OUR 26TH YEAR!

EPARA BEACON

VOL. 6, NUMBER 12 THE OFFICIAL NEWSLETTER OF THE EASTERN PENNSYLVANIA AMATEUR RADIO ASSOCIATION DECEMBER 2022

NEXT CLUB MEETING: JANUARY 12TH

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.

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

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

Meeting ID: 854 6334 6031 Password: 244632

It is with such sadness that we learn of the passing of Dick Teasdale WA3MPD. I've known Dick since I got my license and I know how much he selflessly gave to the amateur radio community. Since becoming president of EPARA I have had to say goodbye to so many pillars of the ham radio community, this latest loss is one that can not be filled. This is a tremendous loss, and I know we will all be keeping his family in our thoughts and prayers.

I hope you all had a great Thanksgiving! So, the month of December is mainly focused on family as we head into the holidays. I will be making arrangements for EPARA for the new year by scheduling the meeting room at the 911 center for club meetings, VE sessions as well as ARES meetings. I also will be reserving Big Pocono State Park for field day and antenna weekend.

We will be holding the club dinner at the Chestnuthill Diner on Dec 8th at 7PM. You may have heard that they had a fire at the diner, I did confirm that the restaurant is open for business and able to host our event. So, I hope to see you at the club dinner.

We will resume meetings in 2023 on January 12. I hope you all have a Merry Christmas, A Happy Hanukkah, and a wonderful New Year
73 Chris AJ3C

CONTACT INFORMATION

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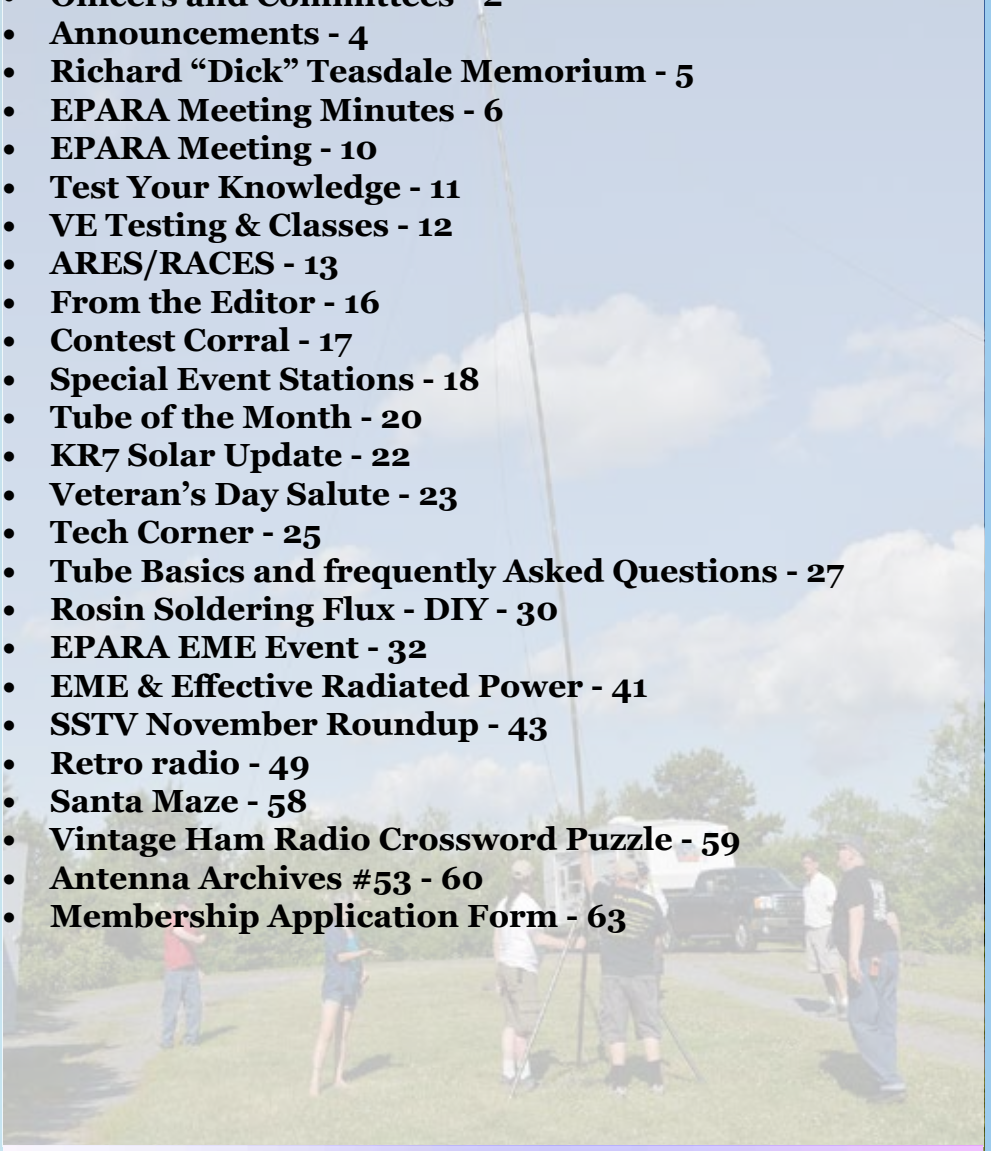
What's INSIDE this ISSUE



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 Club Dues!
Club dues are coming due next month. Contact Scott KC3IAO via his email: KC3IAO@hobbyguild.com and you can send him a check or pay via PayPal.

Christmas Dinner:
This years Christmas dinner will be held on December 8th at the Chestnuthill Dinner once again. We will meet between 7:00 and 7:30pm.

Santa Net:
We are happy to announce that the Santa Net will be in full swing on Christmas Eve. Anyone wishing to help Santa and Mrs Claus please get in contact with Chris AJ3C. Norad will be there to help Santa talk to the kids on Christmas Eve at 7pm. Hope to meet you all there!

Ham TV to Return to the ISS
During the AMSAT-UK Space Colloquium on October 8th, AMSAT announced the Ham TV unit for the ISS is repaired and on the way to Houston for testing. The flight date dependent on testing.

Ham TV has been inoperative since April 2018. It had been active since April 2014, having been launched to the ISS in 2013. It was returned to earth for diagnosis and repair in late 2018.

The ARISS Ham TV transmitter is capable of downlinking DVB-S digital video of ARISS contacts and other activities on board the ISS to amateur ground stations in the 2.3 GHz amateur band. More information can be found at https://www.ariss.org/hamtv-on-the-iss.html

4H Ham Radio Club
EPARA is looking forward to getting involved with the startup of a local 4H club dedicated to the fundamentals of ham radio for our younger generation. Announcements will follow as we make plans in the near future.

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.

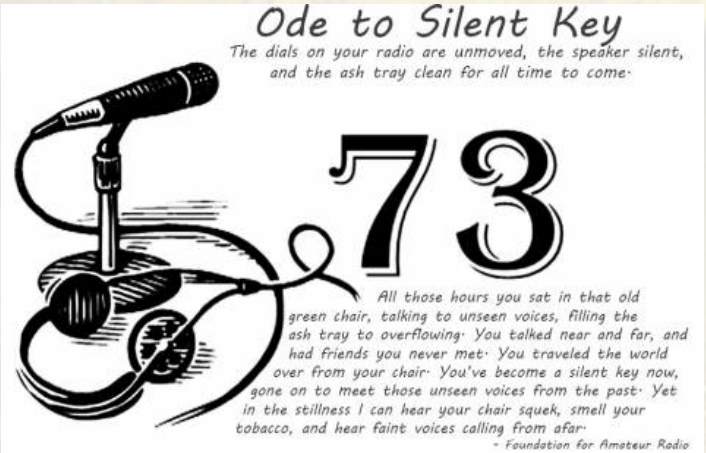
Richard W. "Dick" Teasdale, Sr., 82, of Bangor, PA passed away Saturday, November 26th, at Slate Belt Health and Rehab. Center.

Richard was born in Scranton, PA on June 5, 1940, a son of the late Richard and Sylvia (East) Teasdale. He was the husband of Lea (Nunnamaker) Teasdale. Together they celebrated their 61st wedding anniversary on November 18th.

Dick was a 1958 graduate of Hatboro-Horsham High School. He was employed as the Director at the Northampton County 911 Emergency Dispatcher Center, until retiring in 2010. Dick was formerly employed at Xerox. He was an Amateur Radio Operator, using the Call Letters - WA3MDP. He also enjoyed flying and had his private pilot license.

He was a member of Christ Presbyterian Church of the Slate Belt in Bangor, PA. where he held various office positions including Deacon, Elder, Clerk of Session, and Chairman of the Property Committee.

In addition to his wife, Lea, Dick is survived by a son, Richard W. Teasdale, Jr. a daughter, Heather Dollinger, wife of Robert, and two grandchildren: Andrew Holland and Jessica Holland. He was preceded in death by a brother George Teasdale.



https://www.gaffneyparsons.com/obituary/richard-dick-teasdale-sr

EPARA GENERAL MEMBERSHIP MEETING AGENDA

EPARA Membership Meeting Minutes
November 10th *2022*
General Membership Meeting 7:30Pm

Open meeting:

Meeting called to order at 7:30 pm on November 10th, 2022 by Chris AJ3C

Declaration of Quorum.
Total attending **23**. Present at 911 Center **20**. Present on Zoom **3**. Visitors present **2**

Pledge of Allegiance / Moment of silence:

Membership Meeting – Minutes October 13th, 2022 Secretary - Kevin W3KCF:

Meeting minutes for Oct 13th 2022 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 Martin – KC3TOE 2nd by Charlie – KB3JUF Motion Passed

Treasurers report:

Treasurers report: For November 2022 EPARA Club Meeting.
Read by **Chris – AJ3C**

Bank Account Statement Opening Balance 10/31/22 statement.): $4585.26

Income:
$10.00 Hamfest
$40.00 50/50
$ .20 Bank interest
Expenses: None

Closing Balance: $4635.46

Our PayPal Account: 10/31/22 statement. (No transactions this month)

Income: $0.0
Fees: $0.0

Balance: $447.58

Motion to accept by Ruth Ann – W9FBO Seconded by Dan – KC3JCE Motion Passed

Correspondence:
None

EPARA GENERAL MEMBERSHIP MEETING AGENDA

Reports of officers and committee's:

Bill AB3ME – Program Committee

Bill stated there would be no presentations tonight after the meeting and there are no other presentations scheduled at this time.

Chris -AJ3C stated that those interested in giving a presentation, please contact him or Bill – AB3ME.

Charlie KB3JUF – ARES/RACES:

Charlie reiterated that all involved in ARES need to be motivated. Make sure you attend our meetings on the 4th Friday of the month and keep your Task Books up to date. Complete any and all training required and stay enthused. Charlie also stated, please check in on the Sunday Night ARES Net.

Charlie mentioned we are in the recruitment stage. We are looking for volunteers to increase membership in our ARES group.

Ruth Ann, W9FBO – PIO:

RuthAnn stated that our grant application is its final review process and we are still in the running. She also said the Veterans Parade went very well and the club was noticed. In March of 2023, RuthAnn said she would like the club to participate in the Saint Patrick's Day Parade. She would like us to come up with some sort of live float showing what Amateur Radio is all about.

Chris AJ3C, -- Instruction and Training:

VE sessions are complete for 2022. Chris said VE sessions would begin again in January 2023. The process for testing has been revised and all information can now be scanned and sent to the ARRL instead of mailing in the information.

Chris said he is trying to book a room and start a new class for the General applicants possibly in March or April of 2023. Then, starting in the Spring, we will hold a class for Technicians.

Chris AJ3C – Website:

Will be doing a revamp of the website in the near future.

Bob W3BMM – Social Media:

Bob said, "**please like the site"**. Chris said, as always, share material with Bob for the club's various social media accounts.

He mentioned that the ARRL has very good material on their Facebook account.

Bob said he would like to get Groups IO (input/output) setup for the club. It's a platform that brings everything into a central location for easy access.

Al, KB3OVB: Membership:

AL said we are currently at 69 members with 2 more members to be voted in tonight. Giving us a total of 71 members.

EPARA GENERAL MEMBERSHIP MEETING AGENDA

Eric N3SWR – Newsletter:

Eric said all's well with the newsletter. Keep sharing content with him. He plans to have audio links and additional pages in the next addition.

Sat-Com / EME Group:

Bob – W3BMM, said both antennas are complete and ready to go. The base station is finished and allows both antennas to placed 10' in the air. For those wishing to participate in the EME event, we are going to meet at the 911 Center at 1430 on the 13th and caravan down to the property. The address is 1637 Mack Road in Plainfield. Moon rise is projected to be around 1942, but we need time to setup and prepare.

Old business:

Any other old business:

New business:

EPARA Christmas Dinner:

Our annual Christmas dinner will be held at the Chestnuthill Diner. It will be on December 8th at 7PM.

Annual Santa Net:

EPARA will hold the Santa Net on the 045 repeater. It will be on Christmas Eve at 7PM. Alex asked RuthAnn if she would be willing to be Mrs. Claus again this year. She said as far as she knows, it's a yes.

Any Other New Business

Pete - K3PMC came from NJ. He was 1 of 2 volunteers that worked at the Ocean County Emergency Center during Sandy. He talked about overseeing care of 8000 people in need, alongside the Red Cross. They worked for 5 days using their emergency radio equipment.

Pete's purpose for speaking to our club tonight, was to inform us, that He received permission from Monroe County to start a 4H club for Ham radio. Participants would be from 8yrs old to 18yrs old. There would be scholarship's available for those participating. He was looking to see if any members in our club would be available to teach and help run the club. Chris asked to meet with him after the meeting.

Votes/New Members:

Russ and his son Sam, were voted in as our newest members. Welcome!

Vote was unanimous - approved.

Announcements:

Len -KC3OND asked for comments and recommendations from all that participated in our ARES Emergency Drill.

EPARA GENERAL MEMBERSHIP MEETING AGENDA

Alex -KD2FTA announced our latest 80m SSTV Net on the 1st and 3rd Thursday of the month. It starts at 1930. Check in on 147.045 repeater, then head to 3.847 to transmit and receive. Don't forget to download the MMSSTV software.

Any Additional Announcements

Tonight's 50/50 Raffle: $70.00. Won by Al – KB3OVB

Adjournment…

Meeting was adjourned at 2025:

Motion to close by Martin -KC3TOE 2nd by Ed – KC3OLB Motion Passed.

Secretary

Kevin Forrest
W3KCF

EPARA MEETING

TEST YOUR KNOWLEDGE!

What is the primary purpose of a phasing line when used with an antenna having multiple driven elements?

A. It ensures that each driven element operates in concert with the others to create the desired antenna pattern
B. It prevents reflected power from traveling back down the feed line and causing harmonic radiation from the transmitter
C. It allows single-band antennas to operate on other bands
D. It makes sure the antenna has a low-angle radiation pattern

Last month's answer was, D. Varying tone frequencies representing the video are transmitted using single sideband. The image is converted into a radio signal by modulating a specific sequence of frequencies. The information is encoded using analog frequency modulation in a carrier wave. Both the sender and receiver must be in sync for this to function. If they are not in agreement, the image will appear slanted. That is why synchronization tones are included in each photograph.

DMR
DIGITAL MOBILE RADIO

The EPARA HOT SPOT Wednesday night DMR rag chew is here!

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!

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!

AMATEUR RADIO CLASSES

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.

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.

Credit: https://www.onallbands.com/want-to-put-your-ham-radio-skills-to-good-use-get-involved-in-emcomm/

From the Editor

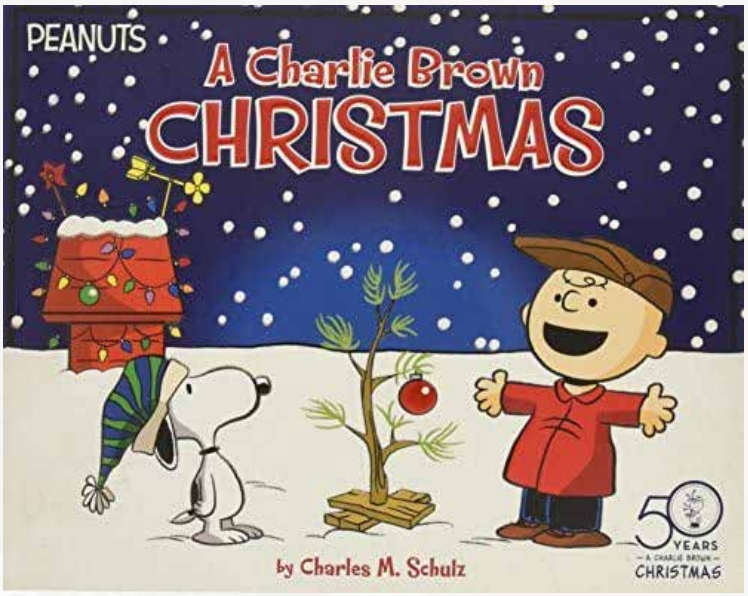
Eric, N3SWR

It was indeed a fun time up on the mountain for the annual ARRL EME contest. I honestly had a great time and took a bunch of pictures and helped where I could. You all did a great job of coming together, designing, building and creating our EME station. Thanks must also go out to Kevin for use of the land and buying pizza for all!

Veteran's Day was a positive event and I wish to tank all those involved for attending and send me pictures to include here. We also made a spot in the Pocono record I'm told. EPARA is growing!

Being this is also the final edition of our newsletter for the year, I wish you all a safe and happy holiday!

Cheers for now!
Eric
N3SWR



"Before you marry a person, you should first make them use a computer with slow Internet to see who they really are."
—Will Ferrell

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).

Contest Corral

December 2022

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		Date-Time		Bands	Contest Name	Mode	Exchange	Sponsor's Website
1	0000	1	300	1.8	QRP ARCI Topband Sprint	CW	RST, SPC, mbr or power	qrparci.org/contest
1	0000	2	300	7	Walk for the Bacon QRP Contest	CW	Max 13 WPM; RST, SPC, name, mbr or power	qrpcontest.com/pigwalk40
1	0300	1	400	1.8-28	CWops Test (CWT)	CW	Name, mbr or SPC or "CWA"	cwops.org/cwops-tests
1	0700	1	800	1.8-28	CWops Test (CWT)	CW	Name, mbr or SPC or "CWA"	cwops.org/cwops-tests
1	1700	1	1900	3.5-14	RTTYops Weeksprint	Dig	Other station's call, your call, serial, name	rttyops.com
1	2000	1	2200	1.8-28, 50	SKCC Sprint Europe	CW	RST, SPC, name, mbr or "none"	www.skccgroup.com
2	2000	2	2100	1.8-28	K1USN Slow Speed Test	CW	Max 20 WPM, name, SPC	www.k1usn.com/sst.html
2	2200	4	1600	1.8	ARRL 160-Meter Contest	CW	W/VE: RST, section; DX: RST	www.arrl.org/160-meter
3	0600	3	800	7, 14	Wake-Up! QRP Sprint	CW	RST, serial, suffix of previous QSO	qrp.ru/contest/wakeup
3	1200	4	1159	3.5-28	PRO CW Contest	CW	RST, serial, "/M" if member	www.procontestclub.ro
3	1800	4	2359	3.5-28	FT Roundup	Dig	W/VE: RST, state/province; DX: RST, serial	www.rttycontesting.com
5	0000	5	100	1.8-28	K1USN Slow Speed Test	CW	Max 20 WPM; name, SPC	www.k1usn.com/sst.html
6	0100	6	159	1.8-28, 50	Worldwide Sideband Activity Contest	Ph	RS, age group (OM, YL, Youth YL or Youth)	wwsac.com/rules.html
6	0200	6	400	3.5-28	ARS Spartan Sprint	CW	RST, SPC, power	arsqrp.blogspot.com
6	1700	6	1900	3.5-14	RTTYops Weeksprint	Dig	Other station's call, your call, serial, name	rttyops.com
7	0230	7	300	1.8-14, 21	Phone Weekly Test	Ph	Name, SPC	www.perluma.com/Phone_Fray_Contest_Rules.pdf
7	1300	7	1400	1.8-28	CWops Test (CWT)	CW	Name, mbr or SPC or "CWA"	cwops.org/cwops-tests
7	1700	7	2100	144	VHF-UHF FT8 Activity Contest	Dig	4-char grid square	www.ft8activity.eu/index.php/en
7	1900	7	2000	1.8-28	CWops Test (CWT)	CW	Name, mbr or SPC or "CWA"	cwops.org/cwops-tests
8	1700	8	1900	3.5-14	RTTYops Weeksprint	Dig	Other station's call, your call, serial, name	rttyops.com
10	0000	11	2359	28	ARRL 10-Meter Contest	CW Ph	W/VE/XE: RST, state/province; DX: RST, serial	www.arrl.org/10-meter
10	0000	12	2359	1.8-7	PODXS 070 Club Triple Play Low Band Sprint	Dig	RST, SPC	www.podxs070.com
10	0600	11	1800	1.8-28	TRC Digi Contest	Dig	RST, serial, "TRC" if member	trcdx.org/rules-trc-digi
10	1200	11	2359	1.8-28, 50	SKCC Weekend Sprintathon	CW	RST, SPC, name, member or "none"	www.skccgroup.com
10	1300	11	1300	3.5, 7	ARI 40/80 Contest	CW Ph Dig	RS(T), 2-letter province code	www.ari.it/en/contest-hf
10	1600	11	1559	3.5-28	International Naval Contest	CW Ph	RS(T), mbr (and club) or serial	www.marinefreunde.com
11	2000	11	2300	1.8-28	QRP ARCI Holiday Spirits Sprint	CW	RST, SPC, mbr or power	qrparci.org/contest
11	2100	11	2259	14	CQC Great Colorado Snowshoe Run	CW	RST, SPC	www.coloradoqrpclub.org/contests
12	0100	12	300	1.8-28	4 States QRP Group Second Sunday Sprint	CW Ph	RS(T), SPC, mbr or power	www.4sqrp.com
14	0130	14	330	3.5-14	NAQCC CW Sprint	CW	RST, SPC, mbr or power	naqcc.info
14	1700	14	2100	432	VHF-UHF FT8 Activity Contest	Dig	4-char grid square	www.ft8activity.eu/index.php/en
15	0000	16	300	14	Walk for the Bacon QRP Contest	CW	Max 13 WPM; RST, SPC, mbr or power	qrpcontest.com/pigwalk20
16	1600	16	1700	3.5, 7	AGB-Party Contest	CW Ph Dig	RST, serial, mbr (if member)	www.ev5agb.com/contest/agb_party.htm
16	1800	16	2200	1.8	Russian 160-Meter Contest	CW Ph	RS(T), oblast code or serial	www.topband.ru/rules.htm
17	0000	17	2359	1.8-28, 50	Feld Hell Sprint	Dig	RST, mbr, SPC, grid	sites.google.com/site/feldhellclub
17	0000	17	2359	3.5-28	OK DX RTTY Contest	Dig	RST, CQ Zone	okrtty.crk.cz/index.php?page=english
17	0000	17	2359	1.8-28, 50, 144	RAC Winter Contest	CW Ph	VE: RS(T), province/territory; Non-VE: RS(T), serial	www.rac.ca/contesting-results
17	1400	18	1400	1.8-28	Croatian CW Contest	CW	RST, serial	9acw.org/index.php/rules
17	1500	18	1500	1.8	Stew Perry Topband Challenge	CW	4-char grid square	www.kkn.net/stew
18	1800	18	2359	3.5-28	ARRL Rookie Roundup, CW	CW	Name, 2-digit year first licensed, SPC	www.arrl.org/rookie-roundup
18	2300	19	100	1.8-28	Run for the Bacon QRP Contest	CW	RST, SPC, mbr or power	qrpcontest.com/pigrun
21	0130	21	330	3.5-14	NAQCC CW Sprint	CW	RST, SPC, mbr or power	naqcc.info
21	1700	21	2100	1.2 G	VHF-UHF FT8 Activity Contest	Dig	4-char grid square	www.ft8activity.eu/index.php/en
25	0000	25	1159	3.5-28	RAEM Contest	CW	Serial, latitude and longitute (e.g., 57N 85O)	raem.srr.ru/rules
26	0830	26	1059	3.5, 7	DARC Christmas Contest	CW Ph	RS(T), DOK (or "NM" if not a DARC member), serial	www.darc.de/der-club/referate/conteste
28	0000	28	200	1.8-28, 50	SKCC Sprint	CW	RST, SPC, name, mbr or "none"	www.skccgroup.com
30	1200	30	2359	3.5-28	YOTA Contest	CW Ph	RS(T), age (avrg age for multi-ops)	www.ham-yota.com/contest
31	0900	31	2359	3.5, 7	Bogor Old and New Contest	Ph	RS, operator age	www.orari-bogor.org

There are a number of weekly contests not included in the table above. For more info, visit: **www.qrpfoxhunt.org**, **www.ncccsprint.com**, and **www.cwops.org**.
All dates and times 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!

12/02/2022 | 81st Anniversary of Civil Air Patrol

Dec 2-Dec 4, 1500Z-2300Z, W9CAP, Saint Charles, IL. Illinois Wing Civil Air Patrol. 7.255 14.250 18.125 28.450. QSL. AttnL LtCol Robert Becker, PO Box 4027, Saint Charles, IL 60174. www.qrz.com/db/w9cap

12/02/2022 | W2W Pearl Harbor Day Commemoration

Dec 2-Dec 12, 1300Z-2200Z, W2W, Baltimore, MD. Amateur Radio Club of the National Electronics Museum. 7.041 7.241 14.041 14.241. Certificate & QSL. K3NY, 108 Brent, Arnold, MD 21012. The Amateur Radio Club of the National Electronics Museum (ARCNEM) will operate W2W in commemoration of the anniversary of Pearl Harbor Day and the role of electronics in WWII. If the Museum station is not available, operators may operate from their home stations. Primary operation will be Dec 2-Dec 7 with additional operation possible during the Dec 8-Dec 12 period as operator availability permits. Operation on 80M (3.541, 3.841) and digital modes possible during event. Frequencies +/- according to QRM. QSL and Certificate available via SASE. Details at ww-2.us

12/03/2022 | 75th Anniversary

Dec 3-Dec 10, 0000Z-2359Z, W2MM, Apopka, FL. Quarter Century Wireless Association (QCWA). SSB: 28.325 21.365 14.262 7.244 3.810; CW 28.050 21.050 14.040 7.035 3.540. Certificate. Larry Gabriel, K7LG, 1972 Martina St., Apopka, FL 32703. www.qcwa.org

12/03/2022 | Anniversary of the Attack on Pearl Harbor

Dec 3, 1400Z-2000Z, NE1PL, Fall River, MA. USNR. 20 meters 40 meters. QSL. Rick Emord, 135 Wareham st, Middleboro, MA 02344. on phone and digital 20 and 40 meters and any other bands as operators and equipment allow. www.ne1pl.org

12/03/2022 | Celebrating the 21st Amendment to the US Constitution

Dec 3-Dec 6, 1200Z-0500Z, W8A, Kent, OH. Breweries On The Air. 7.24 14.24 50.175. Certificate. Thomas R Sly, WB8LCD, 1480 Lake Martin Dr, Kent, OH 44240. A good time will be had by all! www.breweriesontheair.com

12/03/2022 | Christmas in Bethlehem

Dec 3, 1200Z-2300Z, W9WWI, Sellersburg, IN. Clark County Amateur Radio Club. 28.400. QSL. Clark Co. ARC, P.O. Box 201, Sellersburg, IN 47172. n9dprh@gmail.com or https://facebook.com/w9wwi

12/05/2022 | 75/75 Contest Celebrating Our 75th Anniversary

Dec 5-Feb 18, 0000Z-2359Z, member call, Various towns and locations. Quarter Century Wireless Association (QCWA). Phone/CW only on 6, 10, 15, 20, 40, 80, and 160 meters. Certificate. request , certificate at, website. QCWA members contact 75 QCWA members in 75 days. Call "CQ QCWA". This is an operating event. www.qcwa.org/1-worked-75-75-members-contest.htm

12/08/2022 | Final Moon Landing of Apollo 17

Dec 8-Dec 11, 1500Z-2359Z, K5A, Springdale, AR. Razorback Contest Club. 7.040 7.190 14.040 14.260. QSL. Razorback Contest Club, 3407 Diana St., Springdale, AR 72764. Commemorating the final moon landing of Apollo 17. rccw5yo@cox.net

12/08/2022 | WX3MAS Special Event

Dec 8-Dec 11, 1400Z-2200Z, WX3MAS, Nazareth, PA. Christmas City ARC and the Delaware-Lehigh ARC. 3.850 7.270 14.265. QSL. WX3MAS, Greystone Building, 14 Gracedale Avenue, Nazareth, PA 18064. CW, SSB, and Digital Thursday through Sunday - 1400 to 2200 UTC, but may be extended if conditions permit. https://dlarc.club

12/10/2022 | 150th Anniversary: Lighting of Bodie Island Lighthouse

Dec 10, 1300Z-1900Z, W4PCN, Nags Head, NC. Outer Banks Repeater Association. 7.265 14.265. Certificate & QSL. OBRA SE Station Carl Hacker WC5WM, P.O. 1085, Nags Head, NC 27959. OBRA website under reconstruction. Use WC5WM@arrl.

Amateur Radio Special Event Stations!

net for questions. wc5wm@arrl.com

12/10/2022 | 160th Anniversary of the Battle of Fredericksburg

Dec 10, 1400Z-2000Z, W4F, Fredericksburg, VA. Stafford Amateur Radio Association. 7.250 14.250; 40-10 meters, CW, Phone and FT8. Certificate. Email Jay Chamberlain, NS4J, at ns4j@arrl.net, for certificate. Commemorating the 160th anniversary of the Civil War Battle of Fredericksburg, VA, Dec. 11-15, 1962. PDF certificate will be available. No paper QSL or certificates. https://www.ws4va.org/index.html

12/10/2022 | Pearl Harbor Remembrance Day (12/7/41)

Dec 10, 1700Z-2359Z, NI6IW, San Diego, CA. USS Midway (CV-41) Museum Ship. 14.320 7.250 14.070 PSK31 DSTAR on PAPA repeaters. QSL. USS Midway Museum COMEDTRA, 910 N Harbor Drive, San Diego, CA 92101. www.qrz.com/db/ni6iw

12/16/2022 | National Wreaths Across America Day

Dec 16-Dec 19, 0000Z-2359Z, W1A, Milbridge, ME. Maine Ham Radio Society. 7.240 14.240 21.340 28.440. QSL. Philip Duggan, 195 Kansas RD, Milbridge, ME 04658. mainehamradiosociety.com

12/17/2022 | Christmas in Bethlehem New Mexico

Dec 17-Dec 24, 1400Z-2300Z, KC5OUR, Belen, NM. Valencia County Amateur Radio Association. 21.283 14.283 7.183 3.883. QSL. VCARA, PO Box 268, Peralta, NM 87042. kc5our.com

12/17/2022 | Edwin Howard Armstrong Commemoration special event

Dec 17-Dec 19, 0000Z-2359Z, W4A, Bluff City, TN. N9EN. 3.540 7.040 14.040 21.040. QSL. Brad Anbro, 1118 Walnut Grove Road, Bluff City, TN 37618. USA stations QSL direct with SASE; foreign stations QSL via buro or direct n9en@live.com

12/24/2022 | W8MRM Motor City Radio Club 90th Anniversary

Dec 24, 1400Z-1800Z, W8MRM, Inkster, MI. Motor City Radio Club. 7.190 14.290. Certificate. Motor City Radio Club, P.O. BOX 1337, Southgate, MI 48195. www.w8mrm.net

12/26/2022 | American Revolution - Battle of Trenton

Dec 26-Dec 31, 0000Z-2359Z, W2T, Trenton, NJ. Delaware Valley Radio Association. 14.250. Certificate & QSL. DVRA, PO Box 7024, West Trenton, NJ 08628-0024. Certificate of Commission in the Continental Army Signal Corps available. See website. www.w2zq.com

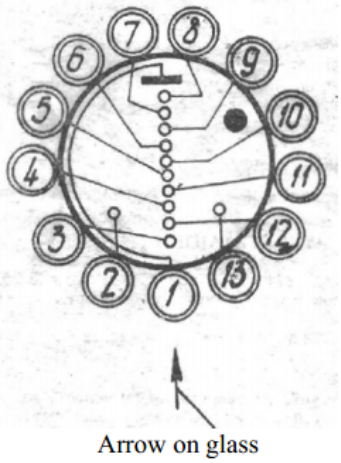
IN-14 Nixie Tube

The IN-14 is cold cathode neon gas discharge indicator intended to display Arabic digits in a shape of “0 1 2 3 4 5 6 7 8 9” and two dots on both bottom corners. Digit size approx 18x12mm (H,W). Tube has long, versatile, directly solderable wires.

IN-14s are perfect to use in nixie clocks: do not require rare and expensive sockets, firing voltage approx 140-150V.

Each IN-14 tube is able to display the following shapes: ‘0 1 2 3 4 5 6 7 8 9’ and pair decimal points. Tube comes with plastic socket.

Pins are counted clockwise from pin #1 which is shown by arrow on glass body underneath the plastic spacer. Pins are counted looking to the tube from the pin’s side (bottom).



Arrow on glass

Pin number	Description
1	Anode
2	Cathode comma
3	Cathode “1”
4	Cathode “2”
5	Cathode “3”
6	Cathode “4”
7	Cathode “5”
8	Cathode “6”
9	Cathode “7”
10	Cathode “8”
11	Cathode “9”
12	Cathode “0”
13	Cathode comma

Basic electrical and lighting parameters

Firing voltage (no more than)	170V
Current for digits (no more than)	2.5mA
Current for commas (no more than)	0.3mA
Brightness (no less than)	100 cd/m²
Viewing angle (no less than)	+/- 30°

Allowable limits

Power supply voltage	200V
Current for digits	2.0 - 3.5mA
Current for commas	0.3 – 0.7mA

Average current (supplying from mains 50Hz via single-period rectifier)	
Current for digits (no more than)	2.0mA
Current for commas (no more than)	0.2mA

Multiplex mode	
Power supply voltage	190V
Average current for digits	0.7 - 1.5mA
Average current for commas	0.15 – 0.6mA
Pulse current for digits	7 – 13mA
Pulse current for commas	1.5 – 5mA
Pulse width (no less than)	70μS
Period	1 – 1.8 kHz

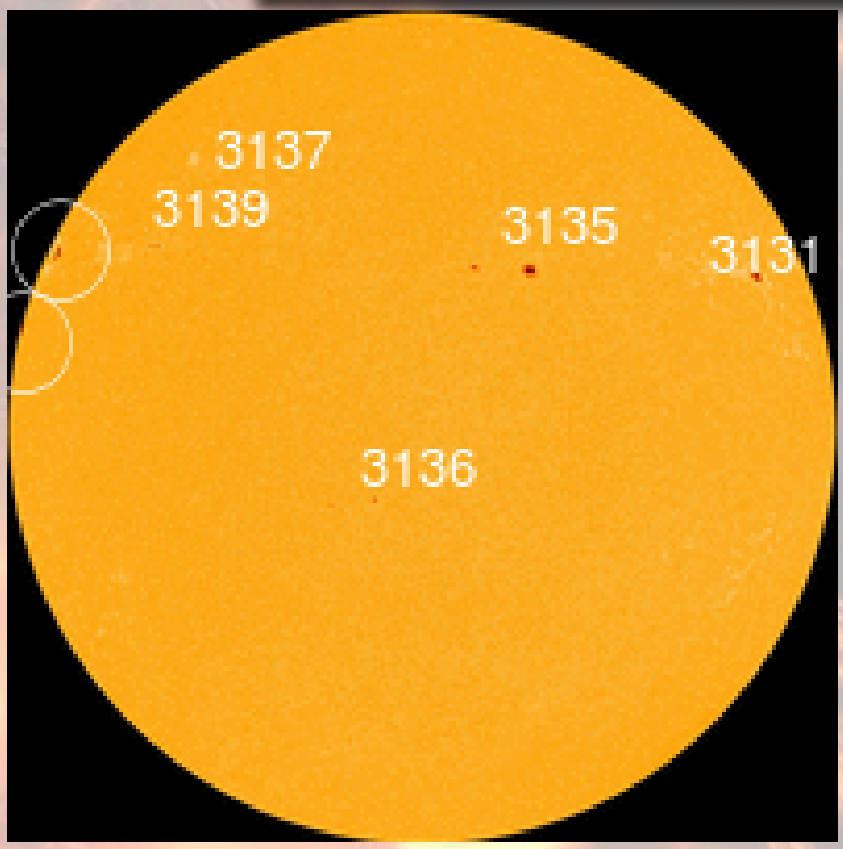
Tube does not contain precious metals.

Notes

Pin soldering and bending should be performed at least 5mm away from the glass body. Avoid multiple soldering – desoldering.

After long period of non-use it is recommended to train cathodes applying working current for 1 minute for each cathode.

Solar activity perked up this week. Average daily sunspot number rose from 58.4 to 70.3, and solar flux averages increased from 113.3 to 129.9.



There are still problems with the Fredericksburg magnetometer, so I used numbers from the Boulder, Colorado magnetometer for the middle latitude A index.

At 2318 UTC on November 3, 2022 the Australian Space Weather Forecasting Centre issued a geomagnetic disturbance warning:

"Increased geomagnetic activity expected due to coronal hole high speed wind stream from November 4-5."

Planetary A index averages went from 19.4 to 13.7, and middle latitude numbers changed from 9.1 to 14.3.

The solar flux prediction shows the highest values over the next week, starting with 130 on November 4, then 135 on November 5-6, then 130, 135, 130, and 125 on November 7-10, 115 on November 11-12, 112 on November 13-14, 110 on November 15, 108 on November 16-18, 104 on November 19, 100 on November 20-23, 98 on November 24-25, then 100, 105, 105 and 110 on November 26-29, then 112 on November 30 through December 2, then 118 on December 3-6, 115 on December 7-9, and 112 on December 10-11.

Predicted planetary A index is 22. 30, 15, and 8 on November 4-7, 5 on November 8-10, then 18 and 15 on November 11-12, 5 on November 13-17, then 25, 15 and 8 on November 18-20, 5 on November 21-22, then 8, 15 and 25 on November 23-25, 15 on November 26-27, then 18, 12, 10, 12, 20 and 15 on November 28 through December 3, then 5 on December 4-6, 18 on December 7-8, 15 on December 9, and 5 on December 10-14, and 25 on December 15.

HONORING ALL WHO SERVED

VETERANS DAY | NOVEMBER 11

HONORING ALL WHO SERVED

What Do VHF and UHF Mean?

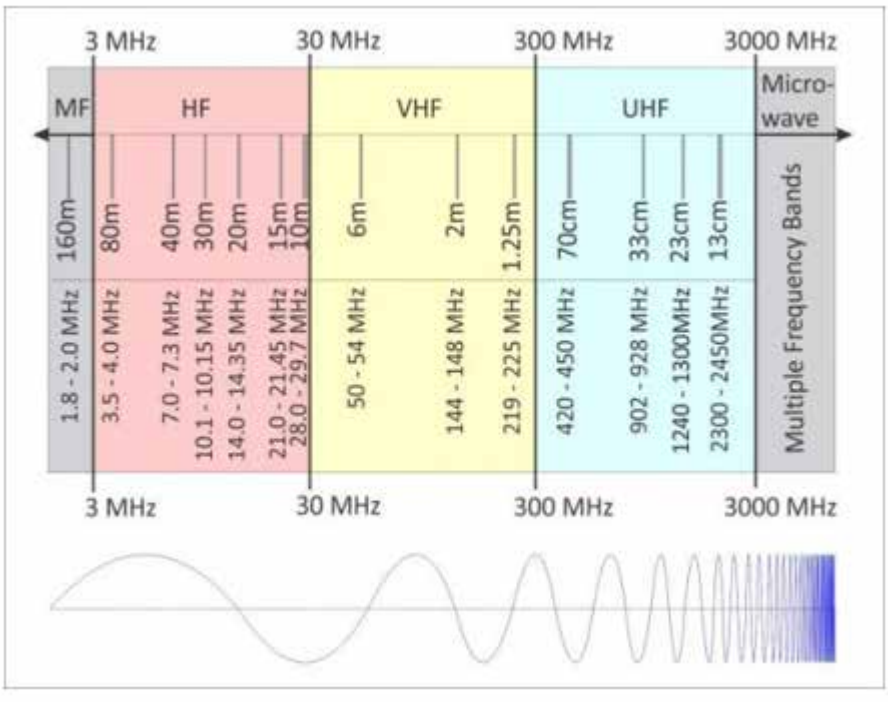
Recently, I engaged in a discussion about a UHF (Ultra High Frequency) radio. It seems a ham was complaining that someone had advertised an 800 MHz radio, describing it as "UHF". His issue was that in land mobile radio, UHF is commonly used to refer to radios in the 380 to 500-ish MHz range. I disagreed with him, saying that 800 MHz is in the UHF range. I was using the ITU definition of UHF, which is any frequency between 300 MHz to 3 GHz. The disagreement was not a big deal but it did cause some confusion. (Of course, I was right and he was wrong, most definitely.)

This got me thinking about how we toss around these terms quite loosely, even though they have precise definitions. Let's start with the basics, the ITU definitions of radio spectrum.

LF	Low Frequency	30 kHz to 300 kHz
MF	Medium Frequency	300 kHz to 3 MHz
HF	High Frequency	3 MHz to 30 MHz
VHF	Very High Frequency	30 MHz to 300 MHz
UHF	Ultra High Frequency	300 MHz to 3 GHz
SHF	Super High Frequency	3 GHz to 30 GHz

You can see that the basic scheme divides up the spectrum into decades (factors of ten), aligned with frequencies that start with 3 (e.g., 3 MHz, 30 MHz, 300 MHz). If we map the amateur bands onto this system, we see that the bands from 80m (3.5 to 4.0 MHz) through 10m (28-29.7 MHz) fall into the HF range, as expected. Note that 10m almost qualifies as a VHF band, coming in just shy of the 30 MHz limit. That band does have some VHF tendencies. The 160m band (1.8 to 2.0 MHz) actually falls into the MF range even though many of us just think of it as HF.

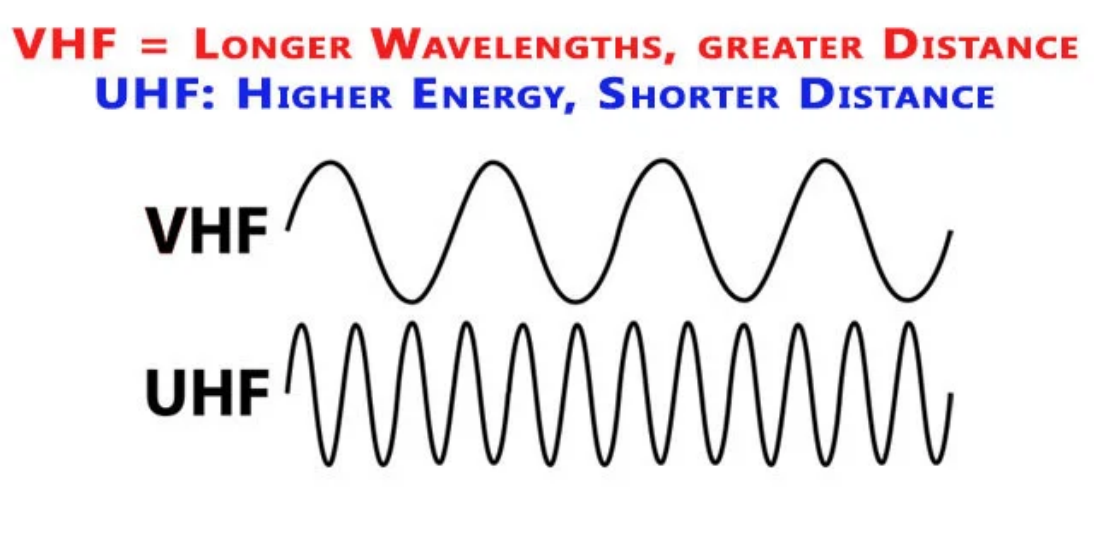
Let's take a look at how the US amateur bands line up with this scheme.
Amateur bands within HF, VHF, and UHF ranges. (Some omissions for legibility: 60m, 17m, 12m HF bands.)

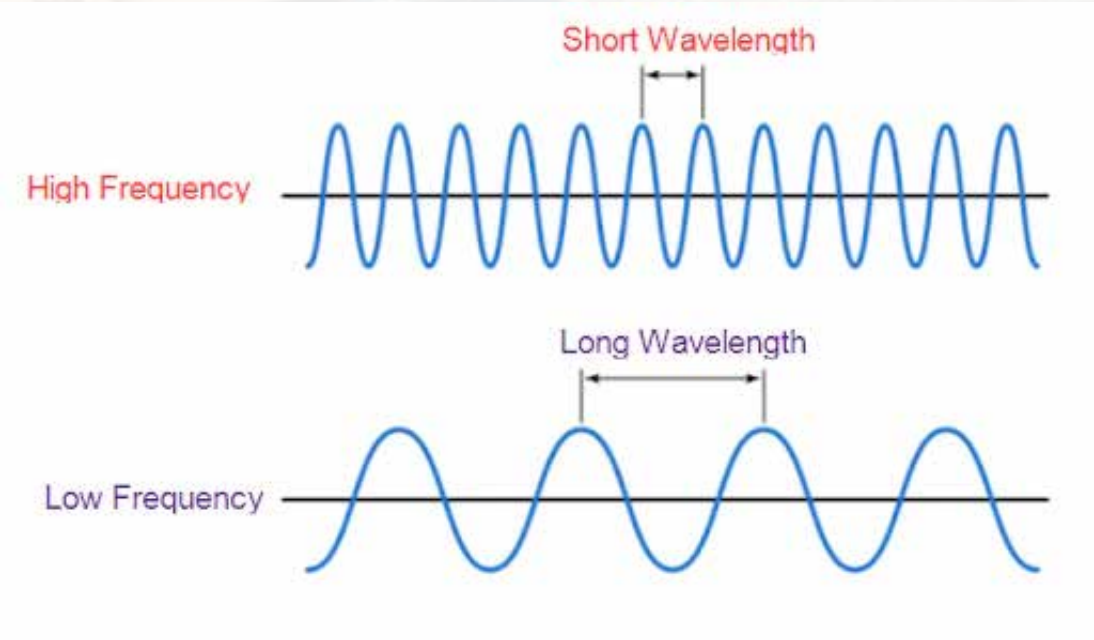


There are three VHF bands: 6m (50 to 54 MHz), 2m (144 to 148 MHz) and 1.25m (222 to 225 MHz). The UHF range includes the 70 cm (420 to 450 MHz), 33 cm (902 to 928 MHz), 23 cm (1240 to 1300 MHz), and 13 cm (2300 to 2450 MHz) bands.

The two most commonly used bands in the VHF/UHF region are 2m and 70cm. These bands are home for many FM repeaters, FM simplex, SSB simplex, and plenty of other modes. Common dual band transceivers, both mobile and hand-held, operate on the 2m and 70cm bands. These radios are so common that we often refer to them as VHF/UHF dual band radios. Accordingly, you will often hear hams refer to the 2m band as simply VHF and the 70cm band as UHF, as if VHF means 2 meters and UHF means 70 cm. I know I've been guilty of saying "let's switch over to VHF" when I really mean "let's go to the 2m band." The 2m band is certainly VHF but VHF does not always mean 2 meters. Similarly, we might say "I'll call you on the UHF repeater" when it would be more precise to say "I'll call you on 440 MHz."

Many times, being loose with terminology doesn't matter but there are times when using the right words can make a difference. Think about this the next time you are referring to a particular frequency band.
73 Bob K0NR





I HAVE A BRAND NEW TUBE THAT'S NOISY. WHEN I PUT MY OLD TUBES BACK THEY WORKED FINE. THIS TUBE IS DEFECTIVE.

Okay... I know this one's not really a "question" but we get it so often that it needs to be addressed anyway. **Many times when a piece of tubed equipment is noisy, the cause is a bad connection between a tube and the socket, not a noisy tube.** In fact, the majority of tubes we have returned to us for warranty replacement, are not noisy at all!

Remember: ***Tube sockets are not highly reliable connectors!*** If the sockets are dirty or not tight enough, or if the pins are slightly "thinner" than your original tubes, or have a little grime on them, it can cause one or more pins be unable to make solid contact. This can result in noise.

So... make sure your tube pins are clean before plugging them in. Also, make sure your sockets are clean and tight. Many times, just the act of removing a tube and re-seating it, either in another position or back into its original spot, can alleviate the problem. You might also try gently twisting the tube in its socket, to make sure it's getting a solid connection on all the pins.

HOW DO I KNOW WHEN MY TUBES NEED REPLACING?

Power tubes like EL34's and KT88's are good for about 2500 hours or more. But may go longer in an amplifier with a conservative design. Small signal tubes with numbers like 12AX7, 12AU7, and 6922, and rectifier tubes like 5AR4 may go 10,000 hours. So you get years and years of enjoyment. Using a tube tester may or may not tell you if you need a replacement. The best approach is to buy a new set of tubes, and install them. If they don't sound a lot better, put in the old ones and suck every bit of life out of them.

WHAT IS THE PROPER METHOD FOR HANDLING VINTAGE TUBES?

Many vintage tubes were labeled with ink designed to fall off easily. **So do not touch it!** If you get it wet at all, it may go away right in front of your eyes, and just shipping and pulling it in/out of the box can damage the logo. If the box is an original vintage box, **open it carefully using a butter knife under the flap.** The ends can tear right off easier than you would believe and some people prize the boxes.

As for the glass itself, despite what some people might tell you, the oil on your fingers will NOT damage the glass or leech through it. Tubes are not halogen bulbs. Tubes may get hot to the touch, but your finger oil will not cause the tube to break when heated up, nor will it affect tube life or sonics. It will not go through the glass.

WHAT IS THE BEST WAY TO COMPARE MY TUBES?

We recommend not pulling tubes in and out a bunch of times to compare tubes. The best way to do this, if you really have to, is spend a day with one tube and another day with the next tube. We know it is tempting to pull them in and out a lot because it's fun, but when you do, you may loosen the tube socket if you go in and out a few hundred times. Tubes, sockets, and tube gear are very durable. But use common sense. In addition, tubes need to be left undisturbed to sound their best.

MY TUBES FLASH AT START-UP. IS THAT NORMAL?

Many European tubes in the 12AU7, 12AT7, and 12AX7 families may flash brightly when you first power up your gear. **This flash is normal.** It is also normal for the intensity of the flash to vary from tube to tube, and the flash intensity may also vary or even go away as the tubes age.

What is **NOT** normal is a flash from power tubes. If this happens at any time, ***turn off your amp immediately!***

WHAT'S THE BEST WAY TO BIAS NEW POWER TUBES IN MY AMP?

If you are new to biasing… carefully read and follow the manufacturer's instructions. Pay attention and make sure you are not in a hurry, stoned, or distracted. Even the most seasoned tube-head will tell you mistakes do happen. Remember, the voltages involved here are lethal.

When we match tubes, we are most interested in how the tube "idles" or draws current. Think of a power amp with four tubes as a car engine with four carburetors. If there is an idle adjustment for each "carb" that would be the same as an individual bias adjustment screw for each tube. If there is only one bias screw for each two tubes, you need a matched pair of tubes. One bias screw for each four tubes, you need the tubes in matched quads. If each tube has its own bias screw, or if you have a PrimaLuna or Mystere amplifier with Adaptive Auto bias, there is no need for matched tubes, though it certainly doesn't hurt.

Bias voltage is actually negative voltage applied to the grid to bring the tube to the idle point desired. That idle point is the one we read on a meter. Some manufacturers give you a specific point like 50 *millivolts*, or 50 *milliamps*. **Make sure you use the right reading!** Some may give you a range of say 40 to 50 or 55 to 65. The higher the number the tube is idling at, the hotter the tube is running. Running tubes with a hotter idle does NOT guarantee the best results. We always recommend biasing your amp to the setting specified in your amp's manual or maybe a little lower, but never higher. The engineers who designed your amp chose that setting for a reason.

ALWAYS BE CAREFUL

★ ★ ★

(A) Kill all transmitter circuits completely before touching anything behind the panel.

(B) Never wear 'phones while working on the transmitter.

(C) Never pull test arcs from transmitter tank circuits.

(D) Don't shoot trouble in a transmitter when tired or sleepy.

(E) When working on the transmitter, avoid bodily contact with metal racks or frames, radiators, damp floors or other grounded objects.

(F) Keep one hand in your pocket.

(G) Develop your own safety technique. Take time to be careful.

★ ★ ★

Death Is Permanent!

Usually, it's a good idea to leave your gear on during the day if you plan on listening to your system at different times, then turn it off at night. Of course it's always smart to turn your system off if you're leaving the house... whether it's for a couple of weeks or just a couple of hours.

MICROPHONY, TUBE DAMPERS, AND TAPPING ON TUBES -

Okay...listen closely class, because I will say this only once: **DO NOT TAP ON TUBES!** You can permanently damage them! Repeatedly tapping on a tube's glass can cause a perfectly good tube to become too microphonic for use.

ALL tubes are microphonic to a greater or lesser degree. Whether or not that microphonics is audible will depend more on the *tube's function* in the product, rather than the microphony of the tube itself. In some positions, you will never hear anything, even with the worst tube. In other positions you will hear something even with the best tubes. At that point you make a judgement call: does this level of microphony interfere with my listening enjoyment?

Tubes are supposed to make noise when tap you tap on them! If a tube is truly microphonic, and in a position where it is critical, you will know it. It will feedback as you play music and be so objectionable you'll turn it off.

For those interested in a more in-depth discussion on microphony, click here.

SHOULD I USE TUBE DAMPERS?

Uncle Kev doesn't care for them much, but... try them. Some folks like them. Others say tube dampers make the music sound sterile or hard. A small amount of microphony can be pleasing, as it can inject a sense of "air" into the presentation. This answer will vary based on the system, your taste, and the individual tube you are using. If you don't like the sound with the tube dampers, you can always take them off.

The 6DJ8/6922/7308 family of tubes is a special lot and are prone to be sensitive to vibration. That does not mean all of them are microphonic by definition; though some are. What's this mean for you? In high gain pre-amps, you may hear a slight "TING!" when flipping some switches. Usually this is caused by the grid wires picking up vibration through the tube pins. We listen to each tube in circuit and ship tubes according to the product it goes into, in order to give you the best results. If you own a preamp from Audible Illusions or CAT (to name a couple), and you experience a slight ring for a second when you bang on the pre-amp or flip switches, don't sweat it... unless you plan on playing bongos on your pre-amp while the music playing. I must say... if that's your plan... you may want to re-think your strategy.

One More helpful hint: We recommend that you have something hooked up to the output of any tube product when they are turned on. This applies to pre-amps, amps or anything else. If a tube preamp is left on for an extended period without being hooked up to a power amp, mute it.

Rosin soldering flux, DIY

Should we ever find ourselves in the situation where we simply need to rely on ourselves, then here is a simple means to make a soldering flux using only natural ingredients.

Description
There are more ways of making rosin soldering flux, this is the most basic way but you will be surprised of how well the end product works compared to commercial variants.

Details
Let's make rosin soldering flux.
From Wikiless: "Rosin, also called colophony or Greek pitch, is a solid form of resin obtained from pines and some other plants, mostly conifers, produced by heating fresh liquid resin to vaporize the volatile liquid terpene components. It is semi-transparent and varies in color from yellow to black. At room temperature rosin is brittle, but it melts at stove-top temperature. It chiefly consists of various resin acids, especially abietic acid."

Some commercial flux variants contain a lot of chemicals that evaporates when heated, that again could leave toxic gases in the work environment and bad chemicals in the nature. I am not saying gases from rosin flux is harmless, but I really think they are less harmful than most of the products in the store.
You should always use proper ventilation when soldering -Anyhow, this is how you make your own flux using only natural ingredients.

All you need is the pine resin itself and some alcohol (rubbing alcohol/ surgical spirit/ ethanol, 80vol% or stronger), I guess other solvents works as well but alcohol (at least ethanol) does not make any toxic gases.
My recipe here is basically the same as the rosin flux you could by in the store back in the days. Biggest difference being this have alcohol added making it liquid as opposed to the old type being solid. The old timers would probably recognize the smell of this flux. It works with both leaded and lead-free solder.

If you live in urban areas or are too lazy to get out in the woods to get pine resin you can buy ready-made rosin in your local music instrument shop. Rosin helps to create friction between the bow hair and strings on violins and cellos. Just crush it and dissolve it in alcohol.

1: Gather some pine resin, this could be resin that have oozed out of a wound on a tree, it does not matter if it is old and dry and full of dead ants. the important thing here is to not kill the tree, we need them for more important stuff, like transforming CO2 to oxygen.

2: Do some mechanical cleaning, try to remove some of them dead ants and most of the tree bark.

3: Put the resin in a glass jar and fill just enough alcohol so that all resin is covered in alcohol.

4: Stir or shake until the resin is completely dissolved. It's okay to leave it overnight if you don't want to stir so much, do not use the oven to heat it up as the liquid and the gases is extremely flammable at this point.

5: Use a coffee filter or similar and filter the liquid over in a clean glass jar, add more alcohol if you are having problems with the liquid being too viscous to pass through the filter. Repeat the filtering process if necessary.

6: Now you can adjust the viscosity to your liking, for a thicker product you just leave the jar without a lid so that the alcohol evaporates, and if you like it thinner just add more alcohol, just remember that by adding alcohol you also thin out the active ingredients, so don't add to much. Some like it being very syrupy so that one can use it to tack down smd components to the pcb. For hot air soldering maybe it's better with a thinner product. Make a little of both and try to see what you like the most.

7: Now you can solder together your time machine using a more environment friendly flux.

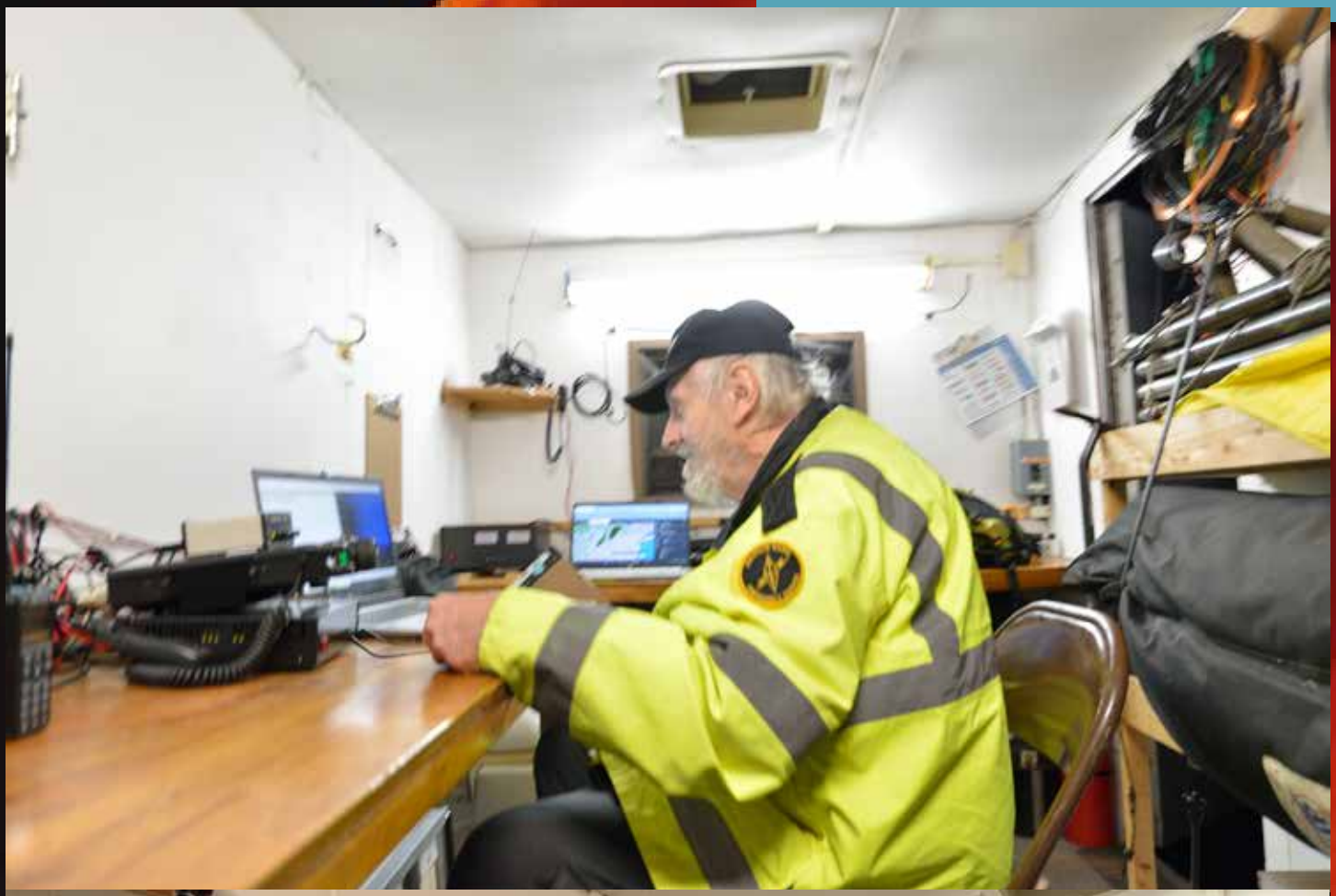
I have made flux both by heating the resin, and also without using heat at all, and I can't say I have noticed any difference in the quality of the end product. Maybe someone with more experience and/or education can comment on this matter. Just remember that both the resin itself and also the alcohol is extremely flammable and may self-ignite on relatively low temperatures, use proper ventilation and take precautions if you are going to heat it up.

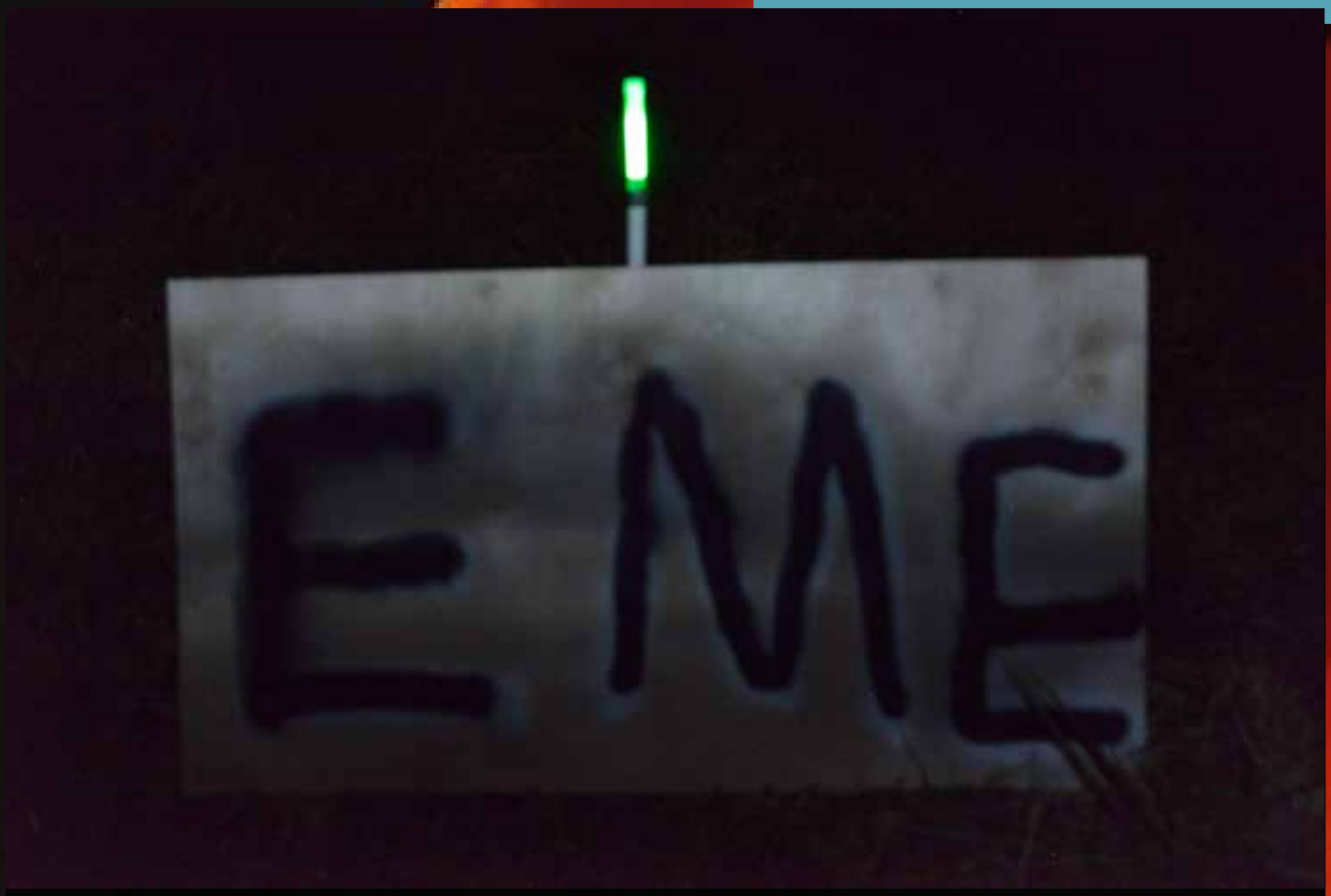
This type of flux leaves a thin layer of residue on the pcb that can be easily cleaned off with a brush and alcohol. It has isolating properties so for home use it's not necessary to clean the pcb after soldering, at least I don't do it myself.

Happy soldering!


National Parks
ON THE AIR

EPARA EME Events

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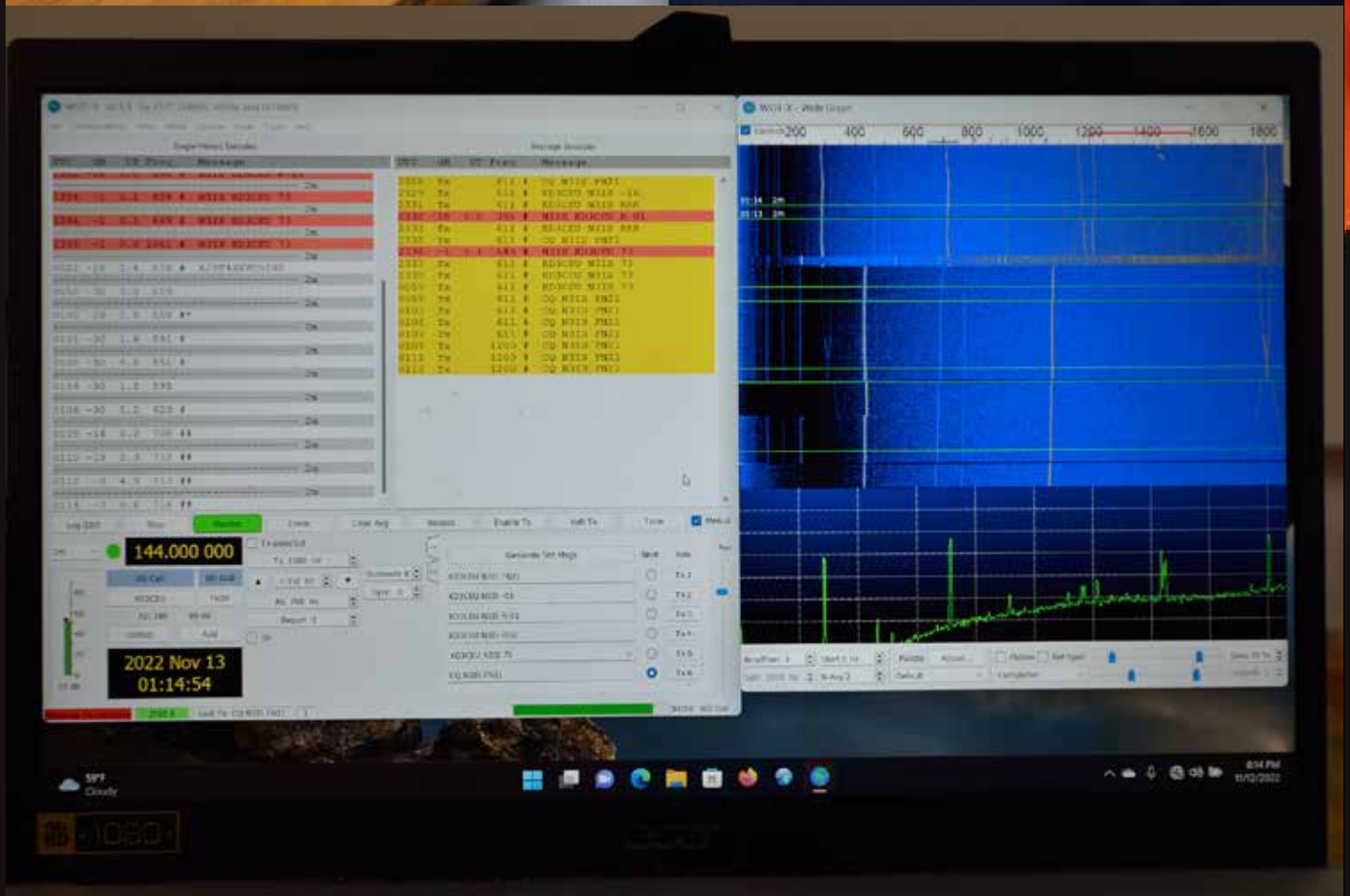
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How Does Effective Radiated Power Figure into EME Operations – de KD2FTA

If you've been involved in the recent club EME activities, you've probably heard from some members of the group talk about the effective radiated power coming out of the antennas. We estimate about 3000 or slightly more watts of power are coming from the antennas, and I often get asked, "Aren't we going over the legal limit? The answer is no as I'll explain below.

Referred to as **ERP, effective radiated power** is simply the power that will need to be supplied to a reference antenna to produce the same power the Yagi, Helical, or Dish antenna is producing in a specific direction.

To understand an antenna's performance, it's important to know how an antenna radiates power. For example, an isotropic (omnidirectional) antenna radiates power uniformly in all directions, whereas a directional antenna (like the club EME Array) radiates power in a specific direction. Yagi antennas radiate the most power from the rear of the antenna forward, although there are some side lobes and some power is directed backwards.

CAUTION! Math and science content below. Stop reading if math is not your thing!

By definition of antenna gain, the ERP can be written as:

ERP = Pt × Ag where **Ag** is the antenna gain **and Pt** is the total power transmitted by the antenna, which can be expressed in the following equation: **Pt = RF power – cable loss**

Here's a quick example, and you can use it to calculate what our EME antenna is capable of doing. The **ERP** of an antenna system is **100,000 watts**, and the antenna gain is **7 dB**. How much total power does the antenna actually transmit?

Solution: Ag = 10 × log (ERP/Pt) = 7 dB Therefore:

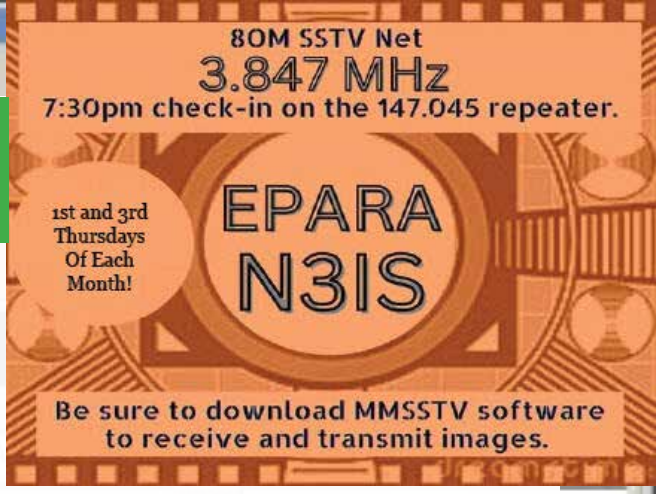
$ERP/Pt = 10^{.7} = 5$

Pt = ERP/5 = 100,000/5 = 20, 000 Watts

So with a linear amplifier producing say **200 watts** and ignoring line losses (which we shouldn't do but here we will) our antenna array using two M2 Yagi antennas **(~ 14.65 dB gain)** produces an **ERP of ~ 2930 watts** of effective radiated power!

This is why we tell everyone not to stand in front of the antenna array when we transmit.

SSTV November Roundup

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ANYONE I HAVE
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PLEASE BE PATIENT.
I WILL GET TO YOU
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HA1AD
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LIFE'S SHORT...
FLY NAKED

Every 1st and 3rd Thursday of the month N3IS invites all of its members to join the fun on 80 meters! Come share your pictures and participate in the EPARA SSTV net. We start at 7:30 on 3.845MHz +/- 3 or so KHz on lower side band. We keep the pics interesting but also family friendly! 73 for now from the EPARA SSTV group.

Introducing the A.R.R.L. Safety Codes - Study Them

By George Grammer,* W1DF

Safety Technique in Transmitter Operation and Construction

March 1939 QST

We've been told that the American pioneers once had a saying, "The only good Indian is a dead Indian." We'd like to paraphrase that slogan and shift the phase by 180 degrees: "The only good amateur is a live amateur." And then never forget it when we're working around radio equipment.

Far more amateurs die from natural causes, or from accidents not connected with radio, than are killed by electrocution in the course of ham operating or experimenting. That is fortunate. "Fortunate" is exactly the right word, too, because nearly every amateur can tell of a narrow escape from death or serious injury by electrical shock - we know, because we've heard of innumerable cases since the untimely deaths of Ross Hull and Phil Murray. And most hams, having come through such an experience without serious damage, never realize by what an exceedingly small margin they made good their escape. With a small change in atmospheric or bodily conditions, or a slight difference in the layout of equipment or bodily position at the time of contact, there might have been an entirely different story to tell - with someone else doing the telling.

We've talked a lot about safety among ourselves here at Headquarters in recent months. What could be done to make amateurs safety-conscious, to instill in them a healthy respect for electrical circuits? What should be done to transmitters to make them more safe to operate and adjust? We spent days in round-table discussions examining suggestions, contributed by amateurs in the field as well as ourselves, from all angles to expose their weak as well as strong points. We consulted safety codes of other organizations in the electrical field. We came to the realization that much could be done to make equipment, particularly transmitting equipment, safer, but that, at least at the present stage of the game, no transmitting equipment could be built that would permit the operator to blindfold himself, stick his hands in the works with all the power on, and be perfectly safe while doing it. We realized, too, that a lot of inertia had to be overcome - no one is going to get involved in constructing safety devices when, after all, he's not going to be guilty of carelessness in handling dangerous voltages. And so we found that the subject of safety naturally divided itself into three sections: First, a set of rules for personal conduct in the handling of transmitters; brief, easily memorized, designed to prevent shock when operating or adjusting any transmitter. Second, a set of constructional precepts which, although involving no special hardships or expense, would minimize danger of shock in normal operating or adjustment; really, a code of good practice in transmitter construction. Third, special devices such as interlocks, warning signals and the like, whose purpose is to protect the operator from the disastrous consequences of a moment of forgetfulness.

With so much that can be said and done about safety, we must confine ourselves to the first two classifications for the present; special safety devices will be reviewed in a future issue.

> Every amateur should make it a point to read this article thoroughly. It summarizes the results of much individual thinking and many intensive group conferences into two simply-applied safety codes, one covering precautions that should be taken when working around transmitters, and the other, methods of making the transmitter itself less dangerous in ordinary operation. Read them; put them into effect at once!

The "personal" code is most important. Its seven simple points should be remembered as automatically as the characters of the international telegraphic code, and applied as instinctively. They are displayed prominently elsewhere in this article, but are so fundamental that they deserve repetition here:

(A) Kill all transmitter circuits completely before touching anything behind the panel.

If we could be sure this rule would be followed unfailingly by everyone, we could almost end the discussion right here. After all, no one is ever hurt by a "dead" circuit. But far-reaching though it is, this rule is not quite enough. Phil Murray, remember, was handling only a microphone, supposedly as safe a piece of equipment to touch as anything about a transmitter. When changing coils, making internal adjustments, or shooting trouble inside the transmitter, kill all the power circuits before handling anything. If you have to see what happens with the power on, don't close the switch until after you're clear. Does the risk seem worth the few minutes saved by disregarding this rule?

(B) Never wear 'phones while working on the transmitter.

Headphone circuits usually work back to ground, and the cord insulation isn't intended to stand high voltages. When you get a shock, your hand is nearly always at one end of the circuit; your chances are pretty slim if your head is at the other end.

(C) Never pull test arcs from transmitter tank circuits.

R.f. may not shock you, but it can cause bad burns. And it can readily travel through a pencil or screwdriver - possibly to be followed by high-voltage d.c. Like s.w.l. cards, the arcs may impress the visitors but they don't mean much.

(D) Don't shoot trouble in a transmitter when tired or sleepy.

And, we might add, after a convivial evening. Your reactions are slow, you're more likely to forget to take normal precautions. Get some rest first.

(E) When working on the transmitter, avoid bodily contact with metal racks or frames, radiators, damp floors or other grounded objects.

One side of the high-voltage circuit is, or should be, grounded. You don't want to contact ground with any part of your body while working on some part which may be at high potential. This is a precaution which, if made a habit, may save you should you forget "A".

(F) Keep one hand in your pocket.

This can also be made a habit. Its purpose, of course, is to prevent the two hands from being the opposite terminals of a circuit through the vital parts of the body.

(G) Develop your own safety technique.

Take time to be careful.

We all develop operating habits which become practically automatic. Make it a point to develop safety habits, too. You can, for instance, train yourself to open the main switch without conscious thought every time you push back your chair to get up from the operating table. Work out a routine for safe operation, practice it, make

it a part of your second nature.

Code for Transmitter Construction

We've conceded that no transmitter can be made completely shock-proof under any and all conditions. But all transmitters can be constructed so that all operations such as tuning and switching normally carried on from in front of the panel are perfectly safe. And much can be done to "safetyize" the inside of the set.

In formulating the construction rules to follow we had a dual idea in mind: First, to eliminate danger from sources where it should not normally be expected, such as at front-panel controls. Known "hot" spots in the transmitter are still to be treated with utmost respect; still, it is possible to make some of them innocuous. Second, to minimize the danger to life should there be a breakdown somewhere in the equipment. This seldom-considered point is highly important, as the Murray case proves. Altogether there are eighteen rules, most of them already in common use by the more thoughtful constructors, at least. The majority deal with methods rather than specific equipment, and none of them appreciably raises costs. Those not already observed in existing transmitters can be applied quite readily, often with but little inconvenience. The reason, for each one should be obvious, but we'll devote a few words of explanation to each. Here they are:

(1) Grounds - With chassis construction, all negative terminals of plate-voltage supplies and positive terminals of bias supplies should be connected to chassis and to a good ground. Chassis should be connected together and to the rack, frame or cabinet, if of metal.

With breadboard construction, negative terminals of plate-voltage supplies and positive terminals of bias supplies should be connected together and to a good ground.

The important thing here is that everything supposed to be at ground potential actually should be grounded. Then if a transformer or other component breaks down, no harm can come to the operator from touching a normally "dead" component or structure. Fuses may blow, and some equipment may be damaged, but such things can be replaced. Phil Murray would be alive today if there had been an actual ground on the speech amplifier.

It has been suggested that both sides of power-supply circuits should be insulated from all metal chassis, the r.f. returns being made to chassis through by-pass condensers. Thus the chassis and either side of the circuit could be touched simultaneously without danger of a greater jolt than the discharge from a small by-pass condenser. But this system gives no protection from defective equipment, and we believe it better to conform to the standard practice of connecting one side of each supply circuit (negative in the case of plate supplies and positive in the case of bias supplies) to the chassis, and then grounding the chassis. Of course, there is no large metal surface in the usual type of breadboard construction, but the general principle should be followed just as faithfully.

(2) Control Shafts - All shafts, jack frames and other metal parts protruding through panels should be grounded, regardless of whether the panel is metal or insulating material.

For safety in tuning, this rule is extremely important. Obviously, there should be no possibility of getting "bitten" from a control which one has to handle. Condenser shafts, in particular, only too often are at the full plate voltage above ground, and only such insulation as the tuning knob may have protects the operator. Even though the knob may be good bakelite, there is still a set screw coming too close to the fingers for comfort. The only safe way is to make the shaft dead, either by using a circuit which permits grounding the condenser rotor, or by using an extension shaft to drive the condenser through an insulating coupling. In the latter case

the extension shaft alone is not enough; it should be grounded to the panel, if metal (the panel in turn being grounded), or directly connected to ground by wire. Then if the coupling breaks down the only damage is to the plate supply. Extension shafts and panel bushings are readily obtainable and inexpensive.

(3) Plugs, Jacks and Cords - When plugs and jacks are used for meter switching, the circuit should be arranged so that the jack frames can be grounded. The plug cord should be heavily-insulated flexible cable, or shielded cable with the shield connected to the plug sleeve.

This rule is very commonly disregarded - mostly, it must be admitted, in connection with supposedly non-dangerous low-voltage circuits. Certainly no jack on the front panel of a transmitter should be at anything except ground potential; it is only too easy to touch it accidentally. Practically, this means that the meter jack must be connected in the negative plate-supply lead or positive bias-supply lead; if it cannot be connected in this way because a common supply is used for two or more stages, then some other method of meter switching should be used.

Note that additional precautions should be taken with respect to the cord. This is not just one of those things to "make assurance doubly sure" but is an essential part of the rule. Should the meter develop an open circuit, a considerable difference of potential - possibly depending upon the circumstances, the full plate voltage - will appear across the wires of the cord. There should be no possibility of insulation breakdown which might result in a serious shock. The safer of the two alternatives is to use a shielded cord, with the shield connected to the plug sleeve and thus automatically to ground, through the jack frame, before the meter circuit is made.

Always
Be
Careful
* * *
(A) Kill all transmitter circuits completely before touching anything behind the panel.
(B) Never wear 'phones while working on the transmitter.
(C) Never pull test arcs from transmitter tank circuits.
(D) Don't shoot trouble in a transmitter when tired or sleepy.
(E) When working on the transmitter, avoid bodily contact with metal racks or frames, radiators, damp floors or other grounded objects.
(F) Keep one hand in your pocket.
(G) Develop your own safety technique. Take time to be careful.
* * *
Death Is Permanent!

(4) Cases and Cores - Transformer and choke cores, cases and other metal work not normally a part of the electrical circuit should be grounded.

This is a measure against equipment failure. Breakdown of a winding to the core is probably the commonest of transformer and choke failures. Since the core and case are normally dead such a breakdown can be doubly dangerous, because the appearance of voltage on them is totally unexpected. Don't take it for granted that the bolts holding the units to the chassis make a ground connection; test with an ohmmeter and make sure of both core and case. Units with the core enclosed are best, since the laminations of the core are usually insulated to some extent to prevent eddy-current loss.

(5) Master Switch - There should be one power line switch, in a conspicuous and easily-accessible location on or near the transmitter, which controls all power to the transmitter,

Without such a switch, the habit of turning off all power before going behind the panel may be difficult to form. Make it easy to kill the transmitter - you're more likely to follow the cardinal " A" of the" ABC's."

(6) Power Supply Enclosures - Power sup-plies should be so enclosed or constructed, or so located, that accidental bodily contact with power circuits is not possible when adjustments are being made to r.f. or audio units.

A grounded cover over a power supply is the safest type of construction. With relay racks, the power supplies are usually at the bottom where a leg or knee may come in contact with exposed wiring when adjustments are being made. Lacking a cover, the next best thing is to use construction without exposed high-voltage points; this is covered in some of the following rules. Alternatively, the power supply may be located well out of reach when work is being done on the transmitter; this means, however, that it cannot be on the same rack or frame with the transmitter proper.

(7) Bleeders - A bleeder resistor should be connected across the d.c. output terminals of each rectified a.c. power supply.

From the electrical design standpoint, every power supply of this type ought to have a bleeder anyway. As a safety precaution, to discharge filter condensers, the bleeder is absolutely essential. Filter condensers can store up quite a charge, particularly on circuits over 1000 volts, and even though the discharge may not last very long it is not to be lightly dismissed - there may be enough energy available to be as dangerous as a continuous contact. And a lot of things can happen in the reaction; the uncontrollable jump you give may result in damage both to yourself and the apparatus.

Even with a bleeder on the supply, it doesn't pay to take it for granted that the condensers are discharged when the power goes off. Bleeders can open up with no warning. Special methods of making sure of the bleeder will be discussed in subsequent issues.

(8) Resistors - Resistors should be so located or protected that accidental bodily contact is impossible. When one side of the resistor is open for adjustment, the resistor should he mounted with the exposed side in such a position that it cannot he touched. Sliders, when used, should be insulated or protected by barriers.

Tubular resistors, unfortunately, are made with exposed terminals. This is also true of the slider on the semi-variable type. Equally unfortunately, a resistor usually has to be mounted in a rather exposed location if it is to dissipate the power it is rated to carry; for the same reason, it cannot ordinarily be mounted inside a box. A lattice or cane cover, which would give the necessary protection and still allow plenty of air circulation, would be a good thing to have. Without it, install the resistor where it can't be touched unintentionally, or put a grounded metal barrier, large enough to prevent accidental contact, in front of it.

Don't depend on the coating for insulation - it's there to protect the resistance wire, not you.

(9) Plate Milliammeters - Plate milliammeters preferably should be connected in the negative plate-supply lead so that one side of the meter can he grounded. If this is not possible, the meters should be mounted behind the panel (behind glass if possible) so that accidental contact is impossible.

This practice will protect the meter as well as the operator. Even bakelite-cased meters are rated for only 500 volts or so when mounted on a grounded panel. The danger point on a meter is the reset screw, which is responsible for more than one shock, and the screw therefore should be kept at ground potential. If the meters have to be connected in the positive leads, by all means put them where they can't be touched. An insulating mounting behind a relay-rack panel, with a slot for viewing, is not hard to rig up, and should always be used when the meters are above ground.

(10) H. V. Leads-High-voltage leads should he a good grade of high-tension wire insulated for at least two to three times the peak operating voltage.

Insulation should be good enough so that a high-voltage lead can be run along a grounded chassis or frame

without danger of breakdown. Then there will be no danger to the operator should the wire be accidentally touched. Note that peak operating voltage is specified - this is at least twice the steady d.c. plate voltage when the stage is plate-modulated. Automobile high-tension wire, in the better grades, is inexpensive and amply rated for most amateur plate supplies.

(11) Terminals - Exposed terminals and tube caps should he protected by insulating coverings. Barriers should be placed over exposed transformer terminal boards.

High-voltage terminals, tube caps and the like are highly dangerous points and, usually, only too easy to touch unless deliberate care is taken to avoid them. Insulated caps for tubes have been obtainable for a long time, although not generally used by amateurs. They cost little and are not troublesome to install.

We need a new type of high-voltage terminal to replace the feed-through insulator generally used for the purpose. It could be built much along the same lines, but should have a ceramic cap which screws or otherwise fastens to the body of the insulator and which covers the actual connection after it is in place. There's an opportunity here for some manufacturer to bring out a really useful gadget. In the meantime, a rubber sleeve of the type used with test clips could be slipped on the wire before fastening, and afterward pulled over the terminal to cover all the metal normally exposed. It would afford considerable protection.

Likewise, there's room for improvement in transformer terminal boards in the field of protection from accidental contact. When the transformer is mounted so that the present type of terminal board is within reach in the normal course of operating or routine adjustment, it ought to be covered up. This can be done quite easily by running all the wires through a piece of bakelite the same size as the terminal board and shoving the bakelite piece up quite close to the terminals. It will be rather hard to get your fingers in, and you'll probably be reminded to turn off the power before changing connections.

(12) Layout - In construction of r.f. units, components should be located so that danger of touching high-voltage circuits during adjustments or coil changing is minimized.

In other words, don't layout a circuit so that you practically have to put your hand against the tank condenser or the plate of the tube when you change coils. Coils which have to be changed always should be on the most accessible part of the chassis.

(13) Parallel Feed - When design considerations permit its use, parallel feed to transmitting tubes is recommended for circuits in which coils must be changed manually.

The dangerous thing about a tank coil is the d.c, voltage - r.f. may cause a bad burn but is not likely to be fatal. So, if there's no d.c. on the coil your chances are much better should you forget" A" of the" ABC's." As a matter of fact, there's a lot of unfounded superstition about parallel feed, dating back to the days when it was hard to get a good choke. But at the present time suitable chokes are certainly available for low- and medium-power transmitters, at least when the set is not intended to cover the whole spectrum. Admittedly, it is asking a lot of a choke to work on all bands from 5 or 10 to 160. We don't say categorically that parallel feed must be used; rather, we say that if it can be used in your particular transmitter, it should be, and the set will be just that much safer to operate.

(14) Series Feed - With series plate feed in the final stage, coupling to the antenna preferably should be inductive; if direct coupling is used, blocking condensers amply rated to withstand the peak plate voltage should be installed between the plate tank circuit and the antenna system.

This hardly needs comment. We certainly don't want the plate voltage to appear without warning at the

feeders or on the antenna. Use good blocking condensers, not only rated for the peak plate voltage (including modulation) but also to carry the r.f. current that will have to flow through them.

(15) Breadboards - Breadboard-type transmitters should be provided with panels to prevent accidental contact with live components when controls are operated. Items (2) and (3) should be observed with respect to apparatus mounted on or projecting through the panel.

It is obviously desirable to have a breadboard transmitter arranged so that no danger spots are waiting for unwary fingers when only normal tuning operations are being carried on. If you have a breadboard layout, by all means put a panel in front (wood, predswood or similar materials will do) and then treat the panel just as though the set were in a rack. Meters can be mounted conveniently at the back of the breadboard where they are easily visible but well out of reach.

(16) Clips - Adjusting clips on tank coils should be provided with insulating sleeves. Rubber sleeves over clips used to vary antenna coupling in direct- or capacity-coupled circuits may prevent a burn or shock should the operator forget to turn off the power while making adjustments. They're worthwhile protection, inexpensive and can be installed in a few seconds.

(17) Keys - The arm of the telegraph key should be grounded in every case. In keying circuits which do not permit a direct ground on the key, a suitably-insulated relay should always be used. Live parts of the key should be protected from accidental bodily contact by suitable covers or barriers.

Lots of fellows have had jolts from keys, especially those using center-tap keying. Always arrange the circuit so that the arm of the key can be connected to an actual ground. This automatically safetyizes most of the exposed metal parts; the remaining hot points should be covered over so they can't be touched. It would not be hard to make a small box of wood or metal to fit over most of the key, leaving only the operating lever in the open. Manufacturers could help out here, too.

Incidentally, the key symbol that appears in diagrams (including those in the Handbook) is not to be taken as a literal representation of the method of connecting the respective sides of the key. Convenience usually dictates which way the key is drawn, and although we intend to make the picture and practice conform wherever possible, always remember that in doing the actual wiring the key arm should go to ground, no matter how it is represented in the diagram.

(18) Relays - Relays should be provided with covers, or installed in such fashion that accidental closing by mechanical means cannot occur.

A relay is a useful and often indispensable device, but is not always to be trusted. A power or keying relay mounted in the transmitter often can be turned on unintentionally if something (a tool, for instance) should drop on it and close the contacts. Therefore the relay should be so placed in the set that such a contingency cannot occur, or a cover should be installed for the same purpose.

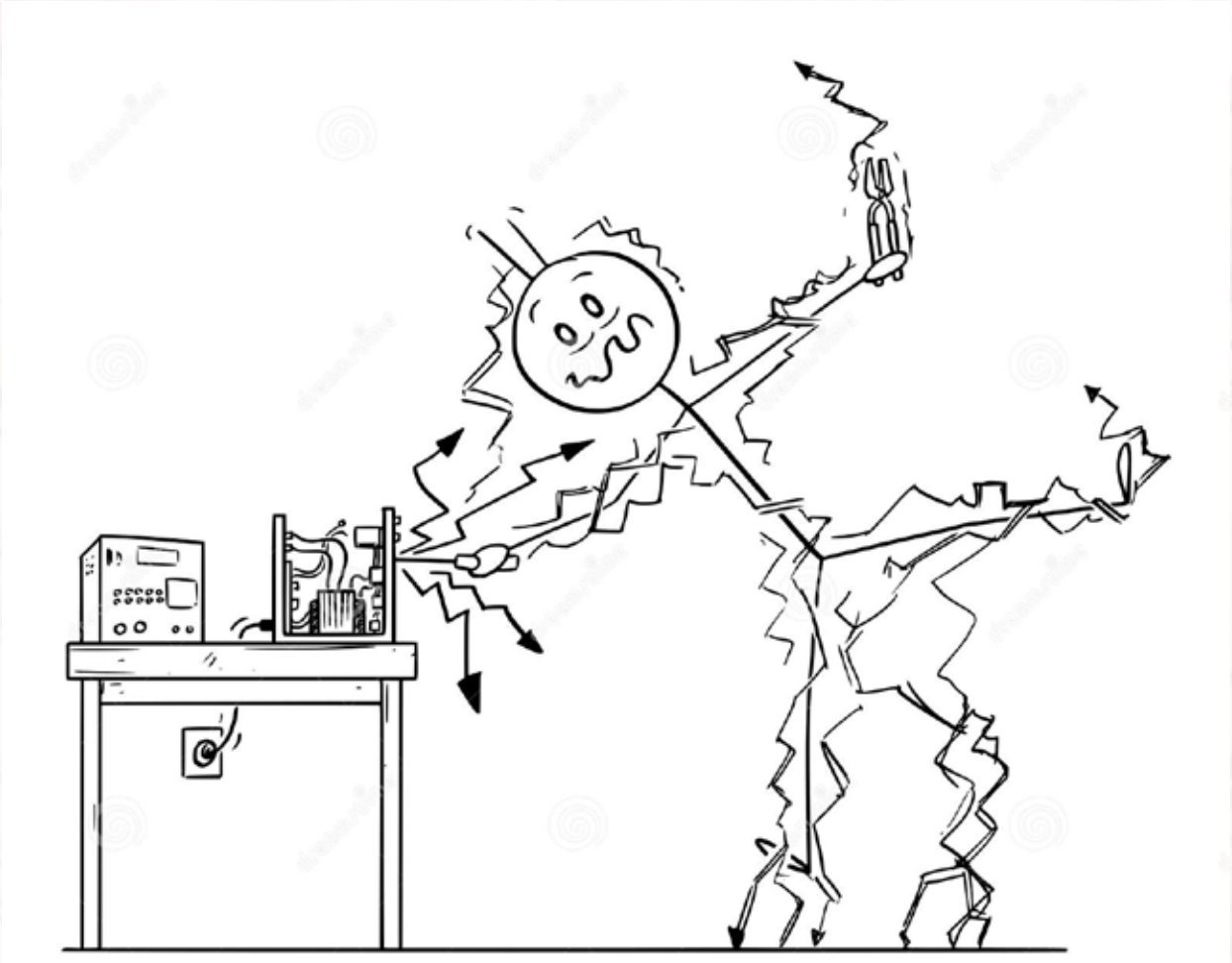
No protection can be afforded against sticking relay contacts without going into our third section of the safety problem, special safety devices. We shall do that later. But Rule 5 of the present series, always remembering" A" of the" ABC's," will take care of such a situation.

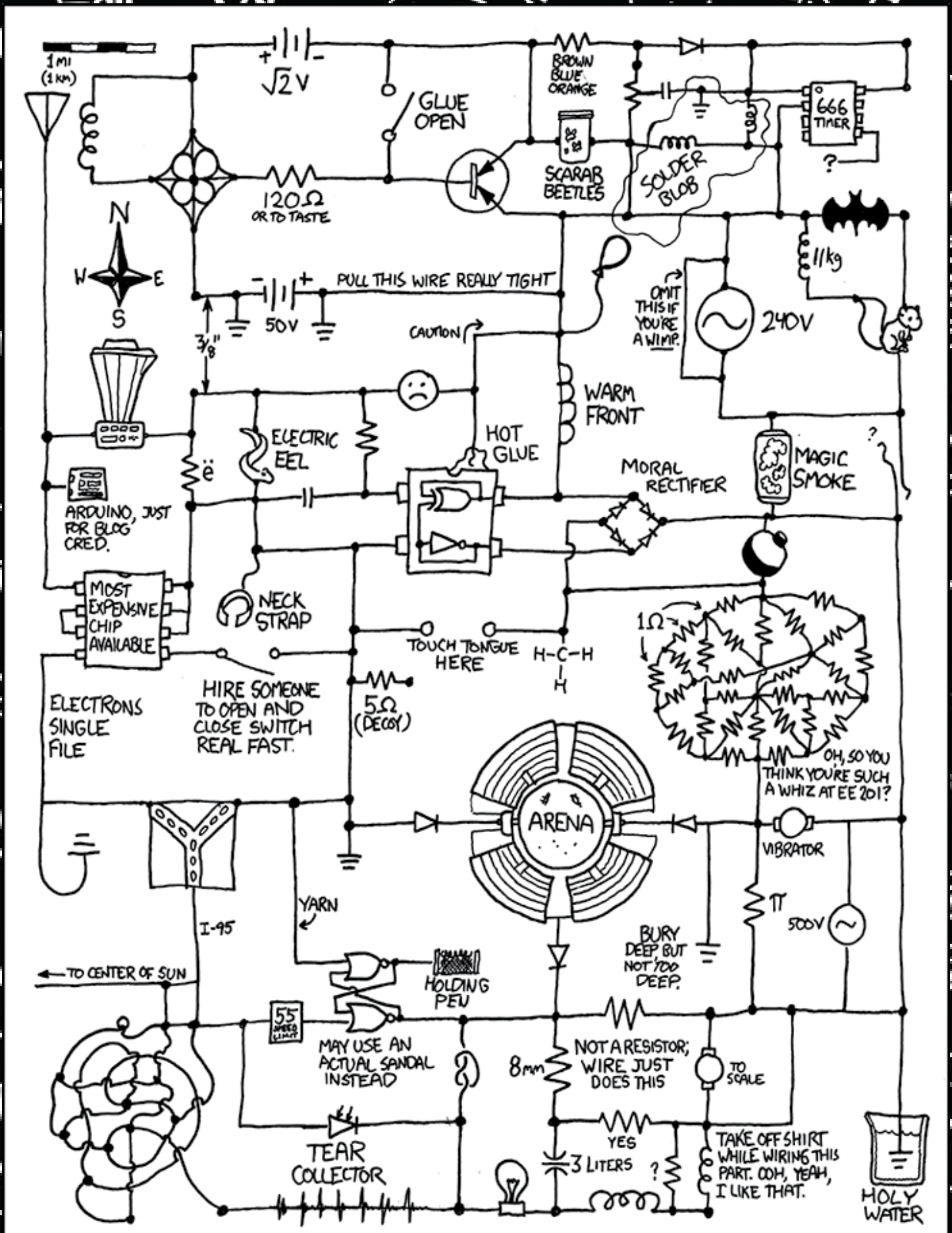
There they are. As we said before, none of them represents any particular hardship, either constructionally or on the basis of cost. All have the weight of logic behind them. Naturally we intend to follow them in our own construction, although freely admitting that exceptions to some of them can be quoted to us both from past QST's and Handbooks.

Accidents still can happen, of course, even though all these constructional precautions are taken; that is why we put primary emphasis on the"ABC's." But following them will do much to reduce the chances of accident; for safety's sake, put them into practice at once.

One point brought up by a correspondent deserves mention. Many 110-volt lines have fuses both in the grounded side and the hot side, and a dangerous condition can arise should the fuse in the ground side burn out, leaving the other fuse intact. Such fusing was common practice years ago, but is contrary to the National Electrical Safety Code. Look over your cellar installation, and check to see if there is a good ground connection to one side of the circuit or to the center wire of a three-wire system. If so, and the ground or neutral is fused, bridge the fuse by a good solid connection using wire of the same size as the rest of the circuit. If you have any hesitancy about making this change, get your local building inspector to confirm it.

In closing, we want to repeat here the thought in last month's Editorial. No voltage, including those in the lower hundreds, can be considered non-dangerous to life. Handle every circuit with caution - remember that the lowly 110 has more electrocutions to its credit than any other.

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CAUTION
OMIT THIS IF YOU'RE A WIMP.
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WARM FRONT
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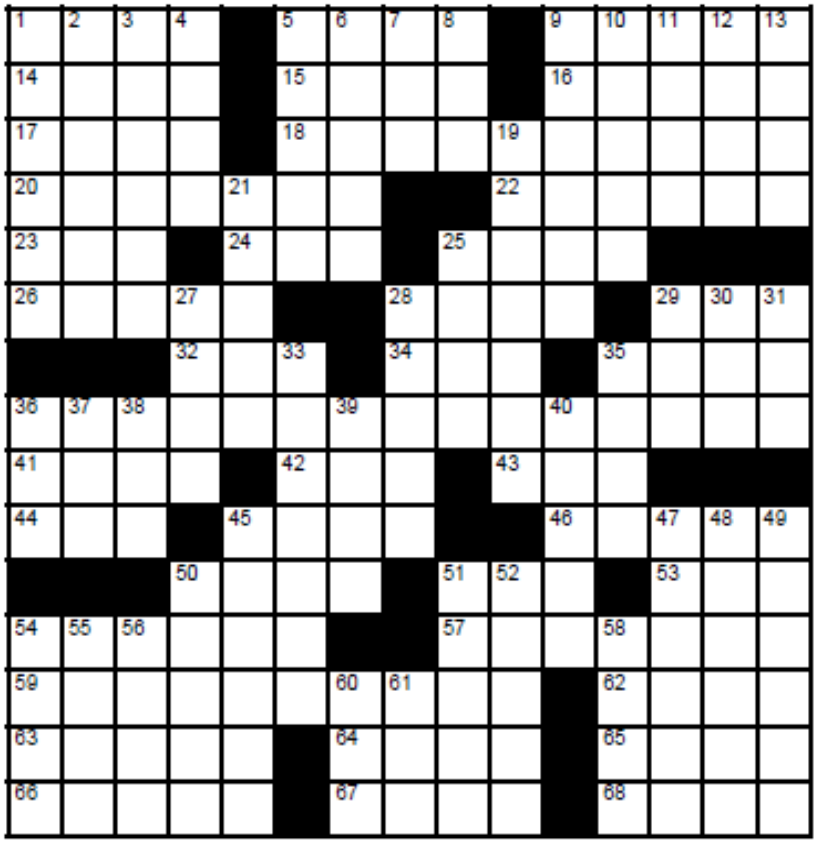
MORAL RECTIFIER
MAGIC SMOKE
ARDUINO, JUST FOR BLOG CRED.
MOST EXPENSIVE CHIP AVAILABLE
NECK STRAP
TOUCH TONGUE HERE
H-C-H H
1Ω
ELECTRONS SINGLE FILE
HIRE SOMEONE TO OPEN AND CLOSE SWITCH REAL FAST.
5Ω (DECOY)
OH, SO YOU THINK YOU'RE SUCH A WHIZ AT EE 201?
ARENA
VIBRATOR
YARN
I-95
1T
500V
BURY DEEP BUT NOT TOO DEEP.
TO CENTER OF SUN
HOLDING PEN
55 SPEED LIMIT
MAY USE AN ACTUAL SANDAL INSTEAD
8mm
NOT A RESISTOR; WIRE JUST DOES THIS
TO SCALE
TEAR COLLECTOR
YES
3 LITERS
?
TAKE OFF SHIRT WHILE WIRING THIS PART. OOH, YEAH, I LIKE THAT.
HOLY WATER


Ho Ho Ho!
NORTHPOLE
Start
Finish
HAVE AN AMAZING HOLIDAY FROM START TO FINISH!
From Jackie

by Chris Codella, W2PA 12/11/2007

Vintage Ham Radio



Across

1. Radio named for a bird
5. Lake ____ swing
9. An SB-220, very broadly speaking
14. Oscar's follower
15. In the middle of EME
16. Tough, durable wood
17. Times past
18. Fine tuning, on some vintage receivers
20. Presses the upper left key
22. They get disqualified in a contest, probably
23. Vibroplex manual item
24. Iowa ham equipment maker, informally
25. Cartoonist Schultz, on CW maybe?
26. _____ generator
28. A step lower in frequency than Re's
29. Proof ender, maybe on CW too
32. Meadow sound
34. Volatile computer storage
35. Four digits of nothing, on CW, for short
36. An R-390 on a carrier?
41. Part of S.R.O.
42. What log entries were often written in, before computers
43. Sixty-one-forty-____
44. Foxhunt (abbr.)
45. Delight
46. Pertaining to a point of connection, in a circuit or network
50. Base predecessor?
51. W2 summer time
53. Dir. beaming Billings from Boise
54. Bad, if a tire...; good, if SWR...
57. Desk Kilowatt maker
59. Lots of Hertz, in the early days
62. ARRL Op-____ (dupe sheets were #6)
63. Receiver maker in HPM's time
64. Walk back and forth
65. Natural antenna support
66. A YL, after getting an X
67. Jet-setters' jets, once
68. Wisdom says that sometimes it's more

Down

1. 20 WPM, 300 Baud, and others
2. SP capital
3. To AMers it's the scratchy one from Heath
4. AMSAT partner
5. Glowing remnant
6. Effect of 5-down on a hot dog
7. Sometimes it's plus sometimes minus
8. AR, on CW
9. Some amplifiers, starting around 1970
10. "Who ___?"
11. Part of EAN, CAN, PAN
12. Future doc's exam
13. Docs of another kind
19. Arrangements or organizations - in databases
21. Like a ruling in HV-land
25. Layer, as with paint
27. Pac. div. ARRL sect.
28. Their dials are greenish-blue
29. Miamisburg, to 28-down
30. Maker of 9-down, once
31. Serial port pin
33. Code proficiency, say
35. Extra stable freq. ref.
36. Kind of logic gate
37. Another kind of logic gate
38. What the original ham band is called today
39. Linear (but not an amp), briefly
40. IN district
45. Honored or favored
47. Covet, as a big antenna farm
48. Collectors' ancestors?
49. Contacts (but not QSOs)
50. ____ King 500
51. VCR button
52. Prescribed amounts
54. Italy, No. Ireland, in prefixes
55. McCartney, Lancelot and others
56. Took a 707
58. Mfgr. of HRO rcvrs
60. Hz, to Hertz
61. A step higher in frequency than so's

MARCH 1976
$1.50

73 ANTENNA ARCHIVES #53

AMATEUR RADIO

By Edison Fong, WB6IQN

The DBJ-1: A VHF-UHF Dual-Band J-Pole

Searching for an inexpensive, high-performance dual-band base antenna for VHF and UHF? Build a simple antenna that uses a single feed line for less than $10.

Two-meter antennas are small compared to those for the lower frequency bands, and the availability of repeaters on this band greatly extends the range of lightweight low power handhelds and mobile stations. One of the most popular VHF and UHF base station antennas is the J-Pole.

The J-Pole has no ground radials and it is easy to construct using inexpensive materials. For its simplicity and small size, it offers excellent performance. Its radiation pattern is close to that of an "ideal" dipole because it is end fed; this results in virtually no disruption to the radiation pattern by the feed line.

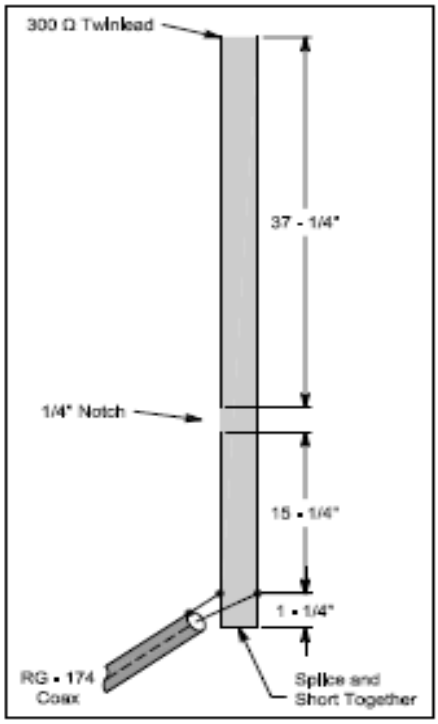


Figure 1—Basic diagram and dimensions for the original 2-meter ribbon J-Pole.

The Conventional J-Pole

I was introduced to the twinlead version of the J-Pole in 1990 by my long-time friend, Dennis Monticelli, AE6C, and I was intrigued by its simplicity and high performance. One can scale this design to one-third size and also use it on UHF. With UHF repeaters becoming more popular in metropolitan areas, I accepted the challenge to incorporate both bands into one antenna with no degradation in performance. A common feed line would also eliminate the need for a duplexer. This article describes how to convert the traditional single band ribbon J-Pole design to dual-band operation. The antenna is enclosed in UV-resistant PVC pipe and can thus withstand the elements with only the antenna connector exposed. I have had this antenna on my roof since 1992 and it has been problem-free in the San Francisco fog.

The basic configuration of the ribbon J-Pole is shown in Figure 1. The dimensions are shown for 2 meters. This design was also discussed by KD6GLF in *QST*.[1] That antenna presented dual-band resonance, operating well at 2 meters but with a 6-7 dB deficit in the horizontal plane at UHF when compared to a dipole. This is attributable to the antenna operating at its third harmonic, with multiple out-of-phase currents.

I have tested single-band J-Pole configurations constructed from copper pipe, 450 Ω ladder line, and aluminum rod. While all the designs performed well, each had shortcomings. The copper pipe J-Pole matching section would be exposed to the

[1]J. Reynante, KD6GLF, "An Easy Dual-Band VHF/UHF Antenna," *QST*, Sep 1994, pp 61-62.

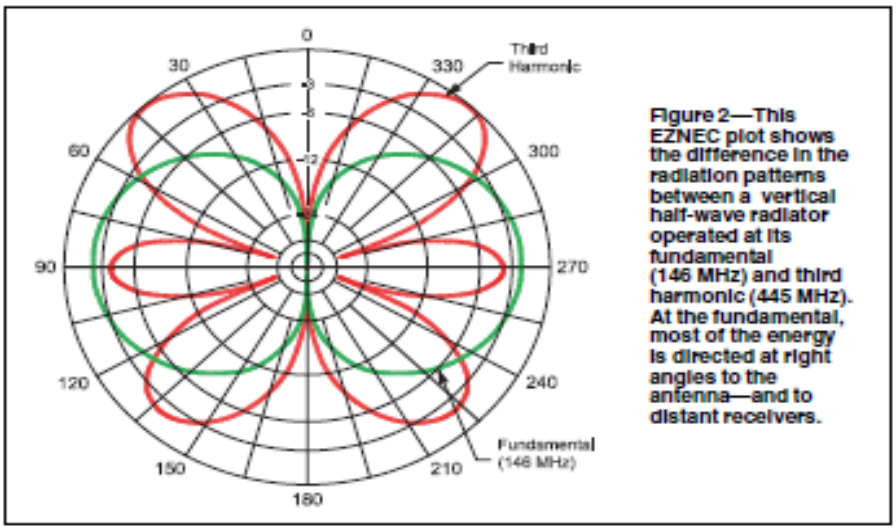


Figure 2—This EZNEC plot shows the difference in the radiation patterns between a vertical half-wave radiator operated at its fundamental (146 MHz) and third harmonic (445 MHz). At the fundamental, most of the energy is directed at right angles to the antenna—and to distant receivers.

Table 1
Measured Relative Performance of the Dual-Band Antenna at 146 MHz

	VHF ¼ Wave Mobile Reference	*VHF Flex Antenna ("Rubber Duck")*	*Standard VHF J-Pole*	*DBJ-1 J-Pole*
Received Signal Strength	–24.7 dBm	–30.5 dBm	–24.3 dBm	–23.5 dBm
Difference from Reference	0 dB	–5.8 dB	+0.4 dB	+1.2 dB

Table 2
Measured Relative Performance of the Dual-Band Antenna at 445 MHz

	VHF ¼ Wave Mobile Reference	*VHF Flex Antenna ("Rubber Duck")*	*Standard VHF J-Pole*	*DBJ-1 J-Pole*
Received Signal Strength	–38.8 dBm	–45.3 dBm	–45 dBm	–38.8 dBm
Difference from Reference	0 dB	–6.5 dB	–6.2 dB	0 dB

Figure 4—The Advantest R3361 spectrum analyzer used in the test.

Figure 5—The completed antenna mounted to the roof.

cable is used for the stub, it is likely that the top of the antenna will require some glue or foam to hold the antenna in place because of the additional cable weight. —*Ed.*] The 300 Ω twin lead is sufficiently rigid so as not to bend once it is inside the pipe. Install an SO-239 connector in the bottom end cap. Once the antenna is trimmed to the desired operating frequency, glue both end caps and seal around the SO-239 connector. Presto! For a few dollars, you'll have a dynamite antenna that should last for years.

The antenna should be supported only by the lower 12 inches of the housing to avoid interaction between the matching stub and any nearby metal, such as an antenna or tower. The results from the antenna are excellent considering its simplicity.

Measured Results

Brian Woodson, KE6SVX, helped me make measurements in a large parking lot, approximating a fairly good antenna range, using the Advantest R3361C spectrum analyzer shown in Figure 4.

The transmitter was a Yaesu FT-5200 located about 50 yards from the analyzer. The reference antenna consisted of mobile ¼ wave Motorola ground plane antennas mounted on an NMO connector on the top of my vehicle. The flex antenna ("rubber duck") was mounted at the end of 3 feet of coax held at the same elevation as the groundplane without radials. The J-Pole measurements were made with no groundplane and the base held at the same height as the mobile ground plane. Table 1 gives performance measurements at 146 MHz, while Table 2 gives those same measurements at 445 MHz.

As can be seen in the UHF results, the DBJ-1 outperforms the standard 2 meter J-Pole by about 6 dB (when used at UHF), a significant difference. The standard 2 meter J-Pole performance is equivalent to a flex antenna at UHF. Also note that there is no significant difference in performance at 2 meters between the DBJ-1 and a standard J-Pole. The flex antenna is about 6 dB below the ¼ wave mobile antenna at both VHF and UHF. This agrees well with the previous literature.

The completed antenna can be seen mounted to the author's roof in Figure 5.

If you do not have the equipment to construct or tune this antenna at both VHF and UHF, the completed antenna is available from the author, tuned to your desired frequency. The cost is $20. E-mail him for details.

Ed Fong was first licensed in 1968 as WN6IQN. His Extra Class came with WB6IQN. He obtained the BSEE and MSEE degrees from the University of California at Berkeley and his PhD from the University of San Francisco. A Senior Member of the IEEE, he has seven patents and two-dozen published papers in the area of communications and integrated circuit design. Presently, he is employed by the University of California at Berkeley teaching graduate classes in RF design and is a Senior Member of the Technical Staff at Foveon Corporation in Santa Clara, California. You can contact the author at 1163 Quince Ave, Sunnyvale, CA 94087; **edison_fong@hotmail.com.**

From February 2003 QST © ARRL

73 ANTENNA ARCHIVES #53

FEEDBACK

◊ In "The DBJ-1: A VHF-UHF Dual-Band J-Pole" [Feb 2003, p 40], replace "VHF" with "UHF" in the headings of Table 2, columns 1 and 2. Column 3 remains "VHF," as it refers to the use of a 2 meter VHF J-Pole on its third harmonic. Also, the area immediately to the left of the RG-174 stub should not be shaded. The decoupling stub is in series with two separate pieces of twin-lead.

◊ In "The DBJ-1: A VHF-UHF Dual-Band J-Pole" (Feb 2003, pp 38-40), the length of the RG-174 matching stub should be shortened a bit to get the antenna closer to a 1:1 SWR. Using the formula for line length versus frequency and wavelength,

$L = (VF \times 984 \times N) / f$

where
L = length (in feet),
VF = velocity factor,
N = number of wavelengths and
f = frequency in MHz

S	W	A	N	■	E	R	I	E	■	A	C	A	M	P
P	A	P	A	■	M	O	O	N	■	L	A	R	C	H
E	R	A	S	■	B	A	N	D	S	P	R	E	A	D
E	S	C	A	P	E	S	■	■	C	H	E	A	T	S
D	A	H	■	A	R	T	■	C	H	A	S	■	■	■
S	W	E	E	P	■	■	D	O	E	S	■	Q	E	D
■	■	■	B	A	A	■	R	A	M	■	T	T	T	T
N	A	V	A	L	B	O	A	T	A	N	C	H	O	R
O	N	L	Y	■	I	N	K	■	S	I	X	■	■	■
R	D	F	■	G	L	E	E	■	■	N	O	D	A	L
■	■	■	G	R	I	D	■	E	D	T	■	E	N	E
I	S	F	L	A	T	■	■	J	O	H	N	S	O	N
K	I	L	O	C	Y	C	L	E	S	■	A	I	D	S
G	R	E	B	E	■	P	A	C	E	■	T	R	E	E
I	S	W	E	D	■	S	S	T	S	■	L	E	S	S

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