



ZERO BEAT

MAY

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Presidents QRM

First, I would like to congratulate the club officer nominees for the 2024-2025 term. The new board is shaping up to be a very good one, and I am confident in their abilities to lead this club for the next year.

With that said, this will be my final President's QRM column for this term, as I have opted not to run for a club officer position for the forthcoming term. I have enjoyed the last two years of leading this club, as well as the one year that I served as 2nd Vice President before that, but now it's time for me to move back into a supporting role as I dedicate more attention and resources to my career and personal life.

The club accomplished quite a bit during my tenure as President. We moved our Field Day activities to a new venue, we had more in-person social events, we officially regained our ARRL Special Service Club status, and – very importantly – we took our “service through education” game to the next level. Of course, I am speaking of the efforts by our mentoring and educational committees to improve our outreach to new and recently reactivated Amateur Radio operators, such as Leonard AD8FK hosting those educational events at his house.

In the forthcoming year, I hope we can continue making the club, and the Amateur Radio hobby, the best that it can be. Thank you all for the opportunity to serve the club for the last several years, and I'll see you around!

Mike Phipps, K8WU President, Hazel Park Amateur Radio Club

Minutes of General Meeting

Pledge of allegiance

Introductions

New member KF8ATI Raymond, passed exam at VE session

Elections

N8VDZ nominated for 2vp

Hugh KE8BED nominated for parliamentarian

Reuven KB3EHW nominated to continue as secretary

Len AD8FK nominated for director

Bob N8REL nominated for treasurer

Brad KE8WNV nominated for 1VP

Potential north receive site for repeater. About \$2000 in cost. Board approved in theory, but moving at the speed of Government.

Michigan QSO party 4/20 12pm-12am. Wes AC8JF- miqp.org. CW/SSB only.

Presentation on DMR.

License classes will return in September.

Testing next session June 4th

Financial report from Bob N8REL - No expenses in March except the phone bill.

Mentoring- Len AD8FK -Next big event is Field day, but he is available to assist others. Sunday night pre-net for new people proposed; less formal, at 8:00pm.

Jay WB8SBI - review of the solar eclipse QSO party.

Meeting adjourned around 9pm

Respectfully submitted,

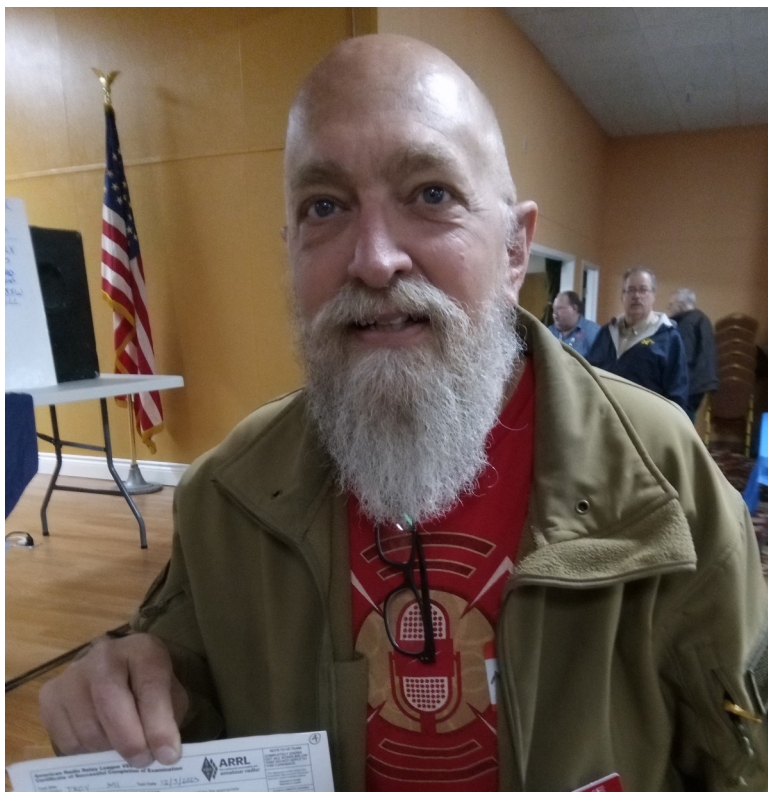
Reuven Gevanyahu KB3EHW

HPARC Secretary

Antenna Build

By Mike Slupinski

And here we find ourselves in the 3rd of 3 in our series of building an antenna in 10 steps. This antenna is a Yagi which is a directional high gain antenna. From my house, none of my antennas allow me to reach the Monroe repeater. As an emergency preparedness guy this is important. Yagi antennas have the advantage of high gain. The more elements the more gain. Another great use of a Yagi is satellites including the International Space Station. Most satellites are 2 meter and/or 70 cm radios and many have repeaters on them. I have made contacts on 2 meter in Wisconsin, Illinois and New York using a Yagi and a satellite's repeater. The first 2 antennas in this series were relatively simple and super cheap. This is a little more advanced antenna #1 because of its construction, (lots of pieces) and #2 because it is more technical, (it has a gamma match.) I have a 2 meter so this one is 70 cm and I hope to use a PVC 4 way connector to stack them and hope they do not interfere with each other. I will find out. :)



So let's get to building!

Acquire the parts and tools:

- 3- 3' X 1/4" round, hollow, aluminum tubes
- 1 - 1" PVC pipe 555 mm long
- 1 - 1" PVC pipe 295 mm long
- 1 - 1" PVC T
- PVC Glue (optional)
- 1 - Plate Mount (Ace Hardware)
- 1 - 2" Hose (band) clamp
- 1 - SO-239 bulkhead mount connector
- 1 - 1/2" wide aluminum strap 6 1/2" long
- 14 - 1/2" ID Spring Band Clamps, (Fuel Hose Clamps)
- 1 - 152.5 mm length of coax
- 1 - 3/8" brass tube 127 mm long (or you could use the same length of the aluminum tubing)
- 1 - 10-32 x 1" stainless steel screw
- 1 - 10-32 stainless steel lock nut
- Hack saw
- Vice
- Soldering iron
- Rosin core solder
- Hammer
- Phillips Screw driver
- Slot screwdriver

Antenna Build (cont.)

Sharpie marker
Drill
1/8" drill bit
1/2" drill bit
Step drill bit
2" x 4" x 6" (pine) (Optional)
1 1/4" Forstner drill bit (optional)
Masking or painters tape (Optional)
Channel lock pliers
1 Can of beer

Mark the PVC for element location.

Connect the 2 PVC pipes to the PVC T (do not glue)

Mark a line on each side of the PVC keeping it centered on the whole length. Make sure the lines are centered and straight across from each other. Many ways to do this, here is one.

Take the pine 2X4 and find the center on the large flat side.

Drill a 1 1/4" hole.

Then find the center on each side of the hole and drill 2 more 1 1/4" holes.

Cut through the very center of all 3 holes so you end up with 2 pieces of wood with holes cut in half.

Take one of the pieces and cut into 3 pieces, let's call them U support blocks.

Take one of the U support blocks and put it under one of the ends of the PVC pipe flat side sitting on the tabletop.

Tape it in place. This will stop the pipe from rotating while marking.

Twist the PVC T so it is upside down (bottom of the T straight up in the air) It needs to be 90 degrees from, or parallel with the radials (depending if horizontal or vertical polarization) but for now make it as close to straight up as you can make it.

Place a second U support block under the other end of the PVC pipe flat side sitting on the tabletop. (Tape or not does not matter)

The 3rd U support block is your marker. Place it under one end of the pipe flat side on the table

Taking your sharpie marker place it on the edge where the wood stop 1/2 way up the side of the PVC and slide the U support block along the pipe making a line along the side perfectly centered on the pipe.

Reach over on the other side and slide the U support blocks back making the same mark on the other side of the pipe.

Make sure to make some tick marks on the PVC T and the pipes to mark its position.

Mark the location of the elements on the lines

Antenna Build (cont.)

Make the first mark 25 mm from the end of the pipe on both lines. These will be the holes for the reflector.

From that mark, make your next at marks 165 mm from there (Radiating Element)

From those marks, 48 mm (Director #1)

From those marks, 131 mm (director #2)

From those marks, 146 mm (Director #3)

From those marks, 169 mm (Director #4)

From Those marks, 193 mm (Director #5)

Drill the holes.

You want as tight a fit as you can get. I used a 1/8" bit and made a pilot hole in each location and then used a step bit to get my final hole.

NOTE: it is advised that you drill from the outside on each hole and not just try to drill straight through the pipe. Just a touch off center and your element will be on a whacky angle and not in a flat plane with the rest of the elements.

Cut your elements to size.

Reflector - 332 mm, Radiating element - 338 mm, Director #1 311 mm, Director #2 308 mm, Director #3 304 mm, Director #4 301 mm, Director #5 298 mm

Add the elements to the mast.

Insert the reflector into the first hole, (25 mm from the end of the pipe)

Add a 1/2" ID Spring Band Clamp to each side. Make sure the reflector is centered. The band clamps simply hold it in place up against the sides of the mast.

Repeat for all the rest of the elements using step 2 and step 3 to match the element with the proper hole.

Make the feed line connector.

Take the plate mount and drill an 1/8" pilot hole 26 mm from one of the ends.

Using the step drill enlarge the hole gradually to fit the SO-239 bulkhead connector.

Bend the plate mount 90 degrees in the center to make an L bracket.

Attach the bulkhead connector to the plate mount so that the feed line screws in over the L of the bracket.

Make the Gamma Match

Take the 6" piece of coax and remove the casing, the braid and if there is a foil insulator remove it also leaving the dielectric intact.

Antenna Build (cont.)

Remove approximately 50 mm of the dielectric from one end.

Solder the end of the coax, with the removed dielectric, to the brass pin on the back of the SO-239.

Slide the brass tube over the coax

Attach the feed line connector/gamma match assembly to the mast.

Where the gamma match attaches to the brass pin needs to align with the center of the Radiating Element. Once aligned use the 2" Hose clamp to connect the connector assembly to the mast.

Bend the gamma match, where it connects to the SO-239 connector, 90 degrees so it is parallel with the radiating element.

Make the Gamma Adjustment strap.

Using the 1/2" wide aluminum strap, a vice and a hammer bend it on each end so it will go around the gamma match on one end and the radiating element on the other side. Use a scrap piece of tubing to bend around. You basically want is continuous loop that will wrap around the gamma match and the radiating element keeping the gamma match parallel with the element.

Drill a 3/13" hole through the center of the strap between the loops through all 3 layers. This is to secure the strap with pressure on the gamma tube and the element.

Attach the Gamma Adjustment strap

Slide the strap over the 2 tubes.

Position the strap 30 mm from the end of the gamma match. (This distance may change when you tune the antenna.)

Insert the 10-32 x 1" stainless steel screw into the hole in the center of the strap. You may need to use channel lock pliers to squeeze the center together to get the screw through all 3 layers. Tightening the screw and nut will pinch the loop locking it in place. Loosen the nut and slide the strap to adjust for tuning.

Crack that beer open you now have a 70 cm Yagi antenna.

With it you can reach repeaters considerably further away than you could before. Remember a couple of things. #1 it is directional so pointing west and trying to make a contact to the east will make you sad. #2 The Reflector is the back of the antenna. #3 it can be used vertically (elements pointing up and down) or horizontally (elements parallel with the ground) but most repeaters are vertically polarized so that's what you want there. But for simplex you can easily go horizontal if you like.

This antenna has more elements than the typical 2 meter Yagi antenna so that is why I chose it for this exercise. To make a 2 meter Yagi the principals are the same just different dimensions.

Member Ken Krause, AD8M, has a well proven 2 meter Yagi design similar to this design and I expect if you ask nicely he will share it with you.

Have fun and let me know if you build this one!

73!

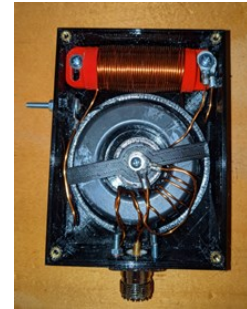
3D Printer: The next shack must-have for the DIY Ham

by Andrew J. (AJ0WX)

DIY has always been a part of amateur radio, from making your own wire antennas to putting together a Heathkit. With the advent of affordable 3D printers, this spirit can be taken to the next level, limited only by your imagination and CAD (Computer Aided Design) skills.

The most common type of 3D printer feeds a spool of plastic into an extruder where it is melted and deposited on the build surface layer by layer until the part is completed. Since the part is built from the ground up, any number of complex shapes can be easily made at home. Open-source software programs are available for each step in the design and printing process, meaning the only investment required is the printer, plastic, and time spent learning. In the spirit of that open source, many 3D printing enthusiasts share their designs on websites such as Thingiverse, so those not proficient at CAD can also print and use those designs.

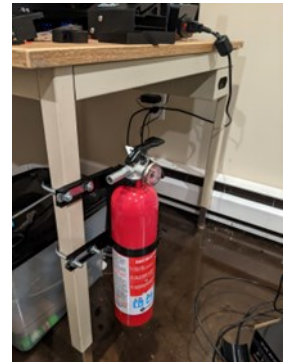
For the ham, there are a number of applications where this capability can come in useful. For example, an end-fed antenna requires a matching transformer and insulator at the end of the wire. Previously, one would have to purchase a box for the matching section along with an insulator. With a 3D printer, these parts can be printed at home in a matter of hours in the exact shape needed. To the right is an example of a matching transformer and loading coil integrated into one package.



Other applications include loading coil forms, parts to assist in antenna builds, and any bracket you could need. It's not just limited to small pieces either; large, complex assemblies, such as an azimuth/elevation rotator for arrow yagis, seen below, can be created from many smaller pieces.



While the parts are all made out of plastic, choosing a higher strength one, such as PETG or ABS, and careful design and testing, parts that can withstand significant loads can be made, such as this fire extinguisher mount for the 3D printing table.



In conclusion, the availability of cheap 3D printers and open source CAD software allows the amateur radio operators of today the freedom to design and make custom parts that they haven't been able to before. For those hams into building their own equipment, this is an invaluable capability.

Volunteers

W8JXU Trustee	Bill N8QVS
Mentoring	Leonard AD8FK
Contesting Mentor	Mike WD8S, Gerry K8GT
STEM/STEAM	Joe WB8ADX
Siren Check Ldr	Marsha N8FE
LoTW Mgr (Log)	Murray KE8UM
Cook	Bill N8QVS
Lark in the Park	John AA8UU
Net Control Op	Len AD8FK
	John W8TOY
	Mike K8WU
	Bob N8REL
Media Team	Hugh KE8BED
	John AA8UU
	Mike K8WU
	John W8TOY
Public Info (PIO)	Joe WB8ADX
Webmaster	Reuven KB3EHW
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	Reuven KB3EHW
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Committee Chairs

Holiday Pot Luck 12/??/24	John W8TOY
Picnic-(Date?)	Jim W8DPM
Swap-(Date?)	John KD8NYF
Field Day 6/22/2024	John AA8UU
Repeaters, W8HP/W8JXU	Joe WB8ADX
Education & Exams	Jerry W9NPI, Bob N8REL
Sunday 2m Net	Bob N8REL
Media	Hugh KE8BE

Mission

Service Through Education

<https://hparc.org/>