



# *PVRC Newsletter*

## *February*

**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 – Mike N4GU**

At the end of January, winter has arrived with a vengeance, even down here in North Carolina. This is a great time for radio while it's too cold to spend much time outdoors. We can huddle up in front the dial or screen and do what we enjoy.

Although we are into a new year, we still have an old nemesis lingering around – Covid. By this point, we've all been affected or know someone who has. The new Omicron wave doesn't seem to be quite as deadly but is twice as contagious as previous variants. Official PVRC policy remains that chapter meeting format, i.e., in person or virtual, are the decision of individual chapters. A few chapters have begun to return to in person meetings, which I'm sure we all wish we could do. But the Covid situation remains in flux and so all chapters and members are encouraged to do what they feel is safe and comfortable. The club will continue to provide the GoToMeeting service for chapter use to conduct online meetings. Likewise, online meetings will continue to count for membership for the time being. Stay safe.

2022 is the 75th anniversary of the founding of the Potomac Valley Radio Club. This is an amazing landmark for the club. What is even more amazing is that we still have active members who have experienced more than 50 of those years. PVRC has a tremendous depth of knowledge and experience in the art of radio and contesting. While we will be celebrating that history throughout this year, we should also be looking toward the future. A lot of us hope to be around for the 100th anniversary.

But not all of us have 20, 30, 40, or more years of ham radio and contesting experience under our belts. We have newer members who have discovered the love of our common obsession relatively lately, either in absolute or relative terms. One of the benefits of PVRC membership is getting to soak up some of that knowledge from fellow members. That was a large part of the in-person meetings where the side discussions were often more informative than the main discussions.

We need to help and encourage newer members to help them on their contesting path. Likewise, some of our newer members are often more conversant on the new modes and technologies than the more experienced of us. We need to learn from them as well. I want to find ways for us to share information and educate each other more effectively. This newsletter is a great resource, but we need articles, so consider writing one. The

club reflector is another resource, but not necessarily the best for intricate subjects. I would like to hear from members with ideas of topics as well as techniques where me might be able to learn and teach each other. One opportunity is the upcoming Galactic Event on February 5. Join us and have fun and learn something at the same time.

**Consider Contributing to the PVRC Scholarship Fund – Frank W3LPL**

PVRC members have been exceptionally generous during 2021, allowing PVRC to sponsor two \$2000 scholarships this year that will be awarded in approximately May 2022

New contributions may allow us to further expand our PVRC scholarships. Contributions of any size are welcome and are fully deductible to the full extent of the law

To contribute:

Print this [form](#). Complete the form, **specifying "PVRC Scholarship" as the scholarship name.**

Mail it with your contribution to:

ARRL Foundation  
225 Main St  
Newington CT 06111

All contributions are anonymous and known only to PVRC's Scholarship Administrator (me). I never reveal the identity of our donors or the amount of their contributions. No PVRC member or officer is ever involved in any aspect of handling scholarship funds.

Thank you for your generosity

<b><u>PVRC Officers:</u></b>		<b><u>Trustees:</u></b>	
President:	N4GU    Mike Barts	K3MM, N3OC, K2AV, K7SV, W3LPL, N3KN, W2RU, W3LL, N4RA	
Vice President:	K3WA    Bill Axelrod	<b><u>PVRC Charter Members (all SK):</u></b>	
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 PVRC on Facebook: <https://www.facebook.com/groups/PotomacValleyRadioClub/>

Another Win for PVRC - Tennessee QSO Party 2021


## Tennessee QSO Party 2021


### #1 Out-of-state Club

# Potomac Valley RC




## 162,233 points





*Mike Murray* W0AG  
*Doug Smith* W9WI  
Contest Managers



PVRCers contributing scores (per 3830scores): K3TN, W4UX, K4ORD, K4GM, N4NTO, WX4G, W3LL, N3KN, K1BZ, WA3FAE, W3MAM, KK4ADQ,

<b>Out-of-state clubs</b>	
<b>Club</b>	<b>Score</b>
Potomac Valley RC†	162,233
Society of Midwest Contesters	109,146
Minnesota Wireless Assn.	96,572
South East Contest Club	90,777
Yankee Clipper Contest Club	84,201

## Two Years of Upgrades at My Station – Nick KK4ODQ

Some of the club members may know me and many of you will not. (See [January's PVRCA Newsletter](#) for Nick's Meet the PVRCAer info – K3TN) But for this month's newsletter I thought I would write about my station and how I have done some big upgrades to it over the course of the last two years.

I got licensed in February of 2013. My father and I took a licensing class through the scouts. I think it was a 8 week class that met once a week and then at the end of the class you sat for the test and got your license. My first station was nothing fancy or exciting, but it seemed to work very well. It was a Icom 726 and a 10M dipole up at about 15 feet

After a few months I sat for my general test. So, after passing that I added a 40M leg to the 10M dipole. It worked well for what it was. Then I wanted something that would perform better. I upgraded to a W8AMZ G5RV which allowed me to really work the DX. That antenna was a great performer for me and did extremely well. A few years later I installed a K4KIO hexbeam on a Rohn push up pole with a Radio Shack rotor on the top. When I upgraded to the hexbeam that **really** opened up the bands to me. Plus it gave me some directivity, since essentially a two element beam on 20-6M.

I was less than impressed with the Rohn push up pole since it was extremely hard to take up and down for maintenance. In April of last year, I bought a AB-577 from Fred W3ICM. That made my whole tower situation much easier, and I like the simplicity of the system. When I started this whole radio thing almost 10 years ago now I never that my station would be where it is today. Attached are pictures of my current station and below each picture will be a little explanation of what it is.



This is my power supply shelf and where all my power strips are. The power supplies are a Astron RS-7A, Astron RS-20A and a Astron RS-35A. The RS-7A I use to power the Palstar HF-Auto Tuner. The RS-20A powers the Icom 5100A. The RS-35A I use to power the Icom 7600



This is the extension cord I use to power my amplifier. I don't have a 220V outlet in the shack. So, I use this extension cord to plug into the dryer socket. I got that short extension cord on Amazon.



Here is the Acom 2000. It is a very nice amp. I got the amp in March of last year and I haven't had any issues with it. Puts out a lot of power with ease. I have the external fan kit attached to the amp. Much easier to use compared to my previous amp which was a Kenwood TL-922A.



Here is my K4KIO hexbeam on the AB-577 mast. Hard to see in the picture but that is 6 tubes up in the air. Right below the hexbeam is a Yaesu G-450A rotor with premade DX Engineering coax and rotor cable. The antenna is up at 40ish feet and seems to do very well.



Here is the DXE RR8HP antenna switch box. I got this antenna switch about 3 years ago now. It has been trouble-free for me. You can connect 8 coaxes to it. Then one coax comes into the shack. The gray cable is the control cable to switch the antennas from the shack. All of the coax here is a mix of RG-213 and LMR 400.



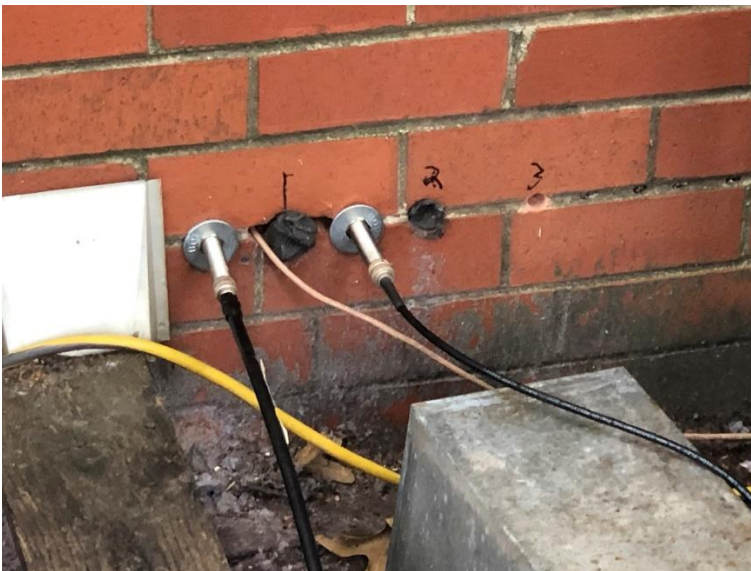
Here is the base of the AB-577. It is staked into the ground with the supplied stakes then gravel below it.



Here is the AB-577 and the elevator with the cage in for necessary support.



Here is one of the guys for the AB-577. I went with duck bill anchors in the ground per K3AJ's recommendation. They seem to be holding up well. Attached to that is a turnbuckle and thimble.

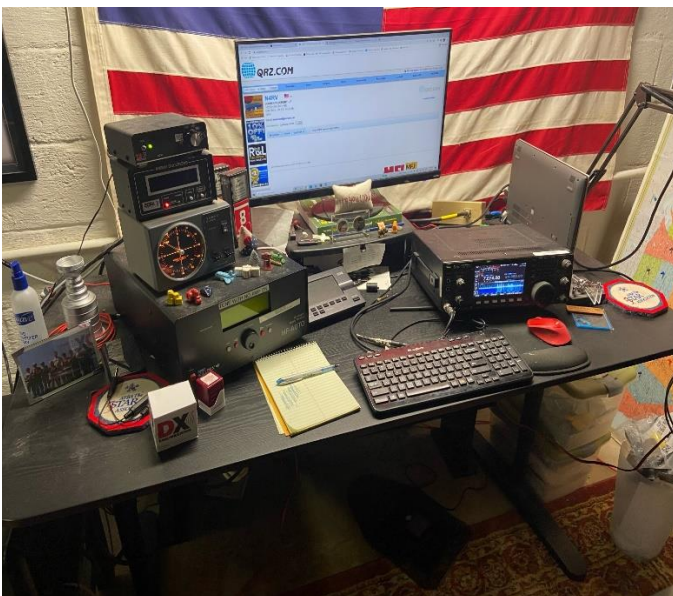


Here is how my coax comes into the shack. I used 14-inch barrel connectors from Joel at the RF Connection. They have been installed for five years now and I have had no issues. Then I used fender washers so the barrel connectors sit flush up against the house.





First thing in the stack is a Palstar HF-auto tuner. I only use that to get up into the phone portion of 80M. I got that July of last year and have not had issues with it. The next piece of equipment is the Rotor controller. It seems to work very well. Then the next piece of equipment is the Array Solutions power master. I really like these meters - they are great and super accurate. Then there is the DXE EC-8. That is how I switch my antennas from the shack.



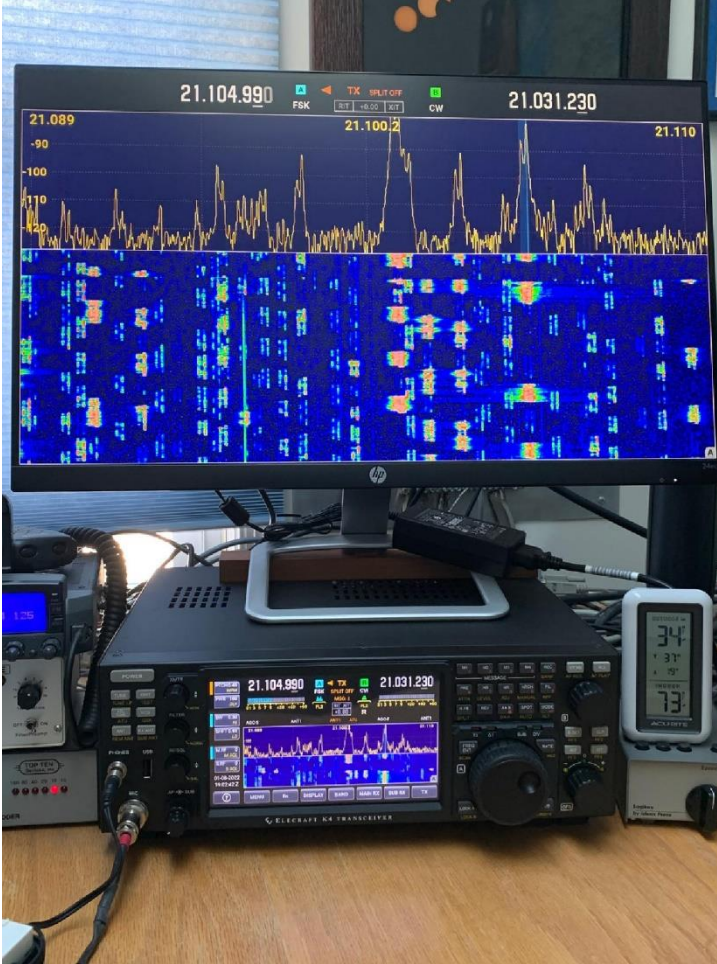
Here is a above shot of the operating position. My antennas are the hexbeam, a 30M dipole at 60 feet, a 80M dipole at 70 feet, a 40M dipole at 60 feet and a 160L at 90 feet with 800 feet of radials below it.



Here is my microphone it is a Heil PR40 that seems to work very well. I always seem to get good audio reports with it.

**PVRCers Begin to Receive Elecraft K4s**

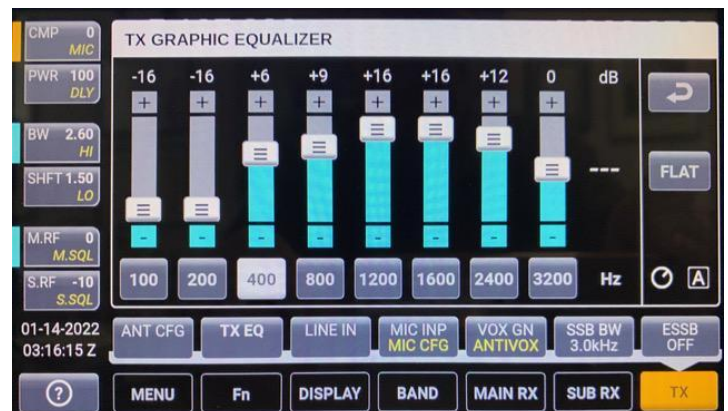
John N3AM received his Elecraft K4D, first ordered at Dayton 2019, and sent in some photos:



Here's a shot of the K4D with external monitor during the ARRL RTTY Roundup. I had set up RTTY on my K3, and the K4 worked with RTTY with no changes needed. The K4 comes with connectors that are compatible with those used on the K3, but also has more sophisticated connectivity via USB. I have not yet taken advantage of that, but plan to in the future.

Firmware updates with additional features are via Ethernet connection. The K4 touch screen is particularly handy, allowing you to touch a signal on the band for instant QSY. The frequency scrolling steps via the VFO tuning knob is determined by the underlined digit on screen and is selectable from 1 Hz to 100 kHz. CW bandpass RX filters can be dialed down to 50Hz without ringing.

Here's the TX SSB equalizer screen, easily adjusted and evaluated with the K4 monitor audio. In this image, the 400 Hz band has been selected and can be adjusted via the VFO A knob, or tapping the + and - keys, or by dragging the on-screen slider. The RX equalizer works the same way.



## PVRC Antennas in the Winter Wonderland



**John K4HQK:** It was so wet that it clung to my wires and 6m Yagi like glue. By the time the snow had stopped I had a core about 3" in diameter around my 40m and 30m dipoles. I had never seen snow do that before.

This is a limb-cluttered shot of my 6m Yagi, also covered in snow.

**Mike AC8Y:** My son (KM4OQO) took some pictures in the snow yesterday. This image shows the dipole antenna drooping down to near ground level and you can just make out the Christmas star still atop the tower



**Mark - K4SO** Here is my meager stack snow and ice covered, yesterday afternoon when the clouds broke up. Rotator kept rotating.

Tri-bander with 30m kit all okay. 6m LFA iced up beyond the antenna tuner range in my KPA1500, unusable 2m 15 el. K1FO, high SWR, unusable 432 19 el. K1FO, high SWR, unusable

14F overnight didn't help. Now 34 at time of this email, VHF/UHF still iced up and unusable.



**Bill WF1L** – my antennas in the snow in Dover, DE



**Mike W3IP:** View of my frozen ring rotor from above this morning. Expecting a slight warming then a refreeze tonight

**Mike W4RN:** Tower 3 at W4RN (VA) as 2022's first snow/ice storm hits.

(2 el 40M yagi @ 30M over two-stack of 5 el 10M mono yagis. In the far distance is 15M tower.

SWR off the charts!

Happy Winter!





**John K3TN:** Here is my snow covered 6M 4 el “death ray” on a Rohn pole with eave bracket a whopping 2 feet above our screened porch. It is “Armstrong” rotated, I leave it pointed SW, as when pointed to EU it sees through our brick house and I actually do better to EU loading up my 135’ OCF dipole at 45’.

**John N3AM:** No antennas, but Brookside Gardens and nearby Pine Lake are 2 miles from our house, and I wanted to see the snow on the trees before it all melted.



**PVRC DXCC Challenge Standings – Frank W3LPL**

Below are the DXCC Challenge 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
W4DR	3191	WS6X	2493	W0YVA	2001	N3AIU	1461
W3UR	3156	K1GG	2474	K5RJ	1961	N3MK	1457
W3LPL	3147	W2GG	2436	N3KS	1906	W8AKS	1432
K4CIA	3124	K5VIP	2431	K4EU	1871	K3WC	1430
N2QT	3093	N4TL	2406	N3ND	1867	N3HBX	1428
W4PK	3038	W4VIC	2403	K3SX	1836	N8II	1390
N4MM	2987	N4GG	2389	W3FOX	1816	W4PRO	1377
W3DF	2963	W3OA	2344	W3KB	1815	KF7NN	1377
WX4G	2949	W2YE	2334	W3DM	1791	W9GE	1364
K1HTV	2936	WA2BCK	2316	K3AJ	1783	AK3E	1348
K5EK	2928	K1ZZI	2314	KE4S	1758	WA3EKL	1340
N3NT	2907	N3RC	2302	W2CDO	1742	KM3V	1319
K2PLF	2903	W3YY	2297	N4GU	1738	ND3F	1319
W0VTT	2895	W2GPS	2255	N4XYZ	1720	N1SZ	1317
KG7H	2892	KA4RRU	2234	W4GP	1710	NR4M	1317
K4SO	2873	K3TN	2223	K4QE	1685	K4ZA	1313
K1AR	2869	NW4V	2219	NE3H	1668	KG4USN	1292
W3LL	2859	K4FJ	2214	K3WI	1652	W3US	1222
N4DB	2850	N4ZH	2188	W3UL	1637	N3RR	1199
W3KX	2834	K1EFI	2186	N3OC	1608	W3NRJ	1188
K3WA	2811	K2BA	2153	K3KY	1606	K3IXD	1090
KG4W	2795	N3QE	2147	KE3X	1588	NE3K	1073
AB3CV	2744	W3MR	2128	K3STX	1579	N3COB	1049
N3MN	2657	W3TN	2125	NA1DX	1564	W4ZV	1047
WB3AVN	2655	N4JQQ	2121	WB4DNL	1553	W3OU	1046
W4FQT	2622	K3PU	2107	N3AO	1527	K4ZW	1038
N3KK	2575	W3GG	2071	WB2ZAB	1522	K4VX	1021
W3BW	2550	N4NW	2068	AA4FU	1519	K1RH	1000
K5RT	2548	AA4NC	2061	K4HQB	1518		
K3JT	2495	N3KN	2006	KU1T	1501		
N4QQ	2494	K4WNW	2004	N4ZR	1491		



**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](#)**

**February 2022**

+ North American Sprint, CW	2300Z, Feb 5 to 0300Z, Feb 6
+ CQ WW RTTY WPX Contest	0000Z, Feb 12 to 2359Z, Feb 13
+ Dutch PACC Contest	1200Z, Feb 12 to 1200Z, Feb 13
+ ARRL Inter. DX Contest, CW	0000Z, Feb 19 to 2400Z, Feb 20
+ CQ 160-Meter Contest, SSB	2200Z, Feb 25 to 2200Z, Feb 27
+ REF Contest, SSB	0600Z, Feb 26 to 1800Z, Feb 27
+ UBA DX Contest, CW	1300Z, Feb 26 to 1300Z, Feb 27
+ North American QSO Party, RTTY	1800Z, Feb 26 to 0559Z, Feb 27

**Editor’s Last Word – John K3TN**

Thanks to Nick KK4ODQ, John N3AM, John K4HQQ, Mike AC8Y, Mark K4SO, Bill WF1L, Mike W3IP, Mike W4RN and Frank W3LPL for contributions to this issue of the PVRC newsletter.

We welcome a new advertiser with this issue – Elecraft. 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 [jpscator@aol.com](mailto:jpscator@aol.com).

**Support Our Newsletter Advertisers!**

The advertisement block contains six logos. At the top left is 'HAM RADIO OUTLET' in white text on a blue background. To its right is 'DX ENGINEERING' in red and black text with a radio wave icon. Further right is 'The Daily DX' logo featuring a sun and mountains. Below these is the 'ELECRAFT' logo with a stylized 'E' symbol. At the bottom left is 'GREEN HERON ENGINEERING LLC' with a heron icon. At the bottom right is 'QSL CARDS By LZ1JZ' in white text on a blue background.



### 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.

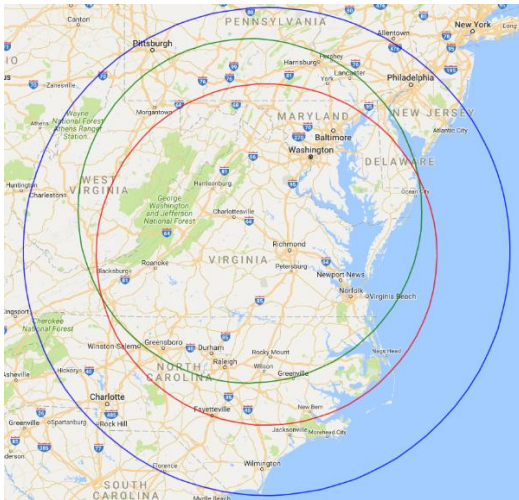
Direct donations to PVRC via Credit Card or PayPal may be made by clicking this "Donate" button and clicking the next Donate button that appears on your screen:



**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](#).



**Green: ARRL VHF Circle**  
175 mile radius  
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78.171W

**Red: ARRL HF Circle**  
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77.858482W

**Blue: CQ HF Circle**  
250 mile radius  
Around 37.43168N,  
77.858482W



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*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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Our in-house team of hams designs and engineers DX Engineering branded equipment, from vertical antennas to advanced design thrust bearings, baluns to receive antenna phasing systems, radial plates to coax connectors. DX Engineering also produces Butternut vertical antennas, Clifton Laboratories products, TransWorld portable HF antennas, Comtek gear, and trusted equipment from Top Ten Devices—all backed by the best support staff in the industry. Enter "DXE" at [DXEngineering.com](http://DXEngineering.com).



### Noise Cancellation and Audio Enhancement Products

By harnessing cutting-edge digital signal processing technology, bhi noise cancellation and audio enhancement products make it easier for you to discern weak audio signals and increase your radio listening enjoyment. Choose from DSP and extension speakers, DSP devices, and the ParaPro EQ20 Parametric Equalizer, which allows you to adjust any part of the frequency range to customize receive audio to suit your own hearing. Enter "bhi" at [DXEngineering.com](http://DXEngineering.com).

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Best Ham Products



BHD-EQ20

### Loop Antennas

DX Engineering carries HOA-friendly Loop Antennas by I3VHF, manufactured by Italy's Ciro Mazzoni. The 78" diameter MIDI Loop covers 80 to 20 meters. The popular 39.8" diameter BABY Loop and the Stealth Loop are great for working 40 to 10 meters when you have limited space. The Stealth Loop features a typical SWR of 1.3:1 and measures 54" x 19.6" x 10.2", making it easy to hide. All three antennas include the ATU 2.0 Automatic Tuning Unit. Enter "MZZ" at [DXEngineering.com](http://DXEngineering.com).

Ciro Mazzoni  
Radiocomunicazioni



### EAntenna and WiMo Products

EAntenna is well known for its lineup of rugged HF and VHF antennas, including Yagi, log periodic, rotatable dipole, and vertical models. These antennas combine cutting-edge computer modeling optimization with robust mechanical and electrical designs to deliver high performance at a budget-friendly price. EAntenna products are now manufactured by WiMo, Germany's largest Amateur Radio supplier. WiMo also manufactures more than 50 models of lightweight pre-assembled Kelemen trap dipole antennas with installed baluns available at DX Engineering. Also check out WiMo's APRS modules, QRM Eliminator, and other gear. Enter "EAntenna," "Kelemen," or "WiMo" at [DXEngineering.com](http://DXEngineering.com).

**WiMo**



### OptiBeam Antennas

Proven in stations around the globe, OptiBeam's German-engineered, handcrafted directional monoband and multiband Yagi and log cell Yagi antennas deliver the highest possible gain, cleanest radiation patterns, optimum band coverage, and power handling without compromise. Many popular models are in stock and ready for fast shipment. Enter "OptiBeam" at [DXEngineering.com](http://DXEngineering.com).



### InnovAntennas

DX Engineering is pleased to be the exclusive North American dealer for finely crafted Yagis, rotatable dipoles, and HF log periodic dipole arrays from InnovAntennas, each one the result of extensive testing and modeling to ensure stellar performance. Antennas are built with top-grade materials, including aircraft aluminum booms and elements, UV-resistant insulators, and stainless steel hardware. InnovAntennas' DXR antennas feature low maintenance; sturdy construction in a manageable size; no hairpins, traps, or matching links; and only one feedline for all bands. Enter "InnovAntennas" at [DXEngineering.com](http://DXEngineering.com).



### HF, VHF, and UHF Amplifiers

For more than 40 years, RM Italy has made versatile and compact amplifiers for base, mobile, and handheld radios. The company's high standards can be seen in everything it produces, from the 300W output BLA350 Plus HF Linear Amplifiers to models (LA-144/145) for maximizing the reach of your HTs. Enter "RM Italy" at [DXEngineering.com](http://DXEngineering.com).

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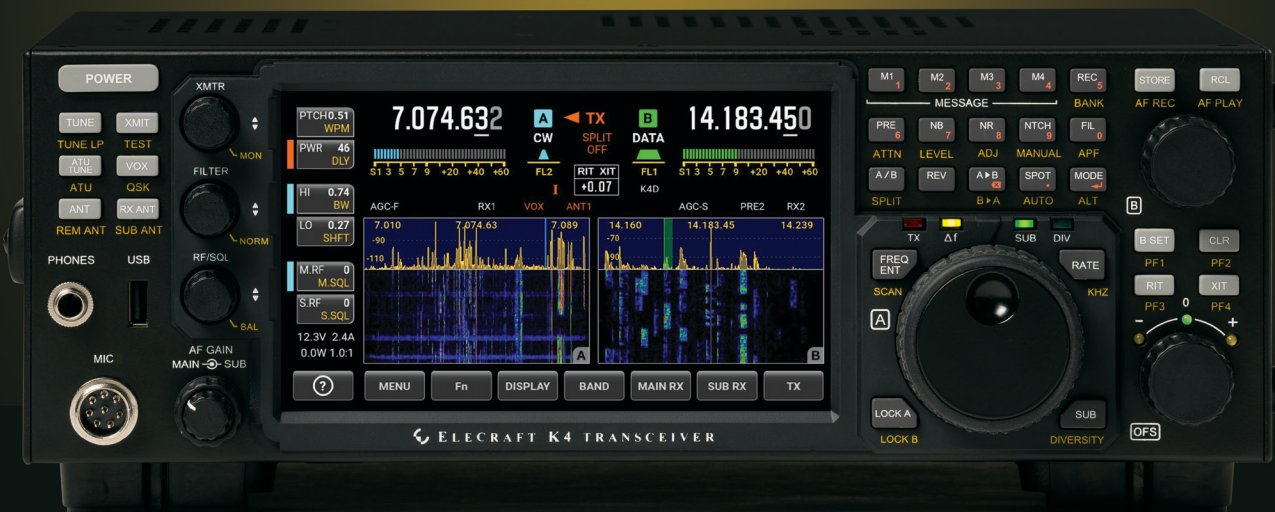
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Email Support 24/7/365 at [DXEngineering@DXEngineering.com](mailto:DXEngineering@DXEngineering.com)

# 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

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

- Rugged Construction in an Ultra Compact Body • Stable 100 Watt Output with Efficient Dual Internal Fans • 32-Bit IF DSP Provides Effective and Optimized QRM Rejection • 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 Reliable Output Power • Real Dual Band Operation (V+V, U+U, V+U, U+V) • 2-inch High-Res Full Color TFT Display • Band Scope • Built-in Bluetooth • WIRELESS-X Portable Digital Node/Fixed Node with HRI-200



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

- Massive heatsink guarantees 80 watts of solid RF power • Loud 3 watts of audio output for noisy environments • Large 6 digit backlit LCD display for excellent visibility • 200 memory channels for serious users



### FT-818ND | HF/6M/2M/440 All Mode Portable Xcvr

- Ultra-Compact/Portable • Multi-Color Easy to See LCD • 208 Memory Channels/10 Memory Groups • Built-in Electronic Keyer • Internal Battery Operation Capability • Two Antenna Connectors • Built-in High Stability Oscillator ±0.5 ppm



### FTM-400XD | 2M/440 Mobile

- Color display-green, blue, orange, purple, gray • GPS/APRS • Packet 1200/9600 bd ready • Spectrum scope • Bluetooth • MicroSD slot • 500 memory per band

### 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-6000R | 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



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### IC-9700 | All Mode Tri-Band Transceiver

- VHF/UHF/1.2GHz • Direct Sampling Now Enters the VHF/UHF Arena • 4.3" Touch Screen Color TFT LCD • Real-Time, High-Speed Spectrum Scope & Waterfall Display • Smooth Satellite Operation



### IC-718 | HF Transceiver

- 160-10M\*\* • 100W • 12V operation • Simple to use • CW Keyer Built-in • One touch band switching • Direct frequency input • VOX Built-in • Band stacking register • IF shift • 101 memories



### ID-4100A | VHF/UHF Dual Band Digital Xcvr

- Compact, Detachable Controller for Flexible Installation • DV/FM Near Repeater Search Function • Apps for iOS™ and Android™ devices • Wireless Operation with VS-3 & UT-137 Bluetooth® Headset & Module • MicroSD Card Slot



### IC-7851 | HF/50MHz Transceiver

- 1.2kHz "Optimum" roofing filter • New local oscillator design • Improved phase noise • Improved spectrum scope • Dual scope function • Enhanced mouse operation for spectrum scope



### IC-705 | HF/50/144/430 MHz All Mode Transceiver

- RF Direct Sampling • Real-Time Spectrum Scope and Waterfall Display • Large Color Touch Screen • Supports QRP/QRPP • Bluetooth® and Wireless LAN Built-in



### IC-2300H | VHF FM Transceiver

- 65W RF Output Power • 4.5W Audio Output • MIL-STD 810 G Specifications • 207 alphanumeric Memory Channels • Built-in CTCSS/DTCS Encode/Decode • DMS



### IC-7300 | HF/50MHz Transceiver

- RF Direct Sampling System • New "IP+" Function • Class Leading RMDR and Phase Noise Characteristics • 15 Discrete Band-Pass Filters • Built-In Automatic Antenna Tuner



### IC-7100 | All Mode Transceiver

- HF/50/144/430/440 MHz Multi-band, Multi-mode, IF DSP • D-STAR DV Mode (Digital Voice + Data) • Intuitive Touch Screen Interface • Built-in RTTY Functions

### IC-V86 | VHF 7W HT

- 7W Output Power Plus New Antenna Provides 1.5 Times More Coverage • More Audio, 1500 mW Audio Output • IP54 & MIL-STD 810G—Rugged Design Against Dust & Water • 19 Hours of Long Lasting Battery Life • 200 Memory Channels, 1 Call Channel & 6 Scan Edges



### IC-7610 | HF/50 MHz All Mode Transceiver

- Large 7-inch color display with high resolution real-time spectrum scope and waterfall • Independent direct sampling receivers capable of receiving two bands/two modes simultaneously



### IC-2730A | VHF/UHF Dual Band Transceiver

- VHF/VHF, UHF/UHF simultaneous receive • 50 watts of output on VHF and UHF • Optional VS-3 Bluetooth® headset • Easy-to-See large white backlight LCD • Controller attachment to the main Unit



### IC-R30 | Digital/Analog Wideband Xcvr

- 100 kHz to 3.3 GHz Super Wideband Coverage • P25 (Phase 1), NXDN™, dPMRTM, D-STAR Mode • 2.3" Large LCD Display & Intuitive User Interface • MicroSD Card Slot for Voice & Data Storage • USB Charging & PC Connection



### IC-R8600 | Wideband SDR Receiver

- 10 kHz to 3 GHz Super Wideband Coverage • Real-time Spectrum Scope w/Waterfall Function • Remote Control Function through IP Network or USB Cable • Decodes Digital Incl P25, NXDN™, D-STAR • SD Card Slot for Receiver Recorder



### ID-5100A Deluxe VHF/UHF Dual Band Digital Transceiver

- Analog FM/D-Star DV Mode • SD Card Slot for Voice & Data Storage • 50W Output on VHF/UHF Bands • Integrated GPS Receiver • AM Airband Dualwatch

### ID-52A | VHF/UHF D-STAR Portable

- Bluetooth® Communication • Simultaneous Reception in V/V, U/U, V/U and DV/DV • Enriched D-STAR® Features Including the Terminal Mode/Access Point Mode • UHF (225~374.995MHz) Air Band Reception



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