OUR 25TH YEAR!

EPARA BEACON

VOL. 5, NUMBER 6 THE OFFICIAL NEWSLETTER OF THE EASTERN PENNSYLVANIA AMATEUR RADIO ASSOCIATION JUNE 2021

NEXT CLUB MEETING: JUNE 10TH

Monroe County Public Safety Center, 100 Gypsum Rd Stroudsburg, PA 18360

Welcome to the EPARA Beacon! This newsletter is published monthly and is the official newsletter of the Eastern Pennsylvania Amateur Radio Association. EPARA has served the amateur radio community in the Pocono Mountains for over 25 years. We have been an ARRL affiliated club since 1995. We offer opportunities for learning and the advancement of skills in the radio art for hams and non-hams alike. EPARA supports Monroe County ARES/RACES in their mission of providing emergency communications for served agencies in Monroe County. Feel free to join us at one of our meetings or operating events during the year. The club meets on the second Thursday of every month, at the Monroe County 911 Emergency Control Center. The business meeting starts at 7:30 P.M. Anyone interested is invited to participate in our meetings and activities.

ARRL Field Day

ARRL Field Day is the most popular on-the-air event held annually in the US and Canada. On the fourth weekend of June, more than 35,000 radio amateurs gather with their clubs, groups or simply with friends to operate from remote locations.

ZOOM Meeting Info: Meetings begin at 7:30PM!

https://us02web.zoom.us/j/85463346031?pwd=bU1KcVZoaVZiVEUvdjRsUXlNNHZkZz09

Meeting ID: 854 6334 6031 Password: 244632

From The President

Sure does feel like summer don't it? Well warm temps means that Field Day is fast approaching and I can't wait! We will be running our normal Field Day ops at Big Pocono State Park. Food, fun, and radio! We have renewed our agreement with the Parks Dept for use of Big Pocono State Park for the next 10 years. Be sure to join in the fun and make a point to come up on top of the mountain.

Hamfest season is also here, it was great to see so many club members at the Split Rock hamfest a few weeks ago. There are two hamfests in July that many of us attend, MURGAS is on July 4th and Sussex is on July 18th. I hope to see many of you at these events. September is when we will host our own hamfest after many years. Be sure to attend our meeting so you know how you can help out.

Well its short and sweet this month, I gotta go and prep for teaching the general class, get the trailer ready for Field Day, and make some club related phone calls. I hope to see many of you on June 10th at our next meeting. 73

Chris AJ3C

CONTACT INFORMATION

President Chris Saunders AJ3C: aj3c@gmx.com	Vice President Bill Carpenter AB3ME: bill47@ptd.net
Secretary Kevin Forest W3KCF: w3kcf@outlook.com	Treasurer Scott Phelan KC3IAO: kc3iao@hobbyguild.com
Member at Large Eric Weis N3SWR: n3swr@ptd.net	ARES EC Charles Borger KB3JUF KB3JUF@gmail.com

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What's INSIDE this ISSUE

EPARA Net list

Monroe county ARES-RACES – Sunday's 8:30 PM, 146.865 MHz, PL -100 Hz

The Monday Night Pimple Hill repeater 8:30 PM (Repeater freq = 447.275 with a - 5MHz offset) DMR TECH Net on TG314273* Time Slot 2

SPARK Information/Swap Net – Tuesday's 8:30 PM, 147.045 MHz, PL 131.8 Hz

The Wednesday Night EPARA Hot Spot DMR Rag Chew net at 8:30 PM, TG 3149822* Time Slot 2 (N3IS Talk Group)

EPARA Tech Net – Friday's 8:30 PM, 147.045 MHz, PL +131.8 Hz

*TG = Talk Group

Announcements
AND UPCOMING EVENTS

EPARA Patches: **Club patches are in! For those that ordered them please step forward to collect them. We also have extra just in case ...**

EPARA Club Dues
Club dues were due January 1st. For those that missed the chance to stay current, there are two (2) methods available to pay to help make this easy for all. Contact Scott KC3IAO via his email: KC3IAO@hobbyguild.com and you can send him a check or pay via PayPal.

EPARA Club Meeting
The next club meeting WILL BE held once again at the Monroe County 911 call center. We will also be holding a zoom meeting from the center for those that wish to join from their homes. This has worked well so far and we will continue the trend.

Big Pocono State Park
EPARA's application for the Field Day and Antenna/ Elmer weekend site has been approved for the next 10 years. This is good news!

No VE Session in June
Due to Field Day festivities during the last weejend of June, VE sessions have been postponed for the following month in July.

Field Day!
Field Day this year is being held during the last weekend in June - the 26th and 27th. Friday the club will be setting things up (2pm) and getting ready for the Saturday kickoff. Field Day begins at 1800 UTC Saturday and runs through 2059 UTC Sunday. Overnight camping is allowed in the park as well.

13 Colonies Special Event!
July 1st-7th 2021 (Starts July 1st 1300 Ends 0400 July 8th)

Rule #1 of Amateur Radio, it is a hobby, unless you figured out a way to fashion a living out of it.
Rule #2 of Amateur Radio, life is not a hobby and typically carries heavy responsibilities of everything that is not a hobby.
Rule #3 of Amateur Radio, never give up a LIFE event for a Ham event. You may make some great memories at the Ham event, but the guilt you may carry missing a LIFE event can be a terribly heavy millstone.
Rule #4 of Amateur Radio, as technology moves forward, so does Ham Radio - do what makes you happiest, experiment with other elements of Ham Radio as LIFE allows.
Rule #5 of Amateur Radio, it is only Ham Radio, when confused always refer to Rule #1 through #4.

EPARA GENERAL MEMBERSHIP MEETING AGENDA

EPARA General Membership Meeting Minutes
May *13th 2021*
General Membership Meeting 7:30Pm

Open meeting:

Meeting called to order at 7:30 pm on May 13th 2021 by Chris AJ3C
Introductions with call signs
Declaration of Quorum.
Total members attending, 23 Visitors present: 1

Pledge of Allegiance / Moment of silence:

Membership Meeting - Minutes April 8th, 2021:
Secretary - Kevin W3KCF:

Meeting minutes for April 8th, 2021 were posted on the EPARA website. Chris – AJ3C asked members if they had seen and read the minutes from our previous meeting. He then asked if there were any questions or objections to the minutes as they were presented. With no objections, Chris asked for a motion to accept the minutes as presented:

Motion to accept minutes as read: By Charlie – KB3JUF 2nd by Eric – N3SWR Motion Passed

Treasurers report:

Scott, KC3IAO stated the opening balance for April was $2921.84 We had income of $15 for dues and $50 for club patches. We earned $.12c in interest, leaving a closing balance of $2996.96. Our PayPal account had an opening balance of $449.43 We had an income of $15 for dues and a PayPal fee of $.74c, leaving a closing balance of $463.69

Motion to accept reports by Ruth Ann – W9FBO 2nd by Joe -KB3VRS Motion Passed

Correspondence:

We received an email from the PA Department of Conservation, stating our agreement has been approved. We need to make the $50 payment for processing and our agreement will be secure for 10 years. This allows us to utilize Big Pocono State Park for Field Day and Antenna Weekend.

Reports of officers and committee's:

Bill AB3ME – Program Committee:

Bill stated that we have no presentation scheduled for after the meeting. KL7H Craig Bledsoe was scheduled to give a presentation, but he was on an airplane heading home. He had stated he was willing to do a presentation on the following Thursday (20-May-21) via zoom, but Bill said we would reschedule for June.

Bill then asked if anyone interested in giving a presentation, please contact him to set things up.

Charlie KB3JUF – ARES/RACES:

Charlie stated there would be an ARES/RACES meeting on Friday the 28th of May following the VE session. Charlie said Chris – AJ3C would be going over Radiograms and he would be talking about ICS 213 Form. Charlie then informed us, that the "Run For Red" had been cancelled due to low participation and rising costs.

Chris AJ3C |-- Instruction and Training:
There will not be a public VE session in June due to Field Day. A special VE session will be held for the General Class student W9FBO – RuthAnn. Chris said there would be a Technician class in the fall sometime in September and he would coordinate with the 911 Center to arrange for a classroom.

EPARA GENERAL MEMBERSHIP MEETING AGENDA

PIO

Public Information Officer position is vacant

Chris AJ3C - Website

The newsletter and Hamfest Flyer have been uploaded to the website and they are now available for download. If anyone would like to set up a table at the Hamfest, please contact Walt as he is the coordinator for this event.

AL, KB3OVB: Membership:

Chris stated, prior to COVID-19 we had 67 members. With all the lockdowns, regulations and lack of events, we lost 17 members and are currently at 50 paid members. Chris believes through the Hamfest, field day and other events we will gain additional interest and members.

Eric N3SWR – Newsletter and Communications:

Eric said there was nothing new to add and Chris thanked him for a fine job well done.

Sat-Com Group: *Planning for an EME project*

Chris asked Bob – W3BMM and Alex – KD2FDA if they had anything new for the club? Alex said they had swept the new antenna and the SWR was perfect for the frequency they are going to operate on. He mentioned we are getting prepared for our EME (Earth/Moon/Earth) attempt at the end of May and we would also be bringing the equipment to field day. He also stated that anyone having an antenna for SatCom, bring it along too.

Old business:

Embroidered Patches:

Chris said there are still about 13 patches available for purchase. For those still interested in purchasing patches, the cost of a patch is $10. PayPal is setup, so if you are interested, contact Scott KC3IAO

Tech Net on DMR:

EPARA Tech Net on the KG3I DMR repeater (T 442.275/R 447.275) The net is hosted on Monday nights at 8:30 PM on Talk Group 314273 ***and is on Time Slot 2, Color Code 0.***

N3IS DMR Talk Group:

EPARA has established a DMR talk group under the club N3IS call sign. The talk group is 3149822 and is accessible via hot-spot only. This group meets Wed nights at 8:30pm for a great time and rag chew.

EME Antenna:

The M2 antennas 2-meter beam has been assembled and tuned for a 1-1 SWR on the desired frequency for moon bounce.

2021 Hamfest:

The EPARA Hamfest will be held on September 19th 2021. We secured rental of the American legion Hall in East Stroudsburg. Hamfest will be on Sunday September 26th 2021 Planning for food concessions will need to begin asap. Vendors are to contact Walt W3FNZ. The new flyer is ready for distro. Bill AB3ME and Chris AJ3C will be meeting with Walt W3FNZ to view the location and pay the rental fee of $100 on May 15th 2021

Any other old business

EPARA GENERAL MEMBERSHIP MEETING AGENDA

New business:

Field Day 2021:

FD will be on June 26th and 27th Setup will be on Friday the 25th at 2 PM. We will be running as a class 2A. The club will be providing some food and drink, attendees should bring additional refreshments.

Motion to remove Rich KC3IAM from membership:

Charlie KB3JUF made a motion to remove Rich KC3IAM for actions prejudicial to the interest of EPARA in accordance with the EPARA Constitution Article III Section 5. The motion was seconded by AL – KB3OVB

Written statements were submitted and read to the membership. Audio recordings supporting the claim were played for the membership.

Motion was debated by membership and put to vote.

Motion to remove Rich KC3IAM passed by unanimous vote.

Votes: Yes - 23 No - 0 Abstain - 1

Rich has been removed as a member of EPARA. He will no longer have voting rights, but will be able to attend club meetings and club events. A certified letter will be sent to Rich – KC3IAM explaining what has taken place and a check for his Dues will be included.

Any Other New Business

50/50 raffle was won by AL -KB3OVB. The pot contained $30.00

Votes / New members:
None

Announcements:

Split Rock Hamfest is on Saturday May 15th starting at 8AM for buyers.

Any Additional Announcements:

Adjournment…

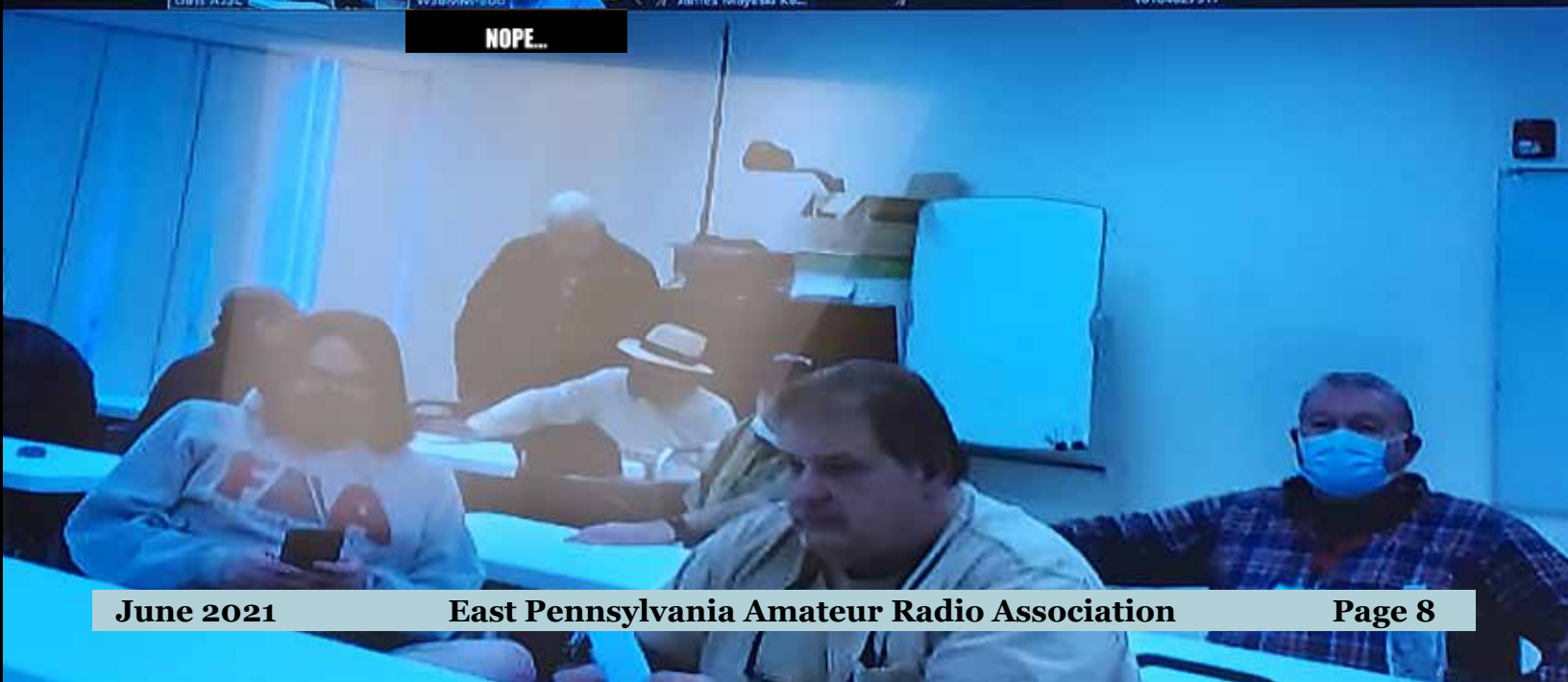
Meeting was adjourned at 8:52 pm Motion to close by Pete -KB3YKJ 2nd by Alex – KD2FTA Motion Passed

Presentation:
None

Secretary
Kevin Forrest
W3KCF


ZOOM
MEETING


J
Roy - W0ROY
16104627917


NOPE...

TEST YOUR KNOWLEDGE!

Why is the F2 region mainly responsible for the longest distance radio wave propagation?

A. Because it is the densest ionospheric layer
B. Because of the Doppler effect
C. Because it is the highest ionospheric region
D. Because of meteor trails at that level

Last month's answer was, A. Fourier analysis
Fourier analysis is the study of how general functions can be decomposed into trigonometric or exponential functions with definite frequencies.

More Digital Mobile Radio news!

The EPARA HOT SPOT Wednesday night DMR rag chew net is coming!

Wednesday evenings at 8:30 PM local, 0:30 UTC!

Tune your DMR radios to Talk Group 3149822 TS2 to join the

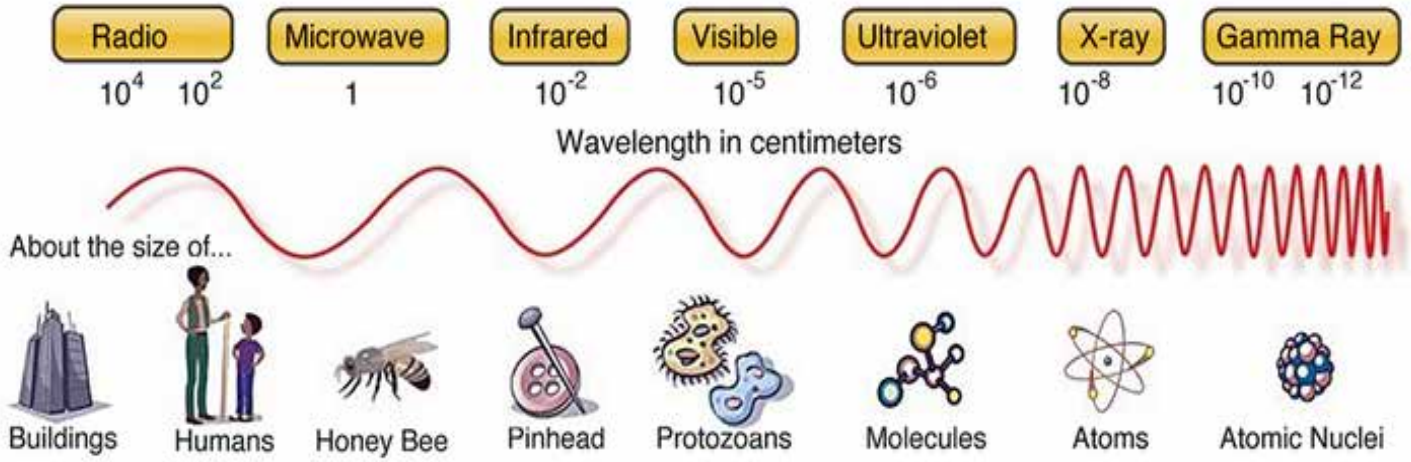
N3IS EPARA Hot Spot rag chew DMR net.

Listen to the Tech Net Friday nights on the 147.045 repeater to learn more about joining this net and for upcoming ZOOM meetings announcements to learn more about programing your radios and hot spots!

DMR
DIGITAL MOBILE RADIO

Radio 101 (in easy terms)

We'll keep the science to a minimum, but to understand things like the difference between CB and Ham or how far your signal will reach, it's helpful to understand the basics of radio. Radio is part of a broader spectrum.



The electromagnetic spectrum

There are all kinds of signal waves around us called the "electromagnetic spectrum." The visible light we see, UV rays from the sun, X-rays, microwaves, the signal from your remote control to a TV, GPS, and radio all fall on this spectrum.

The difference between types of waves is how big and fast the waves are.

Because different sections of the spectrum work well for different jobs (like transmitting TV shows versus cooking food), and to keep the airwaves more organized, governments create and manage blocks of frequencies for different purposes.

Blocks are reserved for satellites, emergency services, military, commercial aircraft, CIA mind control devices, commercial radio stations, mobile phones, and so on.

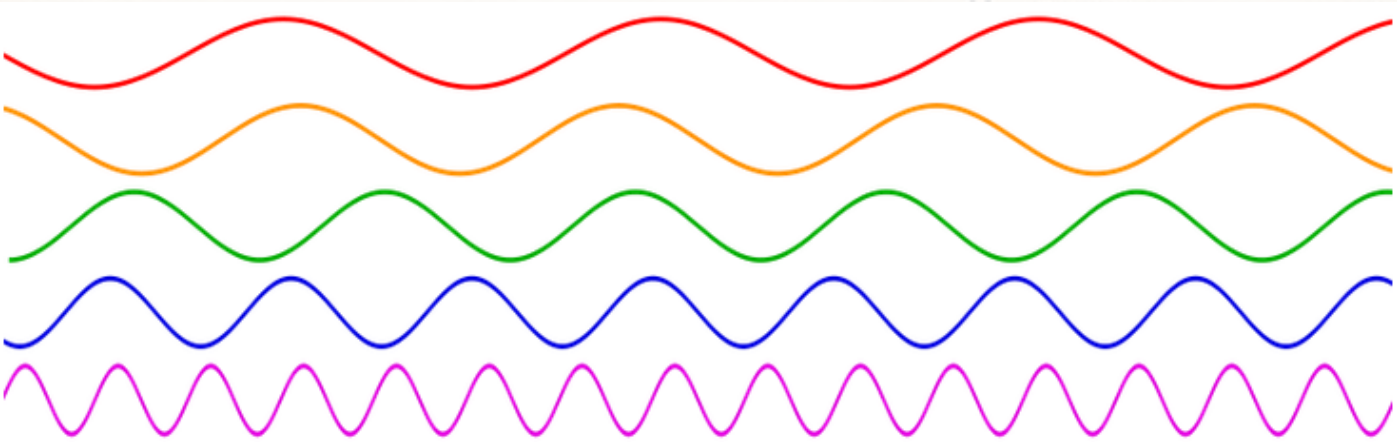
That's why all FM radio stations you listen to in the car are between 88 and 108, which correlates to their frequency of 88 MHz to 108 MHz. AM stations are always between 540 and 1600 KHz.

But not all frequencies are created equal. For example, FM radio stations usually sound clearer than AM radio stations.

The bands used to transmit HD TV signals are different than those used for garage door openers. It boils down to how big and fast the waves are, which affects how much info you can package into a signal. HD TV requires more info per second than simple talk radio.

What are radio frequencies?

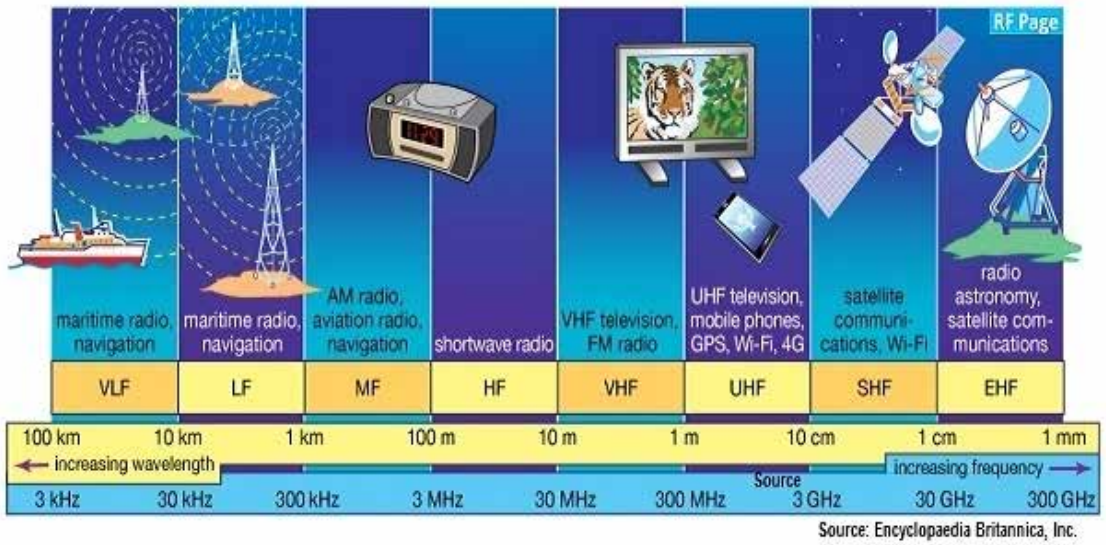
"Frequency" means how often something happens in a specific time window. Fast music might have a frequency of 120 beats per minute, where slow music might be 66.



The red wave has a lower frequency than the purple wave

In radio, frequency is the number of waves per second. You'll see frequencies listed like "840 kHz" or "300 MHz". Hz stands for Hertz, which means one wave. The k, M, and G that goes before Hz is for kilo, Mega, and Giga — yes, the k is lowercase while the others aren't. Just like on the computer, where a Kilobyte < Megabyte < Gigabyte. A Megahertz is one million waves. So a frequency of 300 MHz would be 300,000,000 waves per second.

What is a wavelength?



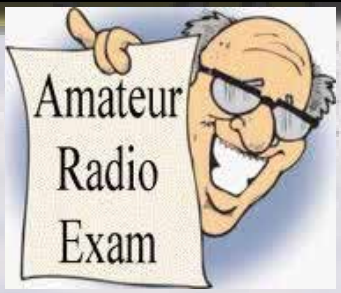
Some radio waves have wavelengths of 60 miles (100 kilometers)!

Wavelength and frequency are an inverse relationship. The higher the frequency, the lower the wavelength. Which makes sense — if a single wave is 60 miles long, it'd be a lot harder to scrunch 300,000,000 of those waves into one second's worth of transmission than if each wave was only an inch long.

Credit:https://theprepared.com/survival-skills/guides/beginners-guide-amateur-ham-radio-preppers/

VE Testing & Classes

Anyone looking to take an exam is encouraged to contact Chris AJ3C to preregister at least one (1) week in advance of the test date. If you have any questions or to register, Chris can be reached via email AJ3C@GMX.COM. VE sessions are being held the 4th friday of each month at 6pm at the Monroe County 911 training center. Seating is limited for the time being so we can follow the health guidelines set forth by the county and state.



VE sessions are back - contact Chris AJ3C for further information!

General license classes will conclude this month. Congratulations to all!

NEWLY RESURRECTED!

HAMFEST 2021

Sunday, September 26th, 2021 - Opening 8am

ALL NEW LOCATION!

The American Legion Post 346
126 E 5th St, East Stroudsburg, PA 18301

Take exit 309 off I-80, then left on 447 N. - 2 miles to Business rt 209 S. - then 1st left to E. 5th St.

Featuring:

- ✓ Hot & Cold Food
- ✓ Beverages
- ✓ Hourly Giveaways
- ✓ Free Parking

Rain or Shine

- ✓ Handicap Accessible
- ✓ Convenient Restrooms
- ✓ Door Prizes!
- ✓ 50/50 Raffle

- ✓ Sat/Comm Demonstration and Information
- ✓ VE Session will be held at 10AM
- ✓ Grand Prize Drawing is an Alinco DJ-MD5T Hand held DMR Transceiver

Google Maps

Eastern Pennsylvania Amateur Radio Association

For more information please visit the EPARA website at: www.qsl.net/n3is

Talk-in: 147.045MHz PL+131.8 · Phone 570-350-1185 · email: 3w3fnz@gmail.com

VISITOR INFORMATION

ADMISSION: Buyers: $7 · Sellers: $10
Vendors & Sellers: 6:00AM · Buyers: 8:00AM
Tailgate Outside or Table Space Inside our Pavilion
Club Table for Consignments

EPARA Website

ARES/RACES meetings are now being held on the fourth Friday of each month at 7PM. The meetings are once again being held at the 911 call center. These meetings will serve as training sessions covering several aspects of amateur radio emergency communications. We will start with traffic handling and the use of Radiograms and the ICS 213 general message form. Future sessions will cover the use of several ICS forms and the setup and use of digital communication modes including Winlink, Packet Radio, APRS, and the FLDIGI software program. Meeting are open to all, you do not need to be an ARES/RACES team member to attend.

Don't forget to sign up with with ARES Connect if you haven't done so already and if you plan to attend the meeting or check-in to the weekly net remember to register you attendance on the ares connect page. To sign please use this link: https://arrl.volunteerhub.com/lp/epa

Want to Put Your Ham Radio Skills to Good Use? Get Involved in

EmComm!

One of the missions of the Amateur Radio Service is for amateur radio operators to provide public service and emergency communications (EmComm) when needed. We act as a voluntary noncommercial communication service and pitch in to help our communities and first responders.

So, what organizations are out there for community-minded amateur radio operators and what can we do to help?

Join In

One good entry point into public service and emergency communications is to join SkyWarn, a volunteer program run by the National Weather Service (NWS) with more than 290,000 trained severe weather spotters. These volunteers help keep their local communities safe by providing timely and accurate reports of severe weather to the NWS.

Not all of these weather spotters are amateur radio operators, but many are. Amateur radio communications can report severe weather in real time. When severe weather is imminent, SkyWarn spotters are deployed to the areas where severe weather is expected. A net is activated on a local repeater and SkyWarn spotters who are Hams check into that net. The net control advises the spotters when they might expect to see severe weather, and the spotters report conditions such as horizontal winds, large hail, rotating clouds, and even tornadoes.

To become a SkyWarn spotter, you must attend a class that teaches you the basics of severe weather, how to identify potentially severe weather features, and how to report them. The classes are free and typically last about two hours. Check your local NWS website for class schedules.

ARES/RACES/CERT

Another way Hams can become involved in public service and emergency communication is to join an ARES or RACES group. Technically, these are two separate services—the Amateur Radio Emergency Service (ARES) is run by the ARRL, while the Radio Amateur Civil Emergency Service (RACES) is a function of the Federal Emergency Management Agency (FEMA). Amateur radio operators who typically take part in one also take part in the other.

To participate in RACES, you'll need to take some self-study FEMA courses in emergency preparedness and emergency-response protocols. Classes may or may not be required to participate in ARES. These requirements are set by each individual ARES group. To get involved with either ARES or RACES, ask your local club members when they meet. You can also contact the Section Manager or Emergency Coordinator for your ARRL section. To contact them, click here and find the section that you live in.

Amateur radio operators belonging to ARES (and its predecessor, the Amateur Radio Emergency Corps) have responded to local and regional disasters since the 1930s, including the 9/11 attacks, and Hurricane Katrina and Hurricane Michael, among others.

The Community Emergency Response Team (CERT) program trains volunteers—both Hams and non-hams—how to be prepared for disasters that may impact their area. They provide basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations. CERT offers a nationwide approach to volunteer training and organization that first responders can rely on during disaster situations, allowing them to focus on more complex tasks.

What Gear Do You Need?

For most local needs, a 5-watt VHF/UHF handheld transceiver is sufficient for utilizing local repeaters to relay messages and report on conditions as they exist. Replacing the radio's stock antenna with a higher gain antenna or connecting it to a magnetic mount on a vehicle will increase range significantly.

Even better is a VHF/UHF mobile radio installed in your vehicle with 25 or more watts output and a good mobile antenna. In the event the repeater loses power, you can talk over a considerably larger area in simplex mode with the extra power and a good mobile antenna.

If you work with an ARES or RACES group, you may be asked to act as a county control station. In this capacity, you'd need both HF and VHF transceivers in a fixed location, such as your house, with a good antenna system and emergency power capabilities like a generator or batteries. This allows you to make contacts within your state and throughout the U.S.

Helping Hams

Ham radio can play a key role in emergency situations. Here are a few examples:

- Ham radio connected firefighters and police departments, Red Cross workers, and other emergency personnel during the 2003 blackout that affected the northeast United States.
- In 2017, fifty amateur radio operators were dispatched to Puerto Rico to provide communications services in the wake of Hurricane Maria.
- Amateur radio operators provided communications in the aftermath of the Boston Marathon bombing when cellphone systems became overloaded.

- During Hurricane Katrina, more than one thousand ARES volunteers assisted in the aftermath and provided communications for the American Red Cross.
- During the devastating Oklahoma tornado outbreak that began in May 1999, amateur radio operators—giving timely ground-truth reports of severe weather—played a critical role in the warning and decision-making processes at the NWS Weather Forecast Office in Norman, Oklahoma.
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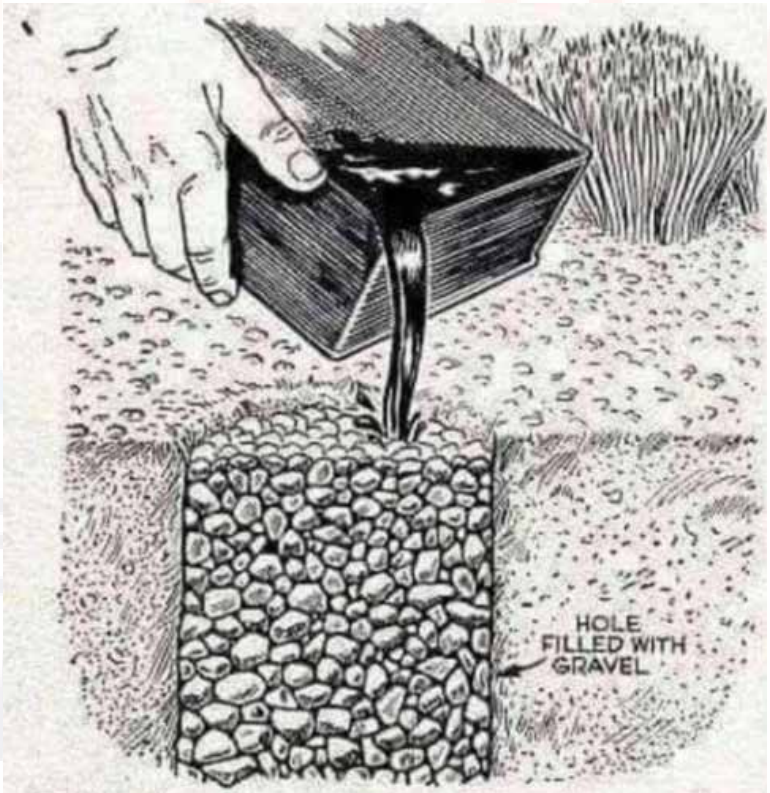
Credit: https://www.onallbands.com/want-to-put-your-ham-radio-skills-to-good-use-get-involved-in-emcomm/

From the Editor

Eric, N3SWR



Disposing of used engine oil can be a problem. Solution: Dig a hole in the ground with a posthole digger and fill it with fine gravel. Then pour in the oil. It will be absorbed into the ground before your next change. Cover the spot with soil.

166 POPULAR SCIENCE JANUARY 1963

Hello once again to our fellow members :)

A friend shared this ad from an old Popular Science magazine - do you remember those days?? I do... Glad to see that's over :)

I finally managed to finish grounding my tower and station. I figured that since the storms won't wait I better get to it and it wasn't a pain to get it done right.

Field Day is just weeks away and i hope to see many of you up on the mountain this year. Something tells me this could be a good year to remember for us all. I hope to see you there!

73 for now!

Eric
N3SWR

"Failure is an option here. If things aren't failing, you aren't innovating enough."
- Elon Musk

Topics of Interest

Have an idea you would like to share with your fellow hams? Interested in one of the new exotic digital modes and would like to get others interested in it too? Found a blog somewhere that you think others would find interesting? Members are encouraged to submit items of interest for publication. Submitted articles (are suggested) to be no more than a page or two in length and may be edited for content and grammar. The EPARA officers and newsletter editor reserve the right to determine which items will be included in The Beacon. The deadline for publication is the 15th of the month. The publication date will be at the end of each month. Copyrights are the property of their respective owners and their use is strictly non-profit/educational and intended to foster the spirit of amateur radio.

If you've taken pictures at an event and would like to submit them for possible inclusion in the newsletter, forward them to the newsletter editor. Please send action shots, if possible. Faces are often preferable over the backs of heads. Many hams may be way too overweight, so please consider using a wide-angled lens.

Disclaimer

The Beacon is not representative of the views or opinions of the whole organization, and such views and opinions expressed herein are of the individual author(s).

Bruce Draper, AA5B, aa5b.corral@gmail.com

Contest Corral

June 2021

Check for updates and a downloadable PDF version online at **www.arrl.org/contest-calendar**.
Refer to the contest websites for full rules, scoring information, operating periods or time limits, and log submission information.

Start - Finish Date-Time		Start - Finish Date-Time		Bands	Contest Name	Mode	Exchange	Sponsor's Website
1	0100	1	0159	1.8-50	Worldwide Sideband Activity Contest	Ph	RS, age group (OM, YL, or youth)	wwsac.com/rules.html
1	1700	1	1900	3.5-14	RTTYops Weeksprint	Dig	Other's call, your call, serial, name	rttyops.wordpress.com
2	1300	2	1400	1.8-28	CWops Mini-CWT Test	CW	Name, mbr or SPC	cwops.org/cwops-tests
2	1700	2	2000	144	VHF-UHF FT8 Activity Contest	Dig	4-char grid square	ft8activity.eu/index.php/en
2	1900	2	2000	1.8-28	CWops Mini-CWT Test	CW	Name, mbr or SPC	cwops.org/cwops-tests
3	0300	3	0400	1.8-28	CWops Mini-CWT Test	CW	Name, mbr or SPC	cwops.org/cwops-tests
3	1700	3	2100	28	NRAU 10-Meter Activity Contest	CW Ph Dig	RS(T), 6-char grid square	nrrlcontest.no
3	1900	3	2100	1.8-50	SKCC Sprint Europe	CW	RST, SPC, name, mbr or "none"	www.skccgroup.com
4	0000	6	2359	1.8-50	PODXS 070 Club 3-Day Weekend Test	Dig	Name, RST, SPC	www.podxs070.com
4	0145	4	0215	1.8-21	NCCC RTTY Sprint	Dig	Serial, name, QTH	www.nccctsprint.com
4	0230	4	0300	1.8-21	NCCC Sprint	CW	Serial, name, QTH	www.nccctsprint.com
4	2000	4	2100	1.8-14	K1USN Slow Speed Test	CW	20 WPM max. Name, SPC	k1usn.com/sst.html
5	0000	5	2359	3.5-28	VK Shires Contest	CW Ph	RS(T), VK Shire or CQ zone	via.org.au/members/contests
5	0000	6	2359	28	10-10 International Open Season PSK Contest	Dig	Name, SPC, mbr	www.ten-ten.org
5	0400	6	2000	3.5-28	DigiFest	Dig	RST, 4-char grid square	rigexpert.com/digifest
5	0600	5	0800	7, 14	Wake-Up! QRP Sprint	CW	RST, serial, suffix of previous QSO	qrp.ru/contest/wakeup
5	0600	6	0600	1.8-UHF	KANHAM Contest	CW Ph	RST, prefecture (if JA)	jarl.gr.jp/kanhamcontest/en
5	1200	6	1159	1.8-28	Tisza Cup CW Contest	CW	RST, CQ zone	tiszacup.eu/index.php/en
5	1300	6	1300	50	UKSMG Summer Contest	CW Ph	RST, serial, 6-char grid	uksmg.org
5	1400	6	0200	1.8-144	Kentucky QSO Party	CW Ph Dig	RS(T), KY county or SPC	www.kyqsoparty.org/rules
5	1500	6	1500	1.8-28	RSGB National Field Day	CW	RST, serial	www.rsgbcc.org/hf
6	1700	6	2200	All	Cookie Crumble QRP Contest	CW Ph Dig	RS(T), SPC, cookie #, name	w3atb.com/cookie-crumble
7	1900	7	2030	3.5	RSGB 80-Meter Club Championship, Data	Dig	RST, serial	www.rsgbcc.org/hf
8	0100	8	0300	3.5-28	ARS Spartan Sprint	CW	RST, SPC, power	arsqrp.blogspot.com
9	0030	9	0230	3.5-14	NAQCC CW Sprint	CW	RST, SPC, mbr or power	naqcc.info
9	1700	9	2000	432	VHF-UHF FT8 Activity Contest	Dig	4-char grid square	ft8activity.eu/index.php/en
12	0000	13	1559	3.5-28	DRCG WW RTTY Contest	Dig	RST, CQ zone	www.drcg.de/drcgww
12	0000	13	2359	50	SMIRK Contest	CW Ph	4-char grid square, mbr	smirk.org/contest.html
12	1100	12	1300	14, 21	Asia-Pacific Sprint, SSB	Ph	RS, serial	jsfc.org/apsprint/aprule.txt
12	1200	13	1200	3.5-28	Portugal Day Contest	CW Ph	RS(T), CT district or serial	portugaldaycontest.rep.pt
12	1200	13	2359	1.8-50	SKCC Weekend Sprintathon	CW	RST, SPC, name, mbr or "none"	www.skccgroup.com
12	1400	12	1800	144, 432	AGCW VHF/UHF Contest	CW	RST, serial, power, 6-char grid	alt.agcw.de/index.php/en
12	1500	13	1500	3.5-28	GACW WWSA CW DX Contest	CW	RST, CQ zone	contest.com.ar/gacw-wwsa
12	1600	13	1600	50	REF DDFM 6-Meter Contest	CW Ph	RS(T), serial, 4-char grid	concours.r-e-f.org
12	1800	14	0259	50 and up	ARRL June VHF Contest	CW Ph Dig	4-char grid square	www.arrl.org/june-vhf
14	0000	14	0200	1.8-28	4 States QRP Group 2nd Sunday Sprint	CW Ph	RS(T), SPC, mbr or power	www.4sqrp.com
16	0030	16	0230	3.5-14	NAQCC CW Sprint	CW	RST, SPC, mbr or power	naqcc.info
16	1200	16	1400	7	SARL Youth Sprint	Ph	RS, age	www.sarl.org.za
16	1900	16	2030	3.5	RSGB 80-Meter Club Championship, CW	CW	RST, serial	www.rsgbcc.org/hf
19	0000	20	2359	1.8-28	All Asian DX Contest, CW	CW	RST, age	www.jarl.org/English
19	1200	20	1159	3.5-28	Ukrainian DX Classic RTTY Contest	Dig	RST, 2-letter oblast or serial	urdxc.org/rtty/eng.htm
19	1400	20	1400	50, 70	IARU Region 1 50/70 MHz Contest	CW Ph Dig	RS(T), serial, 6-char grid	www.iaru-r1.org
19	1500	20	1500	1.8	Stew Perry Topband Challenge	CW	4-char grid square	www.kkn.net/stew
19	1600	20	0400	3.5-28	West Virginia QSO Party	CW Ph Dig	RS(T), WV county or SPC	www.qsl.net/wvsarc
19	1900	19	1959	1.8-50	Feld Hell Sprint	Dig	RST, mbr SPC, grid	sites.google.com/site/feldhellclub
19	1800	19	2359	3.5-14, 18, 21, 24, 28, 144 repeaters	ARRL Kids Day	Ph	Name, age, QTH, favorite color	www.arrl.org/kids-day
20	0800	20	1400	50	WAB 50 MHz Phone	Ph	RS, serial, WAB square or country	wab.intermip.net
20	2300	21	0100	1.8-28	Run for the Bacon QRP Contest	CW	RST, SPC, mbr or power	qrpcontest.com/pigrun
23	0000	23	0200	1.8-50	SKCC Sprint	CW	RST, SPC, name, mbr or "none"	www.skccgroup.com
24	1900	24	2030	3.5	RSGB 80-Meter Club Championship, SSB	Ph	RS, serial	www.rsgbcc.org/hf
26	0600	26	1700	3.5-28	UFT QRP Contest	CW	RST/ QRP/QRO, mbr, or "NM"	uft.net/concours-qrp-uft
26	1200	27	1200	3.5-28	Ukrainian DX DIGI Contest	Dig	RST, oblast or serial	www.izmail-dx.com
26	1200	27	1200	1.8-28	His Majesty King of Spain Contest, SSB	Ph	RS, EA province or serial	concursos.ure.es/en
26	1800	27	2059	All, no WARC	ARRL Field Day	CW Ph Dig	Number of xmtrs, operating class, ARRL/RAC section or "DX"	www.arrl.org/field-day
28	1900	28	2030	3.5-14	RSGB FT4 Contest Series	Dig	4-char grid square	www.rsgbcc.org/hf

There are a number of weekly contests not included in the table above. For more info, visit: **www.qrpfoxhunt.org**, **www.nccctsprint.com**, and **www.cwops.org**. All dates refer to UTC and may be different from calendar dates in North America. Contests are not conducted on the 60-, 30-, 17-, or 12-meter bands. Mbr = Membership number. Serial = Sequential number of the contact. SPC = State, Province, DXCC Entity. XE = Mexican state. Listings in blue indicate contests sponsored by ARRL or *NCJ*. The latest time to make a valid contest QSO is the minute listed in the "Finish Time" column. *Data for Contest Corral is maintained on the WA7BNM Contest Calendar at* **www.contestcalendar.com** *and is extracted for publication in QST 2 months prior to the month of the contest. ARRL gratefully acknowledges the support of Bruce Horn, WA7BNM, in providing this service.*

Amateur Radio Special Event Stations!

05/27/2021 | Fleet Week NYC

May 27-Jun 1, 0000Z-2359Z, W2F, Brooklyn, NY. James Gallo. 14.340. QSL. James Gallo, 149 Marine Ave., Brooklyn, NY 11209.

06/01/2021 | 48th Anniversary of Liga Radio Bogota (HK3LRB) and Dr. Jorge Reynold's 85th Birthday, and 39th Anniversary of Los Libertadores University Foundation

Jun 1-Jun 8, 0001Z-2359Z, 5K48LRB, Bogota, COLOMBIA. Liga de Radio Aficionados de Bogata. SSB CW FT8 RTTY; 28 24 21 18 14 10 7 3.5 MHz. Certificate & QSL. Via LoTW, QRZ.com and eQSL , or via, Bureau, COLOMBIA. Other call signs: 5J39FUL and 5J85FJR www.qrz.com/db/5k48lrb

06/01/2021 | 48th Anniversary of Liga Radio Bogota (HK3LRB) and Dr. Jorge Reynold's 85th Birthday, and 39th Anniversary of Los Libertadores University Foundation

Jun 1-Jun 8, 0001Z-2359Z, 5J85FJR, Bogota, COLOMBIA. Liga de Radio Aficionados de Bogata. SSB CW FT8 RTTY; 28 24 21 18 14 10 7 3.5 MHz. Certificate & QSL. Via LoTW, QRZ.com and eQSL, or via, Bureau, COLOMBIA. Other call signs: 5K48LRB and 5J39FUL www.qrz.com/db/5j85fjr

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Jun 1-Jun 8, 0001Z-2359Z, 5J39FUL, Bogota, COLOMBIA. Liga de Radio Aficionados de Bogata. SSB CW FT8 RTTY; 28 24 21 18 14 10 7 3.5 MHz. Certificate & QSL. Via LoTW, QRZ.com and eQSL, or via, Bureau, COLOMBIA. Other call signs: 5K48LRB and 5J85FJR www.qrz.com/db/5j39ful

06/01/2021 | Amateur Radio In Public Parks Kings County Ca.

Jun 1-Jun 15, 0300Z-0300Z, K6F, Hanford, CA. K6ELK and Amateur Radio Friends & Families. 14.228. QSL. Fred Johnson, 1182 E Myrtle St, Hanford, CA 93230. Special Event Call sign K6F for Amateur Radio in Public Parks Kings County CA. (KCPOTA) Operating from various parks in Kings County to promote amateur radio fun and demonstrate portable operations to our community. Self-Addressed Stamped Envelope (SASE) ONLY. https://www.qrz.com/db/k6f

06/03/2021 | D-Day Commemoration

Jun 3-Jun 16, 1300Z-2200Z, W2W, Baltimore, MD. Amateur Radio Club of the National Electronics Museum. 14.244 14.044 7.244 7.044. Certificate & QSL. W2W D-Day, P.O. Box 1693, MS 4015, Baltimore, MD 21203. Amateur Radio Club of the National Electronics Museum (ARCNEM) will operate W2W in commemoration of the anniversary of D-Day and the role of electronics in WWII. If the Museum is closed, Club members will work the Special Event from their home stations. Primary operation will be June 5-June 7 with additional operation possible during the June 3-4 and 8-16 periods as operator availability permits. Operation on 80M (3.544, 3.844), additional bands and digital modes possible during event. Frequencies +/- according to QRM. QSL and Certificate available via SASE; details at www.ww-2.us

06/04/2021 | 87th Anniversary of the Virginia Fone Net

Jun 4-Jun 5, 1900Z-1900Z, W4V, Leedstown, VA. The Virginia Fone Net. 3.947 7.220. QSL. Jason Rearick, PO Box 372, Patuxent River, MD 20670. If you are a current or past member of the VFN, please stop by, say hello, and share stories!! You do not have to be a member of the VFN to work us. SASE please. n3yug@arrl.net or www.vfn3947.net

06/04/2021 | Salvation Army Donut Day

Jun 4, 1500Z-2300Z, K0SAL, Lincoln, NE. SATERN Lincoln, NE. 14.318. Certificate & QSL. Charles Bennett, P.O. Box 67181, Lincoln, NE 68506. Salvation Army Lassie workers served donuts and coffee to soldiers on the front lines beginning in World War I. kd0ptk@gmail.com

Amateur Radio Special Event Stations!

06/04/2021 | USS Midway Museum Ship: Museum Ship Weekend (event is TBD)

Jun 4-Jun 5, 1600Z-2300Z, NI6IW, San Diego, CA. USS Midway (cv-41) Museum Ship. 7.250 14.320 14.070 (PSK31) DSTAR via PapaSystem repeaters. QSL. USS Midway CV-41 COMEDTRA NI6IW, 910 N Harbor Dr, San Diego, CA 92101. Please include SASE. We operate 1600Z to 2300Z each day. Event is dependent on MSW being scheduled by USS New Jersey. www.qrz.com/db/ni6iw

06/05/2021 | 80th Anniversary of Paley Award Presented to Marshall Ensor

Jun 5, 1500Z-2100Z, W9BSP, Olathe, KS. Santa Fe Trail Amateur Radio Club/Johnson County Amateur Radio Club. 7.020 7.250 14.025 14.250. QSL. KS0KS, Santa Fe Trail Amateur Radio Club, PO Box 3144, Olathe, KS 66063. Also working 30 Meters (10.12 MHz) as conditions change. We will be spotting as well. We will be operating under Marshall Ensor's call sign, W9BSP. www.w0erh.org and www.sftarc.org

06/05/2021 | Museum Ships Weekend

Jun 5-Jun 6, 1421Z-1621Z, K8E, Toledo, OH. Toledo Mobile Radio Association. 14.260 14.039 7.260 7.039. QSL. K8E Col James M. Schoonmaker Team, P.O. Box 9673, Toledo, OH 43697. www.tmrahamradio.org

06/05/2021 | Museum Ships Weekend Event

Jun 5-Jun 6, 0001Z-2359Z, NJ2BB, Camden, NJ. Battle Ship New Jersey Amateur Radio Station. 14.262 14.044 7.262 7.044. QSL. Margaret Burgess, 150 Schooner Avenue, Barnegat, NJ 08005. Check www.nj2bb.org for updates on status of the event and a list of participating ships. NO Certificates this year due to COVID. nj2bb.org

06/05/2021 | NAUTILUS - First Nuclear Submarine

Jun 5-Jun 6, 0000Z-2359Z, N1S, Groton, CT. Generations Amateur Radio Club. 50.5 14.275 7.225 3.850. QSL. Via bureau to K3LBD; direct with SASE to N1S Generations ARC, 110 Vinegar Hill Rd., Gales Ferry, CT 06335. NAUTILUS information http://www.ussnautilus.org. Event information www.qrz.com/db/k3lbd or www.qrz.com/db/n1s

06/05/2021 | USS Houston Memorial

Jun 5-Jun 6, 0000Z-2359Z, WA5DTK, Houston, TX. USS Houston Special Operation Group. 14.260 14.040 7.250 7.030. QSL. Barry Brewer, 601 Wagon Wheel Trl, Pflugerville, TX 78660-3824. Operation during the Museum Ship Weekend.

06/05/2021 | W1AGR Norfolk County Radio Association 100 Year Anniversary.

Jun 5-Jun 12, 0000Z-2359Z, W1AGR, Various cities, MA. Norfolk County Radio Association . 21.285 14.235 7.225 3.825. QSL. Dick Bean, 422 Everett St., Westwood, MA 02090. Members will operate their own stations using the club call, W1AGR. SASE for special QSL. https://www.qrz.com/db/w1agr

06/07/2021 | Dog Island DXexpedition

Jun 7-Jun 18, 0001Z-2359Z, K4D, Dog Island, FL. K5TEN. 40 through 6 meters, SSB CW digital; 50.130 28.310 21.285 14.260 10.110 7.188. QSL. K5TEN, Dog Island DXpedition, 208 Mount Tabor Rd., Hot Springs National Park, AR 71913. IOTA Island NA-085, FL005S www.qrz.com/db/k4d

06/11/2021 | King Kamehameha Celebration

Jun 11, 0000Z-2359Z, K6K , Kaneohe, HI. KH6ML . 14.268 7.188 146.505. Certificate. Michael, 44-096 Keaalau Pl, Kaneohe, HI 967442531. https://sites.google.com/view/k6khawaii

06/12/2021 | 1st Annual US Island Special Event Week

Jun 12-Jun 20, 1200Z-2100Z, K3USI, Fredericksburg, VA. US Island Awards Program. 28.460 21.260 14.260 7.260. Certificate. Jay Chamberlain, 27 Fox Run Lane, Fredericksburg, VA 22405. (US Island Chasers/Activators) This is a 9 day 24 hrs a day from June 12th through June 20 day. Work or Activate/Qualify as many us islands

Amateur Radio Special Event Stations!

for certificates. See website for information. This is an operating event. w4ybv@yahoo.com or www.usislands.org

06/12/2021 | Appleton Flag Day Parade Event Station

Jun 12, 1830Z-2030Z, W9ZL, Appleton, WI. Fox Cities Amateur Radio Club. 14.246. QSL. FCARC, P.O. Box 2346, Appleton, WI 54912. FCARC will be operating while participating in the Appleton Flag Day Parade. The largest Flag Day Parade in the county. We will be operating remotely with our radio van as we go thru the parade route. www.fcarc.club

06/12/2021 | Hudson River Radio Relay Featuring Bannerman's Island

Jun 12, 1700Z-2100Z, N2B + 7 More, Beacon, NY. Hudson Valley Digital Network (HVDN). 7.200 14.250 18.128 50.130. Certificate. Hudson Valley Digital Network, 106 Cedar Ave., C/O HR3 2021 Special Event, Poughkeepsie, NY 12603. Other stations: N2H, N2U, N2D, N2S, N2O, N2N and N2V. Voice, CW, Data & Digital frequencies for this event can be found at: https://hudsonriverradiorelay.com/for-radio-amateurs.html hudsonriverradiorelay.com/for-radio-amateurs.html

06/12/2021 | Iowa's Islands on the Air (USIlands)

Jun 12-Jun 20, 1300Z-1300Z, W0DBQ, Dubuque, IA. Great River Amateur Radio Club. 14.260 28.560 18.128 3.755. Certificate & QSL. Great River Amateur Radio Club, POB 1384, Dubuque, IA 52004. Iowa's Islands on the Air will be be participating with USIlands on the Air special event June 12th to 20th. Certificates for stations working five Iowa Islands. Iowa amateur radio operators will be activating as many islands as possible on the USIlands' webpage.(Iowa islands. Will be using frequencies normally used by USIlands OTA TA. w0dbq.org

06/12/2021 | Kansas Heartland Military Day

Jun 12, 1400Z-2200Z, N0G, Topeka, KS. Kaw Valley Amateur Radio Club. 14.250 7.250. QSL. KVARC N0G Special Event, P.O. Box 750016, Topeka, KS 66675-0016. The Kansas National Guard Museum's annual Heartland Military Day event is held to commemorate the service of the thousands of Kansas National Guardsmen with various displays, reenactments, and military vehicle rides. Also on site will be the touring Remember Our Fallen exhibit honoring those who have given their lives in the Global War On Terrorism. SASE for an event QSL, and $1 donation for expenses is greatly appreciated. Frequencies are +/- QRM. https://www.kvarc.org/specialevent.html

06/12/2021 | Woronoko Heights Outdoor Adventure

Jun 12, 1300Z-1900Z, W1M, Russell, MA. Western Mass Council--BSA. 14.290 14.060 10.115 7.190. QSL. Tom Barker, 329 Faraway Rd., Whitefield, NH 03598. SES operating from Moses Scout Reservation. SASE for QSL.

06/15/2021 | 185th Anniversary of Arkansas Statehood

Jun 15-Jun 20, 1400Z-2100Z, N5A, Springdale, AR. Razorback Contest Club. 14.260 14.040 7.220 7.040. QSL. Razorback Contest Club, 3407 Diana St., Springdale, AR 72764. rccw5yo@cox.net

06/19/2021 | International Museums Weekends 2021 - Cincinnati Art Museum

Jun 19-Jun 27, 0000Z-2359Z, W8M, Cincinnati, OH. OH-KY-IN ARS. 7.250 14.250. QSL. Robert Frey WA6EZV, 7895 Jessies Way, Apt 301, Hamilton, OH 45011. Operating only Saturday and Sunday as per International Museums Weekends recommendations. ohkyin.org

06/25/2021 | Field Day 2021

Jun 25-Jun 28, 0000Z-2359Z, N6R, Simi Valley, CA. Ventura County Amateur Radio Society. 21.320 14.255 7.260 3810.0. QSL. Peter Heins, N6ZE, 1559 Norwich Ave., Thousand Oaks, CA 91360. Commemorating the Lives of President Ronald & Mrs. Nancy Reagan. While N6R is hoping to be operating from the Reagan Presidential Library, it may need to substitute a location or locations in

Amateur Radio Special Event Stations!

and around Thousand Oaks, CA, if the Presidential Library is still closed due to Covid-19. Please check website for possible updated information. www.qrz.com/db/n6r

06/26/2021 | NSS Annual Convention

Jun 26-Jul 2, 1800Z-1800Z, K6V, Weed, CA. National Speleological Society. 14.285 14.050 7.195. Certificate & QSL. Sam Rowe, 2749 Commercial Ave, Madison, WI 53704. Slow CW Saturday only. caves.org

06/27/2021 | Union County Indiana Bicentennial

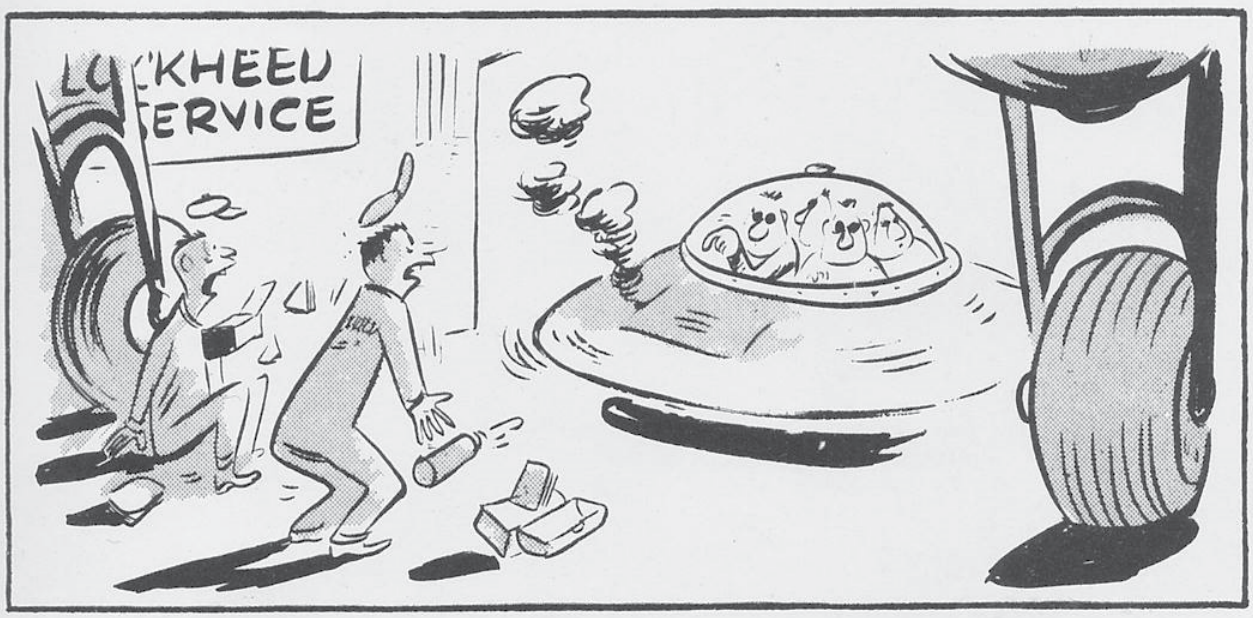
Jun 27-Jul 11, 1200Z-2359Z, K9U, Liberty, IN. Union County Indiana Bicentennial Board. 14.040 3.540 7.185 7.035. QSL. Howie Huntington ,K9KM, 25350 N. Marilyn Ln., Hawthorn Woods, IL 60047. Operators are N9LJT, K9KM, WB9HGN and others from the county. Visitors welcome to participate. Bicentennial Committee has planned 15 days of events. Regional media will have info. k9km@arrl.net

06/28/2021 | 250th Anniversary of Peru, Ma

Jun 28-Jul 9, 0000Z-2359Z, K1P, Hinsdale, MA. K1TTT. 14025 14074 14085 14250. QSL. David Robbins, 15 Baumann Rd, Hinsdale, MA 01235. QSL via LOTW or SASE. Medallions for most band/mode combinations. wiki.k1ttt.net/Peru250thAnniversary.ashx

06/29/2021 | Boy Scouts of America/Michigan Crossroads Council - Trail To Eagle XXVII

Jun 29-Jul 2, 1200Z-1000Z, K2BSA/8, Metamora, MI. Garden City Amateur Radio Club (GCARC). 14.330 7.270 3.840. QSL. Richard Zarczynski/AC8FJ, 7371 N Farmington Rd, Westland, MI 48185-6900. K2BSA/8 will be operating at the D-bar-A Scout Ranch as time permits. We will also be teaching the Radio Merit Badge to our scouters.Grid: EN82ix. https://scoutingevent.com/272-ttexxvii



Lockheed Aircraft Service, Burbank, maintained and overhauled a staggering number of aircraft of every conceivable type.

866A Rectifier

The 866 is a mercury vapor half-wave rectifier intended for high-voltage applications. The voltage drop is approximately 15 volts up to 150 Hz. To avoid unwanted shorts the tube must be operated in a vertical position and the filament preheated for at least 30 seconds before applying the plate voltage. This months tube is another favorite rectifier. If it comes to looks, mercury vapour rectifiers are the way to go. Nothing beats that mystical blue glow of a 866A:

This is a photo taken from a 866A in operation. As the name implies, the tube contains mercury, which get's vaporized during warm up of the tube. When current flows, ionized mercury creates this eerie blue light which is quite intensive. But nothing comes for free, there is a big disadvantage of these tubes: mercury is very toxic and these rectifiers contain lots of it. This article should not be understood as an encouragement to use such tubes. Do so at your own risk. These need to be handled very carefully and all necessary precautions need to be applied to avoid breaking of the glass.

866As have been manufactured by many suppliers. Many are still available in NOS quality. Probably the most from the famous company RCA.

The 866A has more disadvantages over conventional rectifiers. They are single diodes. This means for the classic full wave rectifier scheme 2 of them are needed. A bridge requires even 4. The 866A has some hefty filament requirements: 2.5V, 5A for each tube. But therefore it can supply a lot of current. 250mA average per tube which translates to 500mA DC from a pair of them in a full wave rectifier. At lower voltages (peak inverse voltage below 2500V) this value can even be doubled.

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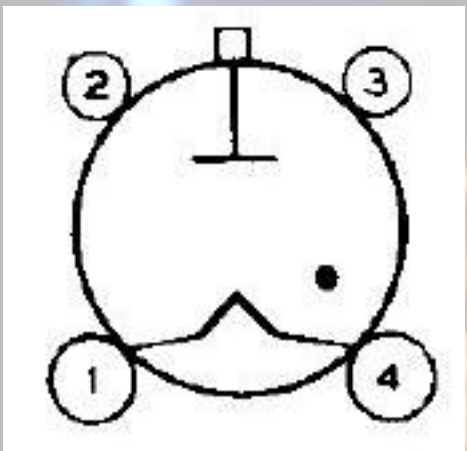
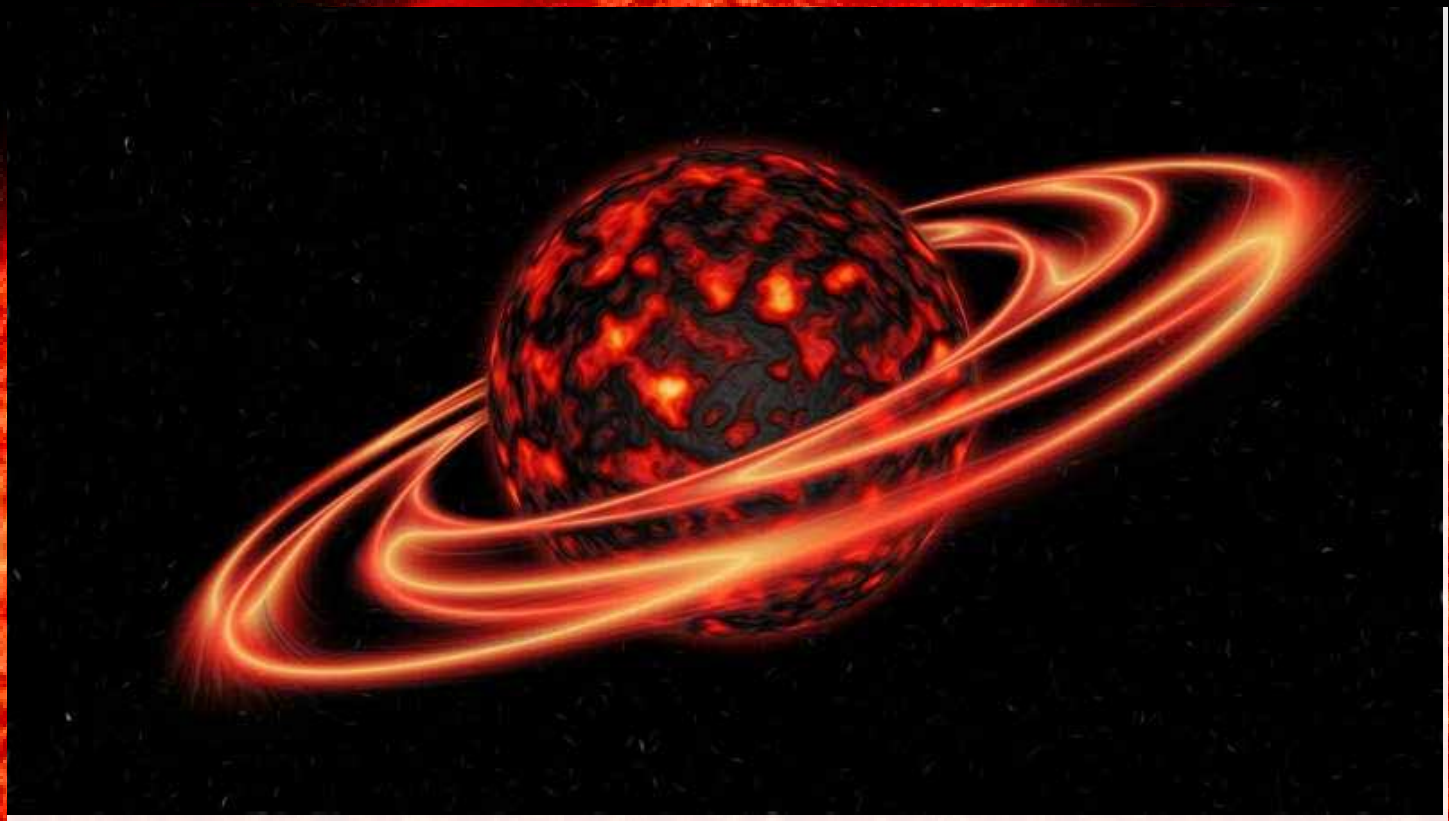
It has the UX4 base like most of the directly heated triodes. Only 2 of the 4 pins are used. The filament is brought out to pins 1 and 4, the two other pins are not used. The plate connection is brought out to a medium size cap at the top. Besides the care which is necessary to avoid the risk of breakage, the operation is also a bit tricky. The filaments must be warmed up for 30-60 seconds before the plate voltage is applied. This is necessary to ensure that the mercury is vaporized. Otherwise small drops of mercury could create an internal short and arc overs which would damage the tube. When a mercury vapour tube is used the first time, or after it has been transported, it needs an initial warm up time of 30 minutes without plate voltage. After that, and if the tube remains in it's socket in vertical position with the base down (which is the only way it is allowed to be operated in) 30-60 seconds warm up for each consecutive turn on cycle are sufficient. A complete datasheet can be found here. I already wrote about an amp with a PSU using 866As. Details can be found in the post about a 6CB5A amp with 866A rectifiers. This article also explains a possible method to provide a delayed high voltage to ensure proper warm up time.



A fascinating tube! If you want to avoid the mercury but would like to have the same looks (except the blue glow) there is a near equivalent vacuum rectifier, the 836, which does not use mercury.

Credit: https://vinylsavor.blogspot.com/2011/08/tube-of-month-866a.html



Solar storms are back, threatening life as we know it on Earth

A few days ago, millions of tons of super-heated gas shot off from the surface of the sun and hurtled 90 million miles toward Earth.

The eruption, called a coronal mass ejection, wasn't particularly powerful on the space-weather scale, but when it hit the Earth's magnetic field it triggered the strongest geomagnetic storm seen for years. There wasn't much disruption this time—few people probably even knew it happened—but it served as a reminder the sun has woken from a years long slumber.

While invisible and harmless to anyone on the Earth's surface, the geomagnetic waves unleashed by solar storms can cripple power grids, jam radio communications, bathe airline crews in dangerous levels of radiation and knock critical satellites off kilter. The sun began a new 11-year cycle last year and as it reaches its peak in 2025 the specter of powerful space weather creating havoc for humans grows, threatening chaos in a world that has become ever more reliant on technology since the last big storms hit 17 years ago. A recent study suggested hardening the grid could lead to $27 billion worth of benefits to the U.S. power industry.

"It is still remarkable to me the number of people, companies, who think space weather is Hollywood fiction," said Caitlin Durkovich, a special assistant to President Joe Biden and senior director of resilience and response in the National Security Council, during a talk at a solar-weather conference last month.

The danger isn't hypothetical. In 2017, a solar storm caused ham radios to turn to static just as the Category 5 Hurricane Irma was ripping through the Caribbean. In 2015, solar storms knocked out global positioning systems in the U.S. Northeast, a particular concern as self-driving cars become a reality. Airline pilots are at greater risk of developing cataracts when solar storms hit. Female crew see higher rates of miscarriages.

In March 1989, a solar storm over Quebec caused a province-wide outage that lasted nine hours, according to Hydro-Quebec's website. A 2017 paper in the journal of the American Geophysical Union predicted blackouts caused by severe space weather could strike as much as 66% of the U.S. population, with economic losses reaching a potential $41.5 billion a day.

To head off such a catastrophe, President Barack Obama's administration laid out a strategy to begin raising awareness of the dangers of massive solar storms and to assess the risks they pose. Last year, President Donald Trump signed the ProSwift bill into law, which aims to build up technology to improve forecasting and measurement of space weather events.
There's debate among scientists about how much can be done to shield vulnerable parts of the planet's infrastructure from the effects of solar storms. Steps such as using non-magnetic steel in transformers and installing more surge protectors in the grid could bolster resistance, but in the end the best defense against catastrophe might be better forecasting.

That would go a long way toward helping utilities prepare for shortages and making sure there are paths to back up their systems in case they lose power. In weeks, a new model developed by the University of Michigan will come online to help improve Earth-bound forecasting.
In the U.K., National Grid is building up its supply of spare transformers and conducting regular drills to deal with a major space weather event, said Mark Prouse, deputy director of the Department for Business, Energy and Industrial Strategy, a ministerial department.

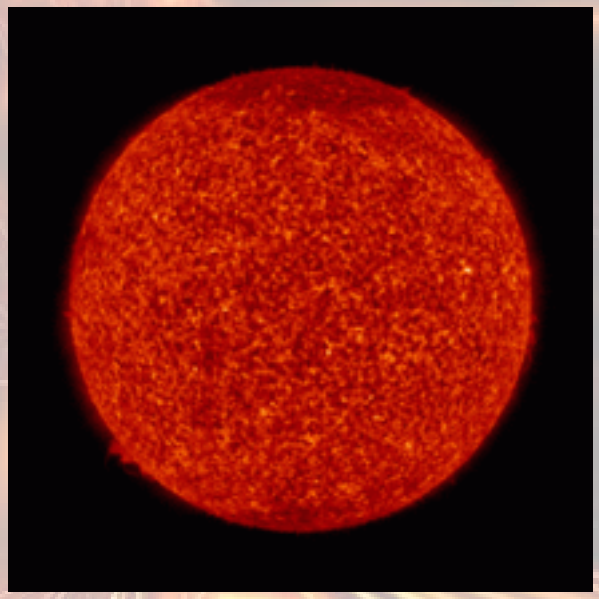
Within the past 15 years, the U.S. and U.K. have built space weather forecasting centers that deliver daily outlooks on what may be coming from the sun for airlines, power grids, satellite owners and anyone else threatened by solar flares. While Earth-bound observers can see explosive storms erupt on the sun, they can't tell the true nature of the threat—exactly how potent it is—until the blast reaches a set of satellites 1 million miles from the planet. At that point, there is only 60 to 90 minutes until it hits Earth.

"Our ability to understand and predict the solar cycle is still very limited," said William Murtagh, director of the U.S. Space Weather Prediction Center.
Just as utilities can prepare for a severe thunderstorm by staging repair workers nearby, similar precautions could be taken ahead of a solar storm, according to Mark Olson, the reliability assessment manager for the North America Electric Reliability Corp., a nonprofit answerable to the U.S. and Canadian governments.

"You have the potential for very large areas to have voltage instability," Olson said. "Situational awareness is the key here, just like in terrestrial weather events."

Solar storms have their roots in an 11-year cycle that shifts the polarity of the sun's magnetic field. The magnetic forces at work on the sun get tangled during the process, and can punch out through the surface, sending the sun's plasma into outer space and potentially triggering storms on Earth.
The most powerful geomagnetic storm ever recorded resulted in the 1859 Carrington Event, when telegraph lines electrified, zapping operators and setting offices ablaze in North America and Europe. If a storm of that magnitude were to hit today, it would likely cut power to millions if not billions of people.

"When I first started on this road and was briefed on space weather I raised an eyebrow," said Prouse. "It is much more mainstream and some of the mystification is gone. You can now raise it as a risk and not get laughed at." Credit: https://phys.org/news/2021-05-solar-storms-threatening-life-earth.html



Tad Cook, K7RA, Seattle, reports: No sunspots again this week, and as of Wednesday, we've seen 15 spotless days in a row. This is the solar minimum. The current Cycle 24 is expected to end by year's end.

Solar-Disk-2019-09-19.gifThe average daily solar flux dipped from 69.4 to 68.1, while average daily planetary A index declined slightly from 8.9 to 8.3, while the average daily mid-latitude A index rose from 7.7 to 8.

Predicted solar flux is 68 on September 19 – 26; 69 on September 27 – October 6; 70 on October 7; 68 on October 8 – 19, and 69 on October 20 – November 2.

Predicted planetary A index is 5 on September 19 – 21; 8 on September 22 – 23; 5 on September 24 – 26; 35, 45, 20, and 10 on September 27 – 30; 8, 10, and 8 on October 1 – 3; 5, 5, and 12 on October 4 – 6; 5 on October 7 – 9; 8, 5, and 8 on October 10 – 12; 5, 8, and 10 on October 13 – 15; 5 on October 16 – 19; 8, 5, and 5 on October 20 – 22; 8, 25, 30, and 18 on October 23 – 26; 8, 5, and 8 on October 27 – 29; 5 on October 30 – November 1, and 12 on November 2.

Sunspot numbers for September 12 – 18 were 0, 0, 0, 0, 0, 0, and 0, with a mean of 0. The 10.7-centimeter flux was 69.4, 68.3, 68.6, 67.7, 68.7, 67.5, and 66.3, with a mean of 68.1. Estimated planetary A indices were 7, 8, 6, 8, 11, 9, and 9, with a mean of 8.3. Middle latitude A index was 7, 8, 7, 8, 10, 8, and 8, with a mean of 8.

A comprehensive K7RA Solar Update is posted Fridays on the ARRL website. For more information concerning radio propagation, visit the ARRL Technical Information Service, read "What the Numbers Mean," and check out K9LA's Propagation Page.

A propagation bulletin archive is available. Monthly charts offer propagation projections between the US and a dozen DX locations.

Share your reports and observations.

The 11 Greatest Vacuum Tubes You've Never Heard Of

These vacuum devices stood guard during the Cold War, advanced particle physics, treated cancer patients, and made the Beatles sound good, so check these out as your lives have definitely been effected by them!

From left, Thales; Robert Phillips; RCA

In an age propped up by quintillions of solid-state devices, should you even care about vacuum tubes? You definitely should! For richness, drama, and sheer brilliance, few technological time-lines can match the 116-year (and counting) history of the vacuum tube. To prove it, I've assembled a list of vacuum devices that over the past 60 or 70 years inarguably changed the world.

And just for good measure, you'll also find here a few tubes that are too unique, cool, or weird to languish in obscurity.

Of course, anytime anyone offers up a list of anything—the comfiest trail-running shoes, the most authentic Italian restaurants in Cleveland, movies that are better than the book they're based on—someone else is bound to weigh in and either object or amplify. So, to state the obvious: This is my list of vacuum tubes. But I'd love to read yours. Feel free to add it in the comments section at the end of this article.

My list isn't meant to be comprehensive. Here you'll find no gas-filled glassware like Nixie tubes or thyratrons, no "uber high" pulsed-power microwave devices, no cathode-ray display tubes. I intentionally left out well-known tubes, such as satellite traveling-wave tubes and microwave-oven magnetrons. And I've pretty much stuck with radio-frequency tubes, so I'm ignoring the vast panoply of audio-frequency tubes—with one notable exception.

But even within the parameters I've chosen, there are so many amazing devices that it was rather hard to pick just eleven of them. So here's my take, in no particular order, on some tubes that made a difference.

Medical Magnetron

When it comes to efficiently generating coherent radio-frequency power in a compact package, you can't beat the magnetron.

The magnetron first rose to glory in World War II, to power British radar. While the magnetron's use in radar began to wane in the 1970s, the tube found new life in industrial, scientific, and medical applications, which continues today.

It is for this last use that the medical magnetron shines. In a linear accelerator, it creates a high-energy electron beam. When electrons in the beam are deflected by the nuclei in a target—consisting of a material having a high atomic number, such as tungsten—copious X-rays are produced, which can then be directed to kill cancer cells in tumors. The first clinical accelerator for radiotherapy was installed at London's Hammersmith Hospital in 1952. A 2-megawatt magnetron powered the 3-meter-long accelerator.

High-power magnetrons continue to be developed to meet the demands of radiation oncology. The medical magnetron shown here, manufactured by e2v Technologies (now Teledyne e2v), generates a peak power of 2.6 MW, with an average power of 3 kilowatts and an efficiency of more than 50 percent. Just 37 centimeters long and weighing about 8 kilograms, it's small and light enough to fit the rotating arm of a radiotherapy machine.

Photo: Teledyne e2v

Gyrotron

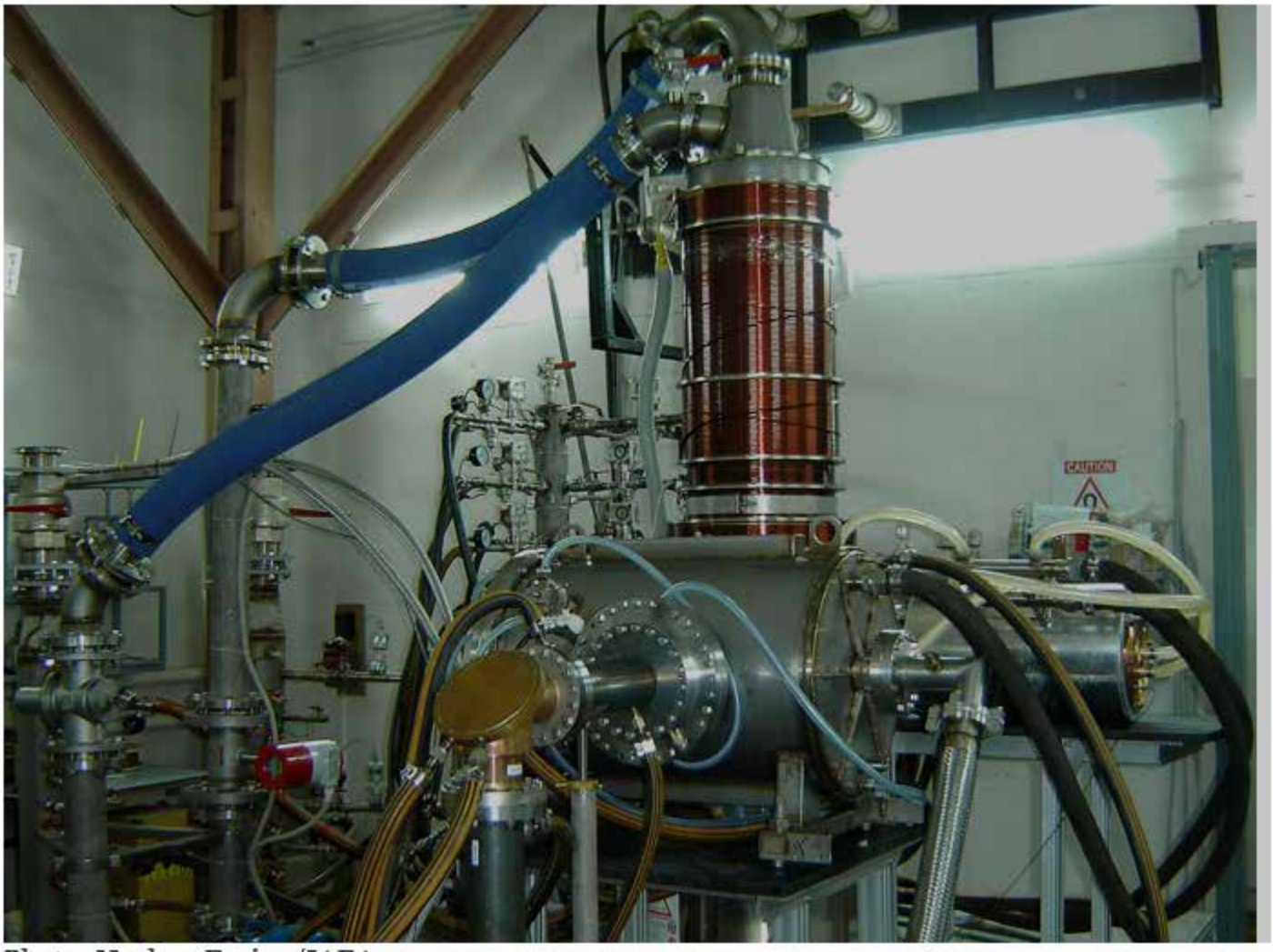


Photo: Nuclear Fusion/IAEA

Conceived in the 1960s in the Soviet Union, the gyrotron is a high-power vacuum device used primarily for heating plasmas in nuclear-fusion experiments, such as ITER, now under construction in southern France. These experimental reactors can require temperatures of up to 150 million °C.

So how does a megawatt-class gyrotron work? The name provides a clue: It uses beams of energetic electrons rotating or gyrating in a strong magnetic field inside a cavity. (We tube folks love our -trons and -trodes.) The interaction between the gyrating electrons and the cavity's electromagnetic field generates high-frequency radio waves, which are directed into the plasma. The high-frequency waves accelerate the electrons within the plasma, heating the plasma in the process.

A tube that produces 1 MW of average power is not going to be small. Fusion gyrotrons typically stand around 2 to 2.5 meters tall and weigh around a metric ton, including a 6- or 7-tesla superconducting magnet.

In addition to heating fusion plasmas, gyrotrons are used in material processing and nuclear magnetic resonance spectroscopy. They have also been explored for nonlethal crowd control, in the U.S. military's Active Denial System. This system projects a relatively wide millimeter-wave beam,

perhaps a meter and a half in diameter. The beam is designed to heat the surface of a person's skin, creating a burning sensation but without penetrating into or damaging the tissue below.

Mini Traveling-Wave Tube

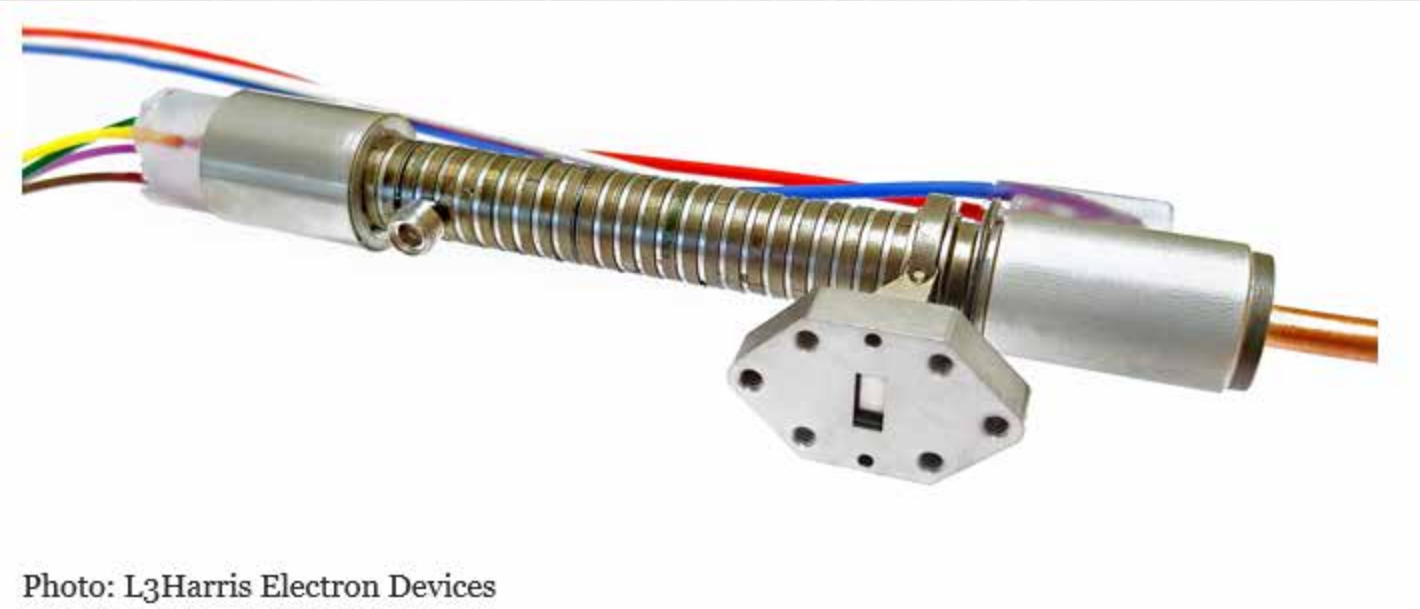


Photo: L3Harris Electron Devices

As its name suggests, a traveling-wave tube (TWT) amplifies signals through the interaction between an electric field of a traveling, or propagating, electromagnetic wave in a circuit and a streaming electron beam. [For a more detailed description of how a TWT works, see "The Quest for the Ultimate Vacuum Tube," IEEE Spectrum, December 2015.]

Most TWTs of the 20th century were designed for extremely high power gain, with amplification ratios of 100,000 or more. But you don't always need that much gain. Enter the mini TWT, shown here in an example from L3Harris Electron Devices. With a gain of around 1,000 (or 30 decibels), a mini TWT is meant for applications where you need output power in the 40- to 200-watt range, and where small size and lower voltage are desirable. A 40-W mini TWT operating at 14 gigahertz, for example, fits in the palm of your hand and weighs less than half a kilogram.

As it turns out, military services have a great need for mini TWTs. Soon after their introduction in the 1980s, mini TWTs were adopted in electronic warfare systems on planes and ships for protection against radar-guided missiles. In the early 1990s, device designers began integrating mini TWTs with a compact high-voltage power supply to energize the device and a solid-state amplifier to drive it. The combination created what is known as a microwave power module, or MPM. Due to their small size, low weight, and high efficiency, MPM amplifiers found immediate use in radar and communications transmitters aboard military drones, such as the Predator and Global Hawk, as well as in electronic countermeasures.

Accelerator Klystron

Photo: Archives and History Office/SLAC National Accelerator Laboratory

The klystron helped usher in the era of big science in high-energy physics. Klystrons convert the kinetic energy of an electron beam into radio-frequency energy. The device has much greater output power than does a traveling-wave tube or a magnetron. The brothers Russell and Sigurd Varian invented the klystron in the 1930s and, with others, founded Varian Associates to market it. These days, Varian's tube business lives on at Communications and Power Industries.

Inside a klystron, electrons emitted by a cathode accelerate toward an anode to form an electron beam. A magnetic field keeps the beam from expanding as it travels through an aperture in the anode to a beam collector. In between the anode and collector are hollow structures called cavity resonators. A high-frequency signal is applied to the resonator nearest the cathode, setting up an electromagnetic field inside the cavity. That field modulates the electron beam as it passes through the resonator, causing the speed of the electrons to vary and the electrons to bunch as they move toward the other cavity resonators downstream. Most of the electrons decelerate as they traverse the final resonator, which oscillates at high power. The result is an output signal that is much greater than the input signal. In the 1960s, engineers developed a klystron to serve as the RF source for a new 3.2-kilometer linear particle accelerator being built at Stanford University. Operating at 2.856 gigahertz and using a 250-kilovolt electron beam, the SLAC klystron produced a peak power of 24 MW. More than 240 of them were needed to attain particle energies of up to 50 billion electron volts.

The SLAC klystrons paved the way for the widespread use of vacuum tubes as RF sources for advanced particle physics and X-ray light-source facilities. A 65-MW version of the SLAC klystron is still in production. Klystrons are also used for cargo screening, food sterilization, and radiation oncology.

Ring-Bar Traveling-Wave Tube

Photo: L3Harris Electron Devices

One Cold War tube that is still going strong is the huge ring-bar traveling-wave tube. This high-power tube stands over 3 meters from cathode to collector, making it the world's largest TWT. There are 128 ring-bar TWTs providing the radio-frequency oomph for an exceedingly powerful phased-array radar at the Cavalier Air Force Station in North Dakota. Called the Perimeter Acquisition Radar Attack Characterization System (PARCS), this 440-megahertz radar looks for ballistic missiles launched toward North America. It also monitors space launches and orbiting objects as part of the Space Surveillance Network. Built by GE in 1972, PARCS tracks more than half of all Earth-orbiting objects, and it's said to be able to identify a basketball-size object at a range of 2,000 miles (3,218 km).

An even higher-frequency version of the ring-bar tube is used in a phased-array radar on remote Shemya Island, about 1,900 km off the coast of Alaska. Known as Cobra Dane, the radar monitors non-U.S. ballistic missile launches. It also collects surveillance data on space launches and satellites in low Earth orbit.

The circuit used in this behemoth is known as a ring bar, which consists of circular rings connected by alternating strips, or bars, repeated along its length. This setup provides a higher field intensity across the tube's electron beam than does a garden-variety TWT, in which the radio-frequency waves propagate along a helix-shaped wire. The ring-bar tube's higher field intensity results in higher power gain and good efficiency. The tube shown here was developed by Raytheon in the early 1970s; it is now manufactured by L3Harris Electron Devices.

Ubitron

Fifteen years before the term "free-electron laser" was coined, there was a vacuum tube that worked on the same basic principle—the ubitron, which sort of stands for "undulating beam interaction."

The 1957 invention of the ubitron came about by accident. Robert Phillips, an engineer at the General Electric Microwave Lab in Palo Alto, Calif., was trying to explain why one of the lab's traveling-wave tubes oscillated and another didn't. Comparing the two tubes, he noticed variations in their magnetic focusing, which caused the beam in one tube to wiggle. He figured that this undulation could result in a periodic interaction with an electromagnetic wave in a waveguide. That, in turn, could be useful for creating exceedingly high levels of peak radio-frequency power. Thus, the ubitron was born.


Photo: Robert Phillips

From 1957 to 1964, Phillips and colleagues built and tested a variety of ubitrons. The 1963 photo shown here is of GE colleague Charles Enderby holding a ubitron without its wiggler magnet. Operating at 70,000 volts, this tube produced a peak power of 150 kW at 54 GHz, a record power level that stood for well over a decade. But the U.S. Army, which funded the ubitron work, halted R&D in 1964 because there were no antennas or waveguides that could handle power levels that high.

Today's free-electron lasers employ the same basic principle as the ubitron. In fact, in recognition of his pioneering work on the ubitron, Phillips received the Free-Electron Laser Prize in 1992. The FELs now installed in the large light and X-ray sources at particle accelerators produce powerful electromagnetic radiation, which is used to explore the dynamics of chemical bonds, to understand photosynthesis, to analyze how drugs bind with targets, and even to create warm, dense matter to study how gas planets form.

Carcinotron

The French tube called the carcinotron is another fascinating example born of the Cold War. Related to the magnetron, it was conceived by Bernard Epsztein in 1951 at Compagnie Générale de Télégraphie Sans Fil (CSF, now part of Thales).

Photo: CSF

Like the ubitron, the carcinotron grew out of an attempt to resolve an oscillation problem on a conventional tube. In this case, the source of the oscillation was traced to a radio-frequency circuit's power flowing backward, in the opposite direction of the tube's electron beam. Epsztein discovered that the oscillation frequency could be varied with voltage, which led to a patent for a voltage-tunable "backward wave" tube.

For about 20 years, electronic jammers in the United States and Europe employed carcinotrons as their source of RF power. The tube shown here was one of the first manufactured by CSF in 1952. It delivered 200 W of RF power in the S band,

which extends from 2 to 4 GHz.

Considering the level of power they can handle, carcinotrons are fairly compact. Including its permanent focusing magnet, a 500-W model weighs just 8 kg and measures 24 by 17 by 15 cm, a shade smaller than a shoebox.

And the strange name? Philippe Thouvenin, a vacuum electronics scientist at Thales Electron Devices, told me that it comes from a Greek word, karkunos, which means crayfish. And crayfish, of course, swim backwards.

Dual-Mode Traveling-Wave Tube

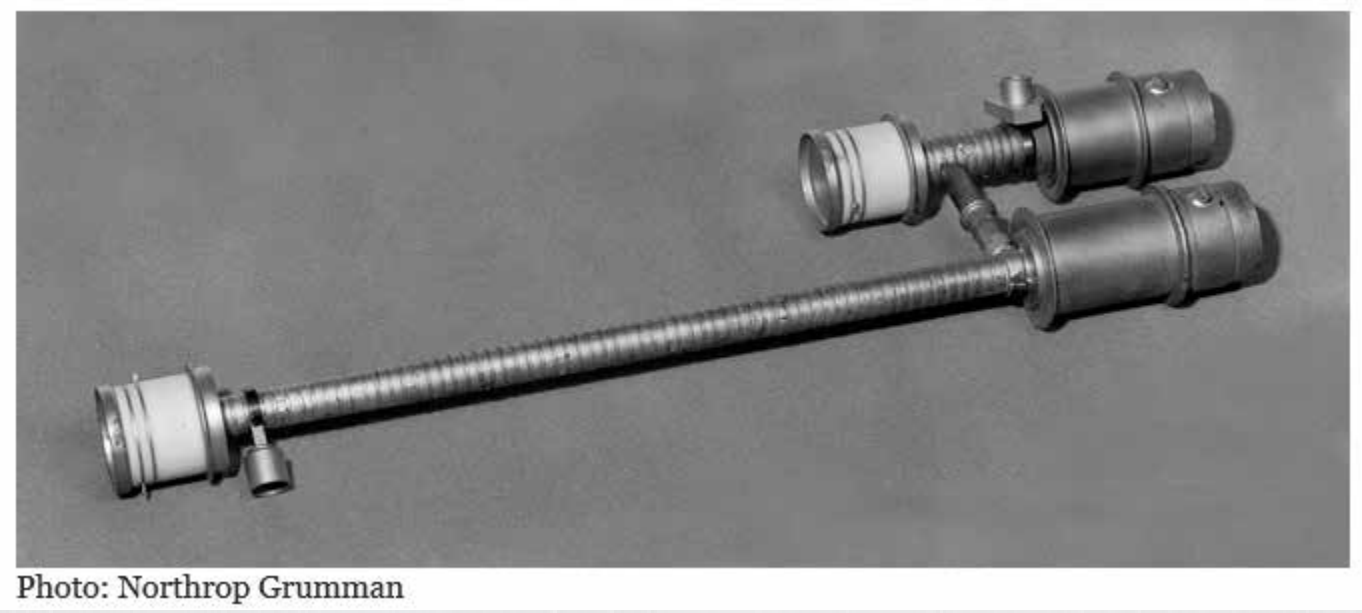


Photo: Northrop Grumman

The dual-mode TWT was an oddball microwave tube developed in the United States in the 1970s and ’80s for electronic countermeasures against radar. Capable of both low-power continuous-wave and high-power pulsed operation, this tube followed the old adage that two is better than one: It had two beams, two circuits, two electron guns, two focusing magnets, and two collectors, all enclosed in a single vacuum envelope.

The tube’s main selling point was that it broadened the uses of a given application—a countermeasure system, for example, could operate in both continuous-wave and pulsed-power modes but with a single transmitter and a simple antenna feed. A control grid in the electron gun in the shorter, pulsed-power section could quickly switch the tube from pulsed to continuous wave, or vice versa. Talk about packing a lot of capability into a small package. Of course, if the vacuum leaked, you’d lose both tube functions.

The tube shown here was developed by Raytheon’s Power Tube Division, which was acquired by Litton Electron Devices in 1993. Raytheon/Litton as well as Northrop Grumman manufactured the dual-mode TWT, but it was notoriously hard to produce in volume and was discontinued in the early 2000s.

Multi-Beam Klystron

Power, as many of us learned as youngsters, equals voltage times current. To get more power out of a vacuum tube, you can increase the voltage of the tube's electron beam, but that calls for a bigger tube and a more complex power supply. Or you can raise the beam's current, but that can be problematic too. For that, you need to ensure the device can support the higher current and that the required magnetic field can transport the electron beam safely through the tube's circuit—that is, the part of the tube that interacts with the electron beam.

Adding to the challenge, a tube's efficiency generally falls as the beam's current rises because the bunching of the electrons required for power conversion suffers.

All these caveats apply if you're talking about a conventional vacuum tube with a single electron beam and a single circuit. But what if you employ multiple beams, originating from multiple cathodes and traveling through a common circuit? Even if the individual beam currents are moderate, the total current will be high, while the device's overall efficiency is unaffected.

Such a multiple-beam device was studied in the 1960s in the United States, the Soviet Union, and elsewhere. The U.S. work petered out, but activity in the USSR continued, leading to the successful deployment of the multi-beam klystron, or MBK. The Soviets fielded many of these tubes for radar and other uses.

Photo: Thales

A modern example of an MBK is shown above, produced in 2001 by the French firm Thomson Tubes Electroniques (now part of Thales). This MBK was developed for the German Electron Synchrotron facility (DESY). A later version is used at the European X-Ray Free Electron Laser facility. The tube has seven beams providing a total current of 137 amperes, with a peak power of 10 MW and average power of 150 kW; its efficiency is greater than 63 percent. By contrast, a single-beam klystron developed by Thomson provides 5 MW peak and 100 kW average power, with an efficiency of 40 percent. So, in terms of its amplification capability, one MBK is equivalent to two conventional klystrons.

Coaxitron

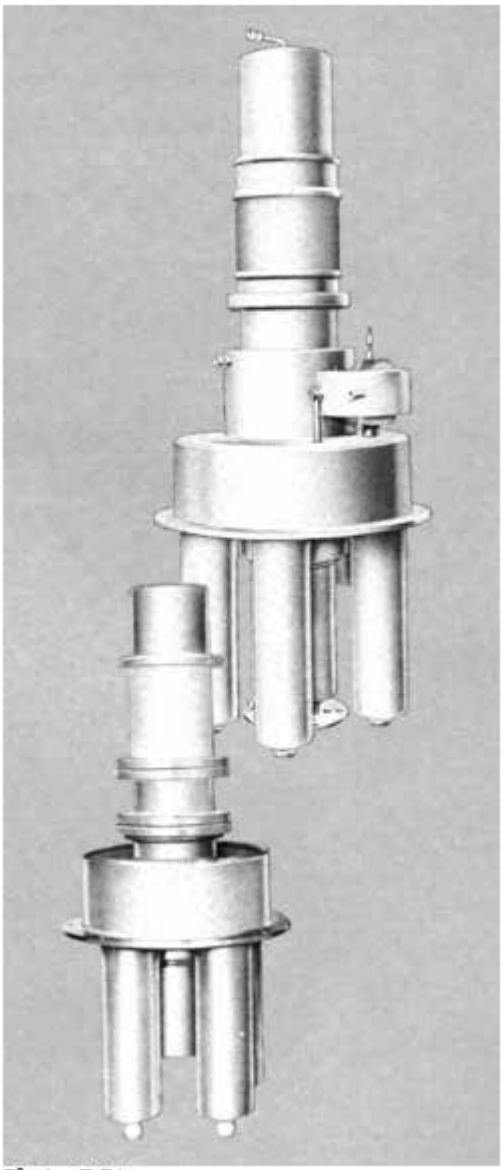


Photo: RCA

All the tubes I've described so far are what specialists call beam-wave devices (or stream-wave in the case of the magnetron). But before those devices came along, tubes had grids, which are transparent screenlike metal electrodes inserted between the tube's cathode and anode to control or modulate the flow of electrons. Depending on how many grids the tube has, it is called a diode (no grids), a triode (one grid), a tetrode (two grids), and so on. Low-power tubes were referred to as "receiving tubes," because they were typically used in radio receivers, or as switches. (Here I should note that what I've been referring to as a "tube" is known to the British as a "valve.")

There were, of course, higher-power grid tubes. Transmitting tubes were used in—you guessed it—radio transmitters. Later on, high-power grid tubes found their way into a wide array of interesting industrial, scientific, and military applications. Triodes and higher-order grid tubes all included a cathode, a current-control grid, and an anode or collector (or plate). Most of these tubes were cylindrical, with a central cathode, usually a filament, surrounded by electrodes.

The coaxitron, developed by RCA beginning in the 1960s, is a unique permutation of the cylindrical design. The electrons flow radially from the cylindrical coaxial cathode to the anode. But rather than having a single electron emitter, the coaxitron's cathode is segmented along its circumference, with numerous heated filaments serving as the electron source. Each filament forms its own little beamlet of electrons. Because the beamlet flows radially to the anode, no magnetic field (or magnet) is required to confine the electrons. The coaxitron is thus very compact, considering its remarkable power level of around a megawatt.

A 1-MW, 425-MHz coaxitron weighed 130 pounds (59 kg) and stood 24 inches (61 cm) tall. While the gain was modest (10 to 15 dB), it was still a tour de force as a compact ultrahigh-frequency power booster. RCA envisioned the coaxitron as a source for driving RF accelerators, but it ultimately found a home in high-power UHF radar. Although coaxitrons were recently overtaken by solid-state devices, some are still in service in legacy radar systems.

Telefunken Audio Tube

An important conventional tube with grids resides at the opposite end of the power/frequency spectrum from megawatt beasts like the klystron and the gyrotron. Revered by audio engineers and recording artists, the Telefunken VF14M was employed as an amplifier in the legendary Neumann U47 and U48 microphones favored by Frank Sinatra and by the Beatles' producer Sir George Martin. Fun fact: There's a Neumann U47 microphone on display at the Abbey Road Studio in London. The "M" in the VF14M tube designation indicates it's suitable for microphone use and was only awarded to tubes that passed screening at Neumann.

Photo: Thump/Soundgas

The VF14 is a pentode, meaning it has five electrodes, including three grids. When used in a microphone, however, it operates as a triode, with two of its grids strapped together and connected to the anode. This was done to exploit the supposedly superior sonic qualities of a triode. The VF14's heater circuit, which warms the cathode so that it emits electrons, runs at 55 V. That voltage was chosen so that two tubes could be wired in series across a 110-V main to reduce power-supply costs, which was important in postwar Germany.

Nowadays, you can buy a solid-state replacement for the VF14M that even simulates the tube's 55-V heater circuit. But can it replicate that warm, lovely tube sound? On that one, audio snobs will never agree.

Credit: https://spectrum.ieee.org/tech-history/space-age/the-11-greatest-vacuum-tubes-youve-never-heard-of


"Eraser fight!!"

ANTENNA ARCHIVES #35

Moxon Dual Band VHF/UHF Satellite Antenna

I have built some simple yagis the last years and seen that many have tried a Moxon Dual Band yagi. I decided to try the model by George Smart – @M1GEO. For all details of the antenna please see George homepage. (https://www.george-smart.co.uk/antennas/dual_band_satellite_yagi/)

I have used the following materials:

- PVC pipe 32 mm diameter
- PVC pipe clamps for 32 mm pipe. These are to attach the elements with glue and the just clamp it on to the pipe. See pictures.
- TIG Aluminium elements (Tigrod ESAB OK 4043 (3.2 mm/1000 mm)
  In Sweden you can buy these at https://www.svetsmaskinservice.se/
- Coax cable direct connection to the VHF element

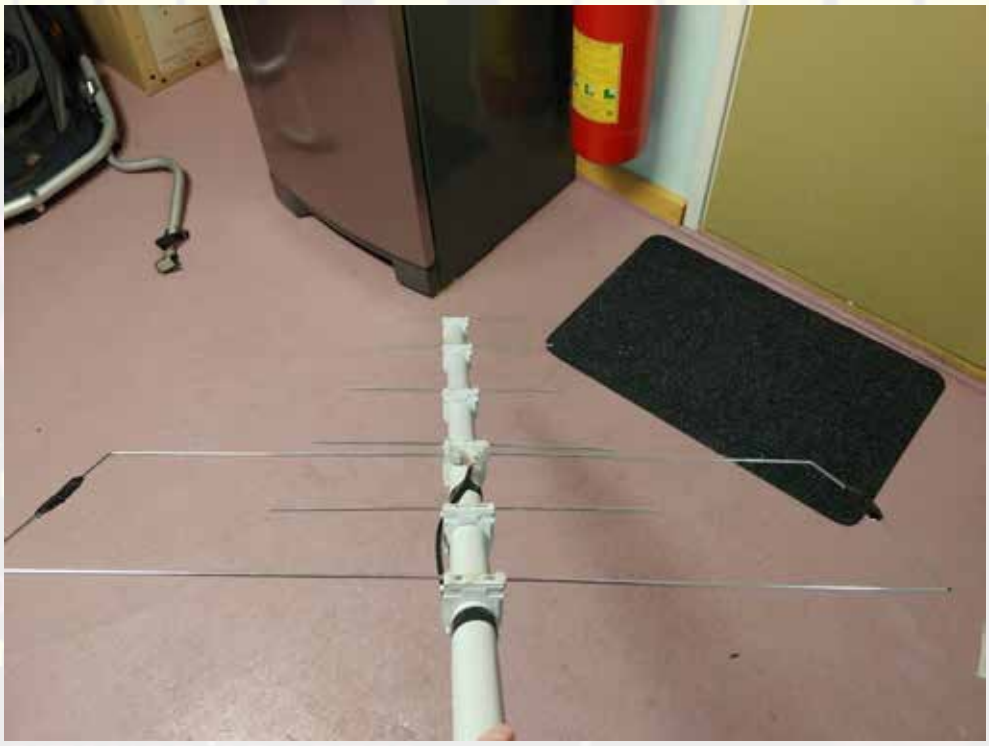
ANTENNA ARCHIVES #35

Some pictures from building

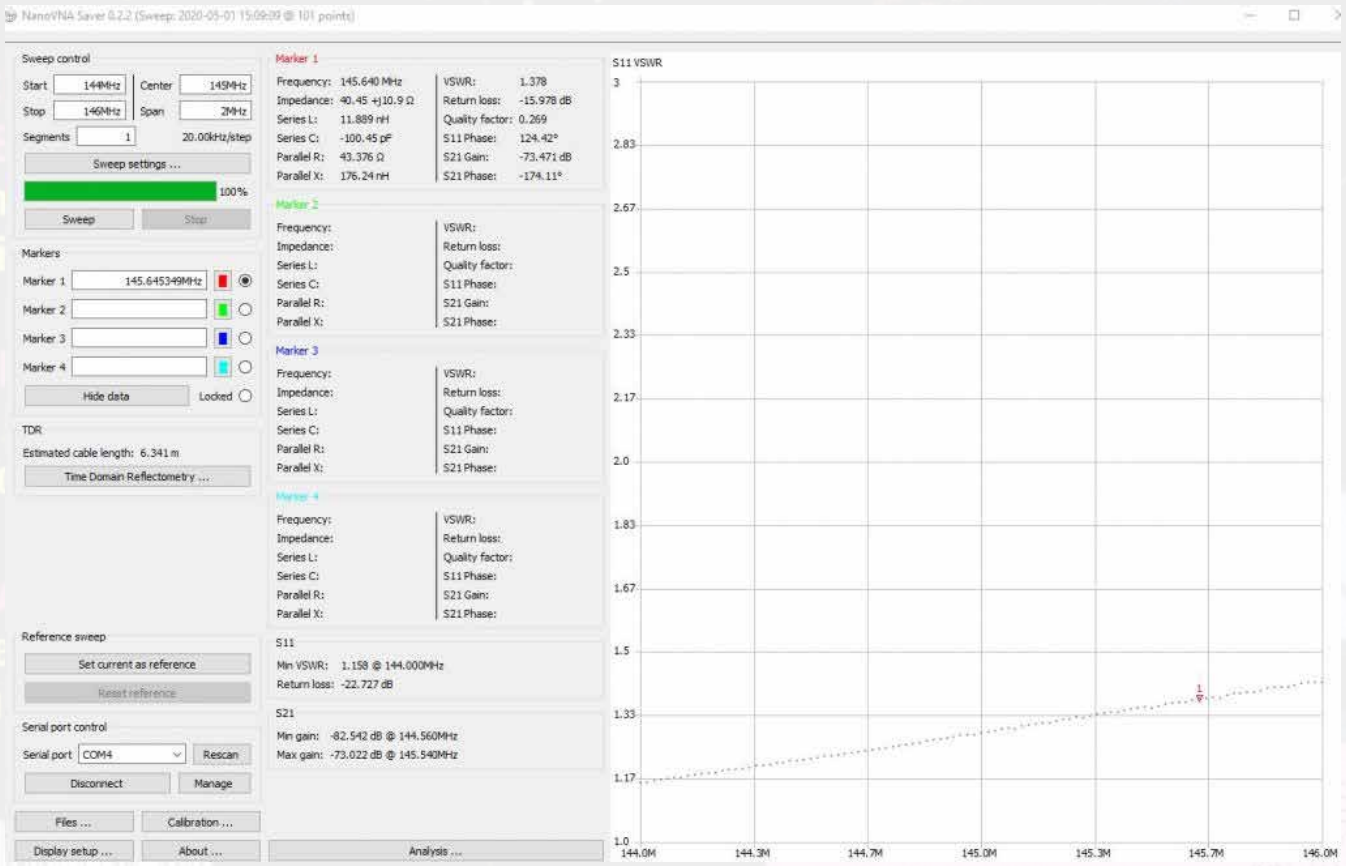
VHF element construction

VHF element test outside

ANTENNA ARCHIVES #35

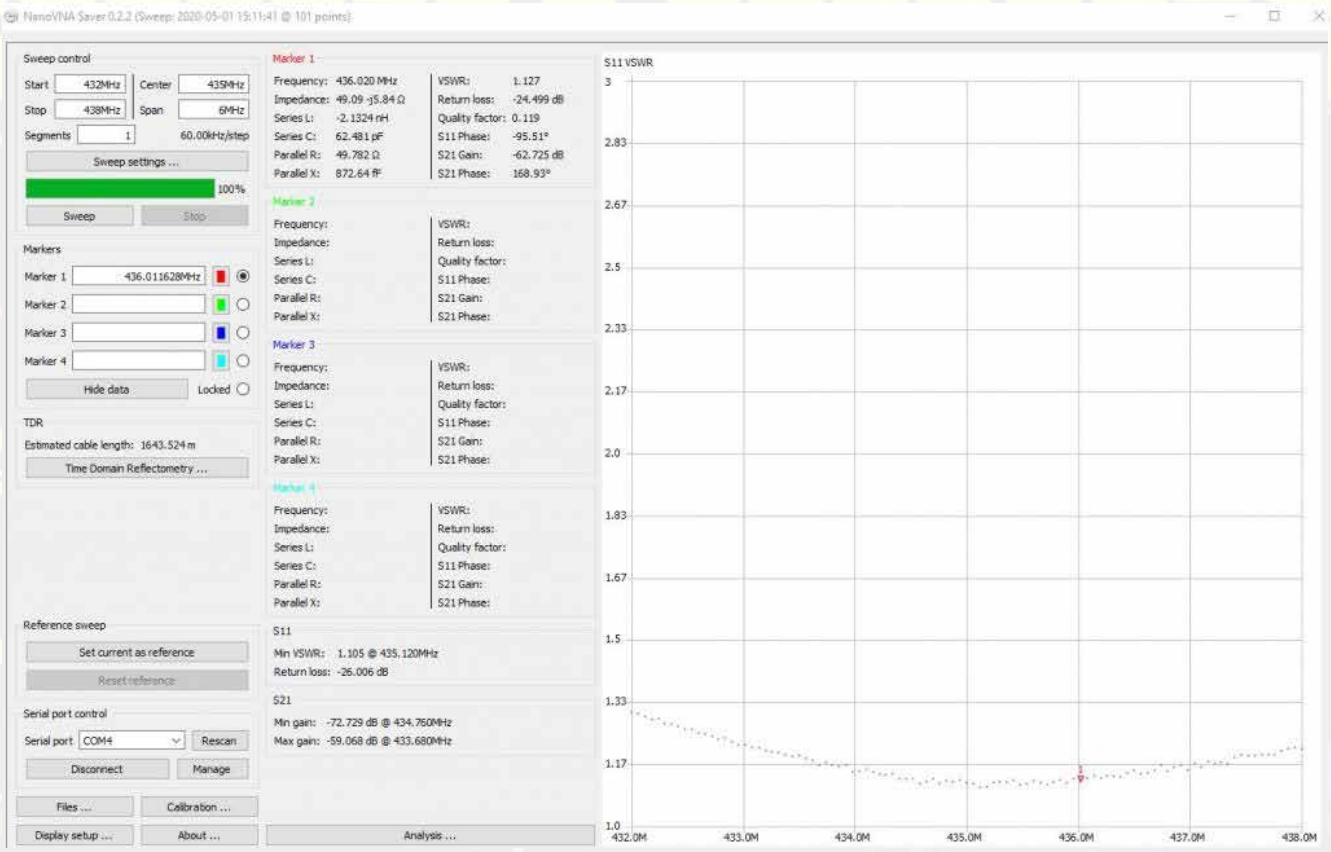


UHF elements completed
SWR measurment



VHF – very good SWR

ANTENNA ARCHIVES #35



UHF – better then VHF!

Real tests on UHF and VHF

UHF:

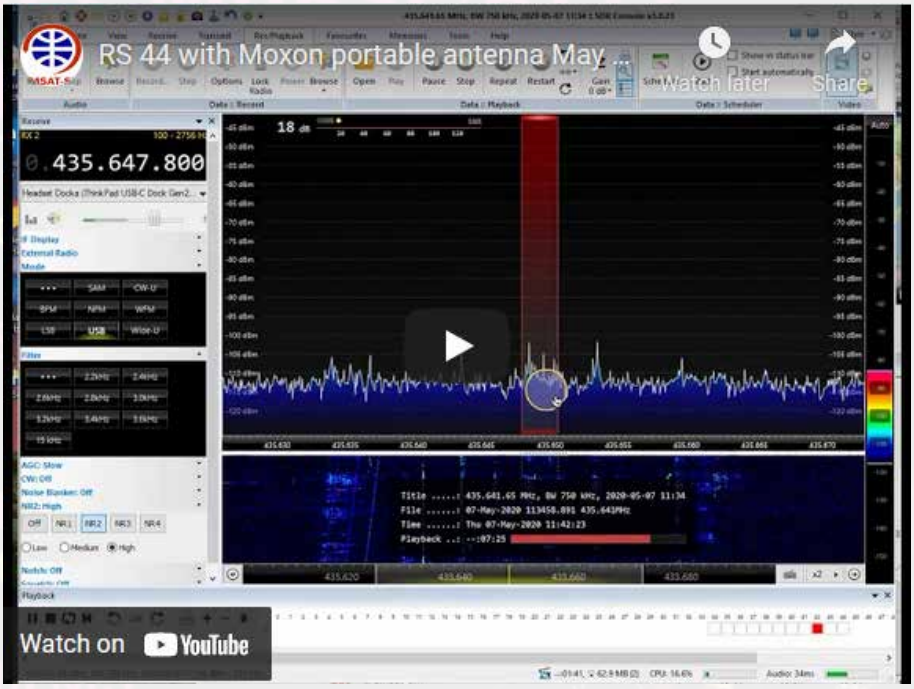
Below a very simple test with RS-44 on UHF SSB and with SDR Console. I will need to do better tests with FM sats like SO-50.

Very simple test on UHF with the RS-44 satellite

Very simple test on UHF with the RS-44 satellite

ANTENNA ARCHIVES #35

This is the second test with RS-44. Recorded with SDR Console v3 and Airspy Mini. As you can see the signal levels are not so high with this antenna so it's sometimes hard to hear the QSOs. And the fading from the satellite is very clear. The antenna was in horizontal position, vertical was even lower signal levels. It would be fun to compare the antenna with an Arrow yagi...
Second test with RS-44 satellite on UHF



Second test with RS-44 satellite on UHF

VHF:
Very good RX!

This is a test with DIY Moxon Dual Band VHF/UHF portable satellite antenna. Satellite received is AO-91 on 145.960 MHz FM. In the video you can see the signal fading when twitching the antenna vertically/horizontal. You can also see when pointing the antenna away from the satellite position that the signal drops.
In the last 20 sec of video you can see, in the background, my large yagis (2×6 el) tracking the satellite.
RX test on VHF AO-91 satellite

ANTENNA ARCHIVES #35

RX test on VHF AO-91 satellite

CUSTOM WOOD PLAQUES DONE VIA CNC ROUTER!

Plaques and other projects are made to order. Contact Bill AB3ME for more info.

Prices do vary depending on the style ordered and start at $40 shipped locally to your door for a "basic plaque" Wood available is Butternut, Oak - light and dark, Black Walnut, Cherry and Hemlock Pine. Various fonts are also available. Local shipping via USPS is $8 and $15 for out of area. Construction time is expected to be a minimum of a few days due to the engraving and finishing process.

Keepsake boxes are also being offered using the same materials along with brass hardware and finger joint construction. Engraving for boxes is free up to 10 square inches and can be done on the top and inside of the boxes. Pricing starts at $225 per box. Work time is a minimum two weeks for construction. PayPal is the preferred method of payment, checks accepted however work will not start until your check clears my bank. My PayPal address for payment is... ab3me47@gmail.com

For more information please visit: Carpenterwoodworksusa.com

EQUIPMENT FOR SALE BY AB3ME

These items were purchased by myself for field day 2018 and have not been used since. Have been kept in weatherproof storage cases with desiccant since. I have kept the removed pluck foam for all weatherproof cases.

Additional items for sale:

1. 50 LF +- Belden #8267 (RG-213) PL 259 one end, will provide a PL 259 for other end.....
PRICE = $35.00

2. 50 LF +- Belden #8268 (RG-214 PL 259 one end, will provide a PL 259 for other end.....
PRICE = $35.00 (same as RG213 but with double shield)

3. 100 LF Cable Experts CXP138FCNM PL 259 ea end equivalent to Belden 9913 Low Loss.....
PRICE = $120.00 (new! this is $150 at HRO)

4. 1 each Triple Magnetic Mount - Black - 3/8-24 Base with 17 Feet of RG-58 Coaxial Cable.....
PRICE = $25.00 excellent condition.

5. 1 each Nagoya Heavy Duty 5" dia NMO, magnetic mount w/ 18 lf RG58A/U coax with PL 259.....
PRICE = $25.00 excellent condition.

6. 1 each Vertex (yaesu) MLS-100 external speaker w/mount, 6.5 foot wire w/ 1/8" connector....Price = $40.00 currently mounted to oak w/feet for indoor use

7. 1 each Dentron Super Tuner, 1000 watt, w/ balun, wire or coax feeds 5 star eham rating.....
Price = $175.00 see pic,excellent condition.

8. 1 each Dentron Junior Tuner, 300 watt, w/balun, wire or coax feeds 4.9 star eham rating.....
Price = $125.00 see pic, excellent condition.

9. 1 each TailTwister rotor and control box (my spare).....Price $550.00/both
Control box separately $300

MEMBERSHIP APPLICATION

E P A R A

Eastern Pennsylvania Amateur Radio Association

Address: PO Box 521, Sciota, PA 18354
Email: N3IS@qsl.net
Website: www.qsl.net/n3is

Date: _____

Name: _____ **Callsign** _____

License: Novice Technician General Advanced Extra

Address: _____

City: _____ **State:** _____ **Zip:** _____

Home Phone: _____

Cell Phone: _____

Email: _____

* **Note:** We do not publicize your phone or email information.

ARRL Member: _____ **Skywarn Spotter:** _____ **ARES/RACES Member:** _____ **VE:** _____

Interests:
DX _____ Contest _____ CW _____ QRP _____ Digital Modes_____ Antique Radio Equipment _____
Building Antennas _____ Electronic Repairs _____ Elmering _____ Kit Building _____ EmComm: ____

Others: _____

How did you get interested in Ham Radio?

_____

Please list any relevant qualifications or assets you have or are willing to share/contribute to the club.

Use reverse side if needed:

_____

_____

_____

Sponsored or Reviewed by: _____ **Callsign:** _____

Membership Rates,

Membership: **$20.00** per year Spouse: **$10.00** per year
Full time Student: **$15.00** per year Senior:(Over 62 years of Age): **$15.00** per year