PVRC Newsletter
January

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President's Letter – Doug AA3S

What a fantastic hobby we have in common! We have earned the privilege of transmitting our voices and data on many frequencies from below the AM broadcast band to as high as we care to go. Our technical skills are trusted to allow us to build our own transmitting equipment, antennas, etc. Our communication skills are expected to allow us to be effective communicators in emergencies and to enhance international goodwill.

The enjoyment each of us gets from this hobby may be limited to one aspect or include several. And it may change with time, as it has for me.

Readers of this newsletter are a bit more focused on the skills that allow them to have fun in radio contests. Your fun may be competing against other operators, your previous best score, propagation conditions, DX QRN, local noise, squirrels eating your feedline (hope they like a good dose of RF!), the list is practically endless

Or a competition against other radio clubs. And that is a major reason for PVRC to exist.

PVRC has been competing since its official incorporation in 1947 and has become perhaps the biggest and most successful radio contesting club in the United States. This month's article is not intended to prove my assertion, but below is some data that suggests it may be true; and more importantly the data do suggest a ***plan*** for PVRC. Some reflection may suggest a plan for you.

Below is a table of the PVRC 5M Contests for the previous few years (data as of mid-December 2022) and some key results. Note that some contest sponsors report a single club score result as the sum of separate CW and Phone events (e.g., ARRL Sweepstakes). The table shows:

- *the number for how PVRC ranked* (1 means PVRC won) in each year of club competition against clubs in the United States (i.e. not including foreign clubs).
- the name of the domestic club who won if PVRC did not win

I did not have time to get anyone else to check my data, so any errors are mine and please let me know of any, but I'm confident that the data is useful for initial planning purposes.

#	PVRC 5Million Point Contest Name	# is PVRC rank, NAME is winning club or closest to PVRC. RED means PVRC did NOT win			
		2022	2021	2020	2019
1	ARRL RTTY Round Up	2, NCCC	3, NCCC	2, NCCC	2, NCCC
2	NAQP Club Competition (CW SSB RTTY)	NA	1, SMC	1, SMC	1, SMC
3	ARRL January VHF	4, Mt Airy	5, Mt Airy	6, Mt Airy	9, Mt Airy
4	CQ160 CW + SSB (rank in U.S.A.)	1, FRC	1, FRC	1, FRC	1, FRC
5	CQ WPX RTTY (rank in U.S.A.)	1, FRC	1, FRC	2, NCCC	1, NCCC
6	ARRL DX CW + SSB	3, FRC	3, FRC	3, FRC	3, FRC
7	CQ WPX SSB + CW (rank in U.S.A.)	**2, YCCC**	1, FRC	2, YCCC	2, YCCC
8	CQMM DX (Brazil)	TBD	3, FRC	4, FRC	2, FRC
9	ARRL June VHF	TBD	2, Mt Airy	3, Mt Airy	2, Mt Airy
10	CQWW VHF Contest	TBD	2, SMC	1, NEWSG	2, SMC
11	WAE CW + SSB +RTTY	**(2, YCCC)**	1, FRC	1, FRC	1, FRC
12	WW DIGI	1, YCCC	3, NCCC	4, YCCC	3, NCCC
13	ARRL September VHF	TBD	3, Mt Airy	2, Mt Airy	6, Rochester
14	CQWW RTTY (rank in U.S.A.)	TBD	1, FRC	1, FRC	1, YCCC
15	WAG (Germany)	TBD	NA	NA	NA
16	CQWW SSB + CW	TBD	3, FRC	3, FRC	3, FRC
17	ARRL SS CW + SSB	TBD	1, FRC	1, SMC	1, FRC
18	ARRL 160M	TBD	1, FRC	1,FRC	2, FRC
19	ARRL 10M	TBD	**2, FCG**	1,FCG	1,FCG

Note that the most recent results are shown in RED when PVRC *did not win* that recent contest and the club that won is shown; for example, in the 2022 ARRL RTTY Roundup PVRC placed second and NCCC won. Other results show the club that placed second when PVRC won.

An important takeaway is that of the nineteen 5M contests there are *ten contests that PVRC has not won recently.* There are some others that could go either way in any given year.

Note that PVRC had been winning the ARRL 10-meter contest each year (bottom of the Table) *but lost in 2021* when the Florida Contest Group (FCG) won. That is one reason that PVRC announced double 5M points just prior to that contest in December 2022.

Also, PVRC has won WAE each of the years shown, but the most recent results, which are not final and do not yet include the RTTY scores, show YCCC will win in 2022 unless our final RTTY scores are better than YCCC by about 2 million points. Looking at 3830 reported scores, PVRC *should* accomplish that, but if we want to keep the PVRC record going, we may want to have a plan to score higher in 2023.

So how can we plan to score higher in our 5M contests? There are many PVRC members who regularly score very high in many of the 5M contests, and those operators are a natural place to start for ideas.

Can you volunteer to be a '5M Contest Tactics Chairperson' to examine a specific 5M contest of special interest to you and determine some practical actions PVRC operators could take to score higher in that contest? Different contests have different geographic areas, propagation characteristics, modes, etc. so "one size will not fit all" contests. An output of these tactics groups might be a 'live document' (one that changes quickly when improvements arise) made available to all PVRC members on-line to help prepare for a specific contest. Not all tactics ideas will be applicable to all operators: an op who chooses to be in the single-band category of a multi-band contest won't need to consider using the band-change minimum time tool in N1MM+ logger, for example. Having a list of ideas unique to each contest should help each of us prepare for and perform better in the contest we choose to be in. We can then give a more confident answer to "QRV?".

Please contact me directly if interested in being such a chairperson or a member of a specific tactics group.

73, Doug Hart AA3S

PVRC Election Results – Tim N3QE

Thanks to all members who participated in this fall's nominations and elections for 2023 PVRC officers and trustees!

And, thanks to our outgoing Club President Mike Barts, N4GU, who worked tirelessly to run the electronic voting this fall. Mike, you've done a great job wrangling the rest of us officers all year to get the club's work done - thank you so much for the leadership. In particular, you've done an exemplary job gathering input from members both across our entire club circle, and in more far-flung places!

All five officer positions are up for election each year. For 2023 the PVRC Officers are:

- President: Doug Hart AA3S
- Vice-Presidents: Bill Axelrod K3WA and Jerome Svinicki K8LF
- Treasurer: Ted Bauer WA3AER
- Secretary: Tim Shoppa N3QE

For the new term beginning in 2023, three Trustee positions (Virginia/WV, MD/DE/PA, and At Large) were up for election and there were 4 nominees - N1RM, W3LL, N3OC, and K7SV. These three newly elected or re-elected trustees will serve through the end of year 2025:

- Virginia/WV Trustee: Rick Miller N1RM
- MD/DE/PA Trustee: Bud Governale W3LL
- At Large Trustee: Brian McGinness N3OC

The complete list of 2023 Trustees, including both those just elected and those continuing from previous trustee cycles, is as below:

- MD/DC/PA Trustee: Frank Donovan W3LPL (terms run through end of year 2023).
- MD/DC/PA Trustee: Bud Governale W3LL (term runs through end of year 2025)
- MD/DC/PA Trustee: Tyler Stewart K3MM (term runs through end of year 2024)
- VA/WV Trustee: Kay Craigie N3KN (term runs through end of year 2023)
- VA/WV Trustee: Rick Miller N1RM (term runs through end of year 2025)
- VA/WV Trustee: Dick Allardyce N4RA (term runs through end of year 2024)
- NC Trustee: Guy Olinger K2AV (term runs through end of year 2023)
- At Large Trustee: Brian McGinness N3OC (term runs through end of year 2025)
- At Large Trustee: Bud Hippisley W2RU (term runs through end of year 2024).

Big Points Working PVRCers in Volunteers on the Air 2023

Via the PVRC email reflector:

John N4MM noted January 2023 QST had details on VotA 2023 – the yearlong operating event to work ARRL Volunteers. Look here.

Frank W3LPL listed the points available for working PVRCers:

High point value QSOs include PVRC members (apologies to those I missed):

- 275 points - - N3KN Past president,
- 250 points - - N4MM Honorary vice president,
- 225 points - - W3TOM Atlantic Division Director
- 150 points - - W2RU past director Roanoke Division,
- 100 points - - PVRC's ARRL Charter Life members (who are you?)
- 50 points - - PVRC's many Maxim Society members
- 40 points - - K4ZA Contest Advisory Committee member
- 40 points - - W0VTT DX Advisory Committee member
- 40 points - - N4JQQ DX Advisory Committee member
- 30 points - - W3UR How's DX columnist
- 25 points - - PVRC's many Diamond Club members

Point value of QSOs with volunteer stations is detailed here.

9 Element Circle Array RX Antenna – Jim AB3CV

This is about my recent construction of a 9-circle array receive antenna. The 9-circle RX antenna was originally designed by W1FV and described in NCJ in two articles. (See links at the end)

The reason for wanting a better receive antenna was that too I often couldn't hear DX stations that others were able to on 80m and 160m. Of course, propagation has a significant effect on what can be heard even within the Mid-Atlantic region but too often I felt like I was missing out. If you can't hear them, you can't work them!

My TX antenna is a quarter wave vertical on 80m with 32 radials averaging 100 feet in length. I have a horizontal tail attached to it at 53 feet by a vacuum relay creating an inverted-L which gives me 160m as well. When on 160m a ¼ wave matching line at the base is inserted which gives me resonance at 1840Khz. Another relay ensures that when not transmitting the antenna is detuned for both 80m and 160m to avoid compromising any receive antennas on those bands. RBN assessment on 80m and 160m shows I'm heard around the world with my 1500W amp. I'm just a bit deaf!

I'm now at 224 entities worked on 160m and 281 worked on 80m and getting new ones on those bands is becoming very difficult. I've often watched videos by VE6WZ on YouTube about various station ideas and found one on his updated combiner box for a 9-circle array. This piqued my interest, and I started doing some research.

My current RX antenna for both 80m and 160m is composed of two 2 element arrays which share a common element for 3 elements in total. The two elements selected are combined by a DX Engineering NCC-2 which allows phasing between the two to achieve directionality and some steering of the receive direction. With 2 elements it forms a cardioid pattern with a deep null to the rear. It performed better here in my current Mt. Airy QTH than it had in my former QTH in Parkton where it was implemented partially in an oak forest. The local RFI environment was an issue there as well. It was however an improvement over what I previously had used in Parkton: a K9AY and a BOG (beverage on ground). The K9AY was also buried in the oak forest which likely didn't help its performance but was constantly getting destroyed by the local deer herd. The BOG never really worked well at all.

My Mt Airy QTH has a side yard where my 2 element RX arrays are located but it isn't big enough to really accommodate either a 4-square or 9-circle. My lot also didn't have enough space for a beverage in any direction much less for multiple directions. However, my side yard is adjacent to my neighbors' largely unused portion of their property: they have a vegetable garden in one portion and an attempted (failed so far) wildflower garden. Other than that, it is just periodically mowed as a grass yard.

I had done some work with a compass. measuring tape and lot description map and discovered that I could implement a 9-circle with only 3 elements on their property if they were willing. I asked them and they immediately agreed to seasonal use of their property from November thru the end of March! Great neighbors! See site map Fig 1 which shows the approximate locations as well as my TX antennas.

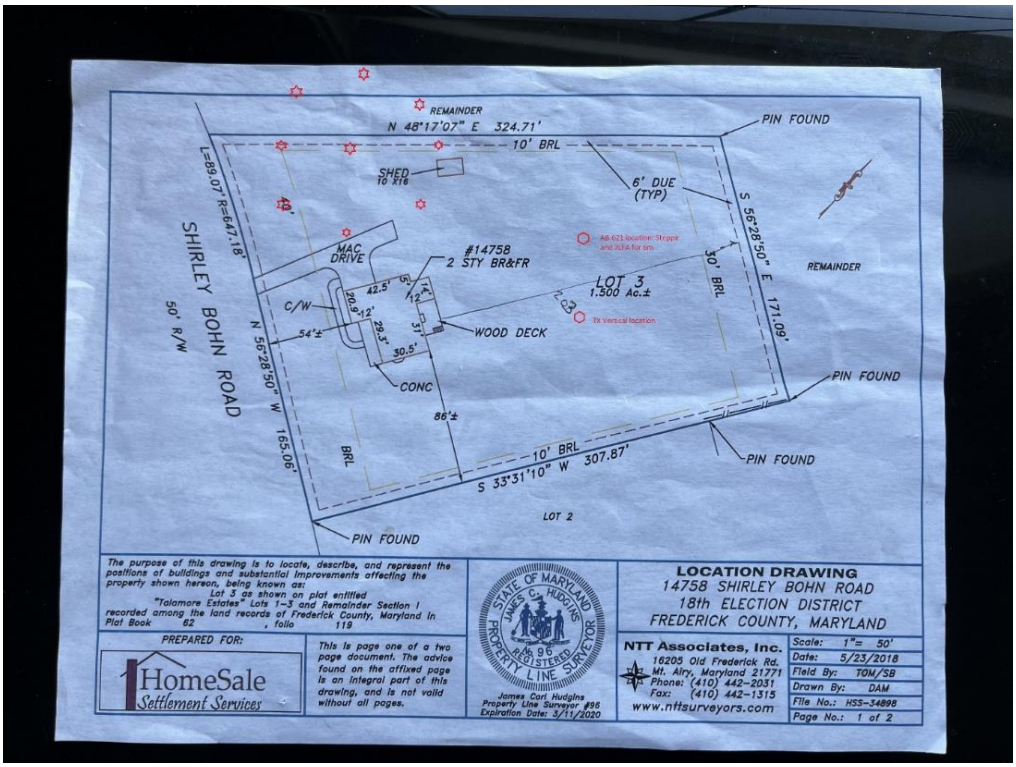


Figure 1 AB3CV Site map

The choice of a 9-circle over a 4-square is worth a mention. Since my use of the full array will be seasonal, I can use the 3 elements pointed on a 45/225 heading without the full array. A 4-square with one element missing is useless. Also, the 9-circle has an antenna for every 45 degrees with only a 1db reduction when a station is between those lobes. I can also easily just put out 3 elements in a hurry if some DX-pedition comes up in another direction when the full array is down.

The 9-circle is comprised of nine 24ft tall, telescoped aluminum elements each on a fiberglass insulator which is then bolted to a piece of 2"x1/8" angle driven into the ground. The angle stock not only acts as the element support but also as a ground reference for each element. See Fig 2.

Eight of the elements are arranged in a 120-foot diameter circle spaced every 45 degrees. The ninth element is in the center. When a direction is selected the center element is always used with diametrically opposed elements to form a 3-element array. The signal from each of the three elements is buffered by a simple impedance converting preamp and summed by the combiner box by using a combination of relays and delay lines. This gives a very directional antenna in a 120-foot circle for 80m, 160m and even 40m, and every 45 degrees at that. Try doing that with just beverages!!

Figure 2. Element mount, one of 9.

DX Engineering had previously sold a full kit to implement the YCCC version of the 9-circle but no longer does so. But I'm comfortable doing construction of electronics and the VE6WZ YouTube videos gave me the confidence to give it a shot. I needed to teach myself KiCAD, the Computer Aided Design (CAD) program used by VE6WZ to create the boards, which I did by watching several videos on YouTube.

I downloaded his designs from the links at his videos and sent them off to a board fabricator that was inexpensive and quick turnaround: JLCPCB. Other parts were ordered from Digikey, MGS4U for fiberglass insulators and DX Engineering for the tubing and miscellaneous parts to construct the elements.

I got my coax from Joel at The RF Connection. Both preamp boards and the controller use only through-hole parts, so construction was easy. My AA54 antenna analyzer was used to create the proper length of the phasing lines. The feedlines from the combiner to elements just need to be identical and long enough to reach - I chose 70 feet. Figure 3 shows the deployed combiner box, the center element and all the cabling

Figure 3. Combiner deployed, coax and center element.

Since I'm planning to remove the elements, cabling, and combiner each April all the coax is just left on the ground. Of course, I'll leave the supports that were driven in the ground for reuse next year.

Instead of a manual rotary switch to control the selection of direction I chose to use a software program called PSTRotator. I have long used PSTRotator for controlling my rotator via a Green Heron RT-21, controlling my Steppir DB-19e and selecting among my TX antennas. A second instance of PSTRotator was created to control my 9-circle rather than use a manual switch box. Each instance uses a USB connected KMTronic 8 port relay box to perform their functions. A small RJ45 breakout board from Winford Engineering was used to implement a diode matrix to form an 8-line to 3-line converter to operate the combiner relays. Figure 4. CAT6 direct burial cable provides power and control signals to the combiner box and preamps. This gives me computer control of the RX antenna direction which in turn gives me the ability to operate remotely. The direction selected can be by clicking on the compass rose or manually selecting the relay desired. The direction can also be driven by my logging program. See Fig 5.

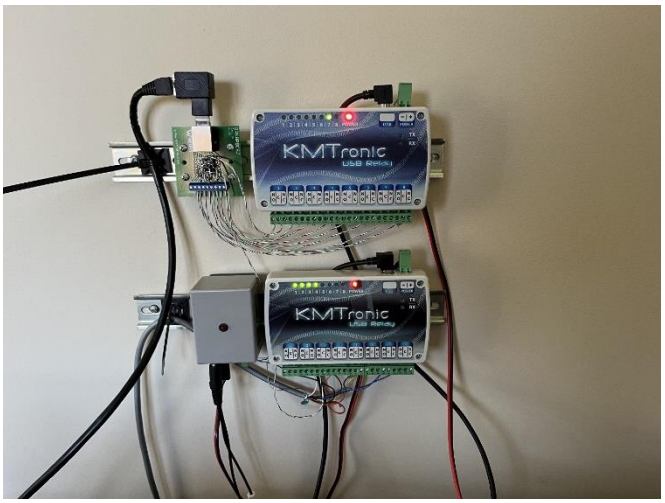


Figure 4 Control switches in shack. Top is RX control, bottom is other antennas

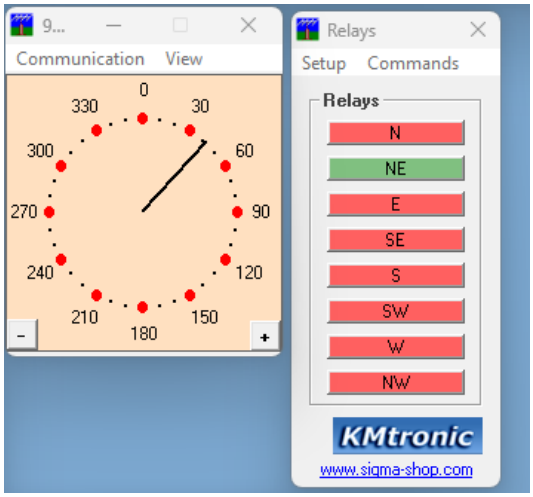


Figure 5 PSTrotator controlling RX direction

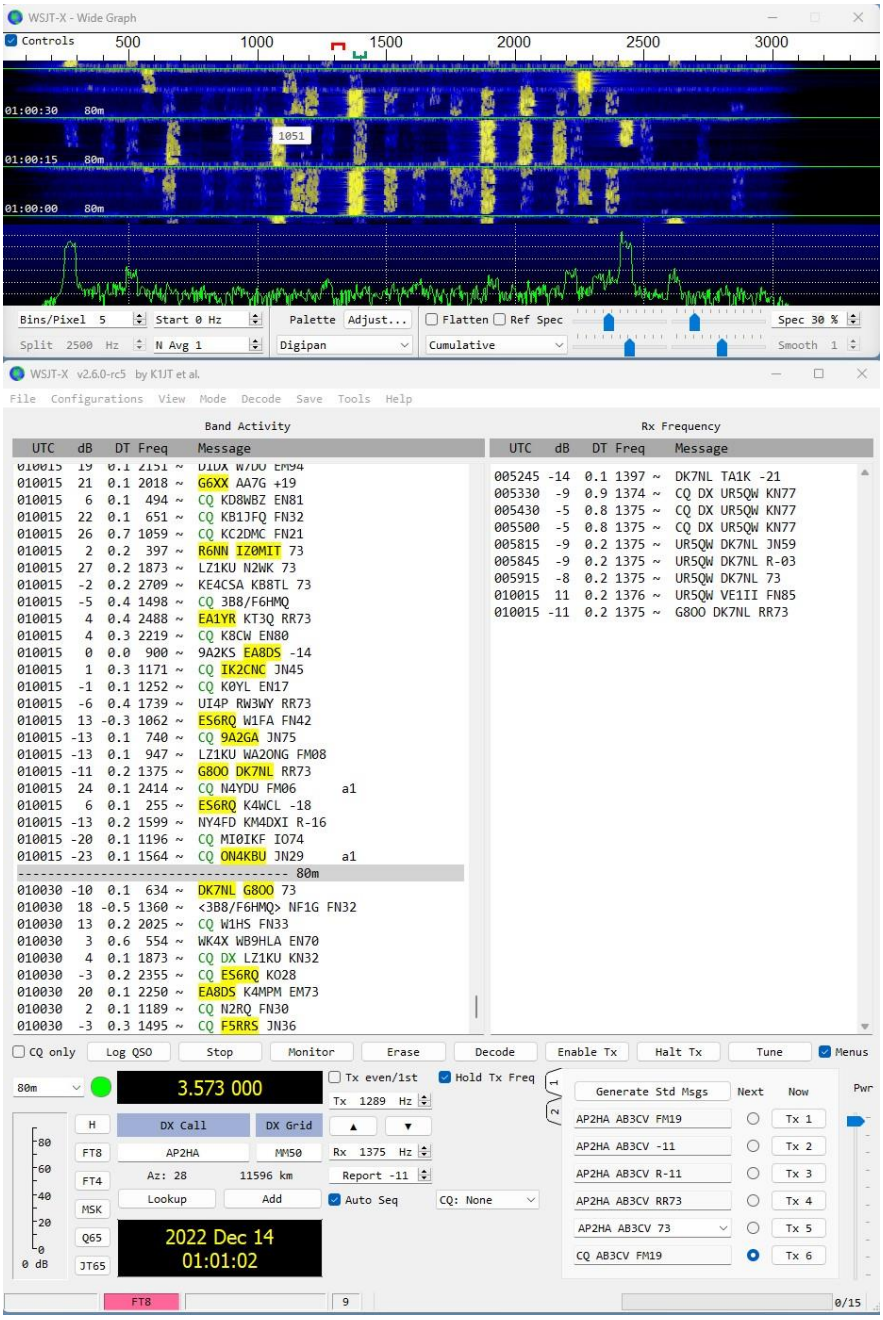
So how well does it work? Great!

I always expect something to go wrong on power-up but this time I had been sufficiently careful, and nothing smoked! I was immediately greeted with wonderful front-to-back performance and good side-lobe shape, both determined by on-air listening of available stations.

My K4D has two separate receivers so I'm able to listen to both antennas and compare them on side-by-side band scopes. Because FT8 presents fairly steady signals for 13 seconds, it was used to compare the two antennas the busy 80m band when first turned on. When pointed to EU the 2-element antenna decodes a lot of stateside stations and the spectrum is quite full, often making it difficult to pull out EU DX. However, the 9-circle really rejects the stateside stations making hearing EU DX very much easier.

It's difficult to show the impact in a single picture but Fig 6 is my best effort. It shows WSTJ and a strong W1 signal around 1350hz in the top of the waterfall which was

reported as +24db on the previous cycle. On this cycle about 2/3 of the way through I switched the antenna from NE to SW and the signal is greatly attenuated (see zoom inset.) It was likely -15db or so. Not every signal receives that level of attenuation of course but it shows the general effect. It is very nice to try to hear signals from EU without so many strong signals coming in from behind. Those of you who have worked at big stations with significant RX antenna farms may be used to this, but it is a real treat for me on my modest 1.5 acre lot (plus a bit more from my neighbors!)



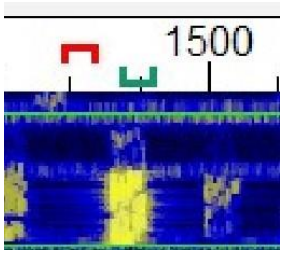


Figure 6 – example performance of the arrray

I also listened to directions around the compass rose on 160m and 80m and was very pleased to see that rotating on and off the direction of a received station had a significant impact on received signal strength.

The output from the 9-circle is quite low so I need to operate with the K4 preamp engaged and I've also added a DX Engineering RPA-2 preamp for a bit more gain to bring the antenna noise floor comfortably above that of the K4.

So far, I'm very pleased with the result! It won't magically create QSOs but it will give me a better chance of hearing in the direction I want with less interference from other stations or QRN.

Links:

- 9 circle overview video and combiner box:
- preamp board
- YCCC 9 circle manual
- 9 circle design part 1
- 9 circle design part 2

New Version of MorseRunner Community Edition Supports ARRL DX

The latest version of Morse Runner has added ARRL DX as a contest you can play around in. From the announcement:

CQ CQ CQ - Morse Runner Community Edition - v1.82 is here!

The Morse Runner Community Edition has already added the ARRL DX, ARRL Field Day, CQ WW, CWOPS CWT, and NCJ NAQP contests to the original CQ WPX and HST modes. Now responding stations might send cut numbers for realism. Download it here:

Next the project will look to provide additional contests, new features, future N1MM integration and usability enhancements. Your feedback, input, and help is appreciated. Users can do this here. Developers can find or join the project here. We hope you like it, 73 de the MorseRunner CE team.

(***de K3TN*** *- My advice for using MorseRunner for increasing contest running skill: click the boxes for QRM, QRN, QSB, LIDS, etc. before you start upping the code speed. The biggest impediment to running is thinking you have to find a really clean frequency, which is kind of like hoping for jumbo shrimp or an exact estimate! Then, turn the caller depth up from 1. Only after you are comfortable running in those conditions should you start raising the code speed*.)

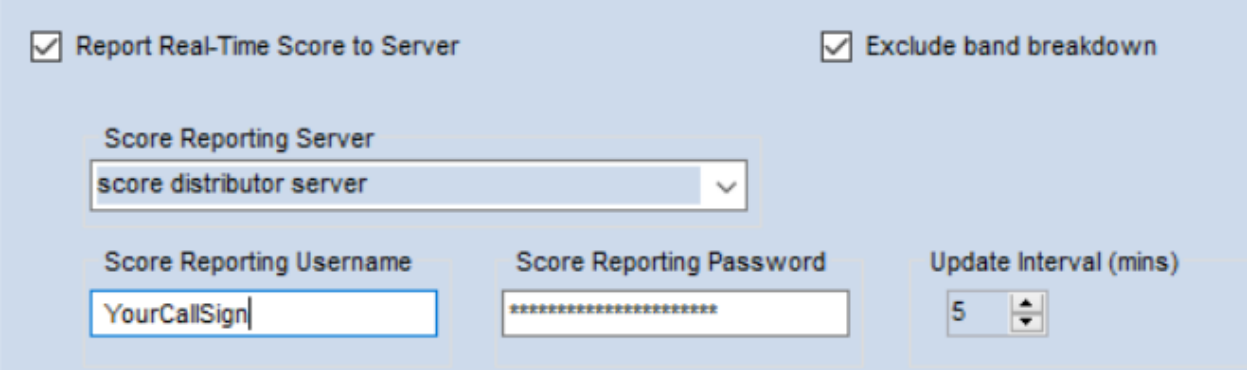
Club Competitions – The Next Few Days… - Doug AA3S

- **ARRL RTTY Round Up - begins 1:00PM Eastern Saturday January 7**
- **NAQP – CW begins 1:00PM Eastern Saturday January 14**
- **NAQP – SSB begins 1:00PM Eastern Saturday January 21**
- **ARRL January VHF - begins 2:00PM Eastern Saturday January 21**
- **CQ160 CW - begins 5:00PM Eastern Friday January 27**

All contests above are PVRC 5M contests PVRC 5M Contest Calendar.

The NAQP contest has been added back into 5M as a *club competition* "with a twist" and a plaque goes to the winning club, sponsored by PVRC. See the announcement on page 2 of the PVRC December Newsletter , a must read. **Double 5M points are offered for this new 5M contest.** But to get any 5M point credit for the new NAQP Club Competition you must participate in the real-time on-line scoreboard; that was the only practical way to implement a low-effort method to compare scores between participating clubs. I have never done the on-line scoreboard before but look forward to it. I did the sign-up and logger program configuration by following the link here. That process was extremely easy and took about 2 minutes.

Following the web blog instructions for the N1MM+ Logger setup, on the N1MM+ Score Reporting tab screen I checked the boxes for *"Exclude band breakdown"* and "*Report Real-Time Score to Server"* and set *5 minutes* as the update interval, see screenshot below. Shortly after each of the six legs of the NAQP ends, the real-time club scores will be harvested into a spreadsheet as explained in the announcement.



If you choose to monitor the real-time scores (you don't have to if it is distracting) you may find that you *modify your operating tactics in real-time to increase your score to stay or get ahead of those operators who you have chosen to compete against*. Tactics include: run vice S&P, increase power, find better band, use spots, make the trade-off of new QSOs vice new multipliers, further stretch the bladder...

Have fun with this new real-time tool and please report your thoughts about it after each leg of the contest!

KPA1500 AMP Finals Device Replacement – Mike W3IP

The KPA1500 is a high performance 160 through 6-meter amplifier that delivers 1500 watts of power to your antenna. The internal antenna tuner can automatically match up to a 3:1 VSWR over all phase angles. The amplifier has built in protection against overheating, too much input power, too much output power, high VSWR, too much current draw, and incorrect voltage levels. However, like other similar amplifiers using LDMOS technology, the amplifier can still fail due to external events such as arcing in cables, connectors, baluns, or an antenna that momentarily touches another antenna or a nearby tower due to wind or ice.

The failure often shows up as a sudden permanent 50% drop in output power, sometimes accompanied by an error message on the KPA1500 such as "low gain", sometimes without an error message. The current draw is also about 50% of its normal level. When this set of conditions is observed, a common cause is the failure of one of the two BLF188XR LDMOS transistors in the KPA1500.

The first time my KPA1500 failed, I sent it back to Watsonville as it was under warranty. The second time I decided I didn't want to be without the amplifier for another two and a half months, so I decided to fix it myself. Digikey had the final devices (BLF188XR) in stock for $226 each (other distributors such as Mouser may also stock these devices - look around). You will need two new ones. Make sure you purchase the SOT539A or SOT539B package style only! My order showed up the next day.

Once the new devices arrived, it took me about 3 hours to change the devices out, having no instructions and having never opened the cover on the amplifier before. The following is the step-by-step process I used to replace both devices. Yes, both devices. Even though only one of them has failed, the remaining device has likely been stressed near its limits, it should be replaced as well. Read through all the instructions before you start, don't take any shortcuts! These instructions assume that you have checked for and ruled out other component failures such as bad relays, or failed solder joints on the feedback jumpers or resistor R38 on the LPF board.

> To replace the devices, the copper heat spreader and final devices assembly must be removed from the chassis. The assembly will be heated on a stove or hot plate until the solder under the devices melts. The old devices are removed, new ones attached, and the assembly will be left to cool. The assembly is then reintegrated into the KPA1500 chassis and tested.

1. You will need a camera (to take a high resolution "before" picture before you get started to refer to later as you go along, and any "along the way" pictures you think may be useful), a soldering gun, Phillips head screwdriver, 2 needle nose pliers, tweezers, an Exacto knife, some 63/37 rosin core solder (1/32 diameter), liquid flux, a block of aluminum (size not too critical, mine was 6 by 4 by 1/2 inch) and your kitchen stove (or a hot plate). Get a copy of the BLF188XR data sheet from the internet for reference.

2. After disconnecting all cables and removing the KPA1500 amplifier chassis from its normal operating position, I set the chassis upside down on a clean grounded 2 foot by 4 foot anti-static mat that I purchased from Microcenter (SKU: 343194 Mfr Part#: 900-114)

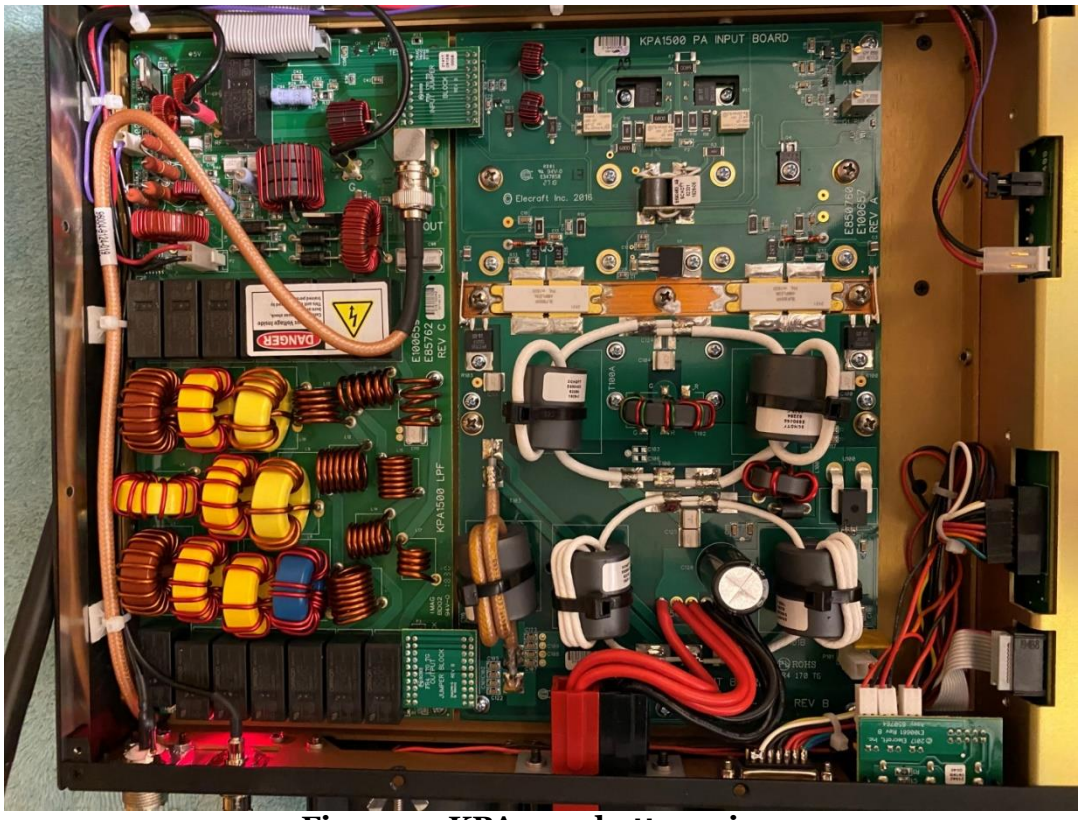


Figure 1 - KPA1500 bottom view

3. Remove all the screws from the bottom cover of the KPA1500 and set aside the cover and screws in a safe place.

4. Document the positions of the input and output jumper blocks. Remove both and set them aside.

5. The BLF188XR final output devices are soldered to a copper head spreader between the PA input board and the PA output board. The gate tabs of the final output devices are soldered to the PA input board. The drain tabs are soldered to the PA output board. Unsolder the gate and drain tabs with a soldering gun using an Exacto knife to help pry up each tab from the pad below it. Use solder wick to remove any excess solder from the pc boards pads.

6. Unsolder the feedback jumpers between the PA input board and the PA output board (there is one jumper on each side between the boards). Save the jumpers for later reassembly.

7. Remove all screws and associated lock washers from the PA input board and the PA output boards. There are screws on the heat sink of four tabbed devices (U1, Q4, R9, and R13) on the PA input board that must also be removed. Be careful with R9 and R13, they may want to stick to the chassis since the heat sink compound underneath the tabs are "sticky" even after the screws are removed. Gentle use of needle nosed pliers may help loosen the resistor body. Do not unsolder these devices. There are screws on the heat sinks of two devices (R100, R103) on the PA output board that must also be removed.

8. Remove the PA input board and place it on the anti-static mat or in an anti-static bag.

9. You now should be able to slide the copper heat spreader assembly away from underneath the PA output board without much force. If the copper heat spreader doesn't want to move, look for other screws that need to be removed!

There is a great video by Jim W6PQL showing him attaching similar LDMOS devices to a heat spreader using a hot plate. The video can be downloaded from https://w6pql.com/video/ldmos2copper.wmv
Be sure you view this video before you start! (Note that Jim uses a different device alignment technique than used by Elecraft).

10. Once removed, examine the copper heat spreader assembly. Take a picture of it. There should be two easily visible scribe marks - mine were between the gate tabs of each device. See Figure 2 and Figure 3. These are the alignment marks for the proper placement of the new devices. If the scribe marks are not present for both devices, you must make them yourself with the old devices in place before you proceed to the next step. **DO NOT SKIP THIS STEP!**

11. Take the copper heat spreader (with the old devices still attached) over to a kitchen stove or hot plate (can be either electric or gas) and set the heat spreader on top of an aluminum plate that is roughly 4" by 6" by 1/2" (size is not critical). The aluminum plate serves as a heat sink to keep the heat even. My gas stove took about 4 minutes to heat up the spreader to the point where the solder melted. Pick up the old devices with needle nosed pliers and set them aside. Take a swipe through the channel with a wet paper towel to wipe off the excess solder in the trench. Turn off the stove for a couple of minutes.

Figure 2 - heat spreader with old solder removed, new solder in the trench

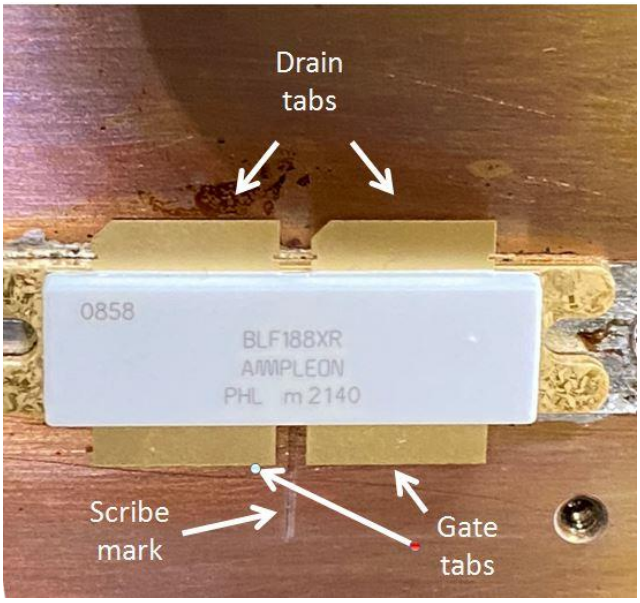


Figure 3 - BLF188XR on heat spreader

12. While the copper is still very warm, take a 2.5 inch length of 1/32 inch solder to fit in the trench symmetrically each side of the scribe (that is less than W6PQL used in his video, as there is still some residual solder left on the copper spreader). Put a thin coating of liquid flux on the bottom foot of each device. Orient the new devices so the drain and gate tabs correctly sit in the trench on top of (and cover up) the solder, with the scribe marks visible between the gate tabs. The drain tabs can be identified by the missing corners on the tabs.
13. Turn the heat on the stove or hot plate back on, wait for the solder under the devices to melt. You should be able to see the BLF188XRs slightly drop into the trench as that happens. Gently push the devices back and forth 1/4 of an inch to spread out the solder under the foot of each device with the tweezers. Ensure the devices end up so the tabs are properly aligned with the scribe marks. The scribe marks make it easy to move the new devices into exactly the right place once the new solder has melted.

14. When the BLF188Xrs are in the correct places, turn off the heat source, then very gently move the spreader off of the aluminum plate and onto an unused (i.e. room temperature) burner or a large heat sink using the two needle nosed pliers. This will allow the copper spreader assembly to cool faster.

15: After the spreader has cooled, visually inspect the copper spreader assembly carefully to make sure there are no solder shorts between any of the gate and drain tabs to the copper spreader (look under the tabs!). Any solder shorts must be removed before proceeding.

16. Slide the copper heat spreader assembly back underneath the PA output board and over the drain tabs. The drain tabs should line up perfectly with the drain pads on the printed circuit board. Put all screws and associated washers back on the PA output board side. Make sure the screws all start correctly, but do not tighten them yet.

17. Now position the PA input board back in place by slipping it under the gate tabs. Try not to bend the gate tabs up in this process, they need to remain flat for soldering. Replace the screws and associated washers on the PA input board and the four tabbed devices (U1, Q4, R9, and R13), all loosely at first. With all screws on both boards in place, tighten them all down.

18. Using the soldering gun, solder the drain and gate tabs to the pads on the circuit board. Use sufficient solder and heat so the end result looks like the "before" picture you took in step 1. Clean off any residual flux.

19. Re-solder the feedback jumpers between the PA input board and the PA output board (there is one jumper on each side of the boards). Clean off any residual flux.

20. Replace the input jumper block and the output jumper block. Refer to your "before" picture to make sure you have the orientation correct and that the jumper plugs line up correctly with the pins on the circuit boards.

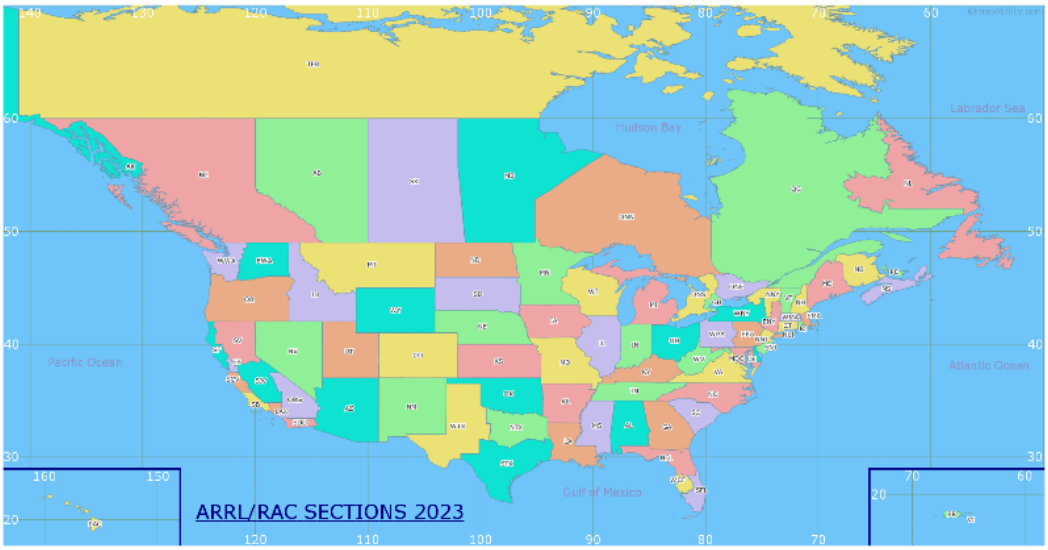
21. The reassembly job is now complete. Double check to make sure all screws and lock washers on the printed circuit boards are in the correct places and are tight, the feedback jumper wires are in place, and the input and output jumper blocks are in place and in the correct orientation - proper operation of the amplifier depends on every step being followed correctly.

22. The now repaired KPA1500 is ready for setup and testing. The only adjustments needed are to set the bias voltages for each of the BLF188XRs. The right way to set the bias voltages is to follow the Elecraft test procedures. To use the Elecraft test procedures, you will need a standalone power supply capable of supplying 53 volts at 3 amps (current limited and with a digital current meter accurate to .1 amps) and a decent digital voltmeter. The test procedure takes only a few minutes to execute. Once complete, put the bottom cover back on the amplifier. Your KPA1500 is ready to operate. The Elecraft test procedure can be acquired via email from support@elecraft.com.

This procedure is not for the faint of heart. But if you are comfortable with these techniques, it is a great way to save 2 1/2 months and as much as five hundred dollars to get your KPA1500 back on the air quickly!

Thanks to N3FL and K3YDX for their review and comments for this article.

New Canadian Sections in 2023 – John K3TN



The Radio Amateurs of Canada (RAC) have announced a realignment of their Field Organization resulting in the addition of a new section and name changes to several others effective January 1, 2023. This will result in the changes to ARRL contests that use ARRL/RAC sections as multipliers, including Field Day, ARRL November Sweepstakes, and 160-Meter contests. (click on map above or here for full size view)

The RAC Field Organization will be reorganized into the following sections effective January 1, 2023:

- Newfoundland and Labrador (NL)
- Nova Scotia (NS)
- Prince Edward Island (PE)
- New Brunswick (NB) – the Maritime Section (MAR) will be abolished.
- Quebec (QC)
- Ontario East (ONE)
- Golden Horseshoe (GH) – currently called Greater Toronto Area (GTA).
- Ontario South (ONS)
- Ontario North (ONN)
- Manitoba (MB)
- Saskatchewan (SK)
- Alberta (AB)
- British Columbia (BC)
- Territories (TER) – Northwest Territories, Yukon and Nunavut will be combined into one section.

Note this means a Sweepstakes sweep will now take working 85 sections overall!

More Ice Impact at W3IP – Mike W3IP

PVRC DXCC Challenge Standings – Frank W3LPL

Below are the DXCC Challenge totals for PVRC members, transcribed from the ARRL DXCC data as of the 20th of each month or so. Thanks to Frank for the data each month to make this a regular feature. Please report any omissions or errors to Frank.

CALL	DXCC	CALL	DXCC	CALL	DXCC	CALL	DXCC
W4DR	3199	K5VIP	2506	W0YVA	2001	KU1T	1501
W3UR	3170	N4TL	2504	K5RJ	1961	N4ZR	1496
W3LPL	3159	K3JT	2495	K3SX	1959	N3AIU	1487
K4CIA	3126	WS6X	2493	N3KS	1906	W8AKS	1461
N2QT	3093	W2GG	2436	K4EU	1871	KM3V	1449
W4PK	3038	W4VIC	2435	N3ND	1867	K3WC	1430
N4MM	2987	W3OA	2426	W3IP	1834	N3HBX	1428
W3DF	2976	N4GG	2389	K3AJ	1818	W3US	1410
WX4G	2960	W2YE	2334	W3KB	1815	N8II	1390
K1HTV	2950	N3RC	2326	W3DM	1791	WA3EKL	1388
K5EK	2937	WA2BCK	2316	KE4S	1758	W4PRO	1377
N3NT	2927	K1ZZI	2314	W2CDO	1755	W9GE	1364
K4SO	2907	W3YY	2297	N4GU	1738	AK3E	1348
W0VTT	2904	K0GD	2289	N4XYZ	1720	NR4M	1326
K2PLF	2903	KA4RRU	2234	W4GP	1710	W3NRJ	1325
KG7H	2895	K3TN	2230	N3OC	1706	ND3F	1319
W3LL	2886	NW4V	2219	KF7NN	1698	N1SZ	1317
K1AR	2872	K4FJ	2214	K4QE	1692	K4ZA	1313
W3KX	2869	N4ZH	2188	NE3H	1668	KG4USN	1292
N4DB	2851	K1EFI	2186	K3WI	1652	K1RH	1226
KG4W	2820	W3MR	2160	W3UL	1637	N3RR	1199
K3WA	2814	K2BA	2153	K3KY	1606	W4NF	1105
AB3CV	2778	N4JQQ	2153	W3XY	1603	K3IXD	1090
K3RA	2674	N3QE	2147	KE3X	1588	N1EK	1089
WB3AVN	2663	W3TN	2125	WB4DNL	1586	NE3K	1073
N3MN	2657	K3PU	2107	K3STX	1579	N3COB	1049
W4FQT	2622	W3GG	2071	NA1DX	1564	W4ZV	1047
K5RT	2587	N4NW	2068	N3MK	1556	W3OU	1046
N3KK	2575	AA4NC	2061	N3AO	1527	K4ZW	1038
W3BW	2550	N3KN	2006	WB2ZAB	1522		
N4QQ	2541	K4WNW	2004	AA4FU	1519		
K1GG	2521	W3FOX	2002	K4HQK	1518		

Membership News – Tim N3QE

Chapter leaders please remember to complete the Meeting Attendance Report. Members can check and update their roster details via the Roster Lookup.

Upcoming Contests – from WA7BNM

January 2023	
+ ARRL RTTY Roundup	1800Z, Jan 7 to 2400Z, Jan 8
+ YB DX Contest	0000Z-2359Z, Jan 14
+ North American QSO Party, CW	1800Z, Jan 14 to 0559Z, Jan 15
+ Hungarian DX Contest	1200Z, Jan 21 to 1159Z, Jan 22
+ North American QSO Party, SSB	1800Z, Jan 21 to 0559Z, Jan 22
+ ARRL January VHF Contest	1900Z, Jan 21 to 0359Z, Jan 23
+ CQ 160-Meter Contest, CW	2200Z, Jan 27 to 2200Z, Jan 29

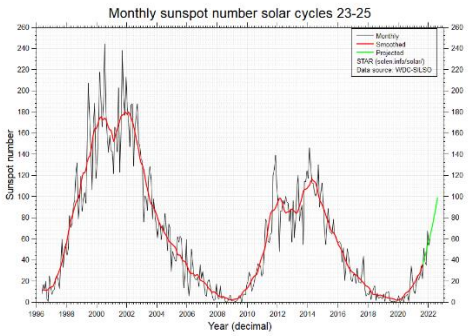
RED – scores count towards PVRC 5M Awards or Challenge Program

Editor's Last Word – John K3TN

Thanks to Mike W3IP, Jim AB3CV, Doug AA3S and Frank W3LPL for contributions to this issue of the PVRC newsletter.

Seems like the solar flux numbers have improved much more so than HF conditions. Here's to hoping that changes in the New Year. As new PVRC president Doug AA3S points out, January is chock full of contests for PVRCers to help the club kick butt in the club competitions and also to rack up points towards 5M awards.

The quality and usefulness of the PVRC newsletter depends on contributions from members. If you have photos from club meetings, screen shots of new contest software, or brief writeups on station improvements or contest war stories, send them in any format to jpescatore at aol dot com.



From the PVRC Treasurer – Ted WA3AER

PVRC has chosen not to implement an annual dues requirement. We depend on the generosity of all our club members to finance our annual budget. In addition, active PVRC members are expected to participate and submit logs for at least two PVRC Club Competition contests per year.

When contemplating your donation to PVRC, each member should consider the benefit you are receiving from PVRC and its many opportunities for your personal growth in our wonderful hobby, then donate accordingly.

Direct donations to PVRC via Credit Card or PayPal may be made by clicking this "Donate" button and clicking the next Donate button that appears on your screen:

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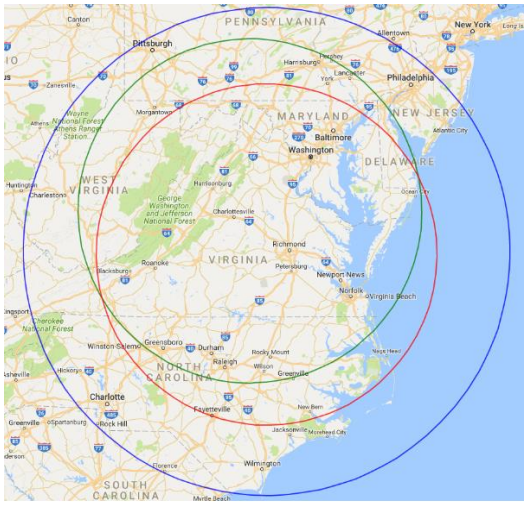
Donations to PVRC are not tax deductible

Eyeball QSO Directions

The latest info on local club meetings and get togethers will always be sent out on the PVRC reflector and posted on the PVRC web site.



Now a Word From Our Sponsors

PVRC doesn't ask for dues, but the Club does have expenses. You can also support the Club by buying from the firms listed who advertise in the newsletter!

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This new compact rig—featuring the latest in SDR technology—makes an excellent choice in the shack or on the go. It includes the Acoustic Enhancement Speaker System (AESS), which combines a mid-low frequency speaker and a side speaker (the included Yaesu SP-40) to produce dramatically improved receive audio you won't find in other transceivers of this size. Features include real-time spectrum scope display; 4.3" high-resolution TFT color touchscreen; intuitive navigation; high-speed DSP for effective QRM rejection; built-in high-speed automatic antenna tuner with 100 channel memory; and much more. **$1,299.95 Enter "FT-710" at DXEngineering.com for current pricing and/or offers.**

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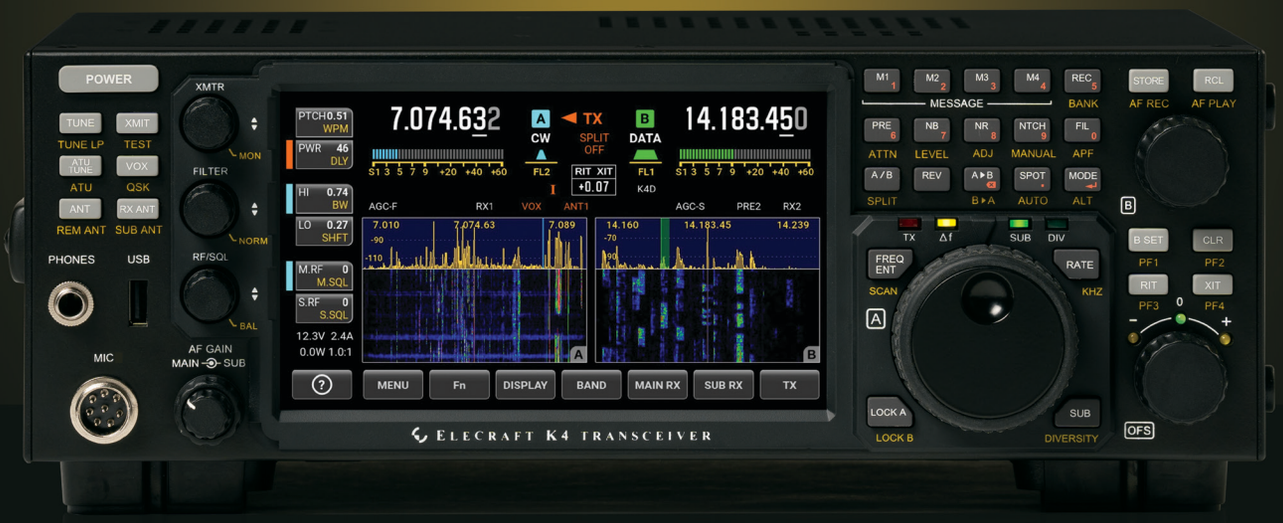

A direct-sampling SDR you'll love to use

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Modular, hybrid architecture adapts to your needs

The basic K4 covers 160-6 m, with dual receive on the same or different bands. The K4D adds diversity receive, with a full set of band-pass filters for the second receiver. (Thanks to direct RF sampling, there's no need for crystal filters in either the K4 or K4D.) The K4HD adds a dual superhet module for extreme-signal environments. Any K4 model can be upgraded to the next level, and future enhancements–such as a planned internal VHF/UHF module–can be added as needed.

Single or dual panadapter, plus a high-resolution tuning aid

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Comprehensive I/O, plus full remote control

The K4's rear panel includes all the analog and digital I/O you'll ever need. All K-line accessories are supported, including amps, ATUs, and our K-Pod controller. The USB display output supports its own user-specified format. Via Ethernet, the K4 can be 100% remote controlled from a PC, notebook, tablet, or even another K4, with panadapter data included in all remote displays. Work the world from anywhere–in style!

K4 KEY FEATURES

- Optimized for ease of use
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- Up to 5 receive antenna sources
- Full remote control via Ethernet

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