

The Zero Beat

THIS MEETING

November 9, 2016
7:30 P.M.
UFCW Hall
876 Horace Brown Dr.
Madison Heights, MI

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GENERAL MEETING

This month, Paul De Athos AA8OZ will talk on "Mobile Radio Made Easy." He will discuss ways to make good mobile rig installations, including grounding, antennas and cables. He will tell us about putting ham radio into cars and a bit about airplane installations. Paul has worked as a car electronics installer. He is a long-time member of HPARC and other local clubs. AA8OZ can be heard working HF from his own mobile rig, and occasionally 2 meters aeronautical mobile.

Come early and visit with fellow hams. Everyone is welcome to come to the meeting and bring a friend along. The coffee will be hot when you arrive. Donuts will be provided during the break.

Anyone wishing to join the club, please go to the club website, www.hparc.org. Fill out the membership form and bring a printed copy to the meeting. Membership forms can also be filled out before the meeting starts.

PRESIDENT'S QRM

Do you ever wonder why an organization dies? Whether it is a tech giant, or a non-profit, what are the factors that bring a successful movement to an unfortunate end?

Many people have written about this topic, and the general consensus is that the main threat to any organization or company is a resistance to change.

As humans we take comfort in life being predictable. When we find something that works, we latch on to it. But it's that latching that eventually causes us to become set in our ways, while the rest of the world passes us by.

I say this now, not because we're doing badly in our club, but so that we look at it as an iceberg that's always out there if we don't navigate around it. I think we're doing well, and we're all committed to doing better.

So be vigilant for the new. Be vocal: say something. We're always reinventing ourselves and the club and the more voices that are heard, the more this is truly our club.

73,

Jonathan Devine (JD) KD8VXZ, President
 Hazel Park Amateur Radio Club

OFFICERS

- **President:** Jonathan
"JD" Devine KD8VXZ
248-821-3045
therealjd@live.com
- **1st VP:** Marsha Fleming
N8FE n8fe@arrl.net
- **2nd VP:** John Teagardin
AA8UU aa8uu@arrl.net
- **Secretary:** Reuven
Gevaryahu KB3EHW
kb3ehw@arrl.net
- **Treasurer:** Robert Lauer
N8REL rlau6aol.com
- **Director:** Bill Ketel N8QVS
n8qvs@arrl.net
- **Parliamentarian:**
Hugh Boyle KE8BED
photoink7@hotmail.com

VOLUNTEERS

- **Technical Coordinator & W8HP Trustee :**
Tony Gallucci N8VR
248-417-9740
n8vr@arrl.net
- **W8JXU Trustee:**
Bill Ketel N8QVS
- **Education/VE Testing:**
Jerry Begel W9NPI
w9npi@comcast.net
- **Contest Mentors:**
Mike WD8S wd8s@arrl.net
Gerry K8GT k8gt@arrl.net
- **Public Information Officer:**
Jerry Begel W9NPI
w9npi@comcast.net
- **LoTW Manager:**
Murray Scott KE8UM
ke8um@arrl.net
- **Newsletter:**
Wes Plouff AC8JF
ac8jf@arrl.net
- **Webmaster:** Larry Koziel
K8MU k8mu@amsat.org
- **Siren Tests:**
Marsha Fleming N8FE
248-542-9573
n8fe@arrl.net
- **Meeting Coffee & Donuts:**
Brenda White KD8SGB
- **Sunday Net:** Bob N8REL
Lee KD8TBC
Bill N8QVS
- **VUCC/WAS Awards Card Checker:** Sean Fleming
K8KHZ k8khz@arrl.net
- **Banquet:** (Open)
- **Field Day Chair:**
John Teagardin, AA8UU
aa8uu@arrl.net
- **HPARC Official Cook:**
Bill Ketel N8QVS
- **Hamfest Chair:** Hugh Boyle
KE8BED (248) 755-6094
HazelParkSwap@gmail.com
- **Holiday Party:** The Board
- **Oak Apple Run Royal Oak:**
Mike Van Buren WD8S
wd8s@arrl.net

LEGISLATIVE NEWS

The Amateur Radio Parity Act, H.R. 1301, passed the U.S. House in September, and now goes to the Senate. Last year, a Senate version, S.1685, passed out of committee with no controversy. However, it is not certain whether the bill will pass in the lame duck session, or a new bill will be introduced when the new Congress meets next year.

Here in Michigan, a distracted driving bill, HB5687, was introduced by state Rep. Martin Howyrlak. The original bill would severely restrict mobile operation, including amateur radio, through broad language intended to prevent cell phone operation while driving. On October 20, ARRL Government Liaison WA8QJE and Section Manager Larry Camp WB8R sat down with Rep. Howyrlak for more than an hour. Howyrlak was receptive to changes protecting radio amateurs. It is unlikely the bill will come to a vote this year, but Rep. Howyrlak intends to reintroduce it next year.

WELCOME NEW MEMBER

Lazaro Carroll KE8FEX

LARK IN THE PARK

On Saturday, October 29, the club held a Lark in the Park event in Madison Heights. 15 club members showed up. Hugh KE8BED brought a rig that he used with Ken AD8M's 20 meter loop. John AA8UU brought a rig and dipole antenna that was on the air on 40 and 15 meters.

Several members made portable contacts in the CQ Worldwide DX contest. There was no agenda beyond getting on the air from outdoors. The weather was great and everyone had a good time.



Clockwise from lower left, Ken AD8M, Jim K8ABZ, Hugh KE8BED, Bob N8REL and John AA8UU

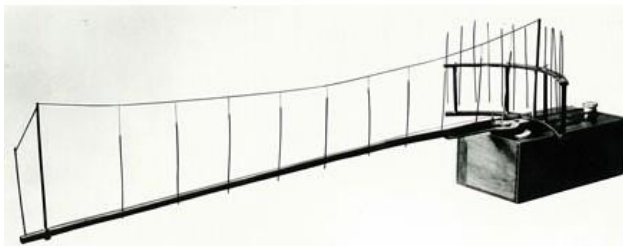
S W E E P S T A K E S P I N S

November is ARRL Sweepstakes month, with the CW contest on Nov. 5-7 and the SSB contest two weeks later, on Nov. 19-21. Once again, HPARC will award pins to any club member who makes at least 100 contacts in the contest during either weekend. Working a "clean sweep" of all 83 ARRL and Canadian RAC sections gets you a Clean Sweep coffee mug. Pins and mugs are awarded at the annual banquet in June. You don't have to claim HPARC affiliation in your ARRL contest entry.

ARRL has tightened its scoring deadline to 15 days after the end of each Sweepstakes segment. Our deadline is looser, Saturday, December 17. Send the following to John Teagardin AA8UU at aa8uu@arri.net: for Sweepstakes pin, a copy of your Cabrillo log file or your log summary sheet. For a Clean Sweep mug, you must send a copy of your Cabrillo file.



THE YAGI-UDA ANTENNA AT 90



Shintaro Uda, left, and Hidetsugu Yagi, right, inventors of the Yagi-Uda beam antenna.

At center, Uda's original VHF test antenna.

By Wes Plouff AC8JF

In 1924, an engineering research group at Tohoku Imperial University in Sendai, Japan, hired a young graduate student named Shintaro Uda. The group, under Professor Hidetsugu Yagi, was formed to develop reliable low-power radio links for communicating between Japan's many islands. Neither man could have predicted then that just two years later, Uda would develop an antenna so iconic that it has remained in steady use 90 years later.

The origins of the Yagi-Uda antenna, often called a Yagi, or just a "beam," are technically clear, but what happened to the men and their invention is complicated.

Like most radio engineers at the time, Uda designed electronic circuits. He became interested in radiation from wire loops, particularly because radio waves could be "focused" by placing a second loop near the first. Uda experimented with different shapes, and settled on straight metal rods. He found what everyone takes for granted today, that a slightly longer element near a half wave dipole makes a signal stronger in the opposite direction, and that a slightly shorter element makes signals stronger in the same direction, and also narrows the "beam" of radiation.

Yagi and Uda wrote a joint paper in early 1926, in English, called "Projector of the Sharpest Beam of Electric Waves." The set of director elements was called a "wave canal," and the whole antenna a "wave projector." They

presented the same information at an international conference in Tokyo late that year. Uda wrote nine technical papers in 1926 and 1927 that appeared in Japan, and one in English published in the USA.

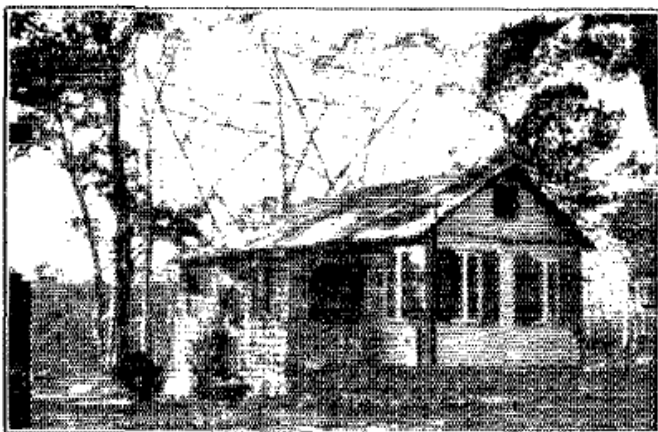
The definition of a Yagi-Uda beam antenna, for this article, is an antenna with a half-wavelength driven element, one reflector element, and one or more director elements, all parallel to each other. This covers all "classic" Yagis. It leaves out two-element beams and antennas with more than one driven element. Uda experimented with added reflectors above, below and beside the main antenna, but these configurations did not last.

Because there is no simple formula for designing this kind of antenna, every Yagi is in some sense a compromise between gain, directivity and bandwidth. Front-to-back and front-to-rear ratios measure directivity. A signal received off the front of the antenna will typically be three to five S-units weaker off the back. Most Yagis have an SWR less than 2:1 for only a few percent away from the center frequency. It is common for a Yagi to barely have a 2:1 match over the full 20 meter band, and only 1 MHz of the 10-meter band.

Here the story gets complicated. Because Yagi was a professor and Uda only a graduate student, Yagi's name came first on joint papers. Yagi applied for an American patent without Uda, and traveled alone to in 1928 to present the invention, and other developments from his lab,

YAGI-UDA CONT'D

to engineers in the USA. Yagi probably set a direction for Uda, but Uda did all the detailed work. History tells us almost nothing about the relationship between the two men. In today's world, the antenna might have been called an "Uda-Yagi" from the outset.



10 meter wire Yagi at W1CCZ, Cape Cod, 1927

The Yagi-Uda antenna raised interest among American radio hams. In the 1920s, amateurs were making the change from spark transmitters to tubes. The ARRL was formed. The new Federal Radio Commission gave amateurs both "W" prefixes for their call signs and defined amateur bands where wide-open spectrum had been the earlier rule. Hams were homebrewers and experimenters. In fall 1927, amateurs made propagation tests on the then-new 10 meter band. They installed a reversible wire Yagi on a tall wooden frame to make contacts from Cape Cod, making contact with Europe and New Zealand.

But after that, interest in the Yagi-Uda slacked off. Although QST carried several articles on 2-element beams, true Yagi-Uda HF antennas were the subject of only three construction articles between 1934 and 1939. There was also some VHF experimentation around 1940. QST did not use the word Yagi in a title until 1950.

In Japan, the Yagi-Uda antenna was used at VHF frequencies for commercial telecommunications and ship-to-shore radio, but found no widespread use. After receiving his doctorate in 1930, Uda became a professor at Tohoku, while Yagi, ten years his senior, continued in his career.

World War II marked a major turning point. Uda remained

an academic working with UHF frequencies, then microwaves. However, Yagi led a government program to harness university research to the Japanese war effort. However, the Allies had secret radar technology operating at VHF and using Yagi antennas. Radar operators were instructed to destroy their equipment rather than let it fall into enemy hands. However, in 1942, when the Japanese Army captured an intact RAF radar station in Singapore, they were shocked to find Uda's antenna in use.

Yagi remained ambitious. In 1946 he became General Director of Osaka Imperial University. Sometime after the war, Yagi was president of the Japan Amateur Radio League (JARL). In 1952, he founded the Yagi Antenna Company, and was its president until 1961. The company survives as a subsidiary of Hitachi.

Uda, on the other hand, remained a professor at Tohoku until his retirement in 1960. He studied traveling-wave tubes, and in the 1950s served as a UNESCO microwave expert in India. He published a textbook, *Yagi-Uda Antenna*, in 1954. Following his retirement, Uda investigated lasers for a time. In 1974, Uda published a technical autobiography, *Wave Projector*. This odd book describes Uda's various projects in detail, but says little about the man or about his relationship with Yagi.

On a visit to the USA in 1951, Uda was astonished to see his antenna on almost every rooftop. Of course, these were TV antennas. Yagi and Uda both died in 1976, but only Yagi's passing was noticed by QST.

Following World War II, interest in the Yagi-Uda antenna picked up again among American hams. For HF, progress was made to address the Yagi's main shortcoming: it was a single band antenna.

The single-band problem gave rise to the tribander antenna. In 1955, Chester Buchanan W3DZZ had an article in QST titled "The Multimatch Antenna." This beam worked on 20, 15 and 10 meters by isolating sections of each element with tuned traps. In 1958, Carl Mosley W0FQY introduced a commercial trap beam, the TA-33. Variations of the classic TA-33 are still being sold today. At least one from the original 1959 production run was still on the air, several owners later, in 2011.

To be continued...

MEETING NOTES

Secretary Reuven KB3EHW was not present at the October meeting. These notes were compiled by President J.D.

KD8VXZ in place of the regular minutes.

Meeting was called to order at 7:30 by the President.

New member introduced: Lazaro Carroll [now KE8FEX].

No license upgrades.

Presentation by John Teagardin AA8UU, 2016 Field Day review, and plans for next year, followed by discussion of the October Lark in the Park.

Break for coffee and donuts. Thanks to new donut czar Brenda White KD8SGB for volunteering.

Motion made and approved to buy up to \$250 worth of new coax cable for Field Day.

M2M - longer session than usual. JD, KD8VXZ talked about the progress of DetroitSat, the opportunity for others to join the team, and showed the new web site detroitsat.com.

Ken AD8M spoke about an antenna project.

Meeting adjourned at 8:50.

DECEMBER MEETING DATE

The December Christmas Party will be held on Wednesday, December 7, as the regular club meeting. The October *Zero Beat* mistakenly listed this on a later date. Unfortunately, due to schedule conflicts at UFCW Hall, the meeting will be held **one week earlier** than usual.

STEALTH ANTENNA GUIDE

Restrictions on outdoor antennas are a problem few HPARC members face, but it's good to know what to do in case your neighborhood association or city complains.

The Villages is a retirement community in central Florida where every property has deed and HOA restrictions. So the amateur radio club there has lots of expertise about putting up stealth antennas. They have a great presentation on choosing a stealth antenna at <http://www.k4vrc.com/>. Scroll down to the bottom right of the page and click on the "Antenna Guide" link. The club also has information on building some of these antennas in the "Resources" tab of the main web page.

It must be good advice. Ten of the club members have achieved DXCC from their retirement homes.

HPARC NETS

HPARC Official Sunday Night 2-meter Phone Net

Every Sunday at 9:00 PM local time on the DART repeater, 146.64 (PL 100), catch up on club news and information, and just to keep in touch. All amateurs are welcome to check in.

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Thursday Night Youth Net, 8 PM EST on the DART repeater, via Echolink *759629 (W5DDL-R).

Yacht Net, Saturday night, 8 PM EST. A youth net on the DART repeater, via Echolink *481872 (W8PIF-R).

Homepage: <http://yachthams.webstarts.com>

N8WYO CW net (Medium speed)

Named in memory of Al N8WYO. The net meets Tuesday night at 8:00 PM on **28.028 MHz** All amateurs are welcome. CW speed fluctuates between 20-25 WPM, but Joe will slow it down if necessary. Listen in at 8 PM sharp!

Wolverine Net

The 75 Meter Wolverine Net meets on 3935 KHz daily at 7:00 PM local time, with pre-net starting at 6:00 PM. You can get details from <http://www.wssbn.com/>

Oakland County ARPSC

Every Thursday @ 8 pm on 146.90 (PL 100). Hospital Radio Net on the last Thursday of each month @7:30. (W8OAK-3 will run packet on 147.56 MHz for those wanting to practice and test their equipment)

<http://www.arpac.com/>

NTS Traffic Nets

The Southeast Michigan National Traffic System (NTS) net Normally held every night at 10:15 PM local time on the 146.76 (PL 100) repeater. New people are welcome.

AROUND TOWN

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

Jimi's Restaurant, 714 South Washington Ave, Royal Oak (across from OCC). Come for the socializing — we're in the back room. Parking: lots of spaces in Jimi's parking lot, and street parking is free until 11 AM.

Oakland Co. ARPSC Siren Testing, 1st Saturday @ 1 PM

March through November except in April, it is held the second Wednesday at 1 pm. Contact **Marsha N8FE** at n8fe@arr.net to be assigned a siren to test.

Amateur Radio License Testing

HPARC and the City of Oak Park offer amateur radio license testing on the **first Tuesday of even months** at the **Oak Park, Michigan Community Center** (14300 Oak Park Blvd, Oak Park, MI 48237) beginning at 7:30 PM contact Jerry W9NPI at w9npi@arrl.net

NOVEMBER CONTESTS

5-7 ARRL Sweepstakes, CW

19-21 ARRL Sweepstakes, SSB

26-27 CQ Worldwide DX, CW

For details and many more contests, visit:

<http://www.hornucopia.com/contestcal/>

HAMFESTS

11/12-13/2016 Fort Wayne Hamfest 9-4, 9-2

Allen Co. War Memorial Coliseum, 4000 Parnell Ave, Fort Wayne, IN (about 3 hours from Hazel Park)

Talk-in: 146.88

<http://www.fortwaynehamfest.com/>

Upcoming

12/04 L'Anse Creuse Swap, Madison Heights

1/29/2017 Hazel Park Swap, Madison Heights

Radio-@-RAM

2016 Meetings

November 9
December 7—early!

2017 Meetings

January 11
February 8

TIME

Socializing @ 7:00 PM
Meeting @ 7:30 PM

PLACE

UFCW Hall
876 Horace Brown Dr.
Madison Heights 48071



Meeting and Swap location



Hazel Park Amateur Radio Club
P.O. Box 368
Hazel Park, MI 48030



Scan this QR code to visit the
HPARC web site

Please check mailing label — is your membership about to expire?