PVRC Newsletter
December 2019

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President's Letter – Tom K3AJ

Spotting and Sportsmanship

You can almost predict it now: after every SSB contest, there will be posts to the PVRC reflector bemoaning the paucity of spots. Repeated appeals to enable "spot all S&P" in N1MM before contests appear to largely fall on deaf ears. What's going on here? I'm not sure, but here are some thoughts.

Let me say at the outset that I started more serious contesting only after CW skimmer, the RBN and the retail DX clusters had come into being. And not long after that RTTY skimmer came along. So, my thinking doesn't date back to packet networks relying on operator-initiated spots. But in today's world with those things all in place, anyone calling CQ in a CW or RTTY contest gets spotted 100% of the time. That raises the question: does anyone really think they are operating unassisted in those modes anymore? But I digress. We can debate that another time.

Until someone manages to come up with an SSB skimmer (and I don't doubt that they will someday) we will rely on operator-initiated spots in that mode. And for sure, that results in a whole different environment than we have come to take for granted in the other modes.

Just my opinion, but I feel that it is a good thing for everyone participating in an SSB contest to spot everyone calling CQ – whether they just worked them or came across them while tuning. More spots increase the fun for everyone. All the running stations gets more callers and those operating assisted get better S&P action.

It occurred to me that other than the sheer laziness of not turning on "spot all S&P" or initiating manual spots there might be something else in play. Obviously, to send spots you need to be connected to a DX cluster. Those operating assisted are connected anyway. But what about those operating in an unassisted class? Doesn't it go without saying that they will not be connected and therefore can't send spots? Probably true, so you can't expect spots from them.

That got me thinking: suppose an unassisted station connected to a DX cluster to send spots but configured their software to suppress incoming spots? Since they would get no

competitive advantage, I figured that would be OK. Having learned to take nothing for granted, though, I thought I would ask the question. I asked the ARRL contest branch, the CQ WW contest committee and the director of the NAQP's if operating that way would be allowed in unassisted classes. Of the three responses I got, surprisingly, two of the three said no – in their opinion unassisted stations should not send spots even if they can't see incoming spots. Although neither provided a clear reason for that advice, I guess it just didn't feel right to them.

For now, let's try in PVRC to show the best possible sportsmanship by spotting everyone in SSB contests when we are operating assisted or in contests (such as VHF contests, WAE or Russian DX) where there is no differentiation between assisted and unassisted. Doing that is good sportsmanship because it helps everyone make more QSOs and makes the game more fun. It goes without saying that only spotting friends or club members would be poor sportsmanship, so we will be equal opportunity spotters. We should respect the advice of at least some contest sponsors and refrain from sending spots while operating in an unassisted class until such time as they offer definitive rules to the contrary. Good sportsmanship requires accepting the calls made by officials on the field – even if we don't agree with them.

73 and Go PVRC!
Tom K3AJ

Tom K3AJ presenting Bob ND3D With His PVRC Olympic Gold Medal at W3LL

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Reviving an SB-220 for a Young Contester – Mike W4RN

Editor's note: a while back I offered my old TS-850 and SB-220 up to anyone who was Elmering potential contesters. Bud W2RU (with shuttle service by Tim N3QE) took the 850 for a local NC young ham, and Mike W4RN (ex-W4AAW) took the SB-220 to QRO the station of 14 year old John N0JSD .

I bought that SB-220 from Bob K3RT back in the late 1980s. It spent time at WB3JRU (now W3RU) and K1DQV, then I got it back and did the keying and fan upgrades. But it has sat on a shelf in the basement for 10 years now and Mike took on the project of bringing it back to life to help a young contester increase his scores – John K3TN

Since the amp hasn't been powered up for a while, I am bringing it slowly up to line voltage with a Variac. In the picture, I had crept it up to 56 VAC input. B+ was about 900 VDC.

I creeped the voltage up over the next few hours and let it then cook for four hours at full line voltage and all looked good. I am supplying a 2 kW SWR bridge, connecting coaxes and a PTT cable with RCA plugs on each end. The amp has been rewired for 110VAC house wiring

Heathkit Equipment / Archive PE1GVK

Loop Antennas Alan WA3EKL

What I thought I knew
What I know now
And why I know it.

I would like to share my experience with loop antennas to you all with the hope that this information will help you construct useful loop antennas for yourselves on whatever band you choose. I would like share a little information with those of you who have never heard this before because I believe it will greatly help you tune any antenna you have or will build in the future.

Bill Orr W6SAI wrote in one of his many antenna books years ago the following statement: "*If the length of the transmission line is ½ wavelength or multiple of ½ wavelength then the impedance of the load will be reflected back to the generator* ***regardless of the impedance of the transmission line***."

Now let me put that in our terms. If your antenna is tuned to 50 ohms to begin with and the length of your transmission line (per the velocity of the line) is ½ wavelength or a multiple of ½ wavelength then that 50 ohms will be accurately reflected back to your transmitter and will give you a 1:1 SWR **no matter what the impedance of the transmission line is**. Your transmission line does not have to be 50 ohms to get a 1:1 impedance match. It can be 50 ohms, 75 ohms, 120 ohms or 500 ohms as long as it's ½ wavelength long at the antenna resonance point. That is why I feed all of my antennas with ½ inch Cable TV semi Rigid hard line which is 75 ohms and has a loss factor of 0.01 db loss per 100 feet at 30 MHz and I can get a 1:1 SWR. I have been using it for almost 40 years.

This is very valuable information. If you build a wire antenna, put it up and attach a random length of 50 ohm coax to it, then check the SWR you have absolutely no idea of where the antenna is resonate at because the coax has become part of the antenna. However if the length of the coax is ½ wavelength or a multiple for the band you have cut the antenna for then you will know exactly what the antenna SWR is, impedance is, etc., and you can now tune the antenna accordingly for the resonance and minimum SWR because whatever the antenna is doing is being reflected accurately down to the meter you are using. This also holds true for yagi beams. Now on to the Allusive Loop Antenna!

In May of 1974 L. V. Mayhead G3AQC published an article in Radio Communication Magazine, a British publication, on Loop antennas titled" Loop Aerials close to Ground" W8GIO Paul Vest (sk) gave me a copy of the article on Field Day at his home in West Virginia that same year. He knew I was an avid antenna experimenter which started when I was first licensed in 1964 at age 16. (Yes, I am an old OM and have been at this hobby for a long time.) At that time Paul, W8GIO, his son Gary, then WA3KCY, now NW5E who has been one of my two lifelong friends and whom I grew up with began to experiment with "vertically oriented" full size triangular loops.

After reading G3AQC's article my first vertically oriented loop was a point up triangle on 20 meters with the base about 3 feet off the ground in Glen Burnie MD hung between some trees and fed on the corner with ¼ wavelength of RG11, 75 Ohm coax then 50

ohm RG8 to a Drake C Line. I called CQ about 2PM in the afternoon and got an immediate answer from a station in Guam out in the Pacific! I was hooked on loops.

Paul, W8GIO had two self-supporting 70 foot towers in West Virginia with a "point down triangle" suspended between the towers so that the flat side was at 70 feet. It was a full size 75 meter loop. All our loops are calculated with the following formula: 1005/freq in MHz = Length in Feet. Paul fed his loop 34.5 feet up from the bottom point on one side of the triangle with a 1:1 balun. 34.5 feet is ¼ wavelength on 40 meters. Paul could use the loop on both 75 and 40 meters by feeding it at this point. He was very effective on 75 and 40 meters against the dipoles and inverted vees and consistently beat them out into Europe.

Before some of you who knew Paul personally say, yes but Paul was on a mountain at 2200 feet and in the Presidential quiet zone near Berkley Springs, let me give you some additional information. I can tell you that 20 meters was just as dead up there as it was around here during those low sun spots times of days gone by. It was worse than what we are experiencing right now with 20 being dead for two to three weeks at a time. I earned my Rag Chewers Club Award by talking from Linthicum to Glen Burnie on 20 meters, bout 8 miles distance.

On the 21 of January one year at about 15 degrees Gary and I put up a 40 meter vertically oriented loop at his home in Arnold MD. It was a "point up triangle" with no insulators except at the feed point and the top point was just going over a tree branch. The base of the triangle was about 7 feet off the ground. It took us about 2 hours to put it up because of the temperature and the wind which caused us to come inside about every 15 minutes to warm up and we were young then! It was fed on a bottom corner with a ¼ wavelength piece of RG11, 75 ohm cable then married to 50 ohm RG8 multiples of ½ wavelength back into the shack. The SWR was 1.1:1.

With 100 watts Gary was working Europeans and South Americans like they were sitting in the back yard. It totally blew away any other antenna he had tried on 40 at that location. At that time, I had a 65 foot tower with at 20 foot aluminum "E" beam bolted horizontally across the top of the tower. It looked like a big "T". It had pulleys and ropes attached to both ends so I could raise and lower experimental antennas from the ground. (You remember I said I am antenna experimenter.) In May of that year I decided to pull down my 40m vee at 65 feet and replace with a point up 40 loop. My thoughts were if Gary was doing so well with the base of his triangle 7 feet off the ground I should do much better with the base of my point up triangle 40 feet off the ground. Oh, was I wrong!

I started with the point up at 65 feet and the base at about 40 feet. Gary was working Europeans and I could not get off my back yard. I was running the same setup, we both were about 40 feet above sea level, lived about 25 miles apart, each running the same power level, and both had the same sandy soil conditions. What was wrong? So, I had an idea. I rigged up the 40 loop on ropes and pulleys so that from one place in the yard I could lower and raise the loop up and down the tower. Over several weeks and at different times of the day I brought out into the yard a receiver and tuned it to the 40 meter foreign broadcast stations. I used the receiver's attenuator so I could get the signal down to about S4 or S5. Much to my surprise as I lowered the antenna closer to ground the louder the broadcast stations became until the horizontal base was about 7 to 8 feet off the ground. Seven to eight feet was where I consistently got the greatest

signal strength every time. I left the antenna at 7 feet temporally and began making as many Q's as Gary with the same signal reports.

According to G3AQC's article here is the following data: A point up loop fed on the corner will yield a vertical polarized lobe at about 30 degrees and a very tiny horizontal lobe at about 45 to 50 degrees. If you make a point down triangle and feed it on the top corner you will get a 20 degree vertically polarized lobe.

If you make a point down triangle and feed it at the bottom point you get two lobes. A vertically polarized lobe at 30 degrees and an equal intensity broad horizontal lobe between 25 and 68 degrees. All these patterns are according to the article by G3AQC.

Let's review:

- Point up, lower corner fed, 30 degrees vertical + tiny horizontal 25 to 68 degrees (easily fed)
- Point down, top corner fed, 20 degree vertical (harder to feed)
- Point down, Point fed, 25 degree vertical + equal strength broad horizontal 25 to 68 degrees. (easily fed)

I have seen these patterns proven on a mini antenna field many years ago by a British ham who brought a 4x5 sheet of aluminum with 5 Gig transmitter and 3 element beam on a 6 foot length of coax. The transmitter attached under the aluminum plate to two terminals in the middle of the plate and was modulated with a tone. You could then make any type of antenna you could think of out of buss wire, plug it into the antenna terminals, then take the receive 3 element around the antenna and see and hear the pattern the antenna was making out to about 5 or more wavelength on the 5 Gig receiver. It was quite impressive and quite an education.

For instance, a dipole has two horizontal lobes perpendicular to the plane of the antenna and at about 45 degrees elevation when the antenna is ½ wavelength above ground. An inverted vee has the same pattern but with a little less intensity in each of the two perpendicular lobes. Why? Because off the ends of the inverted vee is a vertically polarized lobe at about 30 degrees and that is where some of the energy is going. That was amazingly proved on his mini antenna field long before we had any computers with antenna programs.

The point down triangle configuration is the best of all configurations if you want to work US and DX. The point up configuration fed on the lower corner is the best configuration if you only want to work primarily DX.

I have participated in 53 Field Days and have had the privilege of trying many different types of wire antennas due to the good nature of the men and women I participated with using QRP battery power on at least 35 of those field Days. On 40 meters I have been able to do A/B testing of the point down loop whose point was about 8 feet off the ground against inverted vees at 50 to 85 feet and dipoles at 70 to 90 feet. 95% of the time the loop beat out the other two antennas.

When I moved to Severn 18 years ago, I had a 40 meter slightly drooping dipole at 55 feet and it worked well, plus a 2 elements beam at 93 feet. I later moved the dipole to 70 feet on the tower and it didn't seem to work as well. Then I lost a tree that was holding up one end of the dipole and I had to take it down.

I replaced the vee with a point down triangle whose top is at about 49 feet and point at about 8 feet off the ground. The plane of the triangle is oriented North/South and we can work South/Central America stations equally as good as the 2 element at 93 feet. It is almost as good as the beam on European stations. Many times our ops forget to switch back to the beam after switching to the loop to pick up a Central or South American and continue running Europeans on the loop. No, I don't have a big amp on 40 meters, it's just a pair of old 813's I built when I was 18 years old. After 2 contest seasons I asked myself why I didn't get rid of the dipole years ago since I had so much success using a triangle on Field Day.

I want to add a side note of recognition here. I have known Frank W3LPL for over 40 years. I have the utmost respect and honor for him and his knowledge of antennas. I have sought his knowledge and advice on occasions over the years. However, on rare occasions I have built an antenna that does not seem to comply with Frank's teaching's yet still works very well.

So is the case with the vertical loop and I asked myself why? Mayhead, G3AQC's article is titled "Loop aerials close to ground" and emphasizes the top of the antenna should be about ¼ wavelength above ground however you cannot create an equilateral triangle on 40 meters with the point at ¼ wavelength above the ground and the bottom off the ground! In talking to Frank and in studying his teachings Frank emphasizes that the bottom of a loop needs to be at least ¼ wavelength off the ground in order for it to be effective, yet I have proved that not true with my experiments of raising the antenna up and down the tower. Or have I?

Others have put these triangles close to ground and obtained the very same excellent results I have. 8 feet off the ground is only about 1/16 wavelength on 40 meters. So, what is this major discrepancy? The answer is simple. Antenna ground or "antenna reflective ground" is NOT the earth you are standing on in many cases. Where is my actual ground to this antenna? I have very sandy soil here in Severn just as I did in Glen Burnie, and just as Gary had in Arnold many years ago. I use 10 foot long expandable earth anchors for my tower's guy wires. When I installed the anchors all but one of them went down the full 10 feet and I was still in sand! My "reflective earth ground," for lack of a better description, is below 10 feet and most likely some 20 to 30 feet deep which would make Frank's ¼ wavelength statement totally correct. That is why these triangles work so very well close to ground because the antenna's ground is not the ground we are putting them over!

To further support this statement, while I was writing this article I contacted the Anna Arundel County Well expert who looked up the information on my well. He said your well is 115 feet deep and does not hit the clay layer until 75 feet deep. I am sitting on a lot of sand! So again, I ask where is my actual "antenna ground?"

In Glen Burnie at one time I hada point up loop for 75 meters at 65 feet at the top, fed on the bottom corner with a ¼ wavelength of RG11, 75 ohm line then RG213 to the shack. The base was 7 feet off the ground. I was an isosceles triangle (triangle where the two sides are shorter than the base) which was excellent antenna into Europe, near Asia and South/Central America. It was much better than a 75 meter vee at 65 feet.

Since then I have constructed here in Severn 40 and 30 meter point down loops fed at the bottom point and a 17 meter point up loop fed on the side. Experimenting with these loops over the past year has taught me that most of what we find on the internet with respect to loop antennas is people just parroting what someone else has written or said and most of it is totally inaccurate.

One major point to be made it this. Feeding a point up triangle at the top point or the bottom center is an absolute waste of time and energy. Feeding it in either of those two places is no better than an inverted vee or dipole whose height is the same as the triangle's point height. G3AQC stated this and showed those antenna patterns all the way back in 1974, plus it was proved to me on that mini antenna field years ago and that still holds true today regardless of what any antenna program tells you.

Now let us look at feed point impedances for various loop combinations. This is where the title to this article comes in to play. What I thought I knew from the internet, the ARRL antenna handbook, G3AQC and other sources is not what I have learned and now know from directly experimenting with these vertical loop antennas. Some of the internet information on vertical loops agrees with the G3AQC and the antenna book but it just isn't correct! It all goes back to what Frank said about antenna height above ground and what I am now saying about antenna height above ground and true antenna "reflective ground" if you will permit me to use that word for this discussion. Let us take a look.

A 40 meter point up triangle, fed on a side, over poor soil like mine, does indeed have an input impedance of about 110 ohms. Most references say 100 to 120 ohms. That is true over "poor soil." NOT TRUE if it is sitting over a swamp or salt marsh. G3AQC said the feed point impedance is around 60 ohms which is probably true over very good soil. 110 ohms with a ¼ wavelength of 75 ohm coax will yield a 50 ohm feed point at the other end which you can then connected a ½ wavelength of 50 ohm line and it will show a 1:1 SWR at the transmitter.

A point down, point fed vertical triangle on 40 meters with the point about 8 feet above "poor soil" displays a 180 to 200 ohm impedance. This is what most internet sites reflect but they leave out the "poor soil" information because they don't know about it! This will easily match to a 50 ohm line with a 4 to 1 balun of ½ wavelength coax type or the commercial toroid type.

A point down, corner fed triangle is said to have about a 60 ohm feed point. That is not what I found as you will soon see. A 75 meter isosceles point up triangle at 65 feet will behave the same as the above 40 triangle over poor soil. You can match it the same way. Therefore, I believed when I constructed my 30 and 17 meter triangles they would behave the same way as the 40 and 75 meter triangles did. Not so!

I first put up a point down, point fed 30 meter triangle with the point about 9 feet off the ground and the top horizontal 34 feet off the ground. Using the ½ wavelength coaxial balun it worked amazingly well and I got a 1.1 to 1 SWR. In two months using FT8 I had worked all 50 states and all 50 confirmed in three months. In the first two months I had worked 66 countries and in 5 months had 78 confirmed. I decided to change the feed point to an upper corner instead of the bottom point to get more power in the lower vertical lobe – a big mistake! Feeding at the top corner yielded a 20 ohm feed point not 60 ohms like almost all internet sources say. That produced a 2.5 : 1 SWR. Not good.

Then I moved the feed point as some internet sites strongly suggested to exactly ¼ wavelength up from the bottom point which was supposed to give a 50 ohm feed poin - it did not!. That feed point yielded 25 ohms at antenna resonance which created a 2:1 SWR. I have been doing all these measurements with the RIG EXPERT Antenna Analyzer. At that frustration point I reconfigured the feed point back to the bottom point and haven't looked back since.

Then I constructed a point up triangle for 17 meters. I fed it on a corner with a ¼ wavelength of RG11 and checked the SWR with the analyzer expecting to find a 1:1 SWR at the other end of ¼ wavelength of line. Much to my surprise it was 1.6:1 over almost all of the 17 meter band. That told me two things. First the antenna was broad and secondly the impedance of this loop at the corner was not 110 ohms. Back calculating 50/30 = 1.6666 which indicates the ¼ wavelength was matching some impedance down to 30 ohms. Back calculating that impedance indicated that the corner fed vertical loop for 17 meters with it's base 10 feet off the ground was actually 190 ohms. I then made a ½ wave length coaxial balun and put it in place of the ¼ wave matching section and now the SWR was 1.04:1.

So what have we learned? The height above ground of a vertical triangle has a greater effect on the feed point impedance of a corner fed triangles than it does for a point down, point fed triangle. The resonate frequency of the triangle also determines the wavelength height above ground. The higher the frequency the closer the bottom of the triangle can be over poor soil. On good soil this would also hold true except the base would just be higher. As the resonant frequency of the antenna goes up ***and*** the higher the antennas base becomes off the ground the **higher** the input impedance becomes!

In the beginning I said if you want to work US and DX make a Point Down Triangle and feed it at the bottom point. If you want to work Primarily DX make a Point Up Triangle and feed it on a corner. As a lot of you know FT8 shows the signal strength of the contact in both directions. On 30 meters I am running 70 watts to the point down triangle which has the 25 degree vertical lobe and the 25 to 68 degree horizontal lobe. My US contact signal strengths are usually equal or stronger than the station I was working. My DX contacts are usually 6 or more units less than the DX station I was working except for the longest distant contacts where the signal strengths are usually the same or very close because of the 25 degree lobe. This was 30 meter triangle. The 17 meter triangle with its point up is a different story.

I constructed a point up 17 meter triangle fed on the corner. In three days on FT8 I had worked 30 states and confirmed 5 countries, two of which were VK and ZL. In 2 more weeks, I had confirmed 34 states and 14 countries. My US contacts strengths were consistently lower than the stations I was working, and my DX contacts were almost always equal or better than the DX station I was working. On this antenna almost all of the energy is concentrated in that vertical polarized lobe at 30 degrees. I am running 80 watts using FT8 on 17 Meters. You can see the difference between the two orientations and the feed points. Point down is louder in the US, point up is louder in the DX world but both work very well especially the 40 meter point down triangle. Ken, KG4USN and I put up a 40 meter point down, point fed triangle at his QTH in early September. The proof is in the performance. Ask him how he likes his 40 meter Triangle.

My final advice is if you put up on of these triangles connect a ½ wavelength or one wavelength piece of feed line to where ever you are going to feed it and measure the

impedance with an antenna analyzer at that feed point. Then make the appropriate matching network for that feed point and start making contacts!

I hope you all have enjoyed this information and I hope it helps you in designing your next antenna.

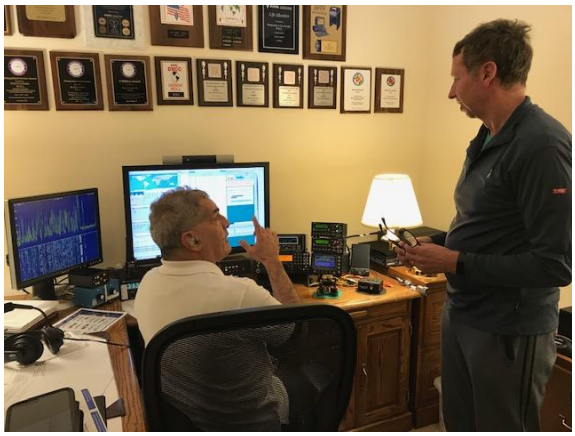
Mercury Transits the Sun – John N3AM

Here's a hand-held photo of the Mercury transit of the sun at 11:18am EST on November 11, 2019 at Boynton Beach, FL. Nikon D7100 camera with 400mm lens and solar filter, f/5.6, 1/1600 sec, ISO 400. As can hopefully be seen, Mercury is smaller than a typical sunspot.

Not That There is Anything Wrong with the Q Precedence – Hank K3YDX

I don't want to offend PVRC's QRPers, but the image above captures how I feel after Sweepstakes!

Mulitop Effort at W3LL in CW Sweepstakes – Bud W3LL



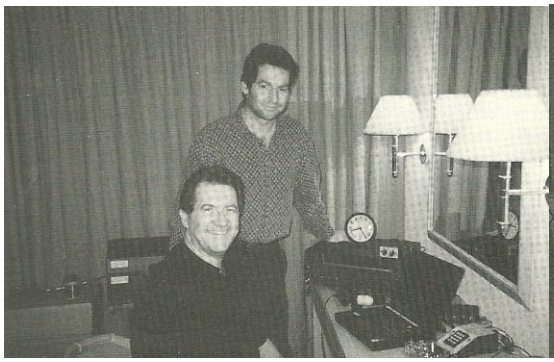
(L) Daryl AC3BU and (R) Bob ND3D giving Bob W3RQ hints on using N1MM during the SS CW contest.

LA8W Contest Station Upgrade – via the Norwegian Radio Relay League

A new shack and big towers/antennas have turned LA8W in Rakkestad, Norway into what should be a loud multi-multi station. Full story here.

From the Way Back Machine: 3A/W0YR 1999 CQ WW CW – Mike W4RN

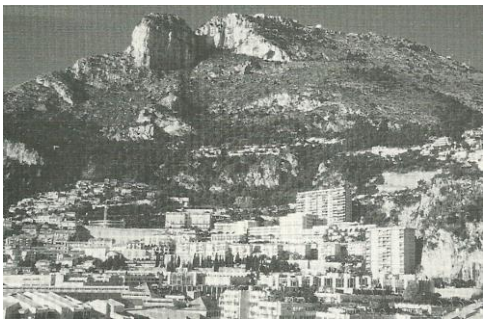
In 2000, I wrote an article for the now defunct DX Magazine that covered the near disaster preceding the November 1999 3A2/WØYR contest DXpedition to Monaco, mounted by Gyuri-HA5JI, George-VA3EU, Tom-K6CT (now K2GO) and me, Mike WØYR (now W4RN).



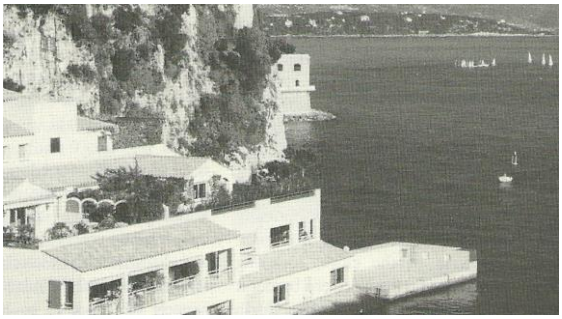
Tom K6GT seated, with Gyuri HA5JI

Mike W0YR takes a break at 3A/W0YR

We operated M/S from atop the Abela Hotel.



The mountain blocking short path to NA



The beautiful view east

So far as I know the score we achieved has not been topped in the last 20 years:

Rank	Call	Cty	Category	Score	QSOs	Zn	Cty		Operator(s)
1	3A/W0YR	3A	MULT-ONE	4,629,456	4,707	139	485	-	W0YR HA5JI VA3EU K6CT

Of course, both Tom and I are PVRC members and I had just joined PVRC through the good offices and efforts of W3UR and K3ZO. He has remained one of my fast friends for over 25 years. Tom is a retired Int'l American Airlines Captain, two-time WRTC Referee, accomplished contester and, at present, he works on the Boeing 787 simulator project in Inchon, South Korea.

Tom and I were planning to have a sort of 20-year reunion at my station this November and work the CQWW CW test together. Unfortunately, Tom recently had to undergo a triple bypass operation in Miami, followed by three weeks of therapy and recover. Much to our disappointment, we have had to scrub the 20th anniversary operation. The good news is that Tom is doing well.

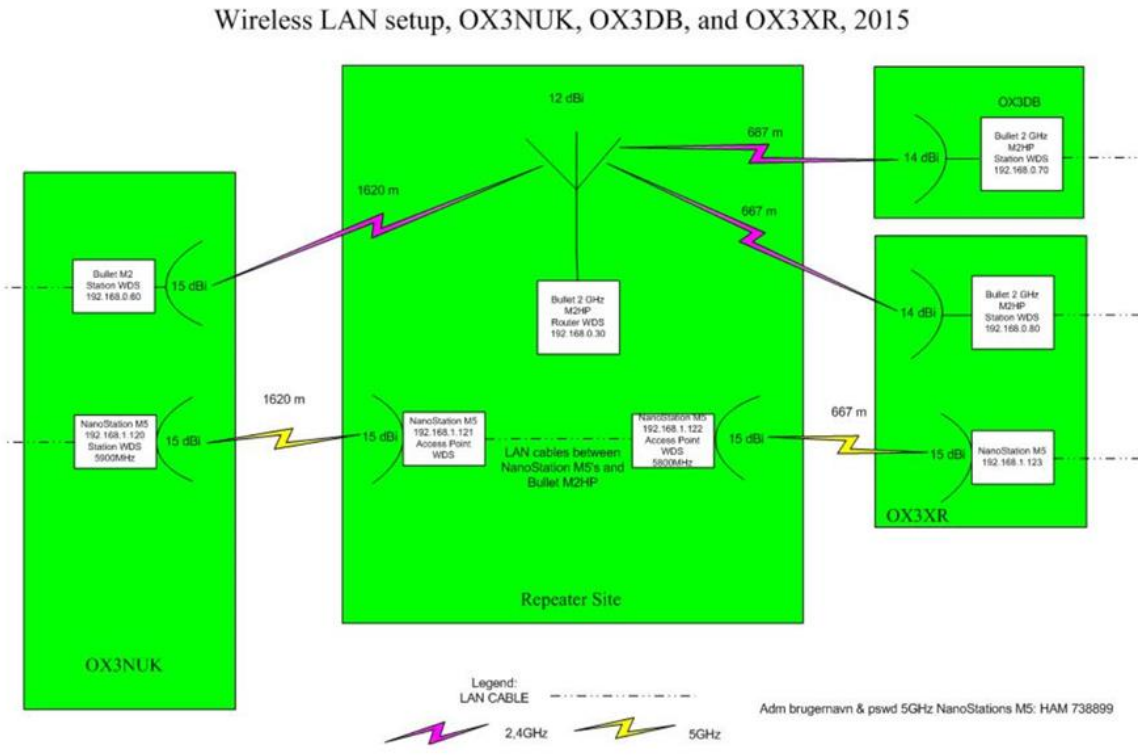
Remote Control in Greenland - Peter OX3XR via Jim N3JT

Below is a schematic showing the WLAN setup we are using for remote control of our equipment in our club station OX3NUK. I'm working on an additional schematic showing what I can remote control. I have a Kenwood TS-480, a SPE 2K-FA antenna switch, remote computer for digimode, antenna rotor, camera etc. See photos on my QRZ.COM.

There is no internet connection and the latency is excellent, only 1-2 msec delay. My colleague Jan/OX3DB is also using the link to remote control his equipment. We are planning to also have Oeystein/OX3AH on the network.

I have been remote controlling my equipment since spring 2007. However, the remote capability improved greatly when I got the Ubiquity WLAN equipment replacing the old standard WLAN equipment. Now I get up to 5-8 Mbit/sec throughput.

The Ubiquity equipment on 5 GHz are Ubiquity NanoStation, info here. On 2.4 GHz I'm using Ubiquity Bullet stations, info here. On both 5 and 2.4 GHz the frequencies are shifted into the Ham Radio frequencies next to the normal WLAN frequencies.



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

- **Dec 6 – ARRL 160M**
- **Dec 8 – FT Roundup**
- **Dec 14 – ARRL 10M**
- **Dec 21 – Croatian CW**
- **Dec 22 – Rookie Roundup CW**
- **Dec 28 – RAC Winter**
- **Dec 28 – Stew Perry Top Band**

Logs Due This Month

- **Nov 29 – CQ WW CW**
- **Dec 15 – ARRL 160**
- **Dec 21 – ARRL 10M**

See WA7BNM's Contest Calendar for more detail and the latest information.

Editor's Last Word – John K3TN

Thanks to Mike W4RN, Alan WA3EKL, John N3AM, Jim N3JT, Bud W3LL and Hank K3YDX for contributions to the final PVRC newsletter of 2019.

The last month of the old year is always a good time to think about how to improve in the following year. If you have suggestions on how I can make the PVRC newsletter more useful or enjoyable, let me know. 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 – 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.

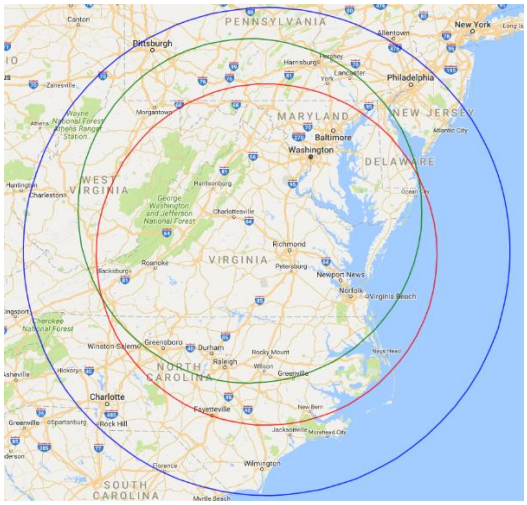
Direct donations to PVRC via Credit Card or PayPal may be made by clicking this "Donate" button and clicking the next Donate button that appears on your screen:

Donate

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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It's Great Being a Ham for the Holidays! Now that you've received your DX Engineering Autumn/Winter 2019 Catalog, take a moment to write out your wish list. Choose from thousands of items, from the latest transceivers to new devices from DX Engineering. Need assistance? Our team of Elmers is only a phone call or email away. Don't have a catalog yet? Get yours free at DXEngineering.com.

Dear Santa

I've been a nice operator all year!
Here's a few items to consider...

- DX Engineering PaddlePad and Footswitch
- New Digital Handheld Transceiver
- The Latest Mobile Rig
- RF2K-S Solid State Linear Amplifier from RF-KIT
- A Base Transceiver from ICOM, Kenwood or Yaesu
- Equipment Covers from EAntenna
- SOTABeams' WOLFWAVE Advanced Audio Processor
- DX Engineering's New Transceiver Key Line Splitter
- RigExpert Antenna Analyzer and NANUK Case Combo
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Check DXEngineering.com for the most up to date holiday shipping information!

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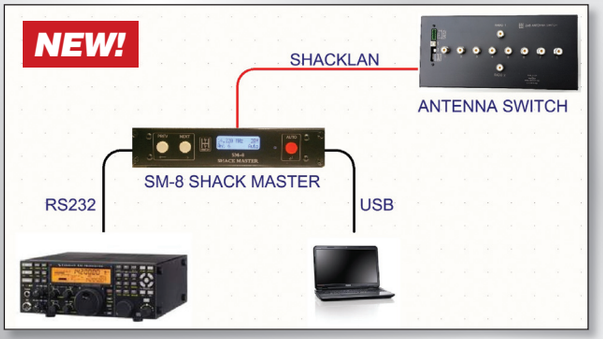
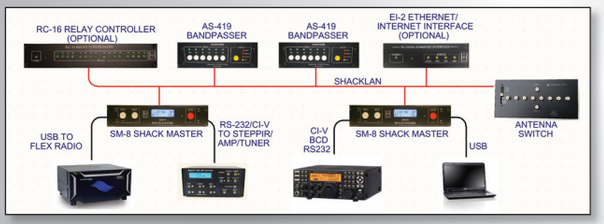
Wiring are simple phone cables that daisy chains to all the devices. Wireless control is also available to your tower located switches. Call us to learn how to set up simple or complex systems. Below is a simple basic system that can switch antennas as you change bands. We can interface to any radio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



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



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.

JK ANTENNAS

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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.

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OM Power

OM Power Amplifier Sales Program

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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 amplfiiers
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

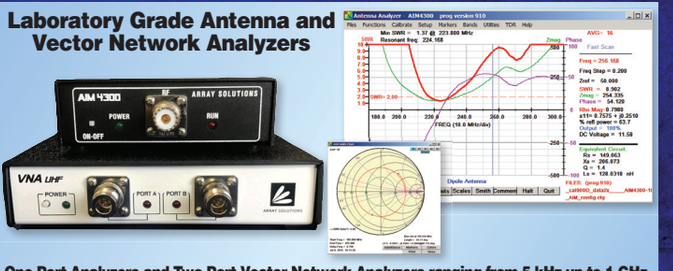
OM2000A+ – OM2000+

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.

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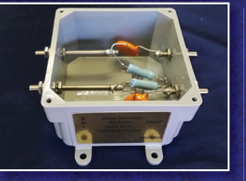
Ratios 1:1, 1:2, 2:1,4:1 and more. RF line isolators. Ratings 3, 5, 10 kW+. Get the most out of your antenna by stopping the coaxial cable from becoming part of it.



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