OUR 25TH YEAR!

EPARA BEACON

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

NEXT CLUB MEETING: MAY 13TH

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=bU1KcVZ0aVZiVEUvdjRsUXlNNHZkZz09

Meeting ID: 854 6334 6031 Password: 244632

General License classes have begun. Good luck to all attending !!

From The President

Things are getting back to some sort of normal! We had our first in person meeting in April and it was well attended. I am several weeks into the teaching of the General License Class and its nice to be back in the familiar routines. Field Day planning has begun, we will be running as a 2 Alpha this year, we will be going for some bonus points for Sat and EME contacts. I'm going to be looking for a few Band Captains to help keep things organized on FD this year. I am also kicking around some antenna Ideas for Elmer/Antenna weekend. We will also be no doubt attempting some EME as well. So, all sorts of things are under way!

New endeavors with DMR continue, the Monday DMR net on the KG3I repeater continues and a club talk group has been established. The 3149822 talk group is accessible via hot spots and is available anytime for member use. It's a nice place for a group of hams to meet and discuss any technical subject or just plain old rag chew without interference or tying up a repeater. There is a scheduled net set for Wednesday's at 8:30PM so feel free to join in.

The QRM and "LIDs" on the local repeaters have become quite ridiculous. This is not just a local problem as it is occurring across the country. I'm sure that things are being done about this and I have heard of some rather heavy fines being leveled by the FCC to the tune of 10s of thousands of dollars. So hang in there and deal or ignore it as best you can, remember the worst thing you can do is acknowledge a jammer in any way. And when it comes to LIDs, simply don't have a QSO with them. If you hear a station who just can't seem to operate correctly no matter how many times they have been corrected or just can't seem to stick to discussing appropriate subjects move to another frequency. Okay, I'll put my soap box away now.

That's it for now, I hope to see many of you on May 13th at our next meeting. 73

Chris AJ3C

CONTACT INFORMATION

President Chris Saunders AJ3C: aj3c@gmx.com	Vice President Bill Carpenter AB3ME: bill47@ptd.net
Secretary Kevin Forest W3KCF: w3kcf@outlook.com	Treasurer Scott Phelan KC3IAO: kc3iao@hobbyguild.com
Member at Large Eric Weis N3SWR: n3swr@ptd.net	ARES EC Kevin McCauley KB3EJM: kb3ejm@yahoo.com

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Sciota, PA 18354	N3IS@qsl.net	Sciota, PA 18354	

What's INSIDE this ISSUE

EPARA Net list

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

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

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

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

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

*TG = Talk Group

Announcements
AND UPCOMING EVENTS

EPARA Patches:
The club patches are ready to be ordered > we need a minimum of 25 patches to make this happen and worthwhile too. Get in contact with the club to place your order please!

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

General License Class!
Classes begin April 7th 2021. There are still seats available for those that are interested. Don't hesitate to contact Chris AJ3C to upgrade your license to general!!

EPARA Club Meeting
The nest club meeting WILL BE held once again at the Monroe County 911 call center! FINALLY! We will also be holding a zoom meeting from the center for those that wish to join from their homes like we have done in the past.

Big Pocono State Park
EPARA has secured the site we use for Field Day and Elmer/Antenna weekend for the next 10 years!

Squirrel fills Antenna with Acorns
https://www.youtube.com/watch?v=cZkAP-CQlhA

EME Antenna has been assembled and tested!
The M2 VHF antenna the club has purchased for Earth-moon-Earth communications was assembled recently at the 911 center. Members of the EME group gathered to assemble and test the M2 VHF Yagi. See page 27 ...

"Close, but..."

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

EPARA GENERAL MEMBERSHIP MEETING AGENDA

EPARA General Membership Meeting Minutes
April 8th*th* 2021

General Membership Meeting Minutes 7:30Pm

Open meeting:

Meeting called to order at 7:30 pm on April 8th*th* 2021 by Chris AJ3C (911 Center and via Zoom)
Declaration of Quorum.
Total members attending, 21 Visitors present: 0

Pledge of Allegiance / Moment of silence:

Membership Meeting - Minutes March 11th, 2021:
Secretary - Kevin W3KCF:

Meeting minutes for March 11*th*, 2021 were posted on the EPARA website. Chris – AJ3C asked members if they had seen and read the minutes from our previous meeting. He then asked if there were any questions or objections to the minutes as they were presented. With no objections, Chris asked for a motion to accept the minutes as presented:

Motion to accept by AL – KB3OVB 2nd by Alex – KD2FTA Motion Passed

Treasurers report:

Scott, KC3IAO stated the ending balance for March 2021 was $3635.68. We had 50 club patches that were purchased bringing in $375.00. The antenna for the EME project was purchased for $347.50 and there were expenses for our Zoom subscription for January – March 2021 for $40.50. The last six months of 2020 budget we had Zoom expenses for $81.00. Income received was $120.00 from dues paid, $10.00 for a club patch and $.16c interest from the bank. This left us with a closing balance of $2921.84. Our PayPal account had a balance of $449.43 with an additional $15.00 dollars received on Apr 8th 2021 from Darryl for Dues. The $15.00 dollars will be reflected in next month's budget.

Dues can be submitted either by sending a check to the club's PO Box, or through PayPal by emailing Scott – KC3IAO:

Eastern Pennsylvania Amateur Radio Association
P.O. Box 521, Sciota, Pa 18354

KC3IAO@hobbyguild.com

Motion to accept reports by Len – KC3OND 2nd by RuthAnn – W9FBO Motion Passed

Correspondence:
None

Chris – AJ3C did mention he was expecting to hear from the West End Fair, but at this time had not heard from them. He said he would reach out to them and see what was going on.

EPARA GENERAL MEMBERSHIP MEETING AGENDA

Sat-Com Group:

Chris said the new antenna is in and needs to be assembled. It is currently in the Radio Room at the 911 Center. He then asked Alex if he had any information regarding the Sat-Com group he'd like to relay. Alex said field day would be coming up soon and wanted to know who's interested in getting together to strategize and maybe make some contacts with our European counter parts.

Old business:

Embroidered Patches:

The patches are in and will be distributed at the meeting. We are still accepting orders for club patches. For those still interested in purchasing patches, the cost of a patch is $10. PayPal is setup, so if you are interested, contact Scott KC3IAO

Tech Net on DMR:

EPARA has started a Tech Net on the KG3I DMR repeater (T 442.275/R 447.275), the net will be on Monday nights at 8:30 PM. A new talk group has been established on the KG3I repeater, the Talk Group is 314273 and is on Time Slot 2, Color Code 0.

Chris mentioned he'd like to utilize the clubs Radio ID to set up a small group as many folks can't reach the repeater and the Brandmeister Hot Spots won't cross talk with Doug's DMARC Repeater.

Any Other Old Business

Club Antenna

Chris mentioned the new antenna is in. It's a Nine Element Beam from HRO. It's currently in the radio room awaiting assembly.

Big Pocono State Park:

The agreement is being processed for use of the Big Pocono State Park for field day in June and Antenna/Elmer weekend in July. The agreement will be valid for 10 years and will cost the club $50 dollars. Processing should be completed in the next few weeks.

2021 Hamfest:

The EPARA hamfest will be held on September 26th 2021. We have secured rental of the American legion Hall in East Stroudsburg. Chris AJ3C has been in contact with Walt W3FNZ and mentioned if anyone has vendor information, please contact Walt. His contact information is listed on the website.

New business:

Repeater Jamming:

Chris asked if anyone has information that would be helpful in rectifying this situation, please contact him at: AJ3C@gmx.com. When the interference occurs, please just ignore these individuals and don't feed into it.

Votes / New members:

Kathy – KC3RKH was voted in as a new member unanimously.

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PROTECT YOUR CAR—BUILD AN AUTOMOTIVE BURGLAR ALARM

EPARA GENERAL MEMBERSHIP MEETING AGENDA

Any Other New Business
None

Announcements:

Split Rock Hamfest will be held in May 15th 2021.
The Sussex County Amateur Radio Club Hamfest will be held July 18th 2021
(http://www.scarcnj.org/hamfest.html)

Any Additional Announcements
None

Adjournment…

Meeting was adjourned at 8:15 pm: Motion to close by Pete – KB3YKJ 2nd by Dan – KC3JCE
Motion Passed

Secretary
Kevin Forrest
W3KCF


ZOOM
MEETING

TEST YOUR KNOWLEDGE!

What is the name of the process that shows that a square wave is made up of a sine wave plus all of its odd harmonics?
A. Fourier analysis
B. Vector analysis
C. Numerical analysis
D. Differential analysis

Last month's answer was, A. Logic devices with 0, 1, and high impedance output states

More Digital Mobile Radio news!

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

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

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

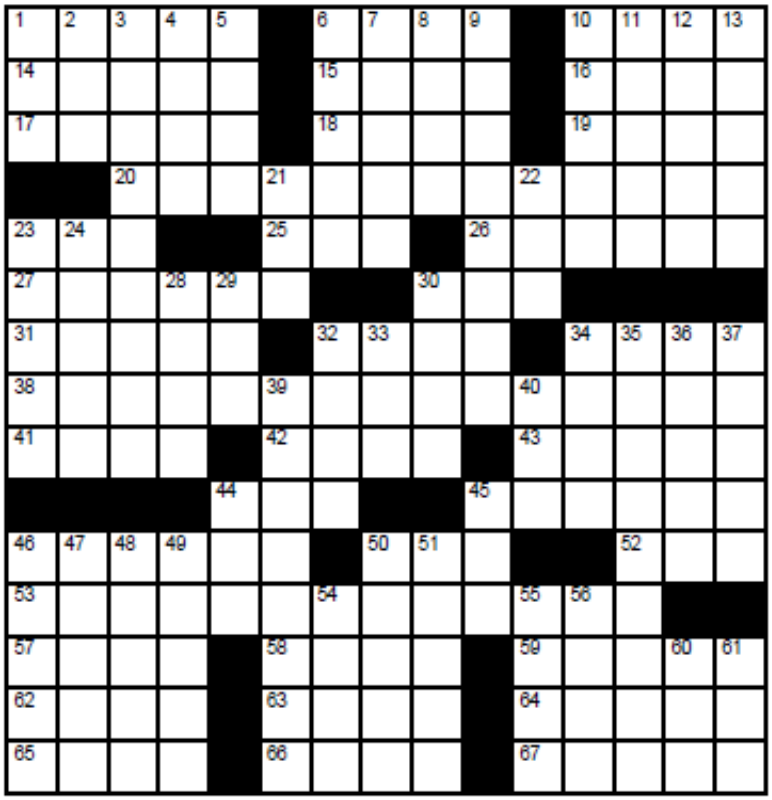
N3IS EPARA Hot Spot rag chew DMR net.

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

DMR
DIGITAL MOBILE RADIO

6/11/2008 by Chris Codella, W2PA

Receiver Pathways



Across

1. Superhet preceder
6. BCD followers
10. UA missile made famous by YI
14. _____ loop
15. Meadow mouse
16. LA capital
17. ___ to back...
18. Part of LAN
19. Nit hatchlings
20. Teetering swizzle stick?
23. Golf ball position
25. Polite partner of TU
26. Sensors using RF
27. Antelope array element?
30. CW preposition
31. VS9H middle name
32. Employs
34. "___ that special?!"
38. Supermarket scanner?
41. What a non-ham might call rigs
42. Prefix with -line
43. I-land wine
44. CW T
45. Told to wait, on CW
46. Thicker
50. Function switch label
52. Double curve
53. Salt shaker?
57. Lone entry class
58. G-land YL title
59. Label on a PS, possibly
62. Like a xmtr in stby
63. And others, for short
64. RCA synonym
65. Rig
66. Pound brass, say
67. Next to Quebec

Down

1. Foxhunt activity (abbr.)
2. Ending, with engin-
3. Go on DXpeditions, far and wide
4. IT9 volcano
5. NCL-2000 mfgr.
6. Olympic swimmer Janet
7. ___-12 antennas
8. High spirits
9. Whiplash preventer
10. State with transistors
11. Possible Bahamas prefix
12. Worrier's worry
13. Action people
21. MI, MO and MT, QP mo.
22. ARRL DX test mo.
23. #44, #47 and others
24. Become accustomed (to)
28. Poor ops
29. F H2O
30. Word with line or point
32. W7 state
33. The Flex, e.g.
34. Desktop feature
35. /MM quarters
36. Big bangs
37. Lock of hair
39. Hand game
40. ZS dir. from W2
44. Stg. before AF amp.
45. W4 sect.
46. A series cap. blocks it
47. Eat away
48. African owner of 27-across
49. Upper or lower user
50. Isle ____ (GD)
51. _____ Day
54. Calling in after the sked
55. Pioneer digital comm. org.
56. EME sound
60. F-land one
61. "___ bad!"

See page 20 for answer key!

The Uncertain Future of Ham Radio

Software-defined radio and cheap hardware are shaking up a hobby long associated with engineering

Photo: John Anderson

John Anderson (AJ7M), from Marysville, Washington on the air from home for the 2020 ARRL Field Day event, held June 27-28. Field Day is ham radio's largest on-air annual event and demonstration.

Will the amateur airwaves fall silent? Since the dawn of radio, amateur operators—hams—have transmitted on tenaciously guarded slices of spectrum. Electronic engineering has benefited tremendously from their activity, from the level of the individual engineer to the entire field. But the rise of the Internet in the 1990s, with its ability to easily connect billions of people, captured the attention of many potential hams. Now, with time taking its toll on the ranks of operators, new technologies offer opportunities to revitalize amateur radio, even if in a form that previous generations might not recognize.

The number of U.S. amateur licenses has held at an anemic 1 percent annual growth for the past few years, with about 7,000 new licensees added every year for a total of 755,430 in 2018. The U.S. Federal Communications Commission doesn't track demographic data of operators, but anecdotally, white men in their 60s and 70s make up much of the population. As these baby boomers age out, the fear is that there are too few young people to sustain the hobby.

"It's the $60,000 question: How do we get the kids involved?" says Howard Michel, former CEO of the American Radio Relay League (ARRL). (Since speaking with IEEE Spectrum, Michel has left the ARRL. A permanent replacement has not yet been appointed.)

This question of how to attract younger operators also reveals deep divides in the ham community about the future of amateur radio. Like any large population, ham enthusiasts are no monolith; their opinions and outlooks on the decades to come vary widely. And emerging digital technologies are exacerbating these divides: Some hams see them as the future of amateur radio, while others grouse that they are eviscerating some of the best things about it.

No matter where they land on these battle lines, however, everyone understands one fact. The world is changing; the amount of spectrum is not. And it will be hard to argue that spectrum reserved for amateur use and experimentation should not be sold off to commercial users if hardly any amateurs are taking advantage of it.

Before we look to the future, let's examine the current state of play. In the United States, the ARRL, as the national association for hams, is at the forefront, and with more than 160,000 members it is the largest group of radio amateurs in the world. The 106-year-old organization offers educational courses for hams; holds contests where operators compete on the basis of, say, making the most long-distance contacts in 48 hours; trains emergency communicators for disasters; lobbies to protect amateur radio's spectrum allocation; and more.

Photo: ARRL

Former ARRL CEO Howard Michel (WB2ITX) at headquarters station, W1AW.

Michel led the ARRL between October 2018 and January 2020, and he fits easily the profile of the "average" American ham: The 66-year-old from Dartmouth, Mass., credits his career in electrical and computer engineering to an early interest in amateur radio. He received his call sign, WB2ITX, 50 years ago and has loved the hobby ever since.

"When our president goes around to speak to groups, he'll ask, 'How many people here are under 20 [years old]?' In a group of 100 people, he might get one raising their hand," Michel says.

Photo: Ronny Risinger (KC5EES)

Members from the LASA High School Amateur Radio Club, K5LBJ, in Austin, Texas participated in School Club Roundup, a twice-yearly on-air event that encourages participation from ham radio school groups.

ARRL does sponsor some child-centric activities. The group runs twice-annual Kids Day events, fosters contacts with school clubs across the country, and publishes resources for teachers to lead radio-centric classroom activities. But Michel readily admits "we don't have the resources to go out to middle schools"—which are key for piquing children's interest.

We need to "convince them there's more than getting licensed and putting a radio in your drawer and waiting for the end of the world."

Sustained interest is essential because potential hams must clear a particular barrier before they can take to the airwaves: a licensing exam. Licensing requirements vary—in the United States no license is required to listen to ham radio signals—but every country requires operators to demonstrate some technical knowledge and an understanding of the relevant regulations before they can get a registered call sign and begin transmitting.

For those younger people who are drawn to ham radio, up to those in their 30s and 40s, the primary motivating factor is different from that of their predecessors. With the Internet and social media services like WhatsApp and Facebook, they don't need a transceiver to talk with someone halfway around the world (a big attraction in the days before email and cheap long-distance phone calls). Instead, many are interested in the capacity for public service, such as providing communications in

the wake of a disaster, or event comms for activities like city marathons.

"There's something about this post-9/11 group, having grown up with technology and having seen the impact of climate change," Michel says. "They see how fragile cellphone infrastructure can be. What we need to do is convince them there's more than getting licensed and putting a radio in your drawer and w

New Frontiers

Photo: Sateesh Nallamothu

Dhruv Rebba (KC9ZJX) with memorabilia from his ham radio contact with astronaut Joe Acaba (KE5DAR) onboard the International Space Station.

The future lies in operators like Dhruv Rebba (KC9ZJX), who won Amateur Radio Newsline's 2019 Young Ham of the Year award. He's the 15-year-old son of immigrants from India and a sophomore at Normal Community High School in Illinois, where he also runs varsity cross-country and is active in the Future Business Leaders of America and robotics clubs. And he's most interested in using amateur radio bands to communicate with astronauts in space.

Rebba earned his technician class license when he was 9, after having visited the annual Dayton Hamvention with his father. (In the United States, there are currently three levels of amateur radio license, issued after completing a written exam for each—technician, general, and extra. Higher levels give operators access to more radio spectrum.)

"We want to be making an impact… The hobby aspect is great, but a lot of my friends would argue it's quite easy to talk to people overseas with texting and everything, so it's kind of lost its magic."

"My dad had kind of just brought me along, but then I saw all

the booths and the stalls and the Morse code, and I thought it was really cool," Rebba says. "It was something my friends weren't doing."

He joined the Central Illinois Radio Club of Bloomington, experimented with making radio contacts, participated in ARRL's annual Field Days, and volunteered at the communications booths at local races.

But then Rebba found a way to combine ham radio with his passion for space: He learned about the Amateur Radio on the International Space Station (ARISS) program, managed by an international consortium of amateur radio organizations, which allows students to apply to speak directly with crew members onboard the ISS. (There is also an automated digital transponder on the ISS that allows hams to ping the station as it orbits.)

Rebba rallied his principal, science teacher, and classmates at Chiddix Junior High, and on 23 October 2017, they made contact with astronaut Joe Acaba (KE5DAR). For Rebba, who served as lead control operator, it was a crystallizing moment.

"The younger generation would be more interested in emergency communications and the space aspect, I think. We want to be making an impact," Rebba says. "The hobby aspect is great, but a lot of my friends would argue it's quite easy to talk to people overseas with texting and everything, so it's kind of lost its magic."

That statement might break the hearts of some of the more experienced hams recalling their tinkering time in their childhood basements. But some older operators welcome the change.

Photo: Sterling Mann

Sterling Mann (N0SSC) is advocating that ham radio shift away from a focus on person-to-person contacts.

Take Bob Heil (K9EID), the famed sound engineer who created touring systems and audio equipment for acts including the Who, the Grateful Dead, and Peter Frampton. His company Heil Sound, in Fairview Heights, Ill., also manufactures amateur radio technology.

"I'd say wake up and smell the roses and see what ham radio is doing for emergencies!" Heil says cheerfully. "Dhruv and all of these kids are doing incredible things. They love that they can plug a kit the size of a cigar box into a computer and the screen becomes a ham radio.... It's all getting mixed together and it's wonderful."

But there are other hams who think that the amateur radio community needs to be much more actively courting change if it is to survive. Sterling Mann (NoSSC), himself a millennial at age 27, wrote on his blog that "Millennials Are Killing Ham Radio."

It's a clickbait title, Mann admits: His blog post focuses on the challenge of balancing support for the dominant, graying ham population while pulling in younger people too. "The target demographic of every single amateur radio show, podcast, club, media outlet, society, magazine, livestream, or otherwise, is not young people," he wrote. To capture the interest of young people, he urges that ham radio give up its century-long focus on person-to-person contacts in favor of activities where human to machine, or machine to machine, communication is the focus.

These differing interests are manifesting in something of an analog-to-digital technological divide. As Spectrum reported in July 2019, one of the key debates in ham radio is its main function in the future: Is it a social hobby? A utility to deliver data traffic? And who gets to decide?

Those questions have no definitive or immediate answers, but they cut to the core of the future of ham radio. Loring Kutchins, president of the Amateur Radio Safety Foundation, Inc. (ARSFi)—which funds and guides the "global radio email" system Winlink—says the divide between hobbyists and utilitarians seems to come down to age.

"Younger people who have come along tend to see amateur radio as a service, as it's defined by FCC rules, which outline the purpose of amateur radio—especially as it relates to emergency operations," Kutchins (W3QA) told Spectrum last year.

Kutchins, 68, expanded on the theme in a recent interview: "The people of my era will be gone—the people who got into it when it was magic to tune into Radio Moscow. But Grandpa's ham radio set isn't that big a deal compared to today's technology. That doesn't have to be sad. That's normal."

"Ham radio is really a social hobby...Here in Mississippi, you get to 5 or 6 o' clock and you have a big network going on and on—some of them are half-drunk chattin' with you."

Gramps' radios are certainly still around, however. "Ham radio is really a social hobby, or it has been a very social hobby—the rag-chewing has historically been the big part of it," says Martin F. Jue (K5FLU), founder of radio accessories maker MFJ Enterprises, in Starkville, Miss. "Here in Mississippi, you get to 5 or 6 o' clock and you have a big network going on and on—some of them are half-drunk chattin' with you. It's a social group, and they won't even talk to you unless you're in the group."

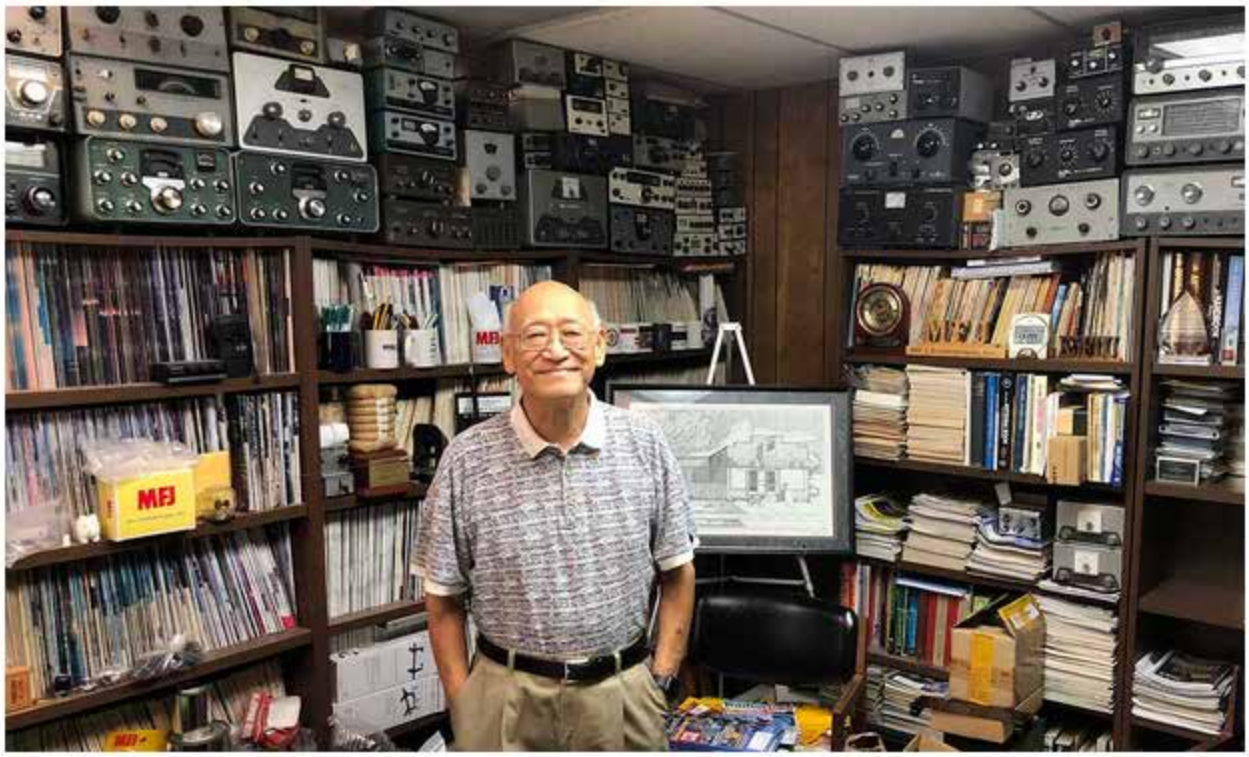


Photo: Richard Stubbs

Martin F. Jue (K5FLU), founder of well-known radio accessories maker MFJ, is developing new products to accommodate the shift towards digital radio communications in the amateur bands.

But Jue, 76, notes the ham radio space has fragmented significantly beyond rag-chewing and DXing (making very long-distance contacts), and he credits the shift to digital. That's where MFJ has moved with its antenna-heavy catalog of products.

"Ham radio is connected to the Internet now, where with a simple inexpensive handheld walkie-talkie and through the repeater systems connected to the Internet, you're set to go," he says. "You don't need a HF [high-frequency] radio with a huge antenna to talk to people anywhere in the world."

To that end, last year MFJ unveiled the RigPi Station Server: a control system made up of a Raspberry Pi paired with open-source software that allows operators to control radios remotely from their iPhones or Web browser.

"Some folks can't put up an antenna, but that doesn't matter anymore because they can use somebody else's radio through these RigPis," Jue says.

He's careful to note the RigPi concept isn't plug and play—"you still need to know something about networking, how to open up a port"—but he sees the space evolving along similar lines.

"It'll all be digital at some point, right at the antenna all the way until it becomes audio."

"It's all going more and more toward digital modes," Jue says. "In terms of equipment I think it'll all be digital at some point, right at the antenna all the way until it becomes audio."

Outside the United States, there are some notable bright spots, according to Dave Sumner (K1ZZ), secretary of the International Amateur Radio Union (IARU). This collective of national amateur radio associations around the globe represents hams' interests to the International Telecommunication Union (ITU), a specialized United Nations agency that allocates and manages spectrum. In fact, in China, Indonesia, and Thailand, amateur radio is positively booming, Sumner says.

China's advancing technology and growing middle class, with disposable income, has led to a "dramatic" increase in operators, Sumner says. Indonesia is subject to natural disasters as an island nation, spurring interest in emergency communication, and its president is a licensed operator. Trends in Thailand are less clear, Sumner says, but he believes here, too, that a desire to build community response teams is driving curiosity about ham radio.

"So," Sumner says, "you have to be careful not to subscribe to the notion that it's all collapsing everywhere."

The Signal From Overseas

China's advancing technology and growing middle class, with disposable income, has led to a "dramatic" increase in operators.

China is also changing the game in other ways, putting cheap radios on the market. A few years ago, an entry-level handheld UHF/VHF radio cost around US $100. Now, thanks to Chinese manufacturers like Baofeng, you can get one for under $25. HF radios are changing, too, with the rise of software-defined radio.

"It's the low-cost radios that have changed ham radio and the future thereof, and will continue to do so," says Jeff Crispino, CEO of Nooelec, a company in Wheatfield, N.Y., that makes test equipment and software-defined radios, where demodulating a signal is done in code, not hardwired electronics. "SDR was originally primarily for military operations because they were the only ones who could afford it, but over the past 10 years, this stuff has trickled down to become $20 if you want." Activities like plane and boat tracking, and weather satellite communication, were "unheard of with analog" but are made much easier with SDR equipment, Crispino says.

Nooelec often hears from customers about how they're leveraging the company's products. For example, about 120 members from the group Space Australia to collect data from the Milky Way as a community project. They are using an SDR and a low-noise amplifier from Nooelec with a homemade horn antenna to detect the radio signal from interstellar clouds of hydrogen gas.

"We will develop products from that feedback loop—like for hydrogen line detection, we've developed accessories for that so you can tap into astronomical events with a $20 device and a $30 accessory," Crispino says.

Looking ahead, the Nooelec team has been talking about how to "flatten the learning curve" and lower the bar to entry, so that the average user—not only the technically adept—can explore and develop their own novel projects within the world of ham radio.

"It is an increasingly fragmented space," Crispino says. "But I don't think that has negative connotations. When you can pull in totally unique perspectives, you get unique applications. We certainly haven't thought of it all yet."

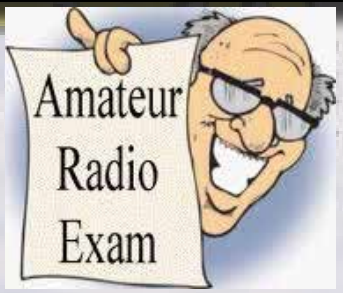
The ham universe is affected by the world around it—by culture, by technology, by climate change, by the emergence of a new generation. And amateur radio enthusiasts are a varied and vibrant community of millions of operators, new and experienced and old and young, into robotics or chatting or contesting or emergency communications, excited or nervous or pessimistic or upbeat about what ham radio will look like decades from now.

As Michel, the former ARRL CEO, puts it: “Every ham has [their] own perspective. What we’ve learned over the hundred-plus years is that there will always be these battles—AM modulation versus single-sideband modulation, whatever it may be. The technology evolves. And the marketplace will follow where the interests lie.”

Credit: https://spectrum.ieee.org/telecom/wireless/the-uncertain-future-of-ham-radio

VE Testing & Classes

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



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

General license classes begin April 7th! Contact Chris AJ3C for further info if needed

General License Class

EPARA will be holding an 10 week course where you can learn everything you need to earn your General FCC Amateur Radio License.

Classes will be for 2 hours on Wednesday evenings from 7PM till 9PM. Classes will follow the ARRL General Class License Manual 9th Edition.

Classes begin on April 7th 2021 at 7PM. Class Location is the Monroe County 911 Control Center 100 Gypsum Rd. Stroudsburg, PA 18360

Students are required to purchase the ARRL General Class License Manual 9th Edition.
Registration is required.

To join, contact:
Chris Saunders AJ3C
AJ3C@gmx.com or call 570-213-4505

NEWLY RESURRECTED!

HAMFEST 2021

Sunday, September 26th, 2021 - Opening 8am

ALL NEW LOCATION!

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

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

Featuring:

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

Rain or Shine

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

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

Google Maps

Eastern Pennsylvania Amateur Radio Association

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

Talk-in: 147.045MHz PL+131.8 · Phone 570-350-1185 · email: wsk11@outlook.com

VISITOR INFORMATION

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

EPARA Website

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

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

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

EmComm!

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

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

Join In

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

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

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

ARES/RACES/CERT

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

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

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

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

What Gear Do You Need?

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

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

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

Helping Hams

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

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

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

From the Editor

Eric, N3SWR

Hello once again to our fellow members :)

I managed to pull together a bunch of reading material from all sorts of areas to help us ease the pandemic pain these days. Many things are happening behind the scenes as of late and all of which should be explained during our future club meetings. I thought we really hit a stagnant spot in our clubs history but as I look around to see what the rest of the society is up to, I think we are starting to finally bounce back.

Speaking of bouncing, the EME group has made some serious strides towards the goal of making that first QSO off the moon! I don't wear hats but mine is off to the group just the same! I'm excited to be part of that and look forward to making the next Field Day and Antenna Weekend one to remember for sure!

I've started to sneak in a bunch of comics from The Far Side to take up some silly space here and there. When you're editing, it becomes a real pain in the butt to make the pages look filled up - especially if you don't have much material to work with. I'm also thinking of dabbling a bit into the HIFI audio realm but only where vacuum tube audio is concerned simply because the electronics involved is common to both in many regards. And we do love our amps!!

Okay - I'm off the soapbox for now. Enjoy the reading for those that are interested and I'll see you all hopefully soon enough. 73

Eric
N3SWR

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

Topics of Interest

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

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

Disclaimer

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

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

Contest Corral

May 2021

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

Start - Finish Date	Time	Date	Time	Bands	Contest Name	Mode	Exchange	Sponsor's Website
1	0000	2	1600	50, 144	Araucaria World Wide VHF Contest	CW Ph	RS(T), 6-char grid square	avhfc.com/rules/en.pdf
1	0001	2	2359	28	10-10 International Spring Contest, CW	CW	Name, mbr or "0," SPC	www.ten-ten.org
1	0300	1	0859	3.5-28	RCC Cup	CW Ph	RS(T), mbr or ITU zone	rcccup.ru
1	0800	1	1400	Above 902	Microwave Spring Sprint	CW Ph Dig	6-char grid square	sites.google.com/site/springvhfupsprints
1	1200	2	1159	3.5-28	ARI International DX Contest	CW Ph Dig	RS(T), Italian province or serial	ari.it/en/contest-hf
1	1200	2	1200	3.5-144	F9AA Cup, Digi	Dig	RST, serial	www.site.urc.asso.fr
1	1300	1	1900	3.5-28	AGCW QRP/QRP Party	CW	RST, serial, Class (A/B)	alt.agcw.de/index.php/en
1	1300	2	0700	1.8-28	7th Call Area QSO Party	CW Ph	RS(T), 5-letter state/county code or SPC	7qp.org
1	1500	2	0300	1.8-28	Indiana QSO Party	CW Ph	RS(T), county or SPC	hdxcc.org/inqp/rules.html
1	1600	1	1800	3.5-28	FISTS Saturday Sprint	CW	RST, SPC, name, mbr or "0"	fistsna.org/operating.html#sprints
1	1700	2	2359	1.8-VHF	Delaware QSO Party	CW Ph	RS(T), county or SPC	www.fsarc.org/qsoparty
1	2000	2	2359	3.5-28	New England QSO Party	CW Ph Dig	RS(T), W1 county/state or SPC	www.neqp.org/rules.html
3	0000	3	0100	1.8-14	K1USN Slow Speed Test	CW	Name, SPC at 20 WPM max	www.k1usn.com/sst.html
3	1630	3	1729	3.5, 7	OK1WC Memorial (MWC)	CW	RST, serial	memorial-ok1wc.cz
4	0100	4	0159	1.8-50	Worldwide Sideband Activity Contest	Ph	RS, age group (OM, YL, or Youth)	wwsac.com/rules.html
4	0100	4	0300	3.5-28	ARS Spartan Sprint	CW	RST, SPC, power	arsqrp.blogspot.com
4	1700	4	1900	3.5-14	RTTYops Weeksprint	Dig	Other's call, your call, serial, name	rttyops.wordpress.com
4	2300	5	0300	All	MIE 33 Contest	CW Ph	RS(T), age	www.ztv.ne.jp/isoda/33
5	1300	5	1400	1.8-28	CWops Mini-CWT Test	CW	Name, mbr or SPC	cwops.org
5	1700	5	2000	144	VHF-UHF FT8 Activity Contest	Dig	4-char grid square	ft8activity.eu/index.php/en
5	1900	5	2000	1.8-28	CWops Mini-CWT Test	CW	Name, mbr or SPC	cwops.org
5	1900	5	2030	3.5-14	RSGB FT4 Contest Series	Dig	4-char grid square	www.rsgbcc.org/hf
6	0300	6	0400	1.8-28	CWops Mini-CWT Test	CW	Name, mbr or SPC	cwops.org
6	1700	6	1900	3.5-14	RTTYops Weeksprint	Dig	Other's call, your call, serial, name	rttyops.wordpress.com
6	1700	6	2100	28	NRAU 10-Meter Activity Contest	CW Ph Dig	RS(T), 6-char grid square	nrrlcontest.no
6	1900	6	2100	1.8-50	SKCC Sprint Europe	CW	RST, SPC, Name, mbr or "none"	www.skccgroup.com
7	0145	7	0215	1.8-21	NCCC RTTY Sprint	Dig	Serial, name, QTH	www.ncccsprint.com
7	0230	7	0300	1.8-21	NCCC Sprint	CW	Serial, name, QTH	www.ncccsprint.com
7	2000	7	2100	1.8-14	K1USN Slow Speed Test	CW	Name, SPC, 20 WPM max	www.k1usn.com/sst.html
8	0001	9	2359	3.5-144	Day of the YLs Contest	CW Ph	RS(T), YL/OM	ka1uln.blogspot.com
8	0500	9	1100	50-1296	SARL VHF/UHF Digital Contest	Dig	RST, 6-char grid locator	www.sarl.org.za
8	1200	9	1159	1.8-28	CQ-M International DX Contest	CW Ph	RS(T), serial	cqm.srr.ru/en-rules
8	1200	9	1200	3.5-28	VOLTA WW RTTY Contest	Dig	RST, serial, CQ zone	www.contestvolta.com
8	1200	9	2359	1.8-50	SKCC Weekend Sprintathon	CW	RST, SPC, name, mbr or "none"	www.skccgroup.com
8	1400	9	0200	3.5-144	Arkansas QSO Party	CW Ph	RS(T), AR county or SPC	www.arkqp.com
8	2300	9	0300	50	50 MHz Spring Sprint	CW Ph Dig	4-char grid square	sites.google.com/site/springvhfupsprints
9	1000	9	1400	7	WAB 7 MHz Phone/CW	CW Ph	RS, serial, WAB square or country	wab.intermip.net/Contests.php
10	0000	10	0200	1.8-28	4 States QRP Grp Second Sunday Sprint	CW Ph	RS(T), SPC, mbr or power	www.4sqrp.com
10	1900	10	2030	3.5	RSGB 80-Meter Club Championship, SSB	Ph	RS, serial	www.rsgbcc.org/hf
12	1700	12	2000	432	VHF-UHF FT8 Activity Contest	Dig	4-char grid square	ft8activity.eu/index.php/en
13	1600	13	2200	3.5, 7	QRP Minimal Art Session	CW	RST, class, number of components	qrpcc.de/contestrules
15	0800	16	1100	3.5	NZART Sangster Shield Contest	CW	RST, serial, branch (if any)	nzart.org.nz/activities/contests
15	1200	16	1200	1.8-28	His Majesty King of Spain Contest, CW	CW	RST, EA province or serial	concursos.ure.es/en
15	1600	15	2159	1.8-50	Feld Hell Sprint	Dig	RST, mbr, SPC, grid	sites.google.com/site/feldhellclub
16	2100	16	2300	3.5-28	FISTS Sunday Sprint	CW	RST, SPC, name, mbr or "0"	fistsna.org
16	2300	17	0100	1.8-28	Run for the Bacon QRP Contest	CW	RST, SPC, mbr or power	qrpcontest.com/pigrun
19	1900	19	2030	3.5	RSGB 80-Meter Club Championship, Data	Dig	RST, serial	www.rsgbcc.org/hf
20	0030	20	0230	3.5-14	NAQCC CW Sprint	CW	RST, SPC, mbr or power	naqcc.info
21	1200	21	2359	3.5-28	Hamvention QSO Party	CW Ph	RS(T), first year attended Hamvention	wwrof.org
22	1200	23	1200	3.5-28	EU PSK DX Contest	Dig	RST, EU area code or serial	eupsk.club
22	2100	23	0200	3.5	Baltic Contest	CW Ph	RS(T), serial	lrsf.lt/en/balticcontestrules
24	0000	24	0100	1.8-28	QRP ARCI Hootowl Sprint	CW	RST, SPC, mbr or power	qrparci.org/contest
26	0000	26	0200	1.8-50	SKCC Sprint	CW	RST, SPC, name, mbr or "none"	www.skccgroup.com
27	1900	27	2030	3.5	RSGB 80-Meter Club Championship, CW	CW	RST, serial	www.rsgbcc.org/hf
29	0000	29	2359	1.8-50	Feld Hell Sprint	Dig	RST, mbr, SPC, grid	sites.google.com/site/feldhellclub
29	0000	30	2359	1.8-28	CQ WW WPX Contest, CW	CW	RST, serial	www.cqwpx.com

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

Amateur Radio Special Event Stations!

05/04/2021 | Wisconsin SimCom 2021 - EVENT HAS BEEN CANCELLED

May 4-May 7, 0000Z-2359Z, W9WCA, Junction City, WI. Wood County ARES/RACES. Allstar 52770/Echolink W9WCA-L 7.250 14.250 3.970. QSL. Wood County ARES/RACES, Attn: SimCom SES, 3530 Bohn Dr., Wisconsin Rapids, WI 54494. QSL via W9WCA with SASE. THIS EVENT HAS BEEN CANCELLED kb9stb@gmail.com

05/04/2021 | World Pulmonary Hypertension Day

May 4-May 6, 1300Z-1159Z, W2H, Forked River, NJ. Jack Bartky. 14.250 7.200 18.130 21.300. QSL. Jack Bartky, 2209 Longwood Drive, Forked River, NJ 08731.

05/07/2021 | Armed Forces Day Crossband Test

May 7-May 8, 1600Z-2000Z, Various, Fort Huachuca, AZ. US Department of Defense. 5330.5 USB 14438.5 USB 14383.5 USB 13164 FM 2484. QSL. Armed Forces Day, station, contacted . Military stations will transmit on DOD frequencies and announce the amateur frequency they are monitoring. For a complete list of participating stations, modes, frequencies, and times, go to www.dodmars.org after 19 April 2021 www.dodmars.org

05/07/2021 | Golden Spike Special Event - W7G

May 7-May 10, 1500Z-2300Z, W7G, Corinne, UT. Ogden Amateur Radio Club (OARC) - W7SU. 14.255 7.235 7.074 7.040. QSL. Ogden Amateur Radio Club (OARC) - W7SU, PO Box 3353, Ogden, UT 84409. Golden Spike Celebration Commemorating the Anniversary of the 1869 Driving of the Golden Spike, completing the Transcontinental Railroad at Promontory Summit, Utah. Golden Spike National Historical Park - National Parks Service 6200 North 22300 West, Promontory Summit, UT 84307. http://ogdenarc.org or http://w7g.org

05/08/2021 | Jamestown Landing Day Event

May 8, 1400Z-2000Z, K4RC, Williamsburg, VA. Williamsburg Area Amateur Radio Club. 7.265 14.265. Certificate & QSL. QSL Manager, P.O. Box 1470, Williamsburg, VA 23187. 414th anniversary of England establishing the oldest English-speaking colony on the American continent. K4RC.net

05/08/2021 | USS Midway Museum Ship Special Event: Battle of Coral Sea

May 8, 1600Z-2300Z, NI6IW, San Diego, CA. USS Midway (CV-41) Museum Ship. 7.250 14.320 14.070 (PSK31) DSTAR via PapaSystem repeaters. QSL. USS Midway CV-41 COMEDTRA NI6IW, 910 N Harbor Dr, San Diego, CA 92101. Please include SASE. www.qrz.com/db/ni6iw

05/09/2021 | National Police Week - Honor Our Fallen Heroes

May 9-May 15, 0000Z-2359Z, K3FBI/0-9, Quantico, VA. FBI Amateur Radio Association. 14.275 14.074 7.275 7.074; all bands, all modes. Certificate & QSL. Jay Chamberlain, NS4J, 27 Fox Run Lane, Fredericksburg, VA 22405. A nation-wide operating event. Multiple FBIARA members will operating during Police Week to honor all Law Enforcement Officers who have died in the line of duty. Look for K3FBI/0-9. 9x12 SASE required for certificate and QSL, with a minimum of $1.25 USD postage for US stations, $2.08 USD postage for Canada. $3.39 USD postage for Europe. www.qrz.com/db/k3fbi

05/11/2021 | Minnesota Birthday Bash

May 11-May 12, 1500Z-0200Z, W0CGM, Dundas, MN. South East Metro Amateur Radio Club. 7.250. Certificate. SEMARC, 1655 68th Street West, Inver Grove Heights, MN 55077. This is to commemorate Minnesota Statehood. May 11, 1858. In December 1856, Henry M Rice brought forward two bills in Congress: an enabling act that would allow Minnesota to form a state constitution, and a railroad land grant bill. Rice's enabling act defined a state containing both prairie and forest lands. The state was bounded on the south by Iowa, on the east by Wisconsin, on the north by Canada, and on the west by the Red River of the North and the Bois de Sioux River, Lake Traverse, Big Stone Lake, and then a line extending due south to the Iowa border. Rice

Amateur Radio Special Event Stations!

made this motion based on Minnesota's population growth www.semarc.org

05/15/2021 | 82nd Annual Ramp Festival

May 15, 1200Z-2200Z, W8TFC, Richwood, WV. The Family Center Amateur Radio Club. 444.450 14.250 7.250 3.850. Certificate. Wally Howerton, WA8LLY, 144 Chief Red Eyes Trail, P O Box 85, Richwood, WV 26261. Certificates will automatically be completed and emailed if operator is listed in QRZ.com. walter.howerton@frontier.com or thefamilycenterofrichwoodwv.com/Ham/default.html
05/15/2021 | EMS Week 2021

May 15-May 23, 0000Z-2359Z, W9A, Junction City, WI. Wood County ARES/RACES. AllStar 52770/ EchoLink W9WCA-L 14.250 7.250 3.970. QSL. Wood County ARES/RACES, Attn: EMS Week SES, 3530 Bohn Dr., Wisconsin Rapids, WI 54494. QSL via W9WCA with SASE kb9stb@gmail.com
05/15/2021 | Ogden Amateur Radio Club Centennial Celebration Special Event Station W7SU/100

May 15-May 23, 1500Z-2300Z, W7SU/100, Ogden, UT. Ogden Amateur Radio Club (OARC) - W7SU. 14.255 7.235 7.074 7.040. QSL. Ogden Amateur Radio Club -W7SU/100, P.O. Box 3353, Ogden, UT 84409. Ogden Amateur Radio Club Centennial Celebration Special Event Station W7SU/100 celebrating 100 years. Founded May 1921, ARRL affiliated January 1937. QRZ.com (W7SU/100/) or ogdenarc.org/100
05/15/2021 | Woronoko Heights Outdoor Adventure

May 15, 1300Z-1900Z, W1M, Russell, MA. Western Mass Council--BSA. 14.290 14.060 10.115 7.190. QSL. Tom Barker, 329 Faraway Road, Whitefield, NH 03598. SES operating from Moses Scout Reservation. SASE for QSL
05/16/2021 | Memorial Day 2021

May 16-May 31, 0000Z-2359Z, K1A, Cleburne, TX. Club KC5NX. 14.255 14.045 7.240 7.235. QSL. Jay D stanfield, 9200 Summit Ct. W, Cleburne, TX 76033. Club KC5NX is operating again this year as K1A in observance of Memorial Day.... We will be on the air on most bands and modes from May 16th untill the 31st.... Please QSL with a self-addressed stamped envelope for our QSL.... www.qrz.com/db/kc5nx
05/20/2021 | Celebrating Lindbergh's Transatlantic Flight

May 20, 1400Z-2000Z, K2CAM, Garden City, NY. Long Island Mobile Amateur Radio Club. 14.240 72.40. QSL. LIMARC, P.O. Box 392, Levittown, NY 11756. Held at the Cradle of Aviation Museum Please QSL SASE https://limarc.org/special-events
05/22/2021 | Chicken Dinner Road

May 22-May 23, 1600Z-1800Z, K7SWI, Nampa, ID. South West Idaho Amateur Radio Club. 146.52 14.250 7.250 3.850. Certificate & QSL. South West Idaho ARC K7SWI, 323 W. Dewey Ave., Nampa, Id 83686-6638. The South West Idaho Amateur Radio Club will be commemorating the original Chicken Dinner that took place on Chicken Dinner Road about 100 years ago. There are different versions of the story available but the most popular is that a local named Laura Lamb was famous in the area for her delicious fried chicken dinners complete with rolls and fresh apple pie. She and her husband knew then Idaho State Governor Ben Ross, who told Lamb that if she could get the road graded and graveled, he would see to it that it was oiled. Governor Ross was good on his word and the local kids started chanting Chicken Dinner every time the school bus turned down the road. An anonymous person painted the words "Lamb's Chicken Dinner Avenue" on the road and these supposedly are the reasons about how the road got its name. The road became even more famous recently as PETA tried to force the State to change the name of the road. The state of Idaho said no way! The SWIARC will be active on 2,14,7,3.5 and other bands as practical, no specific frequencies are determined, on May 22, 2021 from 1600 hours until May 23, 2021 at 1800 hours longer if there is significant interest in the Special Event. Certificate, SASE and 1.00 – QSL, SASE and your QSL. Everyone is welcome and encouraged to visit

Amateur Radio Special Event Stations!

the SWIARC at the special event. We hope to hear you on the air! You can see the entire story and event updates at: https://www.facebook.com/groups/SouthWestIdahoARC

05/27/2021 | Fleet Week NYC

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

05/28/2021 | Birthplace of Memorial Day

May 28-May 31, 1800Z-1800Z, W3M, State College, PA. Nittany Amateur Radio Club. 7.195. QSL. W3M, Nittany Amateur Radio Club, P.O. Box 614, State College, PA 16801. https://www.qrz.com//db/W3M

05/28/2021 | K0S Strange Antenna Challenge

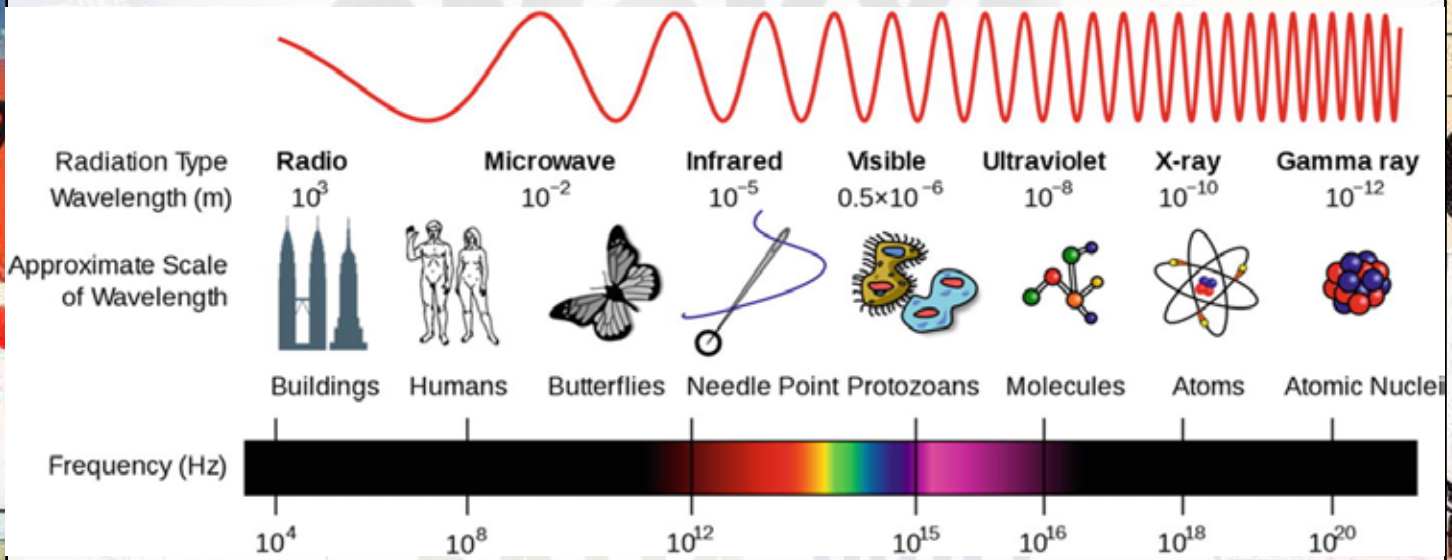
May 28-May 31, 1800Z-2359Z, K0S, Springfield, MO. N0EW. 28.500 14.300 7.200 3.900. QSL. Erik Weaver, 4857 E. Farm Rd. 136, Springfield, MO 65809.

Anyone may operate as a "satellite" K0S station, simply add /K0S to your call sign; each satellite K0S station is responsible for their own QSL.

The purpose of the Strange Antenna Challenge is to utilize antennas *not* made of normal antenna materials. In the past, fences, statues, vehicles, and bridges, have all been pressed into service as Strange Antennas. This also simulates emergency operations following a natural disaster, and is a fun and interesting way to promote your club. erikeweaver@gmail.com

05/29/2021 | Audie Murphy

May 29, 1300Z-2200Z, W2A, Christiansburg, VA. New River Valley Amateur Radio Club. 14.262 7.262 3.860. QSL. Danny Wylam, 710 McDaniel Dr., Christiansburg, VA 24073. Commemorating WW2 hero Audie Murphy, tragically killed in a plane crash 50 years ago on May 28 1971.Operating from Brush Mt. on the Appalachian Trail near the crash site dannywylam@gmail.com



6C4 HF Oscillator, Triode

The 6C4 is a miniature, medium-mu triode suitable for use in a wide variety of general purpose applications. It is especially useful as a local oscillator in high-frequency and very-high-frequency receiver circuits.

GENERAL

ELECTRICAL

Cathode—Coated Unipotential

Heater Voltage, AC or DC	6.3	Volts
Heater Current	0.15	Amperes

Direct Interelectrode Capacitances	With Shield*	Without Shield	
Grid to Plate: (g to p)	1.4	1.6	μμf
Input: g to (h+k)	1.8	1.8	μμf
Output: p to (h+k)	2.5	1.3	μμf

MECHANICAL

Mounting Position—Any
Envelope—T-5½, Glass
Base—E7-1, Miniature Button 7-Pin

MAXIMUM RATINGS

DESIGN-CENTER VALUES	Class A_1 Amplifier	Class C Telegraphy	
Plate Voltage	300	300	Volts
Negative DC Grid Voltage	—	50	Volts
Plate Dissipation	3.5	5.0	Watts
DC Plate Current	—	25	Milliamperes
DC Grid Current	—	8.0	Milliamperes
Heater-Cathode Voltage			
Heater Positive with Respect to Cathode			
DC Component	100	100	Volts
Total DC and Peak	200	200	Volts
Heater Negative with Respect to Cathode			
Total DC and Peak	200	200	Volts
Grid-Circuit Resistance			
With Fixed Bias	0.25	0.25	Megohms
With Cathode Bias	1.0	1.0	Megohms

Design-Center ratings are limiting values of operating and environmental conditions applicable to a bogey tube of a specified type as defined by its published data, and should not be exceeded under normal conditions.

These values are chosen by the tube manufacturer to provide acceptable serviceability of the tube in average applications, taking responsibility for normal changes in operating conditions due to rated supply-voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions, and variations in the characteristics of all tubes.

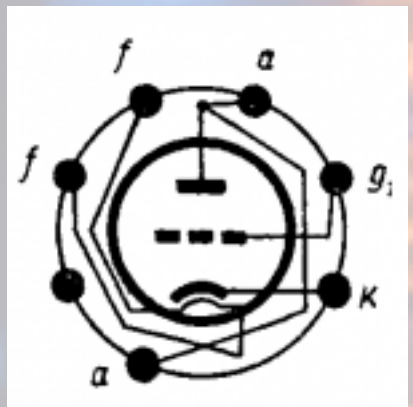
The equipment manufacturer should design so that initially no design-center value for the intended service is exceeded with a bogey tube in equipment operating at the stated normal supply voltage.

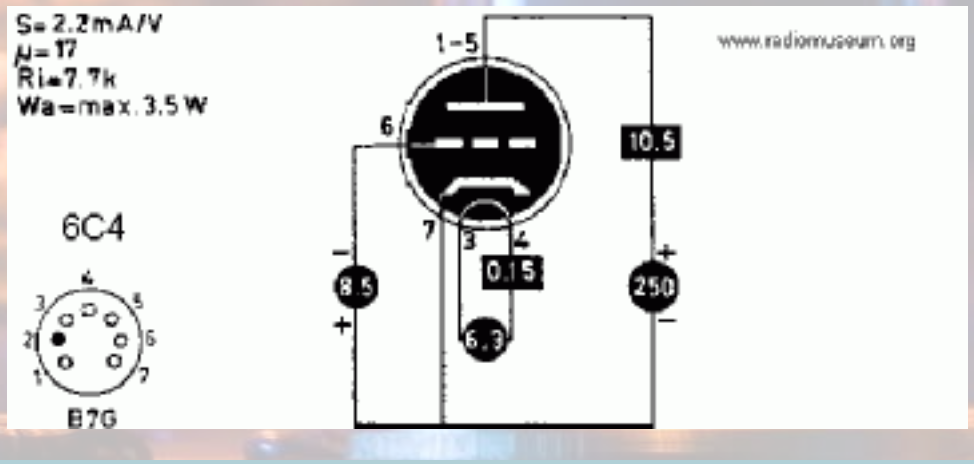
6C4 HF Oscillator, Triode

The 6C4 triode valve was specified as both an amplifier and an RF power valve. In the latter role it would deliver 5.5 Watts in class C operation. With a very small envelope volume, this would make it ideal for hand portable equipment. In larger apparatus it could deliver enough drive power for much larger PA's.

The 6C4 electrodes when put into pairs in the same envelope become the 12AU7.

The 6C4 is a miniature, medium-mu triode suitable for use in a wide variety of general purpose applications. It is especially useful as a local oscillator in high-frequency and very-high-frequency receiver circuits.





Vacuum Tubes

A Tweak Shop Guide to

Zen and the Art of

Vacuum Tube Maintenance

Intro

So you've crossed that bridge and gotten into tubed electronics. Congratulations!

We carry a wide variety of tubes here at The Tweak Shop, with sources from around the world including Russia, Slovakia, and China.

There's a tale about a Soviet pilot who decided to defect in 1976 by landing his MIG-25 in Japan. People were fascinated at the prospect of, finally, getting a look at this, the Soviet Union's most advanced fighter jet. Imagine their surprise when they realized that the fighters communications gear was based on vacuum tubes. (It was discovered that modern solid-state devices fail during the event of a nuclear pulse, while tubes continue operation!) I love that story...

There are a few things you should know now that you've chosen this rewarding audio path, and that's what this page is for: To explain the basic care and feeding of your tube components.

First of all:

Handling Vacuum Tubes

Simple: DON'T. Tubes don't appreciate contact with oils and such from your hands. Oils and dirt build up on the glass envelope of the tube, eventually causing it to run hotter than it should, shortening its life. If you have to remove or replace a tube, wait until it's cooled, then use a paper towel or lint-free cloth to grab it.

Let me re-emphasize this: Try to avoid handling a tube when it's hot. Before trying to remove a tube, make sure the component is turned OFF and UNPLUGGED and the tubes have time to cool (usually just a few minutes).

When removing a tube from its socket be sure you don't jam it back and forth trying to pry it out; gentler is better, here. Grip the tube firmly and pull straight up while gently rocking it a couple of millimeters from side to side if necessary. You should be able to remove even the most stubborn tubes in this fashion.

Cleaning Vacuum Tubes

Over time, most tube pins begin to oxidize, and it behooves you to give them a good cleaning at least once a year. This can be accomplished with any number of contact cleaners or with good, clean Isopropyl alcohol (96-99% pure if possible; DON'T use rubbing alcohol - it contains minerals and oils that tubes don't like). We

recommend using wooden-handled Q-Tips for the actual application and scrubbing (the paper-handled Q-Tips fall apart under pressure). If you still have some of the original Tweak Contact Enhancer around, good for you, but DON'T use it on tube pins. Tweak is not at its best in high-voltage applications.

Sometimes the easiest way to re-establish good contact for the pins is simply removing the tube and putting it back in! This often cuts through the oxidation and re-makes the contact.

Tube sockets should be cleaned as well. Pipe cleaners work fine for larger-pinned output tube sockets. (Again, not to state the obvious, but please only attempt this while the amp or preamp is turned OFF and UNPLUGGED!).

Should I Leave My Tubed Component On All The Time?

In 95% of the cases, no. There are a few components out there (like the T+A V-10 Integrated Amp) that have special circuits that provide a "trickle" voltage to the tubes, even when the component is turned "off". This does two things: It prevents the tubes from being "slammed" into operation when the unit is on, and it also means your "warmup time" to optimum listening is considerably reduced. Components like this are, therefore, "on" even when not "turned on", but this is a rarity. Energy-wise, a constant "trickle" voltage is not something we can recommend, as it can add up to a massive waste of resources. (Fortunately, that feature of the T+A V-10 can be switched in and out.)

In an ideal world, we'd all use massive Variacs to slowly bring our tube equipment up to operating voltage. But that's an impractical fantasy.

It's something of a trade-off. Tubes don't like being turned on and off, but they also don't like being left on all the time just cooking. So it's sort of "six of one/ half dozen of the other". We think the tubes will last longer if not left on continuously, and many components feature a "soft-start" circuit that helps lessen the shock of turn-on.

Bottom line: Unless you really do listen to your system 18 hours a day, turn off your tube gear and prolong the life of your tubes (and save big on your energy bill!).

Situating Tubed Components

In case you haven't noticed, tubes get HOT! The single thing that will shorten their lifespan is making them run even hotter than necessary, so make sure the unit is installed someplace with good ventilation. This DOESN'T mean a wooden, designer-type cabinet with closed doors on the front and a small hole for wires in the back! Open equipment racks and simple amp stands may not be the last word in stylishness, but it's a safe bet your tube equipment will last longer and even sound better with an equipment rack designed for the purpose. If you HAVE to put it in a cabinet with closable doors, always leave the doors wide open when the equipment is on. (This is even a good idea with most solid-state components.)

As to the various forms of isolation feet, we have a rule of thumb: Sorbothane (or equivalent material) pucks under tubed preamps (in places that don't get too warm), and either cones (with solid metal tips) or a combination of cones and pucks under tubed amps. When choosing the soft, Sorbothane types, remember to provide enough of them to support the component without having them "squish" down to the point of losing their damping qualities (10-15% is usually the max). In some cases, proper placement of support is critical for best performance. ASK us about this; every component is different.

Tube Tweaks

There are only a few things we recommend for improving the performance of tubes or prolonging their life. Our current favorites, the new Cool Dampers from EuroAudioTeam, are good for damping the glass envelope of the tube AND cutting down on microphonics (in some circuits you can actually hear the tube "ring" when the component is tapped). We can't recommend use of Sorbothane rings for this purpose and the reason why is simple: THEY MELT! We've seen examples of this, especially when used in preamps that run hot, where the Sorbothane melted down the sides of the tube and onto the adjoining parts and circuit board. Worse yet, once melted, the stuff STAYS melted, making for one hell of a mess. We also aren't too fond of devices that you have to glue to tubes with silicone or such. There are even some devices that make the tube run HOTTER! Is this a good thing? Of course not.

Outro

Well, that's enough to get you by. We've been aficionados of tube gear for a long time so, if you have any questions regarding their maintenance, give us a call at (707) 575-8626.

Otherwise, enjoy!

(Oh, and watch out for that nuclear pulse - your tubes may continue to operate, but you might not!)

THE TWEAK SHOP

"Randy's goin' down!"

Tad Cook, K7RA, Seattle, reports: Four new sunspots emerged this week and were visible every day.

Spaceweather.com issued a warning on April 22: "A CME is heading for Earth. and it could spark a geomagnetic storm when it arrives on April 25. NOAA forecasters say moderately strong G2-class storms are possible, which means auroras could dip into northern-tier US states from Maine to Washington."

Average daily sunspot number surged from 7 to 35.1, while average daily solar flux increased from 75 to 78.

Due to seemingly constant solar wind, average planetary A index rose from 5.1 to 16.4, and average daily middle latitude A index went from 4.1 to 13.

Predicted solar flux is 84 on April 23 – 24; 82 on April 25 – 27; 80 on April 28; 78 on April 29 – 30; 68 on May 1 – 2; 78 on May 3; 72 on May 4 – 9; 75 on May 10 – 15; 78 on May 16; 75 on May 17 – 18; 72 on May 19; 70 on May 20 – 23, and 68 on May 24 – 29.

Predicted planetary A index is 10, 8, 25, and 12 on April 23 – 26; 5 on April 27 – May 3; 15 on May 4; 5 on May 5 – 7; 8 on May 8; 5 on May 9 – 10; 8, 12, 20, 30, 15, 12, and 8 on May 11 – 17; 5 on May 18 – 19, and 8, 12 and 5 on May 20 – 22.

Here's the geomagnetic activity forecast for April 23 – May 18 from F.K. Janda, OK1HH.

The geomagnetic field will be:

- quiet on May 1 – 3, 5, 18
- quiet to unsettled on April 28 – 30, May 6 – 11, 17
- quiet to active on April 26, May 12
- unsettled to active April 27, May 16, 18
- active to disturbed April 23, (24 – 25,) May (4,) 13 – 14, (15)
- Solar wind will intensify on April 23 – 25, (then irregularly between April 26 – May 1), May 3 – 5, (6 – 7, 10 – 11, 16,) 17 – 18, (18)

EME News!

EPARA EME Antenna built and tested

The M2 VHF antenna the club has purchased for Earth-moon-Earth communications was assembled recently at the 911 center. Members of the EME group gathered to assemble and test the M2 VHF Yagi. Frequency sweeps and tests for the operation for the antenna were done to tune for the lowest SRW. The antenna will be operated using the JT65 digital SSB mode, designed by Joe Taylor specifically for low signal moon bounce operation.

The antenna is shown here attached to a portable tripod for horizontal polarization.

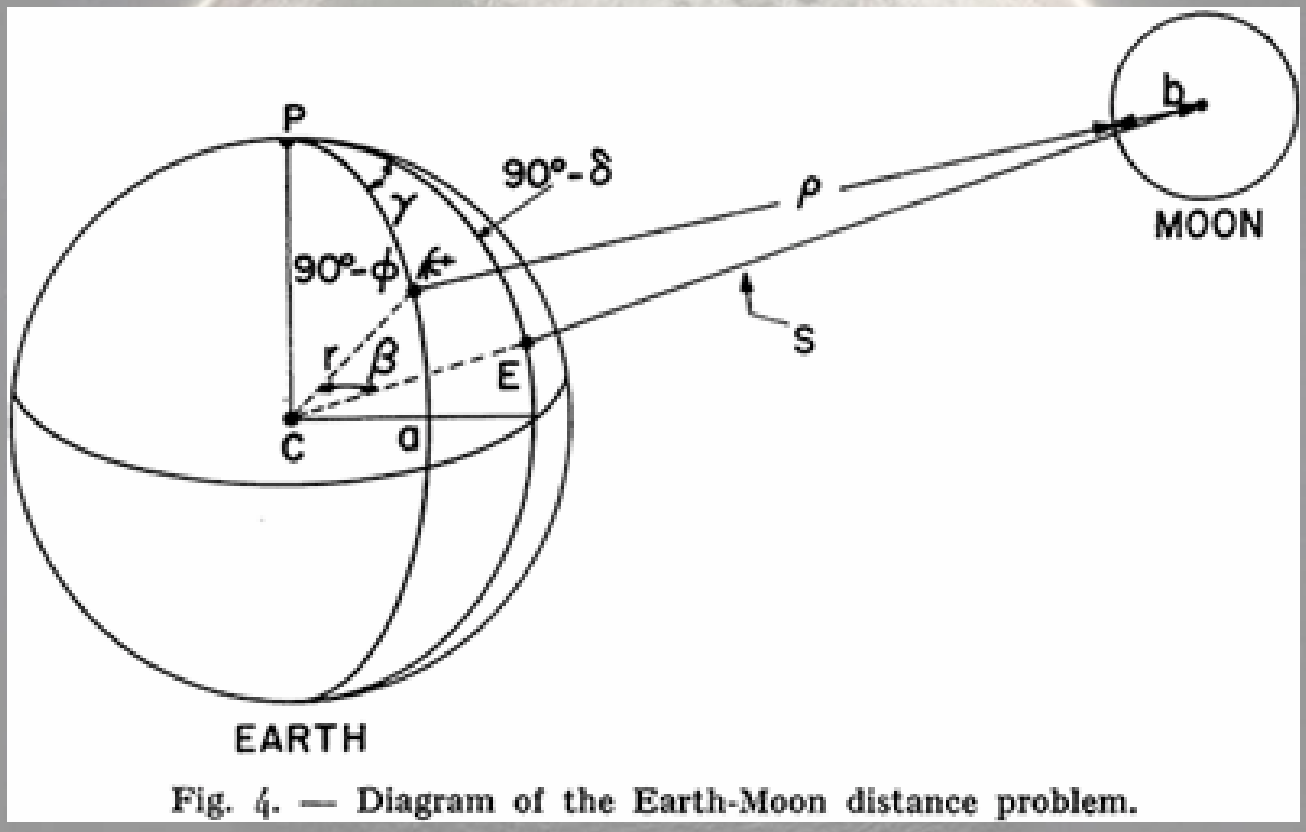


Fig. 4. — Diagram of the Earth-Moon distance problem.

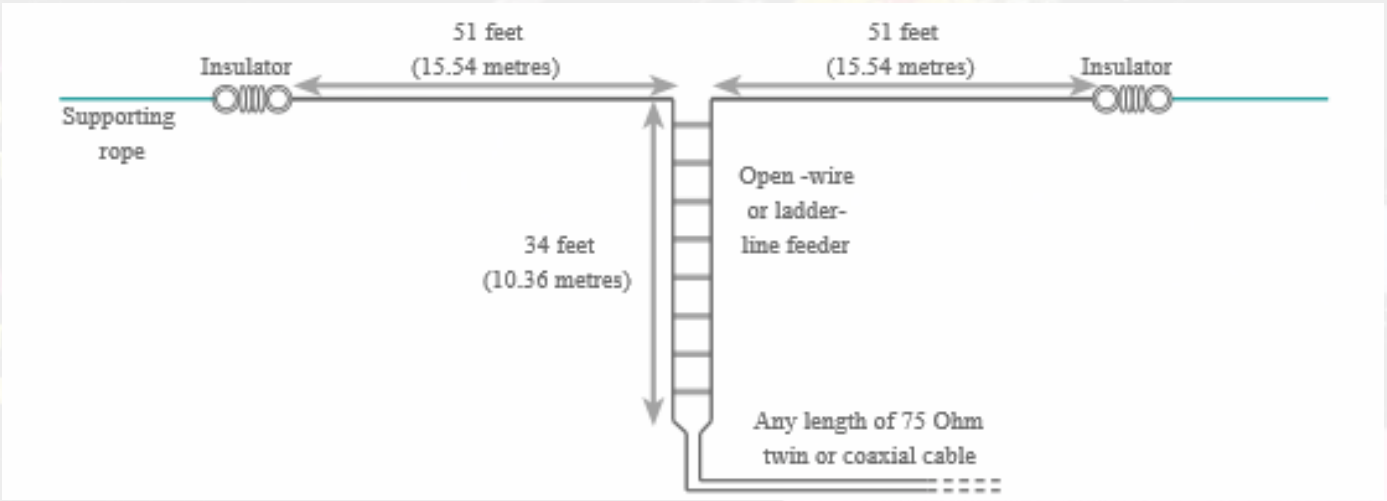
73 – KD2FTA

G5RV Antenna

The G5RV antenna is a popular form of doublet antenna that enables operation on a large number of the HF amateur radio bands: details, construction and performance.

The G5RV antenna has been popular for many years, providing multiband HF amateur radio operation.
The antenna was designed by Louis Varney, who held the amateur radio call sign, G5RV. The design was originally devised in 1946, but it was not until 1958 that it was published when it appeared in the July 1958 RSGB Bulletin.
Since then further notes appeared in RSGB Radio Communication in July 1984.
Over the years, the G5RV antenna has become a very popular form of antenna for many situations and several versions are commercially available, although it is relatively easy to make from wire, insulators and the feeder.

G5RV antenna basics
The G5RV antenna is an amateur radio center fed doublet with a symmetric resonant feeder line, which serves as impedance matcher for a 50Ω coax cable to the transceiver.
There are two implementations of the G5RV antenna. The utilizes 34 feet (10.36 meters) of pen wire feeder, whilst the second uses any convenient length of open wire feeder which is connected directly to an antenna matching tuning unit.
The G5RV antenna that transitions directly to 75 Ω twin cable or coax is probably the more popular and it is shown below. However when using this option it is best to incorporate a balun in the circuit. Also the transmitter will need to have a suitable tuning capability or external tuning unit by the transmitter to ensure that it can match the antenna. Although it is meant to offer a reasonable load, the actual load on some frequencies is most likely to fall outside the range of the transmitter itself.



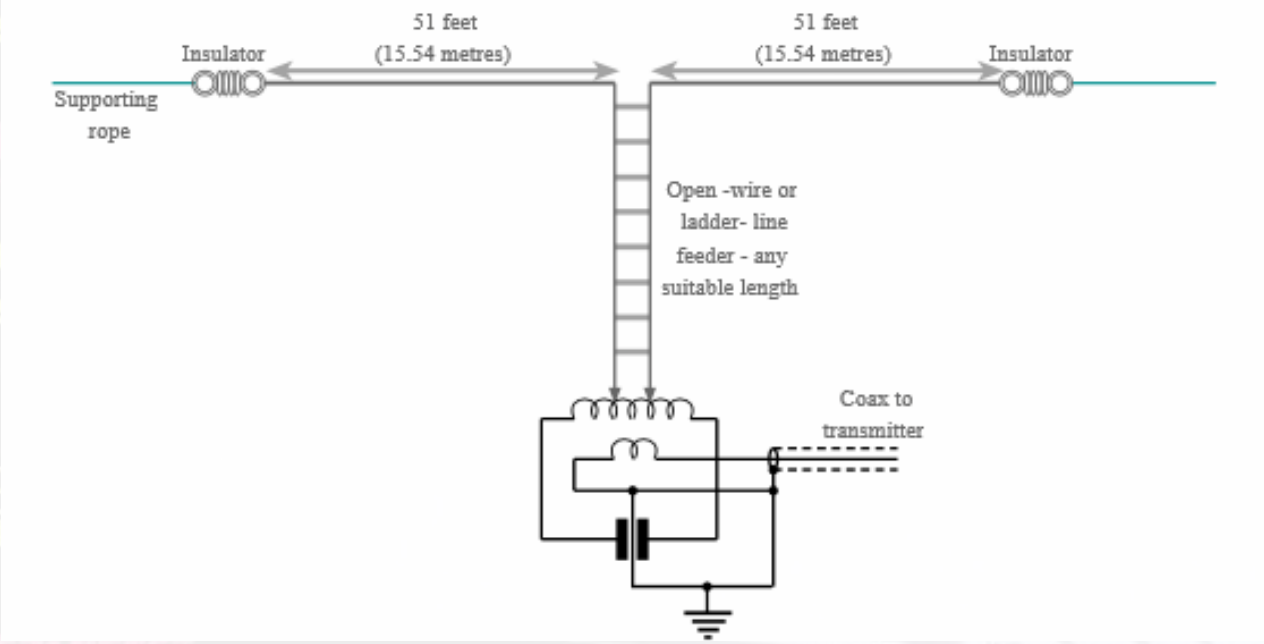
Basic G5RV antenna with 31 feet of twin transitioning to 75 Ω twin or coax.

ANTENNA ARCHIVES #34

Although the G5RV antenna with 31 feet / 10.36 meters of open wire before transitioning to twin or coax is a convenient option, another solution is to use an antenna tuning unit.
Later adjustments took account of the different type of balanced feeders that could be used:

FEEDER TYPE	LENGTH (IMPERIAL)	LENGTH (METRIC)
Open Wire	34 ft	10.36 meters
Ladder line	30.6 ft	9.33 meters
TV 75Ω twin	28 ft	8,53 meters

The original G5RV antenna design included the circuit for a suitable tuning unit, although there are many tuning units that are able to provide a good match. It is necessary to ensure that there is a balanced to unbalanced transition, i.e. a balun is used.



G5RV antenna with Antenna Tuning Unit.

The antenna tuning matching unit provides two functions. One is to match the impedance because. Like any antenna, it will not give an exact match. The second is to provide the balanced to unbalanced transition.
Probably the best option is to use the antenna with an external or remote tuner unit and then the run though any building can be coaxial cable with a low VSWR.

ANTENNA ARCHIVES #34

G5RV antenna operation

The G5RV antenna operates over a wide band and is able to provide a reasonable match on most of the amateur radio bands. The antenna was originally designed in 1946 when the number of bands was much less than it is now. In fact it was designed to meet the needs of the then bands: 80 meters, 40 meters, 20 meters and 10 meters. At this time, even 15 meters was not an allocated amateur radio band.

In view of the number of different bands on which the antenna operates, the way in which it works is slightly different, i.e. the number of wavelengths in each section and hence its performance.

- 3.5 MHz, 80 meters: On 80 meters the G5RV antenna uses the flat top as well as about 5 meters of the matching section to form a half wave dipole. As a result it presents a reactive load it its input.
- 7 MHz, 40 meters: On 40 meters the G5RV antenna operates using the top section plus nearly 5 meters of the matching section and it operates as a partially folded collinear array with two half waves in phase. Again the antenna presents a reactive load to any transmitter at its input.
- 10 MHz, 30 meters: On this band the G5RV operates as two half waves in phase and as a result it presents a very reactive load at the input.
- 14 MHz, 20 meters: This is said to be the band for which the antenna was originally designed. It operates as a 3 λ / 2 dipole and presents a resistive load of about 90 Ω at its input. This provided a good match to the 75 Ω coax that was widely used at the time.
- 18 MHz, 17 meters: The G5RV performs as two in phase full wave antennas which extend slightly into the feeder section. The antenna is slightly reactive, but presents a high impedance in view of the top section being fed at a high voltage point.
- 21 MHz, 15 meters: The antenna performs as a 5 λ / 2 antenna. As it represents an odd number of wavelengths it is fed at a current node and it is only slightly reactive.
- 24 MHz, 12 meters: The G5RV performs as a slightly long 5 λ / 2 antenna and as such it is slightly reactive, but the overall impedance is not too high.
- 28 MHz, 10 meters: The antenna acts as tow 3λ / 2 sections fed in phase. It gives a high impedance load which is slightly reactive.

The antenna is very much a compromise and it presents a variety of different loads to the transmitter. Whilst this may have been acceptable in the days of vacuum tubes / valves when it was designed, modern semiconductor PAs do not like this variety of loads and an antenna tuning unit must be used.IN terms of radiation, the G5RV antenna provides performance almost equivalent to a dipole on 80 and 40 meters. On 20 meters the extended length means that the radiation lobes provide a lower angle of radiation in some direction and therefore it can favor long distance signals in the direction of the lobes as these will tend to arrive at a low angle.

G5RV performance and choice

The G5RV antenna has many advantages, but when selecting an antenna it is worth understanding all the trade-offs against the advantages.

ANTENNA ARCHIVES #34

G5RV advantages

- Multiband capability: The G5RV antenna provide a multiband capability. It is able to operate on all amateur bands between 80 meters and 10 meters.
- Simple construction: The G5RV can be made quite easily using components available from amateur radio stores and outlets.
- Low cost: It is possible to construct a G5RV antenna for very little cost - there are no high price items

G5RV disadvantages

- Compromise antenna: The antenna does not provide a good match on many frequencies - an antenna tuning unit is very advisable.
- Directive pattern: The directional pattern of the antenna will vary according to the frequencies in use.

The G5RV antenna has much going for it and it can provide an idea solution for many situations where a low cost multiband wire antenna is needed. The antenna has been used for many years by thousands of people and given some useful results, although the variable impedance presented to the transmitter means that with current semiconductor based transceivers an antenna tuning unit is required to keep the VSWR within tolerable levels.

CUSTOM WOOD PLAQUES DONE VIA CNC ROUTER!

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

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

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

For more information please visit: Carpenterwoodworksusa.com

EQUIPMENT FOR SALE BY AB3ME

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

Additional items for sale:

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

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

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

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

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

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

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

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

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

MEMBERSHIP APPLICATION

E P A R A

Eastern Pennsylvania Amateur Radio Association

Address: PO Box 521, Sciota, PA 18354

Email: N3IS@qsl.net

Website: www.qsl.net/n3is

Date: _____

Name: _____ **Callsign** _____

License: Novice Technician General Advanced Extra

Address: _____

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

Home Phone: _____

Cell Phone: _____

Email: _____

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

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

Interests:

DX _____ Contest _____ CW _____ QRP _____ Digital Modes_____ Antique Radio Equipment _____

Building Antennas _____ Electronic Repairs _____ Elmering _____ Kit Building _____ EmComm: ____

Others: _____

How did you get interested in Ham Radio?

_____

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

Use reverse side if needed:

_____

_____

_____

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

Membership Rates,

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