



PVRC Newsletter

July 2021

Newsletter Editor: John K3TN 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 – Dan K2YWE

Another Contester's Start

There are several paths a beginning contester may take dictated by inclination, circumstances, and the opportunities presented to them. A common route is to start with a modest home station and build both one's skills and station together over time. The process is accelerated and kept productively on track by having expert advice and guidance along the way. One of the strengths of PVRC is a willingness of the membership to share information and experience to foster such development. We saw the story of Bryan, N3FZ, in last month's Newsletter. Here is another example of how well the process works when it is coupled with a desire for continuous improvement.

Dave W3MAM was licensed in mid-2019 and began his radiosport life with PVRC less than a year later. He started in a severely constrained condo environment with low power and an attic antenna. The antenna was well thought out and installed, but of limited effectiveness due to its location. Dave optimized the antenna and built other options, gaining technical skill and a VNA in the process. His optimized Alpha-Delta was the best he could do.



Still enthusiastic, Dave applied himself with low power SSB, RTTY, and FT8 under the mentorship of K3AJ and steadily contributed scores earned through many BIC hours to PVRC. Dave was hooked on contesting and persevered to contribute over 34K points in various contests over the eight months he operated from his QTH-challenged station. He also participated remotely as part of several K3AJ M/2 and M/S RTTY efforts in the same eight-month period and helped those teams to generate 3.8M points while developing his radiosport skills along the way. Dave understands the value of perseverance as he is also a long-distance cyclist.

W3MAN and his XYL moved to their own property in Queen Anne's County at the end of 2020 and transformed part of an outbuilding to a well thought out radio shack, combining advice from club members on subjects ranging from prime power distribution to operating desk details with his own carpentry and construction expertise.



Following the inside build, Dave and Tom erected an AB-577 topped with a C3SS tribander and VHF J-pole. The new and improved W3MAM was on the air and Dave began to explore and enjoy the potential of his new setup. Dave's abilities and results will grow as he gains experience and continues to benefit from the mentorship of fellow PVRC members. I expect that when the time is right, he will "pass forward" what he has learned in keeping with the same PVRC tradition he benefited from.

W3MAM is traveling the path of building both his skills and station together over time. Another path is the one of guided operation from an established contest station and developing skills before or in the absence of station building. We'll talk about that another time.

PVRC Officers:		Trustees:
President:	K2YWE Dan Zeitlin	K3MM, N3OC, K2AV, K7SV, W3LPL, N3KN, N4ZR, W2RU, W3LL
Vice President:	N4GU Mike Barts	
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PVRC Scholarship Feedback – Dan K2YWE and Frank W3LPL

May 20, 2021
Stephen Chung, KC3ART
7229 Cypress Hill Drive
Gaithersburg, MD 20879

Potomac Valley Radio Club
c/o Dan Zeitlin, K2YWE, President
1036 Skyview Drive
Annapolis, MD 21409

Dear Mr. Zeitlin,

I am honored to be receiving the Potomac Valley Radio Club Scholarship. Thank you for your generous support of my future education.

I first learned about Amateur radio in middle school, where my mentor at an afterschool activity showed me two small radios, and how they worked. I was fascinated by it and ended up earning my Technician License in seventh grade, and my General License the year after that, all before entering high school. Ham radio has opened my eyes to radio science and engineering.

I just finished my junior year at the University of Maryland, College Park majoring in electrical engineering and minoring in computer science. I have interests in microelectronics and signal processing and hope to use my education to design mixed signal electronics for communication applications. This summer, I am also interning at Northrop Grumman.

Thank you again for your generosity and support. With a higher education, I hope that I can teach and inspire others to earn their Amateur radio licenses and further developments in radio and communication technology.

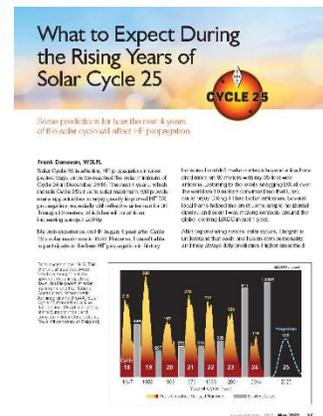
Sincerely,
Stephen Chung, KC3ART

Frank W3LPL Wins the May 2021 QST Cover Plaque Award

From the ARRL:

The winning article for the May 2021 QST Cover Plaque award is “What to Expect During the Rising Years of Solar Cycle 25,” by Frank Donovan, W3LPL.

The QST Cover Plaque Award — given to the author or authors of the most popular article in each issue — is determined by a vote of ARRL members on the [QST Cover Plaque Poll web page](#).



PVRC QSL Collection – John N3MN



The latest PVRC Reunion was the reminder to finally put the PVRC cards together and mount them in a frame. Makes a nice addition to the wall.

Pipe Antenna Award Submissions



Here is my homebrew 6m Moxon constructed solely of PVC pipe, wire and hardware. Note the self-supporting tower. **Dana N6DW**

PVRC Wins More Bling – Dan K2YWE



PVRC won the 2020 PA QSO Party club competition with a total of 520K points! A pat on the back to all members that contributed scores.

The sharp-looking plexiglass club trophy is being awarded to Dave N3XF whose 261K points represented more than half the PVRC total. Well done and congratulations, Dave!

WW Digi Added to 5M Program – Dan K2YWE

The [WW Digi](#) contest has been added to the PVRC 5M program as of the 2021-2022 season. FTx is growing in popularity and including an FT8/4 contest is in keeping with serving our membership and maintaining PVRC as a leader in the contest community.



WW Digi is a World Wide Radio Operators Foundation (WWROF) and Slovenia Contest Club (SCC) collaboration. The USA Club plaque is sponsored by NCCC. YCCC took first place in 2020. NCCC won in 2019. PVRC finished 4th and 8th respectively in those years. WW Digi details may be found [here](#).

Stripping THHN Insulation – Mike N4CF via PVRC Reflector

This morning I stopped by Main Street Supply in Mineral, VA to buy 25 feet of #12 bare copper wire for my 6M Moxon. But no bare wire -- only THHN-insulated. OK, I said, I'll strip it. Little did I know....

After several attempts that didn't work well, I came up with the jig shown in the photo. It's a scrap piece of 1/2" aluminum (wood would work as well) with a semi-circular notch filed into the corner of a cutout.



I clamped the jig in a vise, laid the wire in the notch, and laid the (new, sharp) blade in a utility knife on the wire, with the back of the blade bucked-up against the jig.

I pulled the wire through the jig, and the insulation peeled right off. Quick and easy, and the blade didn't dig into the wire at all. I stripped 25' of wire in three minutes! You can bet I'll be saving that jig for future projects.

(Editor's note – Steve NR4M suggested an alternative approach: "Tie one end, or both, to something secure, like a small tree, and with the wire taugth, you can just walk the length of it, with your box knife, and easily slice the insulation off.")

LZ5DB@LZ5R SO2R 2Band Synchronized Interleaved QSOs

Freq	Band	Time	Call Sign	Sent W/	Rcvd	Pts	Mult	Stat		
7041.9	40	00:40	KN4UUR	599	166	599	008	6	NR4	R1
14088.3	20	00:40	N5DO	599	167	599	002	3		R1
7041.9	40	00:40	9A7T	599	168	599	051	2	9A7	R1
7041.9	40	00:41	UR0WQ	599	169	599	025	2		R1
14088.3	20	00:41	K3LR	599	170	599	006	3		R1
7041.9	40	00:41	AB3CV	599	171	599	055	6	AB3	R1
14088.3	20	00:41	N7RVD	599	172	599	014	3	N7	R1
7041.9	40	00:42	K8MP	599	173	599	048	6		R1
14088.3	20	00:42	PS4T	599	174	599	017	3	PS4	R1

CQ WPX CW 2021
LZ5DB @ LZ5R
 300 QSO/h regular 2BSTQ

Run	Band	Time	Call Sign	Sent W/	Rcvd	Pts	Mult	Stat
RUN 1	600 Hz	00:42	OK4F	599	175	599		
RUN 2	600 Hz	00:42	UR7VA	599	175	599		
RUN 3	880 Hz	00:42	MW1X	599	175	599		

The image also shows a video player interface at the bottom with a progress bar at 17:54 / 20:53 and various control icons.

LZ5DB makes 100 QSOs in 20 minutes during 2021 CQ WPX CW from LZ5R. Click [here](#) or on picture above.

Meet the PVRCer – Rick N1RM

Your Call: N1RM

First Year Licensed: 1968

Previous Calls: WN6EJR, WN1KNR, WN9NBW, WD4LBY, KO4F, AI1V, NNN0KVV, C6ADP

QTH and PVRC Chapter: Reston, VA (shack is in Great Falls, VA)
Purcellville Blue Ridge Chapter



Favorite Contest and Why: CW and RTTY Sweepstakes. The smaller playing field is a good match to my still-developing skills. I also do well in Phone, but it makes me tired! As my skills improve, I think the World-Wide contests will be more fun, too. Though it is not really a contest, Field Day holds some great memories for me since it combines station building, getting together with friends and lots of BIC time.

Least Favorite Contest and Why: I like them all! I am still working at getting more comfortable in the extremely big ones. I need to build my stamina for any contest that combines a need for headphones and a 48-hour operating period!

Favorite part of Ham Radio other than contesting: Working on equipment, working on my station, teaching and making ham radio presentations, experimenting, emergency preparedness drills and public service events.

Favorite thing to do other than Ham Radio: I enjoy music: listening to many different genres, singing in a choir, playing piano and guitar. I probably enjoy playing and singing more than anyone that might get stuck hearing me. I also enjoy studying technical subjects on my own and taking on-line courses to try to keep my “academic brain” from fading away. In the summer, my XYL Kris and I can often be found up on Skyline Drive riding our Harleys.

Anything else you’d like to say? I was introduced to contesting (conceptually) at many extremely competitive Field Day efforts with the Loudoun Amateur Radio Group. After that I was really “hooked” by Mike W4RN who was a terrific Elmer and ambassador for PVRC and contesting. I was fortunate enough to be able to operate K4VV before Jack’s passing. Another great friend and generous “station host” has been Steve NR4M. Many other PVRC mentors have put up with my continuous stream of questions as I have worked through building and improving my station. I am grateful for their friendship, advice, and generosity.

A 40 Meter Delta Loop Beam – Alan WA3EKL

Shortly after I submitted my article “The Amazing Delta Loop,” for publication in the May issue of the [newsletter](#) I had another idea. The 40 meter inverted Delta loop or, as I called it, the Point Down triangle produces a 23-degree lobe of vertically polarized radiation. I also pointed out that a dipole or horizontal beam antenna has to be at least 90 feet above ground to produce the same 23-degree lobe of horizontally polarized radiation. This is why my Point Down triangle on 40 meters works as well as my 40 meter beam at 93 feet. It also gives validity to my other statement in the previous article that the ionosphere does not care about what type polarization is hitting it and the polarization of the wave coming back down can be anything and we can effectively copy that polarization.

Thinking about the above, I concluded, why not build 40 meter beams consisting of two or three element Point Down triangles. Where does the “volume” of contacts on 40 meters come from for us here on the east coast during DX contests? Basically, it is from Europe which is east to north east. Where does the “volume” of contacts on 40 meters come from for us on the east coast during domestic contests? Basically, to the west. How could these triangular beams benefit us as contesters?

If you are only interested in 40 meter DX to Europe build a Point Up triangle beam, feed on a corner side bottom, which yields a 20 to 30 degree lobe of vertically polarized radiation. If you build a two-element beam, build a driven element and a director. A director beam gives more gain than a reflector beam and the spacing between the elements is shorter. Hang out in front of the driven element another Point Up triangle and make it a director cut approximately 5% shorter. (Research will help find the ideal length.) If you want more gain, then hang out another Point Up triangle in back of the driven element and cut it to be a reflector spaced .15 wavelengths from the driven element and approximately 5% longer than the driven element. (Research will also help find the ideal length.) Now you have the equivalent of a 3 element horizontal beam at 90 feet. The “hanging points” for your triangles are only at about 50 feet!

Next configuration: If you want to only work state side contests then build a Point Down triangle beam. Again, the end support points will only be about 50 high and 50 feet apart. This configuration gives you the broad horizontal lobe for the close in contacts and the lower vertically polarized lobe for the farther out contacts. Again you will have a 2 or 3 element beam equivalent to a horizontal beam at 90 feet but you now have 2 lobes to communicate with not just one lobe if you were using the 90 foot beam.

Best of all configurations: Build a three element Point Down triangle beam that is sitting basically east/west. The center element is the driven element. Both outside elements are tuned to be director elements. At the bottom point of the two outer elements hang down a piece of 450 ohm ladder line so that when the bottom of the ladder line is shorted together the director now tunes as a reflector. Connect small 12 volt relays at the top of the ladder line where it is attached to the antenna leads. One relay, with no voltage applied, is normally shorting out the ladder line at the antenna bottom point and that element becomes a director. The other relay, with no power applied, remains open or not shorting out the ladder line and that element remains a reflector. Applying voltage to both relays at once reverses the direction of the beam.

Now you have a two directional beam with a low vertical lobe for DX contests and high and low lobes for domestic contests across the US to the West.

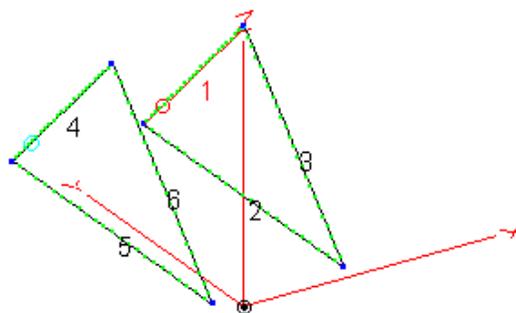
I know someone who built one of these things years ago but it was a five element version. It worked exceptionally well. The exact same concept with relays could be applied to the Point Up triangle beam as well. The outer two elements are tuned as directors. In the center bottom horizontal wire of the two outer triangles, cut them and place an insulator, then hang down the 450 ohm ladder line from the insulators with relays attached to the insulators.

For those who want to build one of these beams here are a few suggestions. A rope between two trees could hold up the two or three Point Up Triangles. Also, a rope between two trees and then another rope, parallel, and between two other trees could hold up the top ends of two or three Point Down triangles.

If you use the insulators that I used in my original article use the formula $1030 / \text{freq in MHz} = \text{Length in feet}$ for the driven element triangle. I would use a .12 wavelength spacing between the triangles for a two element director beam. A two element reflector beam normally uses .15 wavelength spacing. The reflector beam gives a better front to back ratio but less forward gain. I fully believe the DX is going to hear "forward gain" not "front to back ratio" that is why I suggest a director beam over a reflector beam. In the case of the bi-directional beam I would still space both elements .12 wavelength away from the driven element or center triangle. You are going to get maximum gain with .12 spacing of the driven element and a director. I realize the reflector spacing is not ideal but just be happy with the extra gain the reflector element gives you. To maintain symmetry if you move the reflector spacing out a little further to get more gain that means you will have to move the director out further which will reduce its gain. Just leave the spacing at .12 and have fun.

The above beams can be scaled back to 2 element beams with less gain. This would give you one driven element and one parasitic element, tuned as a director, with 450 ohm line hanging down, and one relay switching directions. That system would still simulate a 2 element horizontal beam at 90 feet.

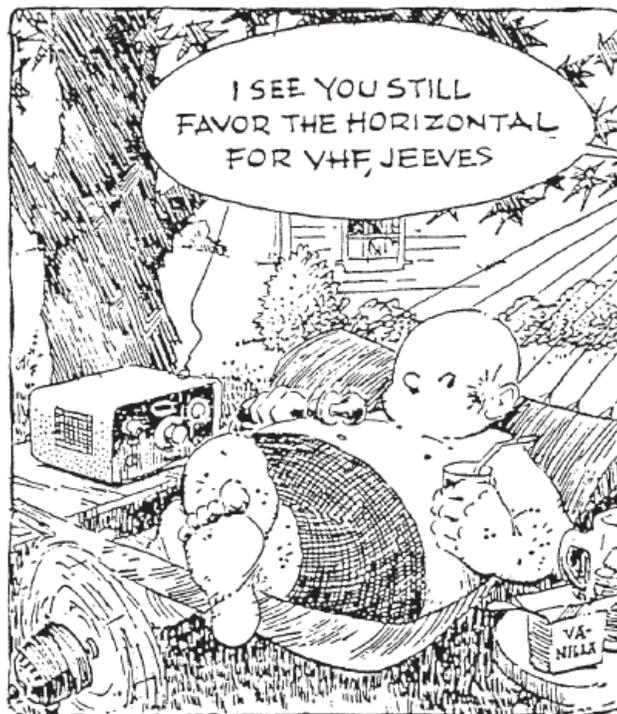
EZNEC



PVRC 6M DXCC Standings – Frank W3LPL

Below are the 6M DXCC 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
W3BTX	167	K3XA	119	N4PY	102
K1HTV	164	AB3CV	118	W4FQT	102
W4DR	160	K3SX	116	K3WC	101
N4MM	147	K5EK	114	N4JQQ	101
W3LPL	139	N4TL	113	W3KX	101
W3UR	139	W3EKT	111	W3XO	100
K2PLF	133	WX4G	111	W4TJ	100
N2QT	132	N4DB	110		
K4SN	131	W4PK	109		
K4SO	127	N4VA	106		
K4CIA	126	W2YE	106		
KG7H	123	K3ZO	103		
NW5E	123	K5VIP	103		
W3LL	122	W3OR	103		



Gil Gildersleeve W1CJD September 1966

Membership News – Tim N3QE

PVRC did not add any new members in the latest reporting period.

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 2021	
+ RAC Canada Day Contest	0000Z-2359Z, Jul 1
+ IARU HF World Championship	1200Z, Jul 10 to 1200Z, Jul 11
+ YOTA Contest	1000Z-2159Z, Jul 17
+ CQ Worldwide VHF Contest	1800Z, Jul 17 to 2100Z, Jul 18
+ North American QSO Party, RTTY	1800Z, Jul 17 to 0559Z, Jul 18
+ RSGB IOTA Contest	1200Z, Jul 24 to 1200Z, Jul 25

Editor’s Last Word – John K3TN

Thanks to Dan K2YWE, Rick N1RM, Alan WA3EKL, John N3MN, Dana N6DW, Frank W3LPL and Mike N4CF for contributions to this issue of the PVRC newsletter.

As usual, the Newsletter will be taking August off as I burn some of the Paid Time Off I accumulated during the pandemic travel hiatus. Should be getting some good bicycling in around upstate NY and Vermont.

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 – Jay W3MMM

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.

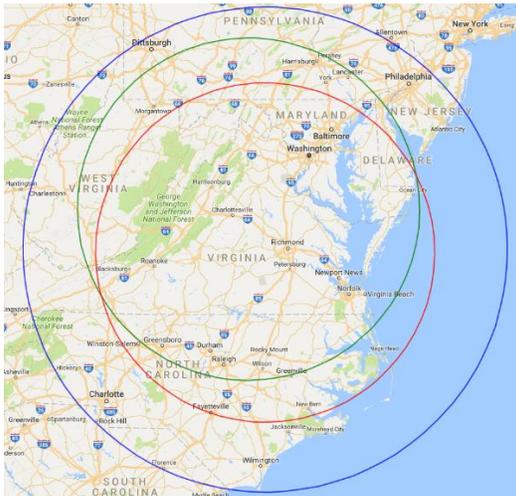
Direct donations to PVRC via Credit Card or PayPal may be made by clicking this "Donate" button and clicking the next Donate button that appears on your screen:



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
Around 38.075N,
78.171W

Red: ARRL HF Circle
175 mile radius
Around 37.43168N,
77.858482W

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



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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These low-loss cable assemblies are available in standard lengths with DX Engineering's revolutionary patented PL-259 connectors. Use the online Custom Cable Builder at DXEngineering.com to build assemblies made to your exact specs. DX Engineering's coaxial cable is also available by the foot or in bulk spools.



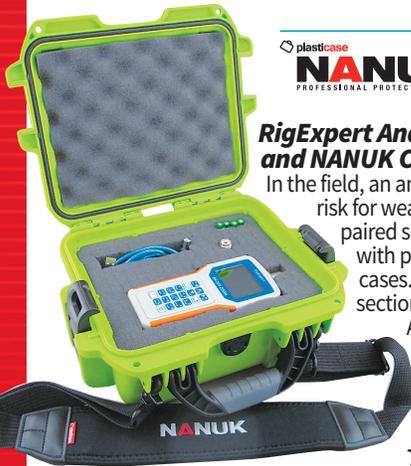
PicoAPRS and PicoAPRS-Lite

Developed for balloon tracking, the versatile PicoAPRS-Lite Transceiver Module features automatic or manual frequency tuning, integrated GPS module with balloon mode, and temperature/air pressure sensor. It easily fits in your pocket or installs out-of-sight in your vehicle. Version 3 of the matchbox-size, fully configured PicoAPRS Transceiver with GPS Receiver has an APRS tracker, a receiver for APRS data, Terminal Node Controller, up to 1W of transmit power, and loads more. Enter "WIMO APRS" at DXEngineering.com.



Headsets and Headphones

DX Engineering carries a great selection of hands-free headsets and state-of-the-art headphones from bhi, Heil, INRAD and other top brands. Don't accept anything less than clear, intelligible speech fidelity whether you're doing the speaking or listening. Click on "Audio" at DXEngineering.com for the full lineup.



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In the field, an antenna analyzer is especially at risk for weather and shock damage. We've paired select RigExpert Antenna Analyzers with perfectly sized NANUK equipment cases. Each case is filled with cubed, sectioned foam for custom configuration. Available separately or in combos. Enter "Analyzer Combo" at DXEngineering.com.



ICO-LC-192



ICO-AL-705



ICOM IC-705

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SOTABeams Masts and Portable Wire Antenna Kits

SOTABeams' lightweight, pre-assembled multi-band dipole antenna kits make it simple to receive and transmit strong signals anywhere you go. Choose from several models, including the 80/40/30/20M Band Hopper, rated at 125W. Also bring along SOTABeams' masts, such as the heavy-duty Tactical 7000hds and MINI Telescopic Fiberglass Pole, for fast deployment and worry-free operating. Enter "SOTABeams" at DXEngineering.com.



AlexLoop

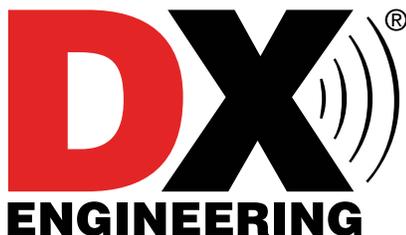
AlexLoop HamPack Portable Magnetic Loop Antenna System

PY1AHD, Alexandre Grimberg brings more than five decades of Amateur Radio experience to the new AlexLoop HamPack, the ultimate magnetic loop antenna solution for portable operating. The HamPack comes with the widely acclaimed transceiver QRP 40-10M AlexLoop antenna; reinforced, full-size backpack that accommodates the antenna, accessories, and any size QRP rig; and upgraded, easy-to-use tuner. Enter "AlexLoop" at DXEngineering.com.



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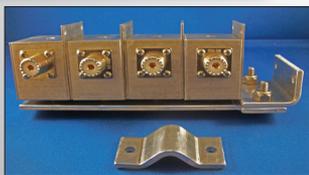
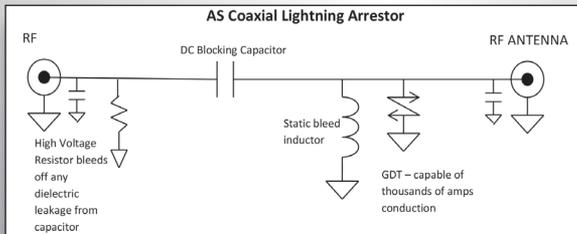
Array Solutions Lightning Arrestors Coaxial, Ladder Line, Single wire, Control Line protection for Rotators, Switches, and Antenna Motors

AS-300 Series arrestors are known for their reliability and performance. They feature easy mounting to plates, ground rods with our stacking bracket and also a convenient screw lug. The stacking bracket can be used on plates as well to save precious room in arrestor enclosures.

- Available in SO-239, Type-N, and 7/16 DIN connectors
- DC blocked, DC pass is available as a custom option
- Unique static bleed system with a UL approved Gas Discharge Tube, also ITU K 12 tested. This system usually prevents the GDT from ever firing unless a direct hit is taken. Saves your radio from static build up on large antennas.
- Models available for 3 kW, 5 kW, 10 kW and higher, details on website. Lower power available.
- FM low power broadcast model AS-303D FM
- Model AS-309H high-power single wire or ladder line arrestor, also DC block with static bleed
- Control line Arrestors for 8, 12, and 16 wires – 65V sparkover.
- Models for HF, VHF to UHF – Extremely low loss and Low VSWR



AS-303U



OM Power Amplifiers Sales and Service



Switches for Six Antennas



5kW - DC to 6m
RATPAK – 1x6

Choice of Multiple Controllers

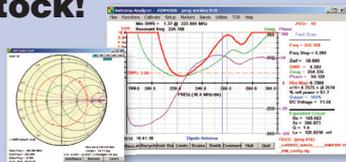
SIXPAK – 2x6



VNAuhf Back in Stock!

Vector Network Analyzer

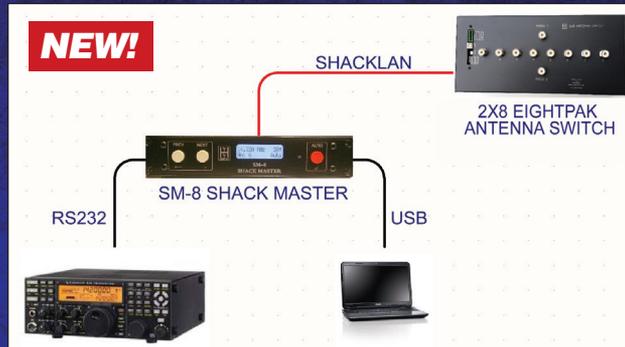
5 kHz - 1.3 GHz \$1295



Hamation Station Automation

Hamation remote and Local Station Control products allow you to automatically or manually select antennas, bandpass filters, and control accessories. Accessories can be StackMatches, Antenna switches, antenna phasing systems, SteppiR controller, turning radios on and off, etc. All of this can be done directly from the Ethernet as well!

Wiring are simple phone cables that daisy chain to all the devices. Wireless control is also available to your tower-located switches. Call us to learn how to set up simple or complex systems. Below is a simple basic system that can switch antennas as you change bands. We can interface to any radio CAT port, not just RS232.



A more complex system could be a SO2R contest station as shown.



The Shared Apex Loop Array™!

Capture the whole band or the whole HF spectrum at once with the Shared Apex Loop Array 2nd Generation. Can be remote controlled over the internet or in your station. 8 directions of directivity.

The Shared Apex Loop Array™ is a revolutionary receiving antenna that will change the way that you listen to the radio! The patented design provides performance in a size and over a wide range of frequencies that will please both the rag-chewer and DXer alike.

Three models to choose from:

- AS-SAL-30 - optimized for VLF, BCB, 1.8-10 MHz
- AS-SAL-20 - optimized for BCB, and 1.8-30 MHz
- AS-SAL-12 - optimized for 3-30 MHz



StackMatch

The original, not the imitations. For phasing 2, 3, 4 and even 6 antennas. Also it can be used to combine vertical and horizontal polarized antennas to diminish fading.



PowerMaster II



RF Power and SWR meter. Couplers for 3 kW, 10 kW or higher available for HF/6 m. VHF and UHF couplers for 1.5 kW. You can connect up to 5 couplers to the display to monitor RF power on different TX lines.



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Check our Website for more new products!

Array Solutions' products are in use at top DX and Contest stations worldwide as well as commercial and governmental installations. We provide RF solutions to the DoD, FEMA, Emcomm, UN, WFO, FAA and the State Dept. for products and installation of antennas systems, antenna selection, filtering, switching and grounding. We also offer RF engineering and PE consulting services.



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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-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



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



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-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



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-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-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

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

This device has not been approved by the F.C.C.



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NEW

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



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-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



NEW

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) • **This device has not been approved by the FCC.**



NEW

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 • WiRES-X Portable Digital Node/Fixed Node with HRI-200



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



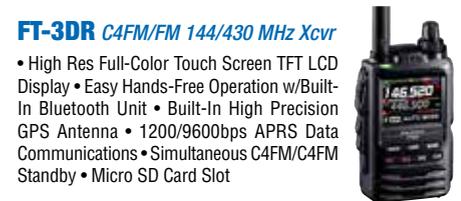
FT-991A | HF/VHF/UHF All Mode Transceiver

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



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-3DR C4FM/FM 144/430 MHz Xcvr

- 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 • Simultaneous C4FM/C4FM Standby • Micro SD Card Slot



NEW

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



FTM-7250DR | C4FM/FM 144/430MHz Dual Band

- 50 Watt Mobile • System Fusion-II Compatible • Operates Advanced C4FM Digital & Conventional FM Modes • 3 Watt Powerful & Clear Audio with Front Speaker



FT-65R | 144/430 MHz Transceiver

- Compact Commercial Grade Rugged Design • Large Front Speaker Delivers 1W of Powerful Rugged 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



FT-60R | 2M/440 5W HT

- Wide receiver coverage • AM air band receive • 1000 memory channels w/alpha labels • Huge LCD display • Rugged die-cast, water resistant case • NOAA severe weather alert with alert scan



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