy-Gain or Diamond Yagis which will work just fine for horizontally-polarized weak signal work on 2m, and if you'd prefer to get a new antenna, radio stores sell a wide range of Cushcraft and M² Yagis. Or better still, you can homebrew a customized antenna.

I have a 6-Element 2 Meter Yagi antenna on an 8-foot (2.4m) boom that I built a while ago. Granted, it had to be pulled down and fine-tuned several times, and the materials I used for the most part were what was on hand or could be ordered inexpensively online with the hopes it lasts more than a couple of years,



This antenna gives me the directional gain that I need to play on 2 Meter Weak Signal. Working 2 Meter Meteor Scatter is somewhat more challenging than it is on 6 Meters, but the antenna is a definite performer on FT8... and it's only at a height of 18 feet (5.5m).. Working alone, it's harder to raise antennas than with help from others, but it will work until it gets warmer and I figure out a mounting technique to raise the antenna even higher. I also don't have a rotator, and the Armstrong Method isn't great during cold and/or inclement weather, so getting a rotator is among my top priorities as well.

Speaking of 6 Meters... that's a VHF band as well, so of course I wanted to be QRV (ready to operate) on it. For the longest time, I used an Alpha-Delta off center fed dipole with an external LDG tuner to get on 6m, but the performance was lousy. Being 135 feet (41.2m) across, it just isn't meant to get on a band with such a relatively short wavelength. The signal gets lost in there. To solve this issue, I cut a dipole for 6m and initially hung it up about 8 feet (2.4m) off the ground. It did improve my performance, and indeed it got me a few QSOs during the Geminids meteor shower in mid-December 2020, but of course, as always, it could stand to be improved.



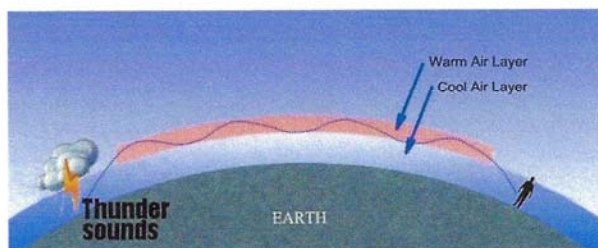
That same antenna is now up 18 feet (5.5) in an Inverted-V configuration hanging from a mast of steel pipe with a length of PVC pipe bolted to it, which in turn is affixed to the fence. Fence posts make great anchors for this sort of thing, I've found. It's a terrific solution for dealing with the phone/cable/power service lines that make it impossible to use about half of the yard for antennas.





Performance on not only Meteor Scatter, but other modes as well using earthbound propagation mechanisms, has significantly improved, especially during band openings or when there are more meteors than usual. Using this configuration, I've worked stations in Connecticut and Missouri using MSK144 on Meteor Scatter (base QRG: 50.260 MHz), and I've been copied as far away as Texas and North Dakota. There were a couple of DX openings on 6m a few days after Christmas 2020, and my log shows a fair bit of activity on FT8, SSB, and CW for that time period which would have been more difficult without having a high efficiency antenna for the band.

This isn't meant to be a technical write-up about how I built these antennas - there are dozens of posts and articles about how to build your own Yagi, Loop, and Dipole antennas, all easily found using the search engine of your choice - but rather, I'm hopeful this article can be an inspiration to ham operators who might otherwise want to get into another aspect of the hobby, but are discouraged by the level of skill required. Put simply, you don't need an expensive antenna and high-performance amplifiers to start working Meteor Scatter, Tropo, or even relatively standard HF DX, so if you want to give it a try and are willing to learn about technology along the way, you can certainly do that too.



Of course, you should always be thinking about how to improve your station. Antennas are perhaps the most important part of any amateur radio station, but the coaxial cable or ladder line that is used and the quality of your transceiver(s) figure into the equation as well. In my case, I'd like to add 10 Meter legs to that 6 Meter Dipole and raise it a few feet higher, with the intent of improving 10 Meter performance. I'm also feeding the six meter dipole with RG8X, which is a tad more lossy on 6 Meter than is ideal; replacing it with even RG8/U or RG213 could ensure more signal power makes it to and from my transceiver. For the Yagi, I definitely prefer it to be higher off the ground, and maybe I'll even build one for 70cm so I can get the multipliers in the ARRL VHF contests. I have a 50-foot (15.2m) run of LMR-600 coaxial cable, which is designed for 432 MHz operation. I was using it with an array of four horizontal loop antennas that was out back on the fence, placed there for testing purposes, and it did not stand up to the weather very well as a result.

Eventually, I may pick up one of those RM Italy solid state 2 Meter amplifiers so I can boost my station's maximum power by 6 dB from 50 Watts to 200 Watts. After that, I'm planning to extend the Yagi's boom and add more elements... then I can start working JT65A QSOs on 2 Meter EME...



The point is, even if you're underpowered and without the same equipment as more experienced hams might have, do whatever you're interested in doing on the bands. You'll still be able to log a significant number of contacts and that's better than the 0% chance that you will have if you never try in the first place. To me, that's a good enough reason to at least put forth the effort.

In other words: Just Try It!

