

# PVRC Newsletter

## July/August

Newsletter Editor: John K3TN [jpescatore@aol.com](mailto:jpescatore@aol.com)

Website: <http://www.pvrc.org>

Meeting Info: <http://www.pvrc.org/chapters.htm>

Facebook: <https://www.facebook.com/groups/PotomacValleyRadioClub/>

### President's Letter – Doug AA3S

The new 2023-2024 Season begins this month with two contests:

- CQWW VHF Saturday July 20 at 2pm Eastern for 27 hours <https://www.cqww-vhf.com/>
- NAQP RTTY Saturday July 20 at 2pm Eastern for 12 hours only! **DOUBLE 5M POINTS**

Since PVRC sponsors an award for the NAQP Club Challenge and other clubs are in real contention with us for this six-event per year contest. In the February RTTY event we were outscored by SMC! So, this July RTTY event is important. For a reminder of how to get 5M credit in the NAQP (different than any other 5M contest!!): you must report your score during the contest to the <https://contestonlinescore.com/> and for a reminder as to how this came about, see the [January Newsletter](#) page 13. See also our website info <https://www.pvrc.org/NOCC.html>.

Note the simultaneous start times for these two 5M contests. Fortunately for those of you wishing to do well in both, the VHF propagation is not likely to be worth your BIC time for much of that contest's 27 hours. Perhaps more important is that the NAQP is VERY important to PVRC as explained above. So try to be in all 12 hours of the NAQP.

Go PVRC! Doug Hart, AA3S, PVRC President

#### PVRC Officers:

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

#### Trustees:

K3MM, N3OC, K2AV, N1RM, W3LPL, N3KN, W2RU, W3LL, N4RA

#### PVRC Charter Members (all SK):

W3GRF, W4AAV, W4KFC, N0FFZ, W4LUE, W7YS, VP2VI/W0DX, W3IKN, W4KFT, W4RQR, W4MKM, W4BFO, W4CC, W4IA

Newsletter Editor: John K3TN [jpescatore@aol.com](mailto:jpescatore@aol.com)

PVRC Website: <http://www.pvrc.org>

PVRC Meeting Info: <http://www.pvrc.org/chapters.htm>

PVRC on Facebook: <https://www.facebook.com/groups/PotomacValleyRadioClub/>

**PVRC Scholarship Fund/WRTC Tent Donor Thank You – Ted WA3AER**

A hearty Thanks to Bob Dannals W2GG for donating equipment and to Ike Lawton, W3IKE, for selling Bob's gear and donating the proceeds to the PVRC Scholarship Fund for this year. Bob and Ike contributed \$1700 due to their efforts and generosity.

Recall that PVRC makes two \$3000 scholarship donations yearly. Please consider donating to our scholarship fund when you make your yearly donation to support PVRC. Consult our Web home page tab, "Scholarship," for complete information on the various ways you may make your donation. Donations made direct to the ARRL Foundation for the PVRC Scholarship Fund are tax-deductible.

PVRC also committed to sponsoring 3 tents for WRTC2026 in the amount of \$4500. We needed to remit that amount prior to May 27, 2024 in spite of not having collected that amount. Hence the PVRC Treasury is now just over \$1500 in the hole.

Many thanks go to the following PVRC members who have already contributed. They are:

K3WA	WA3AER	N3QE	NR4O	N1RM	K3EW
W3LL	N3MK	K2GO	K4QPL	N4ZR	N2FT
N4GU	K2AV	W4VIC	K1HTV	K4TMC	W2CDO
N3KN	W3IKE	K3AJ	KG3V	N1EK	AC5XK
K1BZ	N8II	KK4ODQ	K4ZW	W8KRZ	KB3Z
K3LU	W3EF	K8LF	NN4RB	K3TN	W3US
K2NTO	N3MN				

If you have not already donated, please consider helping close this gap so we do not end this year in the red.

Thank you, in advance, for supporting our up-and-coming young Hams and their education and the WRTC 2026 competitors.

73

Ted Bauer WA3AER  
PVRC Treasurer

**W3LPL Open House Photos – Jim N3JT**



The cycling/contesting/K4 gang of three: John K3TN, Jim N3JT and John N3AM.

- PVRC historian Pip WB4FDT (r) presents Club Secretary Tim N3QE with ARRL 75 years of affiliation plaque.



**The Wayback Machine: Bob Denniston W0DX/VP2VI – via Tony K3WX**

This photo of Bob Denniston W0DX/VP2VI was taken in July 1994 at Bob's condo in St. Croix VI. Bob was a PVRC Charter Member and later on was president of the ARRL and IARU. Bob became a silent key in 2002.



## Laying Radials Across a Gravel Driveway – Ken K4ZW

This last winter I became active on 630 meters (474 kHz). The antenna is an 80' top loaded vertical hanging from trees on the west side of my gravel driveway. The plan was to put down thirty-six 100' radials. Luckily, I had copper wire left over from my 80-meter vertical array project years ago. With today's price of copper, I likely would have put down fewer.

I live on 17 acres so laying out half of the radials on the west side of the driveway wasn't an issue. The challenge was how to run the other half east, across my gravel driveway. First I tried laying them out and simply covering each one with a layer of gravel. That had limited success. Eventually they would start to become uncovered. I could just see an Amazon truck coming up the driveway with wire dragging behind it. I was looking for a Plan B.

I took my pressure washer, with the highest-pressure nozzle, the one that can cut into wood, and used it to cut small grooves into the gravel. This was #16 wire so a 1/4" slit was plenty. It was messy, but it went quickly. Next, I laid the wire in the groove and backfilled it with crusher run gravel from the local stone and mulch store. The mixture of coarse and fine aggregate filled in perfectly after a few days of normal traffic and a couple of rain storms. The same method could be used for other cable, control or coax, if the groove was cut deeper. After a month you can't even tell they exist.

The 630-meter band, 472–479 kHz was formally allocated to amateurs at WRC-12. Power is limited to 5 watts EIRP. Antennas are short electrically and inefficient. Consider that a quarter wavelength is 517'! Transmitter power levels on the order of 50 watts to several hundred are required to achieve 5 watts EIRP. Many modern transceivers will transmit on 630 meters via the transverter port, however an external power amplifier is needed. Even if you don't have equipment to transmit, you can decode many of the WSPR signals using your low band antennas for receive.

In order to transmit, amateurs are required to register on the PLC (Power Line Communications) database. If no objection is received after 30 days, which is almost always the case, you can begin operating. <https://utc.org/plc-database-amateur-notification-process/>

To learn more about 630 meters, I would highly recommend NO3M's 2018 Dayton [presentation](#). Even if you don't plan to get on the band, it's a fascinating read.



## FTx Contesting Hints from PVRC Reflector – Ed N1EK

This list of FTx contesting hints is compiled for PVRC members from comments of PVRC members and the References. They may increase enjoyment and operating efficiency in digital contests and keep PVRC in the contest club lead.

### Setup

- **Software:** Integrate N1MM+ and WSJTx for seamless operation. Easy instructions are in N1MM+ documentation. <https://n1mmwp.hamdocs.com/manual-windows/wsjt-x-decode-list-window/>
  - This provides logging, dupe checking by color coding in WSJTx, highlighting unworked stations on the WSJTx Band Activity window. Take all the time you can to set this up and test that it is working right, otherwise there will be failures during the contest. (Integration of N1MM+ with JTDX for contesting is more difficult/complicated and not usually beneficial.)
  - Start N1MM+ first, then start WSJTx from N1MM+. When shutting down, close WSJTx first and then N1MM+.
- **Contests:** There are seven contests that have all or partial FTx mode content:
  - ARRL January VHF – PVRC 5M
  - ARRL International Digital (June) – PVRC 5M
  - ARRL June VHF – PVRC 5M
  - ARRL Field Day (June)
  - CQWW VHF (July) – PVRC 5M
  - WW Digital (August) – PVRC 5M
  - ARRL September VHF – PVRC 5M
  - FT Roundup (December)
- **Time Synchronization:** Use a background application such as Dimension 4 for the necessary synchronized accurate time. When you are not on time, you will see a number in the DT column that is larger than 0.2 second.
- **File Prep in WSJTx:** Before the contest, in the WSJTx File menu: reset the Cabrillo Log (Contest Log), rename ALL.TXT, rename WSJTx\_log.adi. This will make the files all fresh for this contest.
- **Decode Settings:** Select Deep and Enable AP on Decode.
- **Prepare Alternate Binding:** Preload some Alternate F1-F6 Bindings, especially in Tx 5, so you can be ready to reply as appropriate, such as: \$DXCALL W1AW +0. This is because some QSO partners will require a signal report before they will send an “R”.
- **Bandwidth:** Set receiver bandwidth to maximum (2.7 – 4 kHz) to see stations transmitting at the higher frequencies. A station at 3 kHz may be calling you and you won’t see him if the bandwidth is too narrow. There is no advantage of having a narrower receiver bandwidth for FTx.
- **Preparation:** As with all contests, check the computer/rig/antenna setup in depth days before the contest to ensure everything is working right. You can operate with

the integrated N1MM+/WSJTx setup in non-contest mode to do the checking and get familiar with the flow. When there are problems during testing or during the contest, make notes and try to solve the problem soon.

### Efficient QSOs

- **Log Q After Two Rs:** Log a contact after each QSO partner has sent an R (e.g., R, RRR, R+01, RR73, 73).
- **Omit "73":** The "73" message is unnecessary in contesting and lowers the rate. It is superfluous. Use Halt Tx to stop the 73 message from being sent, if necessary. (No other contesting modes expects you to confirm twice. Yes, the ARRL rules still have this in the example exchange, but they need to change this.) Instead of signing "73" you can instead be: calling a second station that answered your CQ, sending a new CQ, or answering another station that called CQ. However, monitor to see if your QSO partner comes back insisting on a "73" or a repeat.
- **Color Coding:** The WSJTx color coding gives you Red (unworked station in a new Grid mults) and Blue (unworked station in a previously worked Grid). WSJTx sometimes takes a little time to get these fully updated, but they are especially useful.

### Rate

- **S&P vs. Run:** There is little practical difference in rate between running and S&P in digital.
- **Lower S/N:** Learn your signal's lower penetration level. Tend to spend your time calling stations above the lower S/N that you find to be productive.
- **Switch:** When the rate drops, switch even/odd, band, and mode (FT4/FT8) to keep the rate higher.
- **Change Frequency:** Watch the "Wide Graph" band scope and, when the waterfall below your frequency begins to fill (i.e., potential QRM), reposition your transmit frequency to a clearer slot. WSJTx will decode multiple overlapping signals but will be more successful with fewer to decode.
- **Keep Transmitting:** Transmit as frequently as possible so other stations see your callsign, in order to increase replies.
- **Tail ending:** Try tail ending another Q. If you have not worked a station finishing a Q, then that station's callsign will be highlighted in WSJTx, so call him.
- **Preload:** While you are waiting for the QSO partner to send their last transmission, click the next CQ (so it will send CQ in the next 7.5 sec. segment), or click on the next chosen QSO partner target's CQ (so it will send an answer in the next 7.5 sec. segment). This will reduce wasted waiting time. Just watch to ensure that the message from the current QSO partner indicates they got the entire exchange fully and confirmed.
- **Regular Bands When Necessary:** You will find most of the FTx contest operators in the contest-prescribed sub-bands. If your rate tanks, you can venture into the regular FT8 bands. However, be aware that casual FT operators don't care that you

are working a contest, and don't know the contest flow or exchanges. You will have to change into non-contest mode to collect the Q. Convert to non-contest mode by unchecking Special Operating Activity box in Settings > Advanced. Call only CQing non-contest stations that gave their Grid during the CQ, otherwise you may never get the necessary grid. These days, many non-contest operators skip sending the Grid during non-contest casual operating, but contest rules require receiving the grid.

- **Grid is King:** Don't reply to a caller that does not give their Grid (in contest or non-contest mode). Part of the art of the FTx contest is to avoid those non-grid callers in the first place.

## **Operating**

- **Mode Considerations:** FT4 is generally better for higher rates, but rates can drop if poor conditions lead to multiple repeats, because FT4 does not have the robust error checking of FT8. FT8 is generally better for completing a QSO between weaker stations or in more difficult conditions. It is useful to cycle between these modes, depending on the situation.
- **Lock Frequency:** Work with your transmit frequency locked (Hold Tx Freq box), to avoid a pileup on the frequency of the CQing station.
- **Dodging QRM:** There may be QRM at the distant stations that you can't see from your side on the waterfall, so adjust your transmit frequency if the rate drops, even if the frequency appears clear.
- **Dupe Vigilance:** Glance to see if a station is a dupe as you are calling, otherwise everyone's time is wasted. Look for this in the N1MM+ window.
- **Logging Vigilance:** Watch, in real time, to see that N1MM+ accurately logged the exchange. Mistakes and omissions can be made, especially with the Grid, and you will need to fill in the missing information in the log in real time or the Q will be lost. You may need to look back in the decode windows to find the station's Grid.
- **Missing Grid:** If you can't find the missing Grid, enter ZZ00. This will not be counted as a completed QSO, but the log checker will not accept the log with a blank Grid space. Don't fill it in after the contest is over, during off times, or from QRZ.COM. Just let it go.
- **Keep Scouting:** While waiting to see if a CQing station replies to you, be looking around the Band Activity list for another potential QSO partner.
- **Enjoy the Ambience:** Turn the transceiver room audio off. It is only annoying. (Maybe listen to some soothing or energetic music in the background.)
- **Split:** Operate Split Transmit.
- **Bands:** Contesting Sub-bands are typically X.080 MHz for FT4 and X.090 for FT8.
- **Focus:** Pay attention to everything going on and make strategic decisions. If you find yourself thinking this is 'like watching paint dry', you could instead be doing more to analyze the situation and plot your next calls.
- **Multitask:** During the times when the computer is doing some of the work, the operator can be doing other things, like scouting out the next QSO partner from the

decode list, checking the N1MM+ tools, and deciding on band/mode/odd-even changes.

- **Make Changes:** An advantage of occasionally cycling between band, mode, or even/odd is that some stations will be operating only on one of these and you can get more Qs.
- **Pre-dup-checking:** If there is a station further back in their QSO, that you want to work, double click their callsign and N1MM+ will tell you if he is a dupe. So that you don't make a transmission, click Halt Tx right away.
- **Watch for Errors:** When you click a station to call, watch the transmission text to make sure WSJTx is calling the station you intended. Sometimes the wrong callsign is put in.
- **Monitor:** If text is not updating each FTx cycle, make sure the Monitor button is lighted.
- **Oops:** If you have been calling a station and another calls you that you decide to answer, WSJTx may continue to call the first station. So, watch the yellow send line to ensure that the second station is being called.
- **Strategy:** In ARRL Digital contest, target DX stations, because the points are allotted by distance. If you can't get them, work the nearer stations to keep the points accruing.
- **Pre-contest Practice:** Work the Thursday night FT4 mini-contest to practice contest operations and check your station.
- **Ethics:** Avoid automated "non-contemporaneous" operation, filling a Grid from QRZ.COM, lookups after the contest, or using ALL.TXT outside the contest or non-contest contacts. We should acquire this information during the contest and exchanges. It is otherwise better to lose the Q.
- **General FTx Operating:** FTx has characteristics that are complementary to other contesting modes. Signals are decoded at very low S/N, so they can provide weak signal advantages at the receiving station, especially for lower ERP transmitting stations. This is an advantage for transmitting stations with limited antennas or power, or for all stations to reach farther DX. The operating environment is consistent, repeated, and visual, so this can be an advantage for operators who benefit from regularity or are hearing impaired. Thus, the method of operating differs from other modes: more regular, non-auditory, more predictable, computerizable, and amenable to SO2R. Also, as with other modes, it takes practice to increase operating efficiency and enjoyment. A great article by ZL2IFB on how to start operating efficiently/effectively/properly in FT-8 is in References.



**References:**

1. Contesting Fun on That Really Other Mode (FT8) (Ed, W0YK)  
[//www.contestuniversity.com/wp-content/uploads/2024/05/Pg-35.-Ed-W0YK-Contesting-Fun-on-That-Really-Other-Mode-FT8.pdf](http://www.contestuniversity.com/wp-content/uploads/2024/05/Pg-35.-Ed-W0YK-Contesting-Fun-on-That-Really-Other-Mode-FT8.pdf)
2. <https://www.ncccsprint.com/ft4ns.html>
3. [rttycontesting.com/tutorials/n1mm/operating-ww-digi-with-n1mm/](http://rttycontesting.com/tutorials/n1mm/operating-ww-digi-with-n1mm/)
4. FT8 Operating Guide Weak signal HF DXing for technophiles (by ZL2IFB) [chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.g4ifb.com/FT8\\_Hinson\\_tips\\_for\\_HF\\_DXers.pdf](https://efaidnbmnnnibpcajpcglclefindmkaj/https://www.g4ifb.com/FT8_Hinson_tips_for_HF_DXers.pdf)
5. <https://n1mmwp.hamdocs.com/manual-windows/wsjt-x-decode-list-window/>

These hints were compiled from presentations, contributions and comments of: Ed W0YK; Ed N1EK; Tim N3QE; Ty K3MM; Mark KB3Z; Sean N3RTW; Tom, K2GO.  
 Please contact for corrections or additions: [edkerns@hotmail.com](mailto:edkerns@hotmail.com)

**DX Marathon Update – Frank W3LPL**

PVRC is competing in the DX Marathon. Please contribute your normal and contest QSOs to our effort - see [dxmarathon.com](http://dxmarathon.com)

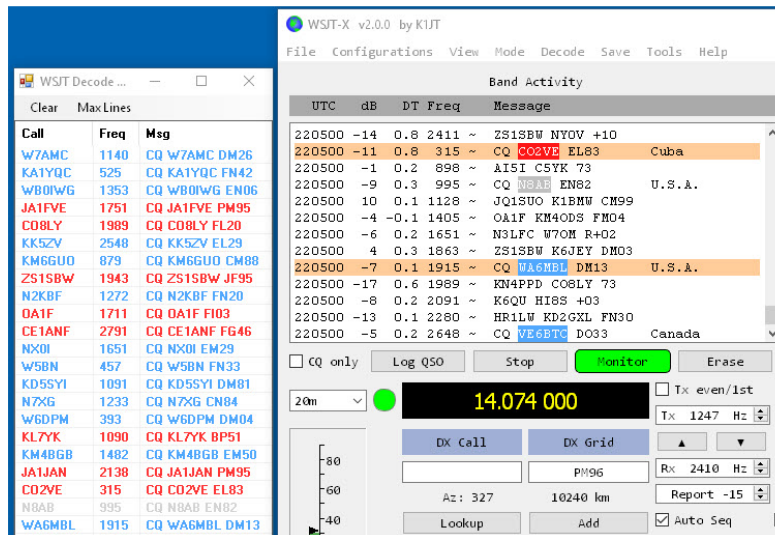
K3RA	275	K3STX	240	WD4ETU	195	N6DW	153
K5EK	274	W3LL	235	N4ZR	194	N4IW	152
W3LPL	273	K3TN	232	N1RM	193	K2EJ	137
K3MM	267	K3WA	227	N3QE	184	W3IDT	133
W4VIC	262	KE4S	223	KB3Z	183	N4CF	128
W3LPL	260	K3AJ	213	N5HC	176	NW3L	113
K1HTV	259	W3ZQI	213	N3RTW	174	WC4J	95
N2QT	255	N3AM	209	KK4ODQ	162		
KM3V	253	N1EK	203	N3ZQI	156		



**PVRC Digital DXCC Standings – Frank W3LPL**

Below are the Digital DXCC totals for PVRC members, transcribed from the ARRL [DXCC data](#) as of the 20<sup>th</sup> 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
K3WC	353	N4DB	317	N3RC	267	K3WI	188
K4FJ	349	K3RA	316	K3JT	265	NR4M	186
W4PK	348	W3KX	316	W8AKS	265	KE4S	186
N2QT	345	K3SX	315	K0GD	261	W3LPL	174
K3SWZ	343	W0YVA	314	W3US	260	N4XYZ	174
W3UR	342	K5VIP	310	N4JQQ	259	K3KY	172
W4DR	341	K1GG	308	K1AR	258	K3PU	171
W3OA	337	KG4W	308	K3TN	253	N6DW	170
W3LL	331	N3MN	305	N3QE	252	KG7H	168
N3NT	330	N4MM	305	N3KN	250	N4GU	163
N4BAA	330	W4VIC	302	W3MR	246	NA1DX	162
K1HTV	327	N4TL	300	W3DF	238	KF7NN	161
K2PLF	327	W2GG	299	K5RT	233	N3AIU	143
K4CIA	327	KA4RRU	295	W3FOX	232	K4HQB	142
K5EK	327	K4WNW	295	N4NW	221	NE3K	120
K3WA	325	W3GG	293	AA4NC	219	K3IXD	114
N3KK	323	W3BW	289	KU1T	210	K4FTO	112
WX4G	323	W3IP	287	WB3AVN	209	N3COB	112
K4SO	320	W2YE	277	W3DM	197	W3MAM	107
K6ND	318	WS6X	274	N3ND	190	N4ZH	100



**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](#)**

**July 2024**

+ RAC Canada Day Contest	0000Z-2359Z, Jul 1
+ Marconi Memorial HF Contest	1400Z, Jul 6 to 1400Z, Jul 7
+ IARU HF World Championship	1200Z, Jul 13 to 1200Z, Jul 14
+ LABRE DX Contest	0000Z, Jul 20 to 2359Z, Jul 21
+ YOTA Contest	1000Z-2159Z, Jul 20
+ North American QSO Party, RTTY	1800Z, Jul 20 to 0559Z, Jul 21
+ CQ Worldwide VHF Contest	1800Z, Jul 20 to 2100Z, Jul 21
+ RSGB IOTA Contest	1200Z, Jul 27 to 1200Z, Jul 28

**August 2024**

+ North American QSO Party, CW	1800Z, Aug 3 to 0600Z, Aug 4
+ WAE DX Contest, CW	0000Z, Aug 10 to 2359Z, Aug 11
+ Maryland-DC QSO Party	1400Z, Aug 10 to 0400Z, Aug 11
+ North American QSO Party, SSB	1800Z, Aug 17 to 0600Z, Aug 18
+ YO DX HF Contest	1200Z, Aug 24 to 1200Z, Aug 25
+ World Wide Digi DX Contest	1200Z, Aug 24 to 1200Z, Aug 25

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

**Editor’s Last Word – John K3TN**

Thanks to N3JT, K3WX, K4ZW, N1EK and W3LPL for contributions to this issue of the PVRC newsletter.

The Newsletter takes the month of August off each year – the next issue will be September. If you have any Field Day photos or stories, send them ‘em in, some have already come in. My wife and I will be bicycling in Wisconsin and I’ll be thinking of Fred K3ZO.

The quality and usefulness of the PVRC newsletter depends on contributions from members. If you have photos from club meetings, screenshots of new contest software, or 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.

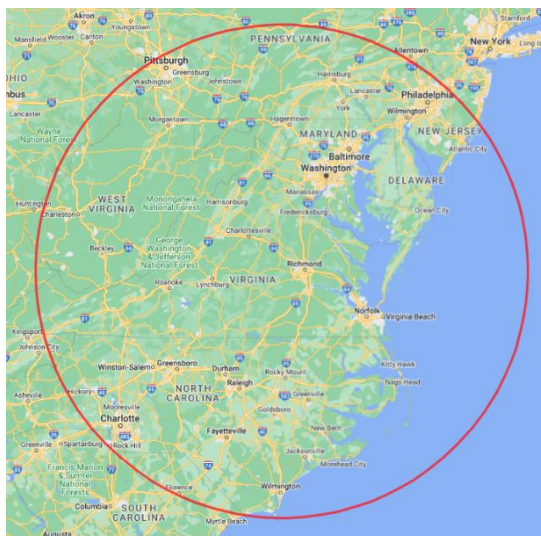
Direct donations to PVRC via Credit Card or PayPal may be made by clicking this "Donate" button and clicking the next Donate button that appears on your screen:



**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!*



**Your source for DX News!**

Get a free two week trial of The Daily DX and The Weekly DX by sending a request to [bernie@dailydx.com](mailto:bernie@dailydx.com).

The Daily DX  
3025 Hobbs Road  
Glenwood, Maryland 21738  
Phone: 410-489-6518



**PVRC QSL Cards**  
by  
**LZ1JZ QSL Print**



## GREEN HERON ENGINEERING LLC

(585) 217-9093  
[www.greenheronengineering.com](http://www.greenheronengineering.com)

---

**RT-21 DIGITAL ROTATOR CONTROLLERS**  
*Unmatched Performance for any Rotator*

**RT-21**



**RT-21D**



**RT-21 AZ/EL**



**Rotator Packages**



**FREE Shipping for PVRC Members**  
At Checkout Enter Coupon Code "PVRC"

**Heavy Duty Custom Mast Clamps**  
-for G-2800 and Orion



**Wi-Fi Option**  
-control your rotator from any web browser device

---

**GH EVERYWARE WIRELESS CONTROLS**

- Internet access for switches and rotators
- Eliminate cables and tethered control boxes
- Create customized on-screen controls
- Great circle maps

---

**GH Everywhere Base and Remote**

- USB and wireless relay controls
- Utilizes your existing antenna switches




---

**Select-8 Wireless Remote Coax Switch**

- Built-in GHE Wireless
- Powered through the coax
- Tower leg Mount
- Amphenol RF connectors








# Summer Ham Radio Fun Begins at DX Engineering!

Having maximum fun with POTA, SOTA, and IOTA, 13 Colonies, and vacation-style DXpeditions starts right here! You'll find our carbon fiber masts, coaxial cable assemblies, the Icom IC-705 and accessories, wire antennas, headsets, Bioenno LiFePO4 batteries, and portable antenna systems like the AlexLoop HamPack. Plus, enjoy superior customer service from our team—active operators who make getting exactly what you need this summer simple, fast, and fun.

## Make the Change to a More Satisfying Ham Radio Purchasing Experience

- Easy ordering by phone or web
- Products from over 170 leading manufacturers
- Friendly customer service from hams with a combined 1,000+ years in amateur radio
- Fastest shipping in the industry
- Responsive and ongoing technical support
- Not 100% happy? We make it right!



### Order by Phone

800-777-0703 Country Code: +1  
9 am to midnight ET, Monday-Friday  
9 am to 5 pm ET, Weekends



### Order Online

[www.DXEngineering.com](http://www.DXEngineering.com)  
Most orders over \$99 ship free  
Request a Free Catalog



### Tech Support

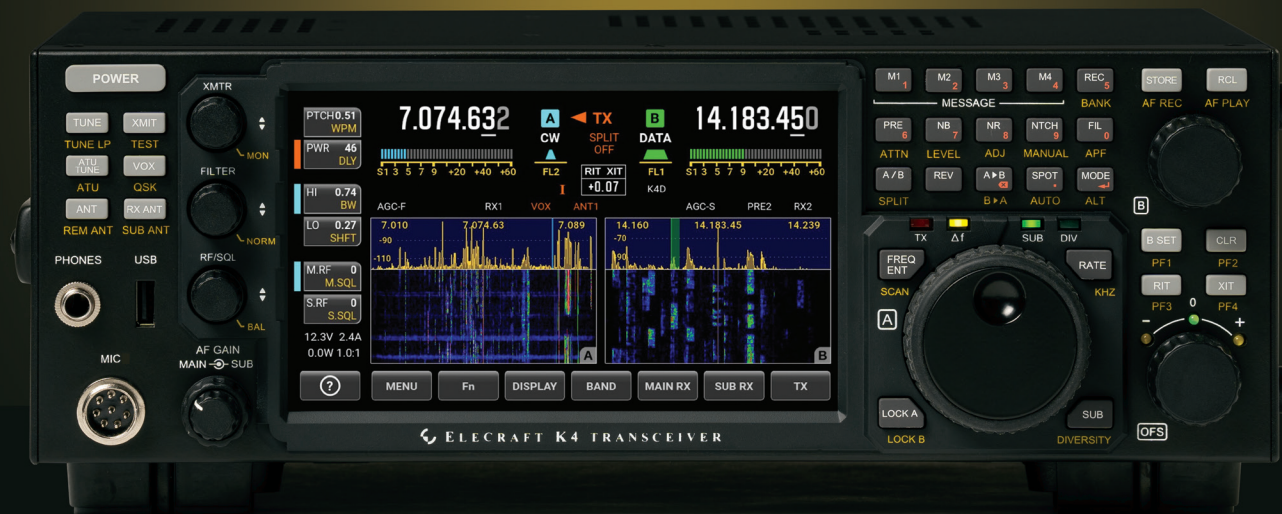
330-572-3200  
[DXEngineering@DXEngineering.com](mailto:DXEngineering@DXEngineering.com)  
9 am to 7 pm ET, Monday-Friday  
9 am to 5 pm ET, Saturday



*OnAllBands.com is dedicated to educating and informing the Amateur Radio community.*

# ELECRAFT K4

## High-Performance Direct-Sampling SDR



### A direct-sampling SDR you'll love to use

Our new K4 transceiver harnesses advanced signal processing while retaining the best aspects of the K3S and P3. It features a 7" touch display, plus a rich set of dedicated controls. Per-VFO transmit metering makes split mode foolproof. Band-stacking registers and per-receiver settings are versatile and intuitive. Control usage information is just one tap away thanks to a built-in help system.

### 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

The main panadapter can be set up as single or dual. Separate from the main panadapter is our per-receiver *mini-pan* tuning aid, with a resampled bandwidth as narrow as +/- 1 kHz. You can turn it on by tapping either receiver's S-meter or by tapping on a signal of interest, then easily auto-spot or fine tune to the signal.

### 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

Modular, upgradeable design

7" color screen with touch and mouse control

ATU with 10:1+ range, 3 antenna jacks

Up to 5 receive antenna sources

Full remote control via Ethernet



The K4 interfaces seamlessly with the KPA500 and KPA1500 amplifiers

*'The performance of their products is only eclipsed by their service and support. Truly amazing!'* Joe - W1GO

# ELECRAFT®

For complete features and specifications visit [elecraft.com](http://elecraft.com) • 831-763-4211

# HAM RADIO OUTLET®

WWW.HAMRADIO.COM

**\*Free Shipping and Fast Delivery!**



### FTDX101MP | 200W HF/50MHz Transceiver

- Hybrid SDR Configuration • Unparalleled 70 dB Max. Attenuation VC-Tune • New Generation Scope Display 3DSS • ABI (Active Band Indicator) & MPVD (Multi-Purpose VFO Outer Dial) • PC Remote Control Software to Expand the Operating Range • Includes External Power With Matching Front Speaker



### FTDX10 | HF/50MHz 100 W SDR Transceiver

- Narrow Band and Direct Sampling SDR • Down Conversion, 9MHz IF Roofing Filters Produce Excellent Shape Factor • 5" Full-Color Touch Panel w/3D Spectrum Stream • High Speed Auto Antenna Tuner • Microphone Amplifier w/3-Stage Parametric Equalizer • Remote Operation w/optional LAN Unit (SCU-LAN10)



### FT-991A | HF/VHF/UHF All Mode Transceiver

Real-time Spectrum Scope with Automatic Scope Control • Multi-color waterfall display • State of the art 32-bit Digital Signal Processing System • 3kHz Roofing Filter for enhanced performance • 3.5 Inch Full Color TFT USB Capable • Internal Automatic Antenna Tuner • High Accuracy TCXO



### FTDX101D | HF + 6M Transceiver

- Narrow Band SDR & Direct Sampling SDR • Crystal Roofing Filters Phenomenal Multi-Signal Receiving Characteristics • Unparalleled - 70dB Maximum Attenuation VC-Tune • 15 Separate (HAM 10 + GEN 5) Powerful Band Pass Filters • New Generation Scope Displays 3-Dimensional Spectrum Stream



### FT-710 Aess | HF/50MHz 100W SDR Transceiver

- Unmatched SDR Receiving Performance • Band Pass Filters Dedicated for the Amateur Bands • High Res 4.3-inch TFT Color Touch Display • AESS: Acoustic Enhanced Speaker System with SP-40 For High-Fidelity Audio • Built-in High Speed Auto Antenna Tuner



### FT-891 | HF+50 MHz All Mode Mobile Transceiver

Stable 100 Watt Output • 32-Bit IF DSP • Large Dot Matrix LCD Display with Quick Spectrum Scope • USB Port Allows Connection to a PC with a Single Cable • CAT Control, PTT/RTTY Control



### FTM-300DR | C4FM/FM 144/430MHz Dual Band

- 50W Output Power • Real Dual Band Operation • Full Color TFT Display • Band Scope • Built-in Bluetooth • WIRES-X Portable Digital Node/Fixed Node with HRI-200



### FT-2980R | Heavy-Duty 80W 2M FM Transceiver

- 80 watts of RF power • Large 6 digit backlit LCD display for excellent visibility • 200 memory channels for serious users



### FTM-200DR | C4FM/FM 144/430MHz Dual Band

- 1200/9600bps APRS® Data Communications • 2" High-Res Full-Color TFT Display • High-Speed Band Scope • Advanced C4FM Digital Mode • Voice Recording Function for TX/RX



### FTM-500DR | C4FM/FM 144/430MHz Dual Band Xcvr

- Front Firing Acoustically Enhanced Speaker System • True Dual Band Operation, C4FM/C4FM Digital D-D Dual Receive • 2.4" High-Resolution Full-Color Touch Panel Display • Built-in High Precision GPS Receiver • Wireless Operation Capability with Optional Bluetooth® Headset

### FT-70DR C4FM/FM 144/430MHz Xcvr

- System Fusion Compatible • Large Front Speaker delivers 700 mW of Loud Audio Output • Automatic Mode Select detects C4FM or Fm Analog and Switches Accordingly • Huge 1,105 Channel Memory Capacity • External DC Jack for DC Supply and Battery Charging



### FT-5DR C4FM/FM 144/430 MHz Dual Band

- High-Res Full-Color Touch Screen TFT LCD Display • Easy Hands-Free Operation w/Built-In Bluetooth® Unit • Built-In High Precision GPS Antenna • 1200/9600bps APRS Data Communications • Supports Simultaneous C4FM Digital • Micro SD Card Slot



### FT-65R | 144/430 MHz Transceiver

Compact Commercial Grade Rugged Design • Large Front Speaker Delivers 1W of Powerful Clear Audio • 5 Watts of Reliable RF Power Within a compact Body • 3.5-Hour Rapid Charger Included • Large White LED Flashlight, Alarm and Quick Home Channel Access



### FTM-600R | 50W VHF/UHF Mobile Transceiver

- All New User Operating Interface-E20-III (Easy to Operate-III) • Robust Speaker Delivers 3W of Clear, Crisp Receive Audio • Detachable Front Panel Can Be Mounted in Multiple Positions • Supports Optional Bluetooth® Wireless Operation Using the SSM-BT10 or a Commercially Available Bluetooth® Headset



- RETAIL LOCATIONS – Store hours 10:00AM - 5:30PM - Closed Sunday
- PHONE – Toll-free phone hours 9:30AM - 5:30PM
- ONLINE – WWW.HAMRADIO.COM
- FAX – All store locations
- MAIL – All store locations

**YAESU**  
The radio

ANAHEIM, CA  
(800) 854-6046

PORTLAND, OR  
(800) 765-4267

PHOENIX, AZ  
(800) 559-7388

MILWAUKEE, WI  
(800) 558-0411

WOODBIDGE, VA  
(800) 444-4799

WINTER SPRINGS, FL  
(800) 327-1917

SACRAMENTO, CA  
(877) 892-1745

DENVER, CO  
(800) 444-9476

PLANO, TX  
(877) 455-8750

NEW CASTLE, DE  
(800) 644-4476

SALEM, NH  
(800) 444-0047

ATLANTA, GA  
(800) 444-7927

\*On most orders over \$100 in the continental US. (Rural locations excluded.) Contact HRO for promotion details. Toll-free including Hawaii, Alaska and Canada. All HRO 800-lines can assist you. If the first line you call is busy, you may call another. Prices, specifications and descriptions subject to change without notice.