



PVRC Newsletter

May 2020

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 – Tom K3AJ

Making the Best of a Bad Situation

One month into whatever the new normal is, not everything is bad.

Last month, we announced that we would be holding web-based or on-the-air chapter meetings for the time being. This has proven to be highly successful – with all but one or two chapters having held those meetings with good participation. Feel free to drop in on meetings of chapters other than your usual home chapter – it is fun to talk to some people that you might not otherwise encounter. In a few cases, members who live far from the nearest chapter and have not been very active recently are showing up and it is great to hear from them.

With the realization that it will probably be some time before all of the stars align to permit in-person meetings (much less when we reach the point where everyone will feel safe doing so), the Officers and Trustees have announced that we will allow participation in remote chapter meetings to count towards the two-meeting requirement for membership during the time period when in-person chapter meetings are not being held. That too has proven to be a win – we recently got the membership application of one well-known young contester who lives very far from the nearest chapter. He now has his first meeting in the books. And we are still adding new members at a healthy rate. Having said this, though, we are all looking forward to seeing each other face to face again. The friendship and camaraderie that are such an important part of belonging to PVRC are best nurtured with real personal contact. But for now, we make do with what we have.

73 and Go PVRC!

Tom K3AJ
President, PVRC

Two More Club Competition Wins!



**CQ WW RTTY 2019 – Plaque Awarded to NR4O
New England QSO Party – Plaque Awarded to K4QS**

PVRC Officers:

President:	K3AJ	Tom Valenti
Vice President:	N4GU	Mike Barts
Vice President:	W3MMM	Jay Horman
Secretary:	N3QE	Tim Shoppa
Treasurer:	K2YWE	Dan Zeitlin

Trustees:

K3MM, N3OC, K2AV, K4ZA, W3LPL, N4MM, N4ZR, W2RU, W3LL

PVRC Charter Members (all SK):

W3GRF, W4AAV, W4KFC, N0FFZ, W4LUE, W7YS, VP2VI/W0DX, W3IKN, W4KFT

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CW WPX SSB Report – Fred K3ZO from the PVRC email reflector

Editor's Note: I normally don't repeat posts from the PVRC reflector, since most people see them there in a much timelier manner. But not everyone does, and Fred's pre- and post-contest writings are like Contest University session. Enjoy – John K3TN

Two hours after I got home from grocery shopping Thursday, I noticed that I had developed a slight sore throat and an "itchy" interior chest, so of course with all the concern about the virus I did notify a few close friends of this. But in the past, I have powered through similar situations during contests by taking two regular aspirins every few hours and liberally spraying Chloraseptic spray directly on the sore throat area. It worked again, and by the time the contest was over the symptoms had disappeared. As I began the contest, however, I admit to having thoughts of: "Well, he went out doing what he loved to do."

I started off with the 20 meter 6-el monoband Yagi pointed at Japan but JA signals were not the greatest, so I quickly turned the beam south and S&Ped Latin Americans until 0030z. Then I took one look at Europe on 40 but discovered that almost all the loud Europeans were in the Mediterranean area and northern Europe was lacking, so I turned the 3-el 80-meter Yagi to Europe and found a great clear spot on 3767.8 and things immediately took off. It's like there was almost no difference in strength between the vast majority of USA stations and those in Europe, and lots of six-pointers went into the log. I was able to run that way for two-and-a-half hours solid and then went to 40 and by then conditions to Europe there had improved. But by 0600z I was back on 80 and Europeans were still blasting in.

Over the past year I had acquired a Waller Flag low noise receiving antenna for 160 meters and had it mounted horizontally on my 140-foot tower just between the 80 meter Yagi and the 20 meter Yagi. The special preamp that comes with the Waller was the source of constant problems because of a complicated relay switching setup to protect the front ends of your radio. Eventually Wally W8LRL sent me his old Ameco preamp.

Meanwhile I had acquired some Yaesu FTDX5000's and discovered that my existing low noise EWE receiving antennas which had originally been installed by Mike W0VTT were not so bad after all. The #2 preamp in the 5000's made all the difference in the world. The main European EWE is superior to the Waller at all times on 160.

But what I have discovered in this contest is that the Waller aided by the Ameco preamp works spectacularly well on 80 meters. With the Ameco peaked for maximum signal the Europeans were stronger on the radio's S-meter than they were on the 80-meter beam itself. The Waller was a great help in pulling through Europeans on 75.

Twenty meters was very crowded during the European runs and I found that, though the high 20-meter 6-el monobander at 150 feet was best for the first two hours that the band was open to Europe, my 4-el dual-driven W6PU quad at 78 feet was superior almost all the time. I like to hang around 14250-14300 with the quad because the SWR on the quad is a perfect 1:1 there and it really plays. Also, Saturday morning I was picking up a lot of neighborhood RFI from, I suppose, various RF-generating home devices on the high Yagi, whereas those QRN sources were not so noticeable on the quad.

In the wee hours of Saturday morning I had precip static on all the Yagis and had to quit a couple of times because of lightning and thunder in the area, and the precip static continued off-and-on into daylight on the 20-meter Yagi. The quad is never bothered by precip static.

There were times on 20 where I was getting more calls off the back of the antenna when it was on Europe, so I gave in to the obvious and turned the quad west for some nice runs which fattened the multiplier count. On Sunday morning it seemed that Northern Europeans dropped out so I took a couple of hours off in what normally is prime time because the rate was pitiful.

Sunday afternoon I finally got around to looking south on 15 with my 8-el monoband Yagi at 155 feet, and after doing an S&P sweep I observed a bunch of PYs working LUs so I thought there might be enough activity to actually produce runs. So, I found a nice clear spot and called CQ and had a very productive run of Latin Americans including some new prefixes. The key is to call CQ slowly and to pass out the numbers very slowly and distinctly in order not to have to repeat the numbers again. Of course, it helps that I have been rag chewing with Latinos in Spanish for years and sent every new Latin American station I worked a direct QSL card, so I am well known down there.

All in all, a very satisfying contest. Ten meters even opened for a while providing some PU Brazilian novice mults which cannot be found on the other bands. Here are the numbers:

CQWW WPX Contest, SSB - 2020

Call: K3ZO
Operator(s): K3ZO
Station: K3ZO

Class: SOAB HP
QTH: MD
Operating Time (hrs): 29:32

Summary:
Band QSOs

160:
80: 607
40: 628
20: 1053
15: 182
10: 24

Total: 2494 Prefixes = 972 Total Score = 6,942,996

PVRC Intra-Club Awards – Dan K2YWE

In the February issue I wrote about PVRC contest award sponsorships benefiting radiosport as a whole and elevating the status of the club. This month I'm writing to tell you about PVRC intra-club awards. The objectives of our intra-club award programs are to foster radiosport skill development within the club, recognize member achievements and contributions, and to improve PVRC's club competition scores. We seek to meet those goals through the incentives of 5M awards, the PVRC Olympics, Sweepstakes Chapter Showdown awards, the Top Gun award, and the President's Leadership Award. They are detailed below:

- **PVRC 5M Program:**
 - Progress Award certificates and endorsements (1-4M)
 - 5M Plaques
 - Endorsement plates (10M and higher)
- **PVRC Olympics:**
 - Gold Medals
 - Silver Medals
 - Bronze Medals
- **Sweepstakes Showdown perpetual trophies:**
 - K3LP Memorial trophy for the chapter with the most new SS logs submitted
 - W4MYA Memorial trophy for the chapter with the largest percent SS score increase
 - Battle of the Potomac trophy for highest aggregate score North or South of the Potomac
- **Top Gun perpetual Trophy:** Performance award with criteria set at beginning of the contest season
- **President's Leadership Award:** Based on President's assessment (last year five were awarded)

The officers review the club's programs annually and occasionally make adjustments that they believe will best further the goals mentioned above. The PVRC Olympics and several perpetual trophies added in recent years were a result of such reviews. Internal club award expenses the past year were \$2,200. We expect the same expenditure or a little less this season. Newsletter advertising revenue comes in early in the calendar year and offsets the cost of PVRC contest plaque sponsorships which we pay for in January. We rely on member contributions to fund our intra-club awards during the remainder of the year.

New 160/80 Spectrum for JAs – Yoshi JG7AMD via Ohio/Penn DX Bulletin

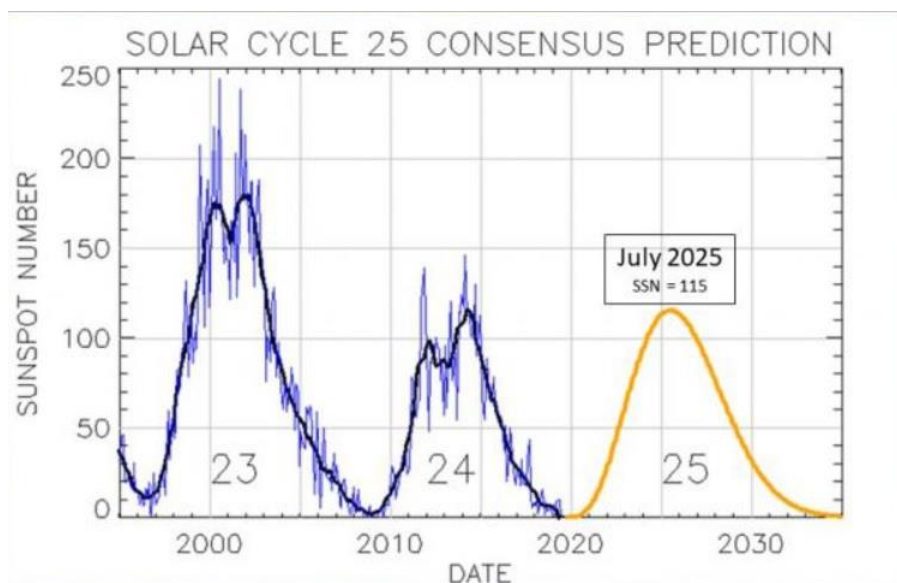
Yoshi JG7AMD [reports](#) that there are changes coming on 160/80m for JA operators. He states, "On March 11th, the Ministry of Internal Affairs and Communications replied for public comments about expanding bandwidth 160m and 80m. The current JA's band plan for 160m is: 1810-1825 kHz CW and 1907.5-1912.5 kHz CW and DATA

The addition will be: 1800-1810 kHz All Mode and 1825-1875 kHz All Mode Yes, All mode means not only data but phone as well. No need big split QSO with FT8 anymore. The starting date hasn't been announced yet, but I guess before CQWW this year.

The Solar Minimum Likely Occurred Christmas Eve 2019 – Frank W3LPL

Some of us have noticed a slight uptick in solar activity since Christmas Eve when two Cycle 25 spots -- AR 2753 and AR 2754 -- appeared simultaneously after 40 consecutive spotless days, the longest such stretch of Cycle 24. Only one of the five subsequent sunspots -- AR 2757 -- has been from old Cycle 24. Every sunspot over the last 12 months has been relatively weak and has had little effect on propagation. Although the date of solar minimum and the beginning of Cycle 25 won't be official until later this year, it's highly likely that it occurred on Christmas Eve 2019. The next important event to look for is an energetic long-lasting Cycle 25 sunspot, hopefully this year.

More information on the topic is available at [IOPscience](#), [SyFy Wire](#), and [Watts Up With That?](#)



Replacement Ear Pads for the CM500 Headset – Mike N4CF

After several years of use, the ear pads on my Yamaha CM500 headset dried out and began to flake. My wife wondered what the black stuff was behind my ears!

When I heard about the hassle of replacing a pad with its skirt trapped in a slot around the headphone, I decided it would be simpler to glue a **generic** pad to the face of the headphone.

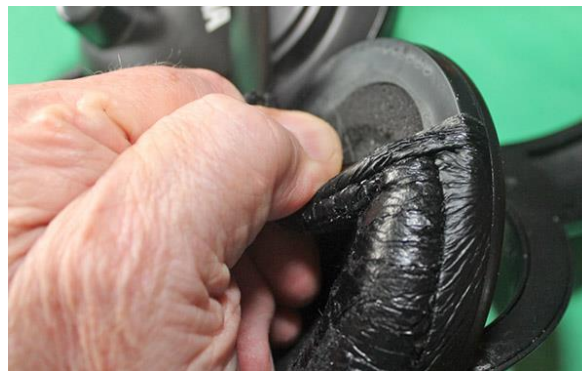
I bought a pair of pads on eBay for about six bucks. The eBay description was "*Pair 100MM Ear Pad Replacement Ear Pads Cushion for Headphones 4 Inches 10CM.*" These are what I received.



The CM500 has oval headphones, but the round replacement pads fit well. Read on to see how I replaced the pads on my CM500.

Step 1 – Remove the old pads

The original pads have a skirt that wraps around the headphone housing and is trapped in a slot. Rather than attempting to disassemble the headphones to remove the skirt, and then try to make the new pad's skirt fit, I decided to pull the old pad's skirt loose, then *glue* the new pad's skirt directly onto the headphone surface. This photo shows me removing the old pad's skirt.



The cable into the headphone runs through a hole in the old pad's skirt, so the skirt must be cut from around the cable. See the red arrow in in the next photo.

Notice that the thin layer of foam covering the headphone has deteriorated. This type of foam commonly becomes gummy and falls apart over time.



Step 2 – Clean out the rotten foam

I used a pocketknife to scrape the rotten foam from the headphones. I didn't worry about removing the adhesive residue, but if it bothers you, naphtha (lighter fluid) on a rag should do the job.



Step 3 – Install the new pads

I spread a thin coat of Amazing Goop, a viscous adhesive (available at Lowe's and eBay) on the new pad's skirt, and pressed it onto the headphone's flat surface, then taped it to ensure a secure joint.



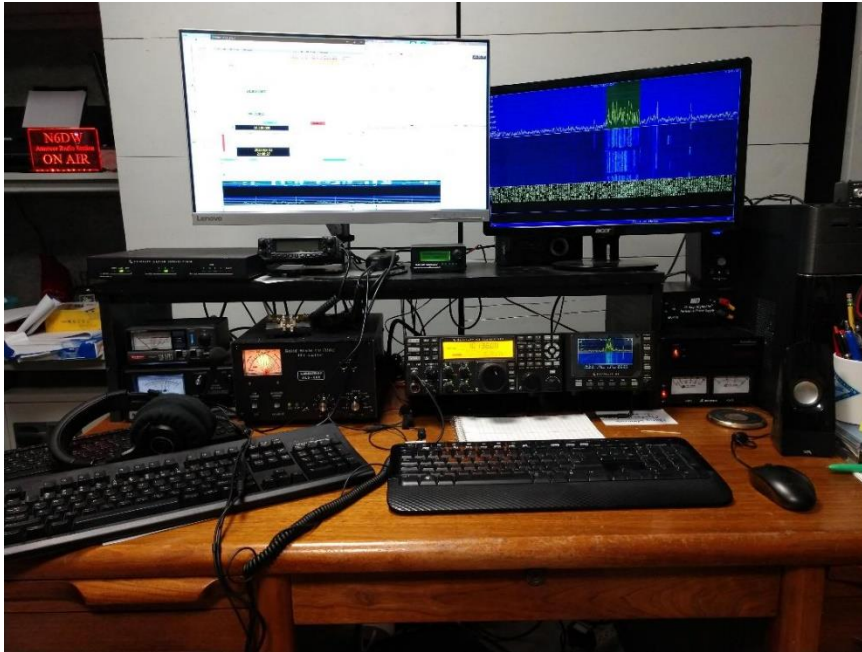
Done!

And that's it. I glued the pads offset slightly below center so they would fit comfortably around my ears with the headset sitting on top of my head.

If the new pads eventually need replacing, they can be removed by pulling to peel off the Goop. (I did exactly this after discovering that centered pads didn't fit my ears well, so I removed them and re-glued them lower.)



Show Us Your Shack! (Screen shots next month)



Dana N6DW's
clean layout



K2YWE station in early sixties
SX-100 receiver
HT-37 transmitter
W9TO keyer, Heath SWR meter
HQ-110 receiver
Reel-to-reel tape recorder
Sure-440 mic
Champion bug
W8FYO paddle
Hermes typewriter
Regency ATC-1 converter
Other stuff . . .





Hank K3YDX showing off his wallpaper



Peter W2CDO generating some heat

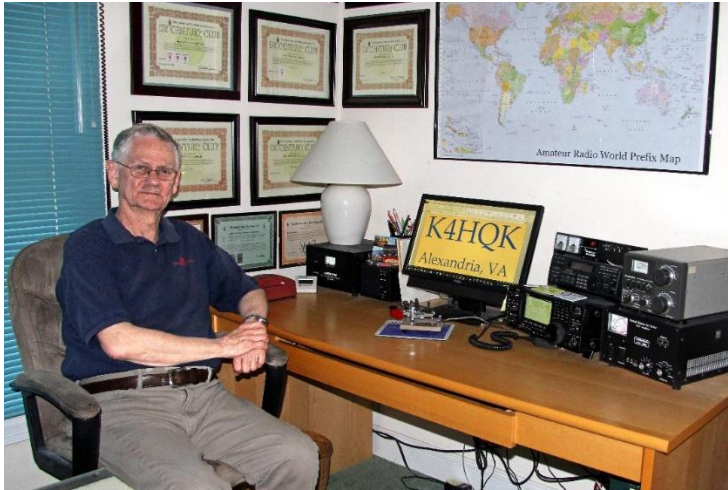


Paul K3STX: Obviously not doing much contesting anymore with this set-up (most QSOs are with the MOPA) and not very active in contesting now, but I still manage to operate the CQ160 contest with my amp and TS-590S.



Mike N4CF: The equipment sits on a 10-foot walnut desk I built in 2014 and is ready to go with the touch of several buttons. I can be on the air on 160m through 6m in 30 seconds.

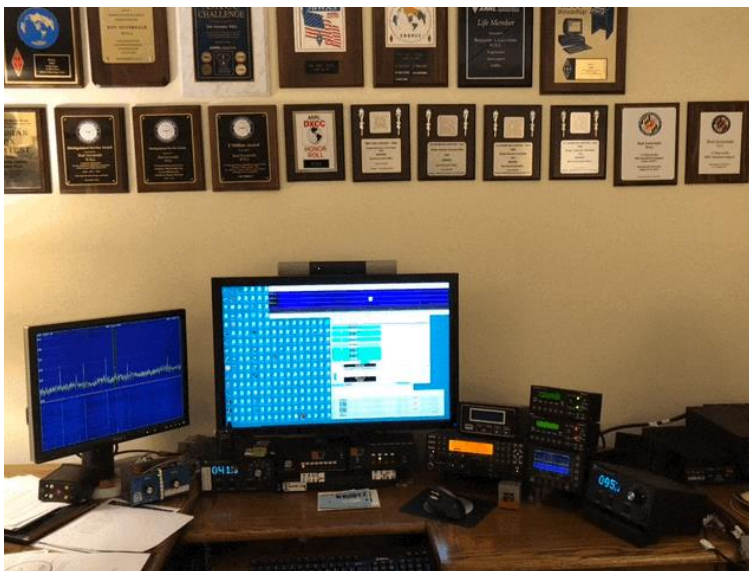
The wallpaper on my computer monitor is one of the astronomy photos I take with a telescope in my [observatory](#).



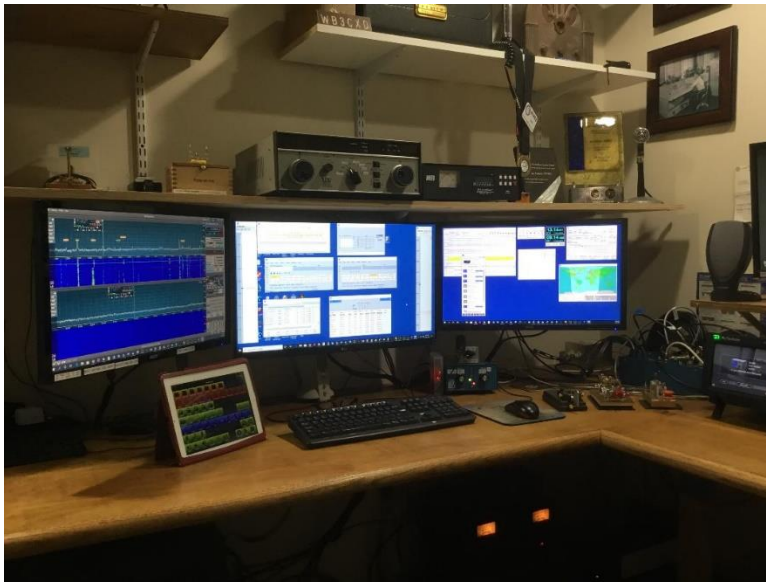
John K4HQB: My modest contest station consists of an Icom IC-7410 transceiver, Ameritron ALS-600 amp, WinKeyer USB, and Kenwood AT-230 antenna tuner for expanding 80/75-meter dipole's range. My paddle is a Vibroplex. Antennas include a Cushcraft R6000 20-6m vertical, a Cushcraft 3-element Yagi for 6 meters, and 80/75, 40 and 30 meter dipoles. No 160m antenna; our "city" lot is way too small.



Rick W2GPS: Here are pictures from 2011(L) and now 2020 (R). I am finally back on the air with full legal power on all bands from 160M through 6M, 300W on 144 and 200W on 222 and 432. All bands are operational on SSB, CW and most digital modes.



Bud W3LL's layout and wallpaper.



Joe N3HEE: Fully capable of S02R. Monitors are 24/27/24" inch 1080p LCD panels. Flex 6600M on far right with separate 22-inch monitor

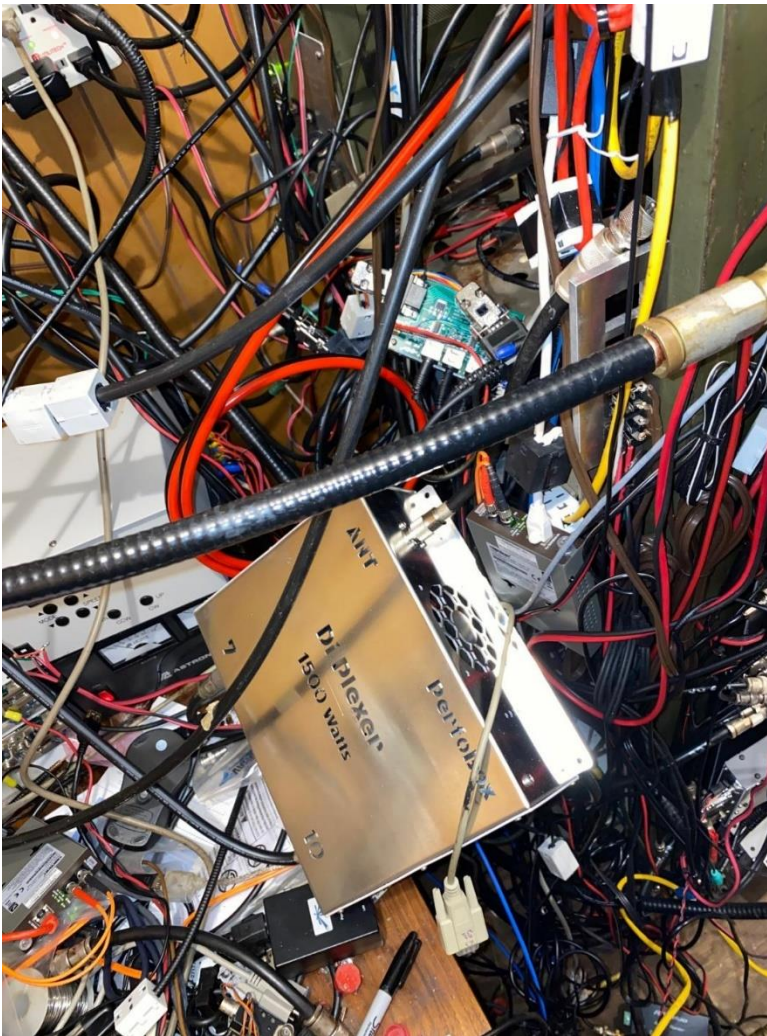
Note my old iPad repurposed as a touch controller for radio and computer, uses Touch Portal software. Touch control of N1MM as well!



Jim WX3B: 20/40/15M positions (top) 80/160/10M positions (bottom)



Gavin KE3L – with K3TN's old TS-850 (which saw lots of use at the W3LPL multi-multi back in the 1990's) being put to good use by a young ham.



Mike W3IP – Mike claims there is a shack under those cables somewhere.

PVRC DXCC Challenge Standings – Frank W3LPL

Frank W3LPL suggested that we include the standings of PVRC members in the [ARRL DXCC Challenge](#). The numbers are your DXCC Challenge total transcribed from the ARRL DXCC [standings](#) data as of the 20th of each month or so. Thanks to Frank for the data each month to make this a regular feature Please report any omissions or errors to [Frank](#).

CALL	DXCC	CALL	DXCC	CALL	DXCC	CALL	DXCC
W4DR	3185	K3JT	2495	AA4NC	2061	WB2ZAB	1522
W3UR	3144	N4QQ	2494	K4WNW	2004	NA1DX	1521
W3LPL	3129	W2GG	2434	N3QE	2000	AA4FU	1519
K4CIA	3114	K5RT	2425	N4JQQ	1981	WB4DNL	1506
N2QT	3070	K5VIP	2360	N3KN	1968	N4ZR	1481
W4PK	3038	N4TL	2358	W9GE	1964	K3WC	1430
N4MM	2979	W3OA	2344	K5RJ	1961	N3HBX	1428
W3DF	2939	W2YE	2334	W0YVA	1936	N3AIU	1415
WX4G	2928	N4GG	2327	N3KS	1906	N8II	1390
K1HTV	2921	K1ZZI	2308	W3KB	1815	KF7NN	1377
K5EK	2900	K1GG	2305	N3ND	1801	ND3F	1319
K2PLF	2892	W3YY	2297	K4EU	1795	N1SZ	1317
KG7H	2869	W4VIC	2288	W3DM	1791	K4ZA	1313
N4DB	2848	N3RC	2265	K3SX	1720	N3MK	1272
N3NT	2835	W2GPS	2255	N4XYZ	1720	NR4M	1224
W0VTT	2824	WA2BCK	2229	W4GP	1710	N3RR	1199
W3LL	2803	NW4V	2219	N4GU	1701	W3NRJ	1188
KG4W	2782	K3TN	2189	NE3H	1668	N3OC	1183
K3WA	2778	K4FJ	2188	K4QE	1666	K3AJ	1172
K1AR	2754	N4ZH	2188	KE4S	1666	W3US	1077
W3KX	2750	K1EFI	2176	K3WI	1652	N3COB	1049
AB3CV	2656	K2BA	2129	W3UL	1614	W3OU	1046
WB3AVN	2655	W3TN	2125	K3KY	1606	W4ZV	1046
W4FQT	2627	K3PU	2107	K3STX	1579	K4ZW	1038
N3KK	2576	W3GG	2071	KE3X	1571	NE3K	1021
W3BW	2536	W3MR	2070	W3FOX	1535		
K4SO	2499	N4NW	2068	N3AO	1527		

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](#)

May 2020

+ CQ-M International DX Contest	1200Z, May 9 to 1159Z, May 10
+ His Maj. King of Spain Contest, CW	1200Z, May 16 to 1200Z, May 17
+ CQ WW WPX Contest, CW	0000Z, May 30 to 2359Z, May 31

Editor’s Last Word – John K3TN

Thanks to Mike N4CF, Fred K3ZO, Dan K2YWE, Frank W3LPL and everyone who sent in photos for contributions to this issue of the PVRC newsletter.

Everyone seems to be learning how to use Zoom for online get togethers in these “interesting” times. I’ve spent my entire career in security, with most of the past 25 years being Internet security. The “Ohm’s Law” of cyber criminals is Low Resistance to a Scam = Distraction x Haste. Every time there is a situation that causes angst or screaming press headlines, the bad guys know haste and distraction are skyrocketing and people’s resistance to scams is dropping.

Zoom has a good set of safety guidelines [here](#).

Beyond that, think twice (or three times) before you click on any links in email, especially if it related to Covid or health care or the stimulus funds -attacks using those issues as bait have skyrocketed.

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](mailto:jpescatore@aol.com).

From the PVRC Treasurer – Dan K2YWE

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.

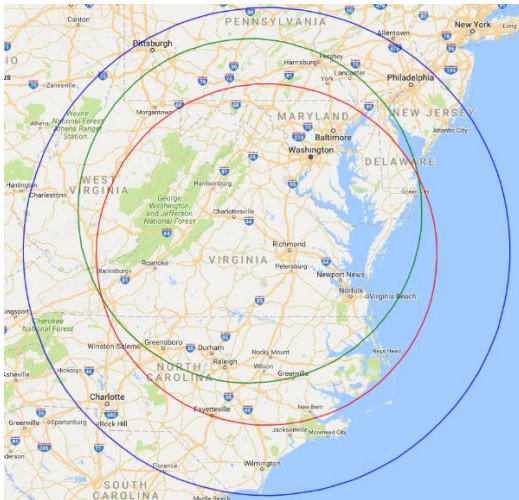
Direct donations to PVRC via Credit Card or PayPal may be made by clicking this "Donate" button and clicking the next Donate button that appears on your screen:



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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Get a free two week trial of The Daily DX and The Weekly DX by sending a request to bernie@dailydx.com.

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Select-8 Wireless Remote Coax Switch

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Check Out What's New at DX Engineering!



RF-KIT RF2K-S Amplifier

DX Engineering is the exclusive North American retailer of RF-KIT's powerful new RF2K-S solid-state linear amplifier, featuring full legal limit capabilities across 160 through 6 meters. It comes with updated fast and quiet PIN diode switching, 1,500W RF power output, low-noise speed-controlled fans, internal antenna tuner, and dual LDMOS devices. Available as a kit. Fully assembled model has not been approved by the FCC and may not be offered for sale or lease, or be sold or leased, until approval of the FCC has been obtained. **Enter "RF-KIT" at DXEngineering.com to learn more.**

New!



New!

Introducing Maxi-Core 20 Baluns and Feedline Choke

DX Engineering ushers in an exciting era of upgraded RF performance across the 1.8 to 54 MHz frequency range with its four new Maxi-Core 20 baluns and one feedline choke. Building on the success of previous DX Engineering and Comtek units, the internally redesigned Maxi-Core 20 lineup—the culmination of years of research and development, equipment advancements and extensive testing— handles full-legal-power-plus and provides higher common mode impedance over the 160 through 6 meter bands. More of your signal gets to the antenna and you can hear more signals with less noise. Easy installation is provided by the optional DX Engineering Mounting Plate and Bracket Kit (DXE-MC20K-BRKT) or Wire Antenna Balun Mounting Bracket (DXE-WA-BMB). **Enter "Maxi-Core" at DXEngineering.com for applications and more details.**



New!

Complete Telescopic Fiberglass Tubing and Cam Lock Clamp Kits

These kits make it easy to set up a reliable temporary antenna mast at home or in the field. They feature durable, smoothly telescoped fiberglass tubing collapsible to either 4 or 7.5 feet for convenient transport. Sections are secured in place with easily adjustable cam lock clamps. Available in heights of 15, 25, and 46 feet. **Enter "Cam Lock Kit" at DXEngineering.com for complete specs.**

DXE-MC20-1-1	High CMI 1:1 Current Choke Balun	\$123.99
DXE-MC20-FC	High CMI 1:1 Feedline Choke, Line Isolator	\$137.99
DXE-MC20-1-1T	High CMI 1:1 Current Choke Balun, Tuner Model	\$122.99
DXE-MC20-C4-1	High CMI 4:1 Current Choke Balun	\$145.99
DXE-MC20-V4-1	Low CMI 4:1 Voltage Balun	\$121.99

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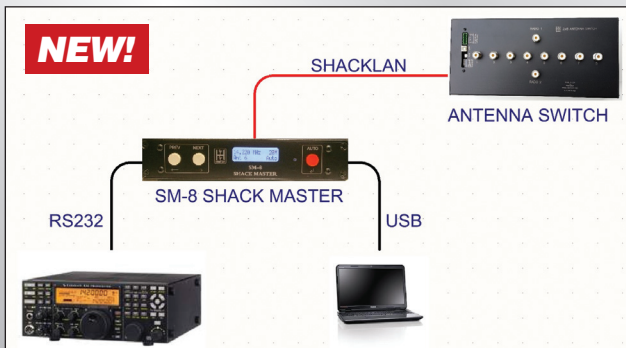
Professional Grade Equipment from Array Solutions



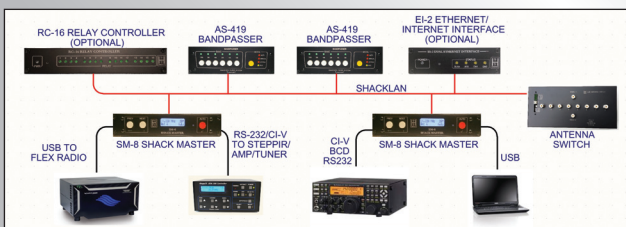
Hamation Station Automation

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 chains 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.



JK Antennas Are Now Sold by Array Solutions

High Quality HF Antennas for the Contester and DXER. We Focus on Quality and it Shows in Everything We Do. Call or email for antenna systems.



RatPack Remote Antenna Switch

Six antenna remote switch with rotary switch controller. Push button controllers available. HF and 50 MHz. Power rating 5 kW CW.

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.

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.



OM Power Amplifiers, The New RF Power Benchmark!



OM Power Amplifier Sales Program

Lower prices than the competition's equivalents, most modern design, and strongest warranty in the market!



OM10C amplifier combiner

The automatic amps can drive an antenna switch of up to 10 antennas and select up to ten bandpass filters applies to all automatic models

OM4000HF	Manual 160-10 m 4 kW
OM4000A	Automatic 160-10 m 4 kW
OM4000HF MARS	MARS and Commercial HF
OM2500HF	Manual 160-10 m 2.5 kW
OM2500A	Automatic 160-10 m 2.5 kW
OM2000+	Manual 160-6 m 2 kW
OM2000+ MARS	MARS and Commercial HF
OM2000A+	Automatic 160-6 m 2 kW
OM10C Combiner	Combiner for two OM amplifiers
OM10C 4000HF MARS	Two OM4000HF manual tuned amps and combiner package
OM10C 4000A MARS	Two OM4000A automatic tuned amps and combiner package

OM4000A - OM4000HF OM2500A - OM2500HF

The A-series are automatic band change amplifiers.

The HF-series are manual band change and tuning amplifiers.

OM4000: 4 kW SSB and CW, 3 kW RTTY, AM and FM

OM2500: 2.5 kW SSB and CW, 2 kW RTTY, AM and FM

OM2000A+ - OM2000+

The **OM2000A+** is the lightest and smallest 2000 W fully automatic HF/6 m power amplifier in the market. Its manual tuning version, the **OM2000+**, is our affordable unmatched best-seller.

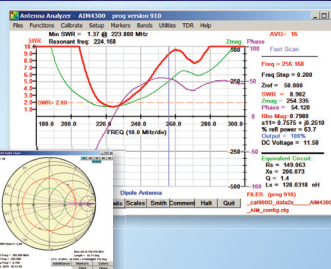
Frequency coverage:

Amateur bands 1.8 - 29.7 MHz including WARC + 50 MHz

Power output: 2000+ W in SSB/CW on HF bands, 1500 W in RTTY
1500 W CW/SSB on 50 MHz



Laboratory Grade Antenna and Vector Network Analyzers



One Port Analyzers and Two Port Vector Network Analyzers ranging from 5 kHz up to 1 GHz

AIM 4300	\$599
VNA UHF	\$1,295

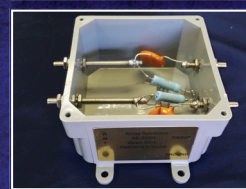
Surge Arrestors

AS-302, AS-303 Coaxial cable arrestors. DC to 500 MHz. N-type or SO-239 connectors. **AS-300SB** Stacking fixture available. **AS-309H**, ladder line arrestor. All have static bleed function. **AS-8SP, AS-12SP** and **AS-16SP** control cable arrestors. Protect your rotator's and other control cables.



Baluns & RF Transformers

Ratios 1:1, 1:2, 2:1, 4:1 and more. RF line isolators. Ratings 3, 5, 10 kW+. Get the most out of your antenna by stopping the coaxial cable from becoming part of it.



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IC-9700
All Mode Tri-Band Transceiver



IC-7300
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IC-7100
All Mode Transceiver



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



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

KENWOOD



TS-590SG
HF/50MHz Transceiver



TM-D710G
2M/440 Dualband



TM-V71A
2M/440 DualBand



TM-281A
2 Mtr Mobile



TH-D74A
2M/220/440 HT

YAESU
The radio



FT-991A
HF/VHF/UHF Transceiver



FT-891
HF+50 MHz All Mode Transceiver



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



FTM-400XD
2M/440 Mobile



FT-70DR
C4FM/FM 144/430 Xcvr

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