



PVRC Newsletter

January 2019

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

Please Allow Me to Introduce Myself...

Let me start by saying that I like contesting. I like CW contesting. I like SSB contesting. I like RTTY contesting. I like operating as a single op from my station. I like operating at multiops. I like DX contests. I like domestic contests. I like 160-meter contests. I like VHF contests - and yes, even using FT8 in VHF contests. I started keeping an electronic log shortly after joining PVRC in 2011, and that log now has 64,000 QSO's. All but a few hundred are contest QSO's. I am proud to display my 5M plaque with a 35M endorsement.

Although licensed since 1967 (WN3HKF, WA3HKF, ND3C, K3AJ) and almost always having a station of some sort, my participation in amateur radio exploded after joining PVRC (it is all K3KU's fault, as Art recruited me via a personal letter). Since joining PVRC, amateur radio and contesting have become a much bigger part of my life. WX3B grabbed hold of me and mentored me, showing me that I could improve my skills and my station by hanging around with the incredible operators belonging to PVRC. The rest is history now.

Through PVRC I have been on a journey of continuous learning and skill development in amateur radio and contesting and having a ball. More important are all the relationships that have resulted as I have gotten to know some amazing people, and those relationships have in many cases evolved beyond just our common interest in amateur radio and contesting. Now as President of PVRC I have the opportunity and responsibility of making sure that others can partake of all the learning, personal development and friendships that can come with PVRC membership. Not to mention the pride we all share in the many club competition victories achieved by PVRC.

My biography? Nothing special. Born in New York City, I have lived most of my life in the Baltimore, MD area, with an interlude living in Philadelphia back in the 1970's (school, marriage and first job). I am an engineer by training, although many of you electrical engineers out there don't consider civil engineers "real" engineers, at least not until something falls down. Most of my career was at the Baltimore Gas and Electric Company. It was really three careers – in fossil power generation, gas distribution and technical/operations support – performing various engineering and management jobs

over the years. I learned a lot about building, operating and maintaining equipment and systems, but more importantly, how none of that stuff can be made to work without helping people with many different skills do their jobs effectively. I have an amazing XYL (she all but forced me to put up a second tower) and two terrific adult daughters (one is an artist and the other a software developer). I now live in Northern Baltimore County MD near the northern extreme of the PVRC circle (yes, it takes well over an hour to get to any chapter meetings from here) and have been retired since 2011. When not contesting, DX'ing, working on my station (or someone else's), I am out riding my bicycle, doing a little fly fishing, volunteering at my Church, vegetating on the beach or reading.

Next month, after having conversations with the newly elected PVRC officers, we will talk about some priorities for 2019 and beyond. In the meantime, the January contest calendar is full – let's have a big turnout in RTTY Roundup, the NAQP's, January VHF and CQ 160 CW. Go PVRC!

<u>PVRC Officers:</u>		<u>Trustees:</u>
President:	K3AJ Tom Valenti	K3MM, N3OC, WX3B, W4ZYT, N4NW, K2AV, K4ZA, W3TB, K3ZO,
Vice President:	N4GU Mike Barts	K2PLF, W3LPL, N4MM, N4ZR, W3MSH, N4NQY, W2RU, K3WRY
Vice President:	W3MMM Jay Horman	
Secretary:	N3QE Tim Shoppa	<u>PVRC Charter Members (all SK):</u>
Treasurer:	K2YWE Dan Zeitlin	W3GRF, W4AAV, W4KFC, N0FFZ, W4LUE, W7YS, VP2VI/W0DX,
		W3IKN, W4KFT

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PVRC Election Results – Bud W3LL, outgoing President

I'm happy to announce the PVRC officers elected to serve in 2019. They are:

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

Please join me in congratulating our 2019 officers!!!

Voting for nominated Trustees was terminated prior to its conclusion. The seventeen incumbent trustees will continue after the first of the year in an acting capacity until either a special election is held or until the next regular election cycle.

Bud, W3LL Receives Distinguished Service Award – Tom K3AJ

Bud W3LL received a Distinguished Service Award at the DC Metro Holiday Dinner at Topolino. The plaque reads: "Distinguished Service Award Presented to Bud Governale W3LL In Grateful Appreciation of Your Outstanding Leadership as President of the Potomac Valley Radio Club 2016 - 2017 - 2018 You Made the Club Stronger and Better."



In the photo left to right, the 2018 PVRC Officers K2YWE, W3LL, K3AJ, N3QE, W3MMM. Photo by AB3CV.

PVRC Galactic Lunch at FrostFest- Ted W3TB

For our members who attend the 2019 Frostfest in Richmond on February 2nd, be thinking about attending the annual PVRC Galactic Lunch organized by the Colonial Capital Chapter. Lunch begins at 1:00 pm at Roma Restaurant Italiano nearby in Mechanicsville. There are many lunch specials all costing \$7.95, so bringing \$10 will buy lunch, tax, and tip. There is also the full menu at the restaurant and bar.

Watch for an email invitation right after the first of the year for a show-of-hands to know who plans to attend. The email will come from Ted W3TB, and responses go right back to him. What a great plan: a great hamfest follow by good lunch fellowship with PVRC members!

(Editor's note: The Anne Arundel Radio Club (AARC) is sponsoring a Bus trip the FrostFest and you don't have to be an AARC member to join them. The buss will leave at 0600 on Saturday Feb 2nd from the Davidsonville MD Park'N'Ride and return by 1800. Cost is \$47 per person, including admission to the FrostFest. Look [here](#) for info.)

The Secrets to Rapid S&P on CW - Pete N4ZR

Well, that'll teach me! I boast about my rapid S&P rates (200/hour and more) in CQWW CW, and John, K3TN promptly asks me for an article for the Newsletter explaining how I do it. I really enjoy fast S&P and think you may too. I'm probably making some disclosures against my own competitive interest, but here goes.

Operate Assisted – There's no way that you can S&P this fast while unassisted. Knowing the callsign of the station you want to work before you QSY and being able to QSY rapidly to his or her frequency is a must.

Use software tools to pounce on the newest spots – always. N1MM+'s Available Mults and Qs Window (Fig.1) lets you list spots in their order of arrival. That way you can either pounce on the top spot on the list or run rapidly down through the list until you find someone callable. N1MM+ has a hotkey (alt+A) which will jump to the first call on the list, and then to each below that, in order. I put this key combination on a single key (using AutoHotkey) or use my mouse.

Call	Freq	Dir	Mode	Mult?	S/N	Time v	Spotter	Grid
OH8VQ	21095.7	030°	CW	Yes 1		1443Z	I20KBR	----
F5RD	21070.0	056°	CW	No		1443Z	F6HJO/P	----
DC2CB	21060.2	047°H	CW	No		1443Z	W6MV	----
W3WPA	21041.1	309°	CW	Yes 1		1443Z	YO5PBF	----
G3KWK	21012.3	049°	CW	No		1443Z	OE4PWW	----
G0CXW	21049.5	049°	CW	No		1443Z	SM3AF	----
EE1K	21077.3	064°	CW	No		1443Z	F5UKL	----
I24CZE	21075.3	055°H	CW	No		1443Z	LZ2UW	----
W3FV	21032.0	013°	CW	Yes 1		1443Z	RN6MA	----
SM6CPY	21068.1	035°H	CW	Yes 1		1443Z	E72U	----
N7JB	21034.1	299°H	CW	No		1443Z	I22RBR	----
HB9CXZ	21049.2	052°H	CW	No		1443Z	R9DA	----
YO2LEE	21008.9	047°H	CW	Yes 1		1443Z	UY5TE	----
N4AAI	21069.3	248°	CW	Yes 1		1443Z	HG8C	----
8J1RL	21019.0	180°	CW	Yes 2		1443Z	HB9DAX	----
N5RZK	21055.1	250°	CW	No		1443Z	LZ3FN	----
W8DD	21092.8	284°	CW	No		1443Z	LZ1KP	----
K3PIN	21020.1	211°	CW	Yes 1		1443Z	YO5PBF	----
VE1AYY	21091.9	057°	CW	Yes 1		1443Z	W6MV	----
WB4I	21031.9	226°	CW	Yes 1		1443Z	LY4CW	----
JG3CKF/1	21024.0	332°	CW	Yes 2		1443Z	IK5ZWU	----
K7ABV	21089.2	298°H	CW	No		1443Z	LZ1QZ	----
KC5FU	21044.4	250°	CW	No		1443Z	UT1IM	----
UN7TDB	21069.9	024°	CW	Yes 2		1443Z	UK8AR	----
BY3CQ	21052.8	001°	CW	Yes 2		1443Z	IK3UN/1	----

Figure 1

Resist the temptation to chase mults, especially easy ones. They will recirculate to the top of the time-ordered list within 10 minutes, after you have hopefully worked 25-30 others.

The whole idea is to get there before all the other RBN users do. To do this, you must **not** wait until you hear the station’s full call. I know this is contrary to many people’s idea of good etiquette but hear me out.

Know the syntax and predominant “style” of exchanges in the current contest, so that you will know, with a high degree of confidence, whether the spotted station is ready for another call. Things like “TEST” and “WW”, for example, tell you without a doubt that you’ve just heard the end of a CQ and you can call without trepidation. If you hear even a part of the last letter of a spotted station’s call, followed by a pause that is longer than the normal word space at the station’s current speed, that also tells you that you can jump in.

Editor’s note: if you do work a station without hearing their full call, you do run the risk of logging a busted call – especially on the second day of the contest when a higher percentage of spots are broken ones. Easy enough to listen for his next call after you work him. When I’m doing this as SO2V with VFO A in one ear and VFO B in the other, I’ll hit A=B and leave VFO B on the first freq until I validate the call, continue working the Available Mult/Q window on VFO A. Pete points out this is not an issue in SS, since the exchange includes the callsign.

Don’t call on the frequency of the spot. As most folks will tell you, that runs the risk of putting you at zero-beat with any other callers. Since cluster spots are rounded to the nearest 0.1 KHz, most of the time that will not be the desired station’s frequency.

There are two ways to handle this. N1MM+ and some other logging software packages make it possible to randomize your calling frequency (make it different from the spot’s frequency) by 10-60 Hz. This capability is hidden away on the Filters tab of N1MM+’s Telnet Window (Figure 2).

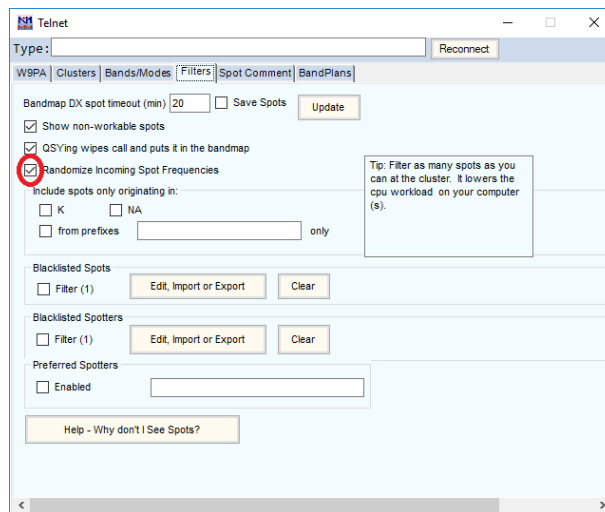


Figure 2

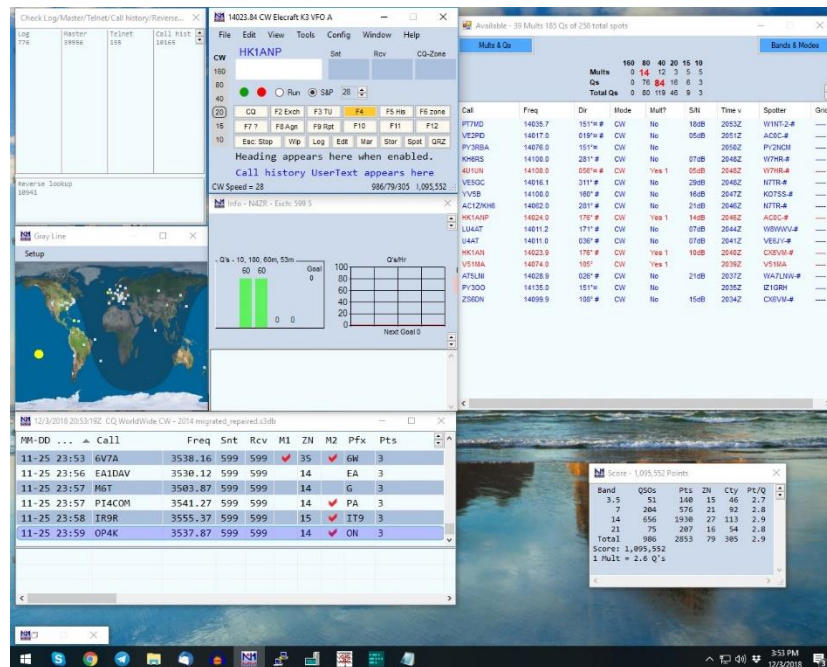
Another approach, which I frankly prefer, is to give a quick nudge to the big knob of your radio, toward zero-beat with the station you're calling. That gets you off the mob's frequency and may even attract the attention of the station you are calling.

And that's all there is to it. If you get bored running, or your station (like mine) isn't up to running productively, give it a try.

Editor's notes – (1) I've long been a fan of this approach and have one variation: you may find you are constantly running into the big gun SO2R and MM stations who have a S&P position focused on the Available Mult/Q window, too – AA3B is who I always seem to run into. If that happens, I'll start clicking on the second spot down, which is almost as fresh as the first one and let the big guns fight it out over the first spot.

(2) If you have a beam, a variation is to sort the spots by beam heading and when you see enough Qs in one region (JA, AP, Carib/SA, AF, etc) swing the beam to the closest (in azimuth) group, work all of them that are still there, nudge the beam to the next group, repeat.

Here's a picture of Pete's typical N1MM setup, with the Available Mult/Q window on the right



Happy New Year

(from [OM3KII](#))

Replacing Ear Pads On a CM500 Headset – Rob KK4R

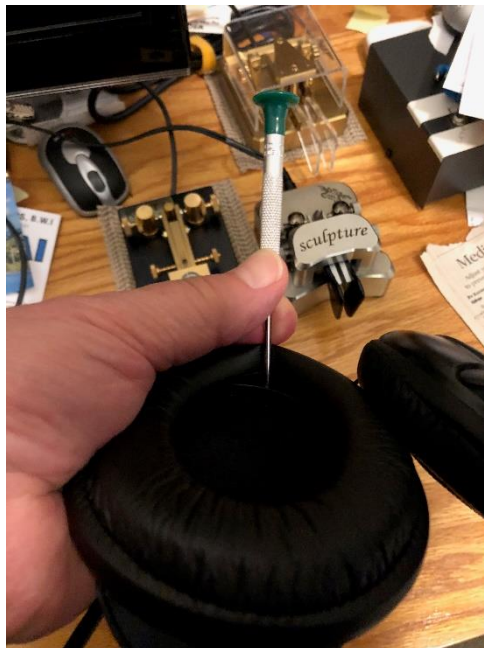
There was a post on the PVRC reflector about Yamaha CM500 ear pads wearing out, and N3QE posted that Koss replacement pads would work and said there is a video somewhere about how to change the ear pads. I didn't find the video, but that didn't stop me. There was a later post by another fellow that replaced his pads and found it quite difficult. His conclusion was that it may not be worth the trouble. Having both tried cloth covers over my ear pads and replacing the ear pads, I think it is worth it for some but perhaps not everyone. If you want to go for it, I wrote down my lessons-learned for our local club and copied that here below.

I ordered the pads direct from Koss (item 143149) for \$5. I found them for more at other vendors but none cheaper than Koss. Worried about shipping? They have a free shipping option and mine came in less than a week.

Editor's note: Ray W8LYJ replied to the original thread, saying "[Scan Sound](#) LEC cushions are easier to get on."

Concerning the missing video, it would have helped. I succeeded without destroying anything, so with a couple of tips, you can get through it easier than I did. This job will be hard if you only have thumbs or don't have any patience. Don't read any further, unless you are tackling this, since you won't necessarily be able to tell what I'm talking about without seeing things.

- 1) The ear pads are tough. They may seem a bit small, but they are an exact fit. You will do some serious stretching and pulling on the skirt. Just don't use sharp objects for the job.



- 2) Remove the old pads by first finding the screws and loosening them. Pull one ear pad away from the center anywhere along its circumference. Work your way

- around the edge looking for small screws under the pad - there are three. The headset will try to get away from you, so part of this exercise is figuring out how to position your hands. A small Philips screwdriver is needed, and a jeweler's screwdriver has advantages. After you loosen at least one screw, you can start to pull the pad skirt out of the crack. It is best to start from the top. You may not be able to get it off without completely loosening the lowest screw, because of the stress relief for the wire that comes out of the bottom of the earpiece.
- 3) At this point, you have a choice whether to leave the cup partially assembled or to take it completely apart. On the microphone side, the mic wire will force you to keep the cup pieces in close proximity. There is an opportunity here to break a wire, but it will be easier to put the pad on with the cup in two pieces. In any case, if you can work without pulling the screws out of the holes in the inner half of the cup, you will save yourself a dexterity test later.
 - 4) Pre-stretch the skirt on the new pads. This will also give you a feel for how tough they are.
 - 5) Start to work a pad onto the cup. There is a cutout for the cable to pass through. That is a good place to start, because you can hook the skirt on the edge of the cutout and it will stay put. Now you have to go around the perimeter and ease the skirt over the cup. You will think it isn't going to fit, but have faith. I held the cup in one hand and used that thumb to pin the skirt down while I pushed the skirt from the inside with a finger. The skirt will ease up onto the shoulder of the cup, and then you can use a finger or thumb to coax it to slide over the shoulder to where it needs to be. Once you get near the end of this operation, the last bit kind of goes all at once. Now go around the cup and even up the fit.
 - 6) Put the cup back together. So easily said! Position everything, which includes the cup halves, the internal foam, and the wire. Note that the skirt has covered the slot for the wire and at least one of the screw cups. You don't need to cut the skirt, but you can without a disaster. I was successful in pushing the skirt out of the way of the screws sufficiently for every screw to pass. You can tuck the skirt behind the screw cups. The skirt will stretch enough to accept the cable in the slot. Line up the cable with the slot and one of the screws, and everything else will fit. Press it all together. Hold tight and tighten the screws.



You did it! (Or at least I did.)

Bandmap/Waterfall Displays – John K3TN

A friend of mine gave me an [SDR Play RSP-2](#) Software Defined Radio he had been playing with and I decided to see if I could get the output integrated with N1MM's bandmap. I already have an Elecraft P3 spectrum display attached to my K3, but the SDR approach would allow me to do the N1MM integration. It looked like a good rainy-day project and we have been having plenty of those.

The first step was to get the RSP-2 connected to my PC via USB and to a signal source. I chose to use the IF Out from the P3. This allowed me to not have to worry about a T/R switch to avoid blowing out the SDR when I transmitted.

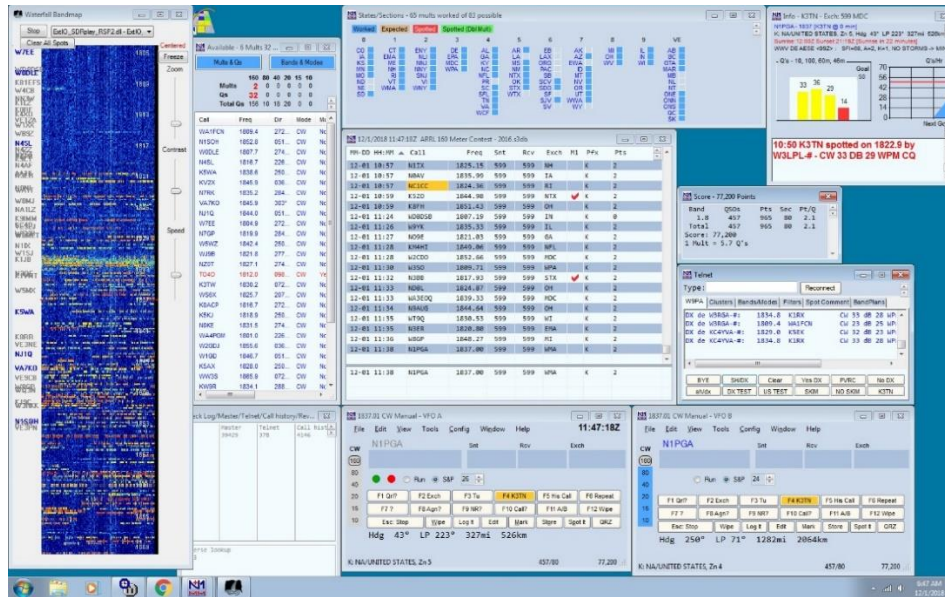
The second step was to load the SDRUno software onto my shack PC to first make sure the SDR worked. There is a wide variety of SDR software you can use, but since SDRUno is the official software package of the SDR Play line of products, I went with it. The software downloaded, installed and started up first try. A very confusing set of complicated screens came up, but no spectrum appeared on the screen. After a bit of [RTFM](#), I realized I had to hit the big green **PLAY** button – voila.

I played with that for a bit and it worked just like a real receiver, albeit with loads of mouse clicking vs. knob twiddling. Since that went so well, I decided to immediately tackle the N1MM bandmap integration.

Pete N4ZR had recommended following the instructions in the N1MM online [documentation](#). It is very well done – I quickly zoomed in on the K3 via IF Out section and saw that using N2IC's Waterfall Bandmap software looked like the path of least resistance.

To get the Waterfall Bandmap software, you first have to join the [Waterfall Bandmap group](#) and wait for Steve to approve your membership. Once I did that, it was pretty much just follow the steps in the Waterfall Bandmap documentation, with one tricky point: the ExtIO DLL that as installed with the SDR software had to be copied into the Waterfall Bandmap directory. The Waterfall Bandmap documentation very clearly says this, but it took me a while to find the damn DLL.

Once I passed that hurdle, the Waterfall Bandmap directions walked me through configuring N1MM, starting everything up and whammo – a screen popped up in place of my usual bandmap window.



Waterfall bandmap on left during 160 contest.

The screen was purty to look at, but I actually did not find it very useful. The waterfall display does give you “freshness” info – you can tell which stations on the bandmap are actively transmitting. But (as Pete N4ZR’s article points out) I find the Available Mult/Q window to be much more useful. If anyone else has done the integration and used it in a contest, let us know how you used it.

K3 Zulu Oscar Turns 51 (in hexadecimal) – Dave K3ZJ via Facebook



Sunday afternoon Fred, K3ZO, took time off from the ARRL 10-meter contest to celebrate his 81st birthday. Shown (L-R) are Carlos (ex-HC1CYB), Dave K3ZJ, Fred K3ZO, and Tom, WA2BCK.

Editor’s note: Fred’s signal is aging well, too. Using a 400’ beverage, Petr OK2FIG/OK1P heard a very loud K3ZO in the ARRL 160 test – listen [here](#) about 1:30 in.

The Stations We Work – YT3X



W0AIH and W3AO FD Article – Twin City Dx Association

The December issue of the Twin City DX Association [newsletter](#) has two articles of interest to PVRicers:

- Al K0AD's remembrances of Paul W0AIH
- Dan W0CN's experience as an op at the W3AO PVRC/CARA Field Day effort



Paul at his favorite operating position at the farm (160 meters)



W3AO's 20M table -- W0CN (L) & W3LPL (not shown) share SSB duties; K3RA (R) on 20CW

2019 ConTest University at Dayton – via Tim K3LR

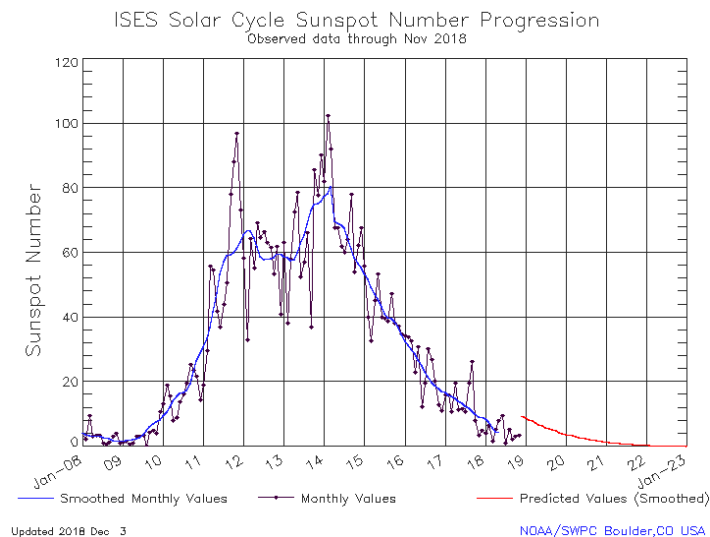
Registration is now open for the 2019 Dayton ConTest University ("CTU") to be held all day on Thursday May 16, 2019 at the Crowne Plaza in Dayton, Ohio. This is the day before Hamvention opens in Xenia, Ohio

Returning professors NC0B, W0YK, N6TV, W3YQ, N0AX and K1DG. You will notice several NEW professors for 2019. New instructors include KG5HVO, N6MJ and KL9A. K5ZD returns to the CTU staff after a multiyear break. CTU professor stalwart Frank, W3LPL is on sabbatical this year. Frank will attend CTU Dayton 2019 and answer questions, but he will not have any teaching duties this year. Congrats to W3LPL!

There are scholarships (registration fee paid) available for CTU through a grant from the Northern California DX Foundation (NCDXF) for those students 25 years old and younger

Full information is on the [CTU web site](#).

Who Needs 15M and 10M Anyway?? – NOAA via Frank W3LPL



NOAA updated its predictions for smoothed sunspot numbers and solar flux through the end of 2022. As of last month, their predictions ended in 2019.

Their [prediction](#) shows a smoothed sunspot number of 10 for December 2018, declining to 2 in July 2020 through January 2021, then 1 during February 2021 through January 2022, and 0 after that and through at least the end of 2022.

I hate predictions, especially about the future...

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 and Log Due Dates

Contests This Month

- Jan 1 - SARTG RTTY
- Jan 5 - ARRL RTTY Roundup
- Jan 12 – **NAQP CW**
- Jan 19 – **NAQP SSB**
- Jan 25 – CQ WW 160 CW
- Jan 26 – REF CW
- Jan 14 – Stew Perry TBDC

Logs Due This Month

- Jan 17 – NAQP CW
- Jan 24 - NAQP SSB
- Jan 31 – RAC Winter

See WA7BNM's [Contest Calendar](#) for more detail and the latest information.

Editor's Last Word – John K3TN

Thanks to Pete N4ZR, Rob KK4R, Dave K3ZJ, Frank W3LPL and Ted W3TB for contributions to the final PVRC newsletter of 2018. Thanks, and kudos to outgoing club President W3LL for always being prompt and informative in his President's column over the past few years.

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).

Happy Holidays, Merry Christmas and Happy New Year to all!



Happy Holidays

From the PVRC Treasurer – Tom K3AJ

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.

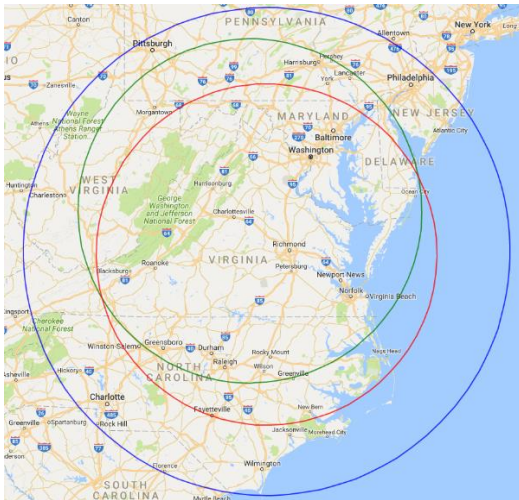
Direct donations to PVRC via Credit Card or PayPal may be made by clicking this "Donate" button and clicking the next Donate button that appears on your screen:



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



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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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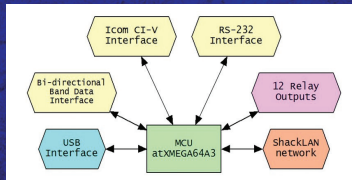
Announcing the new BM-5 BandMaster V

The next generation of the popular BM-3 with direct USB support for FLEX Radios

NEW!



The BM-5 BandMaster V is a full featured unit that contains a universal band decoder and antenna switch controller. It features five communication channels. All channels are active simultaneously and provide data translation for your station accessories. In other words, if you are using an Icom radio on the CI/V interface the BandMaster V will output 4-bit band data as well as RS-232 data in Yaesu or Kenwood format. In reverse, when using a radio on the RS-232 interface the BandMaster V will output 4-bit band data as well as an Icom CI/V data stream. The USB interface may be connected to your PC for radio control. **The USB interface may be connected directly to a Flex SDR with no additional cables or interfaces required.**



RatPack Remote Antenna Switch

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



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.



TwoPak

Two antenna switch, 12V DC via wires or optional via coax cable. DC to 150 MHz. HF 5 kW rating. Metal box.

Off-Center Fed Dipole Antenna

AS-OCF-2K, AS-OCF-5K Seven bands antenna (80 to 6 m). Heavy duty materials. 4:1 balun included. Ratings: 2 or 5 kW or higher available.



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.



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!

OM4000HF	Manual 160-10 m 4 kW
OM4000A	Automatic 160-10 m 4 kW
OM2500HF	Manual 160-10 m 2.5 kW
OM2500A	Automatic 160-10 m 2.5 kW
OM2000+	Manual 160-6 m 2 kW
OM2000A+	Automatic 160-6 m 2 kW

OM Power was founded in 2004 as an initiative of two enthusiastic Slovak ham operators. Since that time OM Power has become a successful and well established company in the production of amplifiers. OM Power amplifiers can be found on all continents and in almost every country of the world. All of the amplifiers have state of the art design, and are solidly built.

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

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.

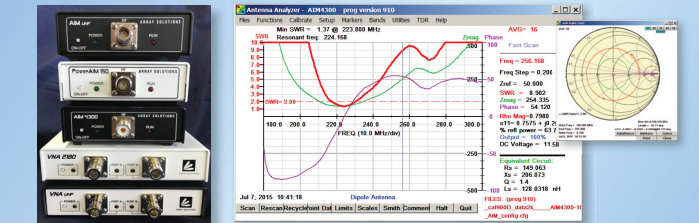
Frequency coverage:

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	\$495
AIM UHF	\$695
VNA 2180	\$995
VNA UHF	\$1,295
PowerAim 150 Broadcasting Engineers Choice. 150 V peak RF capable	\$2,495

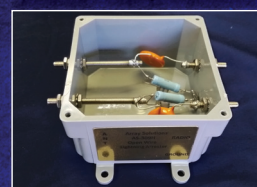
Surge Arrestors

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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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-9100 | The All-Round Transceiver

- HF/50MHz 144/43vvv0 (440) MHz and 1200MHz*1 coverage
- 100W on HF/50/144MHz, 75W on 430 (440) MHz, 10W on 1200MHz*1 • Double superheterodyne with image rejection mixer



IC-7200 | HF Transceiver

- 160-10M • 100W • Simple & tough with IF DSP • AGC Loop Management • Digital IF Filter • Digital Twin PBT • Digital Noise Reduction • Digital Noise Blanker • USB Port for PC Control



IC-R8600 | Wideband Software Defined Receiver

- 10 kHz to 3 GHz Super Wideband Coverage • P25, NXDN™, dPMR™, D-STAR Mode • Large Dot Matrix LCD Display w/ Quick Spectrum Scope • SD Card Slot • Remote Control Function



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-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



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-7700 | HF/50MHz Transceiver

- The Contester's Rig • HF + 6m operation • +40dBm ultra high intercept point • IF DSP, user defined filters • 200W output power full duty cycle • Digital voice recorder



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-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-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-R30 | Digital/Analog Wideband Xcvr

- 100 kHz to 3.3 GHz Super Wideband Coverage • P25 (Phase 1), NXDN™, dPMR™, 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-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

ID-51A PLUS2

VHF/UHF D-STAR Portable

- RS-MS1A, free download Android™ application
- New modes for extended D-STAR coverage • Terminal Mode & Access Point Mode allow D-STAR operation through Internet • DV & FM repeater search function • Dplus reflector link commands



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FTDX5000MP Limited | 200W HF + 6M Xcvr

- Internal Power Supply • Two Totally Independent Receivers
- Super Sharp "Roofing" Filters • High Performance Yaesu Custom- designed 32-bit Floating Point DSP • True Analog Meter Precision



FTDX3000 | 100W HF + 6M Transceiver

- 100 Watt HF/6 Meters • Large and wide color LCD display • High Speed Spectrum Scope built-in • 32 bit high speed DSP /Down Conversion 1st IF



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



FTDX1200 | 100W HF + 6M Transceiver

- Triple Conversion Receiver With 32-bit Floating Point DSP • 40 MHz 1st IF with selectable 3 kHz, 6kHz & 15 kHz Roofing Filters • Optional FFT-1 Supports AF-FFT Scope, RTTY/PSK31 Encode/Decode, CW Decode/Auto Zero-In • Full Color 4.3" TFT Display



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



FT-857D | Ultra Compact HF/VHF/UHF

- 100w HF/6M, 50W 2M, 20W UHF • DSP included • 32 color display • 200 mems • Detachable front panel (YSK-857 required)



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



FTM-100DR | C4FM FDMA/FM 144/430 MHz Xcvr

- Power Packed System Fusion Transceiver • High Audio Output Power • Rugged Powerful Transmitter • Integrated 66ch High Sensitivity GPS • 1200/9600 APRS Data Communications



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-2DR C4FM/FM 144/430 MHz Xcvr

- Analog/C4FM Dual Monitor (V+U/U+U+U) • System Fusion compatible • 1200/9600 APRS Data Communications • Integrated 66ch High Sensitivity GPS • Wide Band Receiver • Snapshot Picture Taking Capability With Optional MH-85A11U



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 Flash-light, 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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TS-990S | 200W HF + 6M Transceiver

- World's first dual TFT display • 200W output on all bands
- ± 0.1 ppm TCXO ensures both high stability and reduced power consumption • Triple 32-bit DSP's dedicated to main/sub receivers and band scope • Main receiver employs full down conversion, new mixer & narrow band roofing filters • Third order intercept point (IP3) +40dBm for highest level of RX performance (main receiver)

Call For Special Price!



TM-D710G | 2M/440 Dualband

- V+V/V+U/U+U operation • Built-in GPS • Built-in TNC for APRS & DX-Cluster operation • 50W 2M & UHF • 1,000 memories • Dual receive • Green or amber backlight colors • Latest APRS firmware w/new features • Sky Command II remote functions

Call For Special Price!



TS-480SAT/HX | HF + 6M Transceiver

- 480HX 200W HF & 100W 6M (no tuner) • 480SAT 100W HF & 6M w/AT • Remotable w/front panel/speaker • DSP built-in

Call Now For Low Price!



TS-590SG | HF/50MHz Transceiver

- Equipped with 500 Hz/2.7 kHz roofing filter as standard • ALC derived from TS-990S eliminating spike issues • Antenna output function (shared with DRV connector) • CW - morse code decoder function • Improved 1st mixer • New PFB key with multi-function knob • New split function enabling quick setting • LED backlight with selectable color tone



TM-V71A | 2M/440 DualBand

- High RF output (50W) • Multiple Scan • Dual receive on same band (VxV, UxU) • Echolink® memory (auto dialer) • Echolink® Sysop mode for node terminal ops • Invertible front panel • Choice of green/amber for LCD panel • 104 code digital code squelch • "Five in One" programmable memory • 1000 multifunction memory

Call Now For Your Low Price!



TH-D72A

2M/440 HT w/extended RX

- 5W TX, RX 118-524 MHz, VxU, VxV, UxU
- APRS w/built-in 1200/9600 TNC • Built-in GPS, Built-in USB, digipeater • Echolink® compatible, • Mil-Spec STD810

Call For Special Low Price!



TS-2000/2000X | HF/VHF/UHF Transceiver

- 100W HF, 6M, 2M • 50W 70CM • TS-2000X 10W 1.2GHz
- Built-in TNC, DX packet cluster • IF Stage DSP • Backlit front key panel

Call For Special Price!



TM-281A | 2 Mtr Mobile

- 65 Watt • 200 Memories • CTCSS/DCS • Mil-Std specs • Hi-quality audio

Call For Special Low Price!

TH-D74A

2M/220/440 HT w/D-STAR!

- D-STAR compatible • APRS ready w/built in GPS • Color weather station information • Built-in KISS mode TNC • High-performance DSP voice processing • Standard compatibility for Bluetooth

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TH-K20A | 2M Handheld

- 2M 5.5W • VOX • CTCSS/DCS/1750 Burst built-in • Weather alert

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- HF and 6 Meter 1KW Amplifier • Match 3:1 SWR with No Tuner • User Friendly QSK Operation • LCD Message Display
- Single 4CX800a Tube • Vacuum Antenna Relays

Call For Additional ACOM Products!



218XATC-PL-(length) RG8x (240UF) w/PL259 Connectors Each End. Weather-Proof Heat Shrink Tubing.

- Stranded Center Conductor.
- 95% TC Braid + bonded 100% Foil Shield.
- Very Flexible, Light Weight, and Smaller than RG8 sizes.
- Non-Contaminating-UV Resistant-Direct Burial-Black Jacket.



233/2-G4-(length).

- Unique design (Nickel Grommets 4" Spacing) allows for easy attachment to a vehicle's body or truck bed to create a "ground-plane".
- Good option as a "buss-bar" in the shack.
- 1/2" wide tinned copper 38x48x8/384 10ga 53 Amps.
- Stocked in 1.5', 3', 5', and 10' foot lengths.



The SDRplay RSP FAMILY

THE WORLD'S FAVORITE SDR RECEIVERS

- Continuous SDR coverage from 1kHz to 2GHz (NO GAPS!)
- Now includes the new RSPduo 14-bit Dual-Tuner SDR
- RSPduo can simultaneously receive on 2 totally independent 2MHz spectrum windows, anywhere between 1kHz & 2GHz
- All RSPs can receive, monitor and record up to 10MHz spectrum at a time
- Visualise all the signals in multiple bands simultaneously
- S/W pre-sets for all the bands from the new LF2200m to 23cm
- Excellent dynamic range for challenging reception conditions
- Built-in High performance Front-end Filters
- Use as a stand-alone general coverage receiver, or as a high resolution Panadapter
- SDRuno Windows SDR software provided free-of-charge
- Also works with other platforms and popular SDR Software
- The perfect gift for newcomers & returners to the radio hobby
- Calibrated S meter/RF power & SNR measurement with SDRuno
- Only needs a computer and an antenna
- Backed by the biggest and best SDR support community



TX-455

- 55' freestanding crank-up • Handles 18 sq. ft. @ 50 mph • No guying required • Extra-strength construction • Can add raising and motor drive accessory • Towers rated to EIA specifications • Other models available at great prices!



MA-40

- 40' Tubular Tower

Call For Latest Pricing!

MA-550

- 55' Tubular Tower • Handles 10 sq. ft. at 50 mph • Pleases neighbors with tubular streamlined look

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RRC-1258 MkII-S-Set

This set of interfaces allows remote control of your Amateur Radio Station via Internet in a user-friendly and cost effective way! RemoteRig gives you control of the radio coupled with crystal clear TX & RX audio and sending CW with your own Paddle!

New! Now Stereo Version for Dual Receiver radios.

Works with all Computer-controllable radios from: **Alinco - Elecraft - ICOM - Kenwood - Yaesu**

For radios with detachable front panels no PC is required for: TS-480HX/SAT; TS-2000 (RC-2000 req'd); IC-703/Plus; IC-706 series; DX-SR8T; IC-2820H; IC-R2500

Just simply insert your control box in place of your front panel interconnect cable, place the body of the radio on the remote end and you are on the air as if you are there! Extra Controller and Remote interface units sold individually for multiple sites/users.

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