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Implementing a High Performance, Low Cost SDR Into Your Station

By Kirk Pengelly, NØKK
Photos, Text and Comments from NØKK, NØAT, N2EME, KB7IJ, and NDØB

Every radio that any of us have owned has received signals. Some do better than others. In other words, some hear more signals than others. One could argue, that with even the best RX in the world, the RX is only as good as what it hears. But that "Best" receiver, is still not hearing some signals. The question each of us should be asking ourselves is "What isn't my receiver hearing?"

First, a bit of background on SDR dongles and SDR receivers. Several years ago we began seeing articles and advertisements in QST for Software Defined Radios (SDRs). I first recall them being for SoftRock receivers. I read one article, skimming over most of it, and moved on. It wasn't exactly "plug and play" at that time. I felt I didn't need to change anything with my station as I was very happy with what I had at that time.

Sometime later, while milling around the flea market in Dayton, I bought a SoftRock 40 meter SDR in partially built form from Gary Grivna, KØGX. My sole intention was to make use of the new trend in contesting at that time, CW Skimmer.

Soon after I bought that SoftRock, the skimmer spots began showing up on cluster networks so I had no use for the SoftRock. It sat for years in a drawer in my shack.

Fast forward a few years. There were still some hams talking about SDR dongles but it seemed that they were primarily in SWL circles. There were also some experimenters. They would mess around with these little devices and Raspberry Pi. They were not being used by serious DX or contest minded hams. Those who were talking SDR were jumping on the FlexRadio bandwagon.

After some time, I too looked at FlexRadio with curiosity. I stood at the booths in Dayton and listened. I read QST articles. I even called FlexRadio and had a long chat about what I would need for a PC or other peripherals in the shack if I were to dip my toe into the SDR waters.

It was also around this time that I purchased my Icom IC-7600. It had a band scope display so I was not in any hurry to find a way to add a panadapter to my radio. Feeling that there was just too much I needed to buy for the shack and not being computer savvy, I saw no added benefit to early SDRs versus what I had at that time (Icom IC-7600 and an Icom IC-756 PROII). To be honest, I still wanted to turn the knobs and enjoy the "feel" of a "real" radio. I dropped the SDR idea completely.

The SDR Situation Today

So let's move the calendar to mid-2015. As I wrote a while back in my biography in The Gray Line Report, I've been spending more and more time using digital modes. It became a way for me to make DXing fun again. Most countries were new again as I'd not yet worked them on JT65 (Even though it's still just a digital QSO). While playing around with JT65 I found my way onto 6 and 2 meter digital modes. On these frequencies the mode of choice was FSK144 (today it's MSK144). These modes are used for 6 and 2 meter Meteor Scatter.

While on Ping Jockey Central, an on-line spotting network for meteor scatter, (https://www.pingjockey.net/cgi-bin/pingtalk) I would chat with several guys on a weekly basis via Ping Jockey's N5TM chat page. It's a chat room where some of the Ping Jockey users would go to discuss radio and what they were working on. More often than not, they would chat about stuff technically way above my head. Some were electrical engineers, software developers, RF engineers etc. One had even won several Grammy awards for innovations in RF broadcasting. They had spent lifetimes building and testing equipment and had an excellent understanding of the hobby and RF electronics.

These hams would always talk about how they could improve their RX on the VHF bands. Over a period of several months, the talk centered on how some of them were experimenting with different SDR dongle receivers. Their findings were blowing them away as they did comparisons using certain SDR dongles vs. their own FlexRadios, ANAN radios, Kuhne transverters and other SDR radios.

I still wasn't sold on the idea. I thought, "How can a cheap dongle outperform some of the top receivers out there?" I was reluctant to try anything new and off the wall. Then Paul, N2EME, sent me this text:

"*Most people cannot allow themselves to believe that today's manufactures are building yesterday's rigs and not building today's best RX. They build old radios for old guys who think the transistor was going a bit too far in radio design*".

Becoming a believer in dongle based SDRs

I just could NOT believe what they were saying and you may feel the same as you read this. They continued to talk about how they were hearing more signals off the moon than ever before. Now this had me interested! Having spent two winters working 2 meter EME, I was all ears for anything that might help me with 2 meter RX. I was struggling some. I had added a 4X7 array and a QRO amp on 2 meters to work the 3YØZ guys via EME. Maybe this would help me nab that new one.

I did not have a FlexRadio SDR or any of the other equipment they had. I'd never even used a dongle or the software to run one. I had zero experience with SDR outside of operating the FlexRadios one year for Field Day. How would I do all this? I mean, I didn't even know what a VAC line or a DAX line was yet! (By the way, they mean Virtual Audio Cable and Digital Audio Exchange.) So what good was all this to me? I listened…. and I drank the Kool-Aid. I inquired about how I could make use of this and what software was needed.

The experimenters were toying around with RTL-SDR .005 ppm (parts per million) dongles and the FUNcube Dongle Pro+. After those first few months chatting with these hams, the new Airspy HF+ hit the market. They welcomed all my questions and began sending me links. Most was way over my head…WHOA! I only had the IC-7600 and an IC-746PRO for 2 meters. I thought I could not use these… WRONG! I could turn my "brick radio" into an SDR RX radio and keep all the feel and functions that it provided!

I was sent a PDF on how to modify my Icom IC-746PRO so it becomes an SDR receiver while keeping all the standard Icom TX functions. I was told, "Kirk, you'll be so much happier with the best RX you can buy. Just DO IT! And, with this mod, you'll be able to use ANY SDR radio RX you want." I would not be limited to just the RTL-SDR or FUNcube and more importantly I would not have to sell my ICOM radios for less than I feel they are worth and pay thousands more for the SDR technologies.

With a lot of help from the SDR community, here is the step by step procedure I implemented a dongle based SDR.

Step 1: SDR Receiver Purchase.

In late 2017, I purchased both the RTL and FUNcube Pro+ dongles and began experimenting. In early Feb 2018, I bought the Airspy HF+ dongle.

The RTL is an entry level, though excellent SDR dongle. It shines on 6 and 2 meters. As a matter of fact, a very well-known EME enthusiast who travels worldwide for EME DXpeditions recently received an RTL for comparison, He found it heard and decoded more signals off the moon than his factory radios. On his next expedition he worked more stations than ever before. The RTL has frequency capability of approximately 25MHz-1700MHz. The frequency range can be extended down to 100kHz or lower with the Ham It Up upconverter, available on Amazon.

The FUNcube Dongle Pro+ is several steps up from the RTL for many reasons. First and foremost are the excellent filters. I encourage you to look into these online. The FUNcube has a bandwidth of 192 kHz and a freq range of 150 kHz to 240 MHz and 420 MHz to 1.9 GHz. Information in the FUNcube can be found at http://www.funcubedongle.com.

Airspy HF+ is several steps above the FUNCube . Early reviews have it performing as

well as some of the SDR receivers in the $500-600 class. I can attest that it is a fantastic SDR Receiver! HF coverage is between 9 kHz - 31 MHz. VHF coverage is between 60 - 260 MHz. Information is available at https://airspy.com/airspy-hf-plus/.

Step 2: Station Implementation

The second step was to look at how I could implement these receivers in my station with the least impact on what was already working well. If I found that the RX was as good as advertised, I'd want to have it functional on both my radios.
Paul N2EME states it this way: "*By the time you have gotten to this part you will have already realized that even a basic $25 RTL running SDR Console is probably a better receiver than your IC-XXX, TSXXX or KXX and that an Airspy HF+ will completely embarrass almost all the radios available from the big 3 manufacturers. Of course at this point you will not believe that a cheap little SDR RX and some Donation Ware software can RX better than the big $$$ rig that you spent half your kid's college fund on. That will only come later after you have played with an SDR RX and seen the many RX options SDR Console offers you*."
Paul Continues, "*While some operators will tap into the rig's IF and use the SDR RX just as a Panadapter, this has two downsides besides having to open your rig up. Often tapping into an IF is not quite as easy as just bypassing the rigs front ends and also with this method you are just using the SDR Rx as a Panadapter and still using the rigs RX to work people. This is like buying a Ferrari only to tow it around behind a Yugo all day. Apart from looking pretty you gain none of the performance that the Ferrari/SDR RX has to offer*.

The question you may be asking is: "How can I use my rig to TX but upgrade my RX to a far better SDR RX?"
Let's take a look into 3 methods I've used to incorporate the SDR receivers into my stock radios, and what it takes. Keep in mind I'm not talking about adding I/Q (in-phase/quadrature) taps for a pan adapter. How do we add SDR RX to our brick radios?

Implementation Method 1: Divert RX in and RX out to Back of Radio

The first method (see Block Diagram 1) was to do an easy modification to my Icom IC-746PRO. It came from Paul, N2EME. He and Jim, WA3LBI (recently SK), had performed this mod and found it to be a fantastic way to implement an SDR RX to a solid HF/VHF radio. What follows is how to complete the mod to the 746. This varies just a bit from how I performed the mod to my 746. I was able to do the mod without adding the barrel connectors to the radio or removing more than the top cover. I'll show a photo of each mod.
The N2EME mod to the 746 is as follows:
As you can see four connectors have been installed on the rear panel of the IC 746. Two for HF/6 meters and two for 2 meters. One connector is RX out the other is RX in. Basically a return feed allows either the IC 746 to work alone (factory) on RX, the SDR to act alone on RX (SDR only) or for both the IC 746 and the SDR to be used in RX (Dual RX).
The internal cover is removed revealing the HF/6 meter SO-259 connectors and the 2 meter connections. The upper pair of SMA connectors are for HF/6 meters while the lower are for 2 meters. This was determined by how the cables wanted to lay. Doing the 2 meter mod was just as easy as the HF/6 mod. With

Figure 2: Four New Connectors on back of Icom IC-746PRO

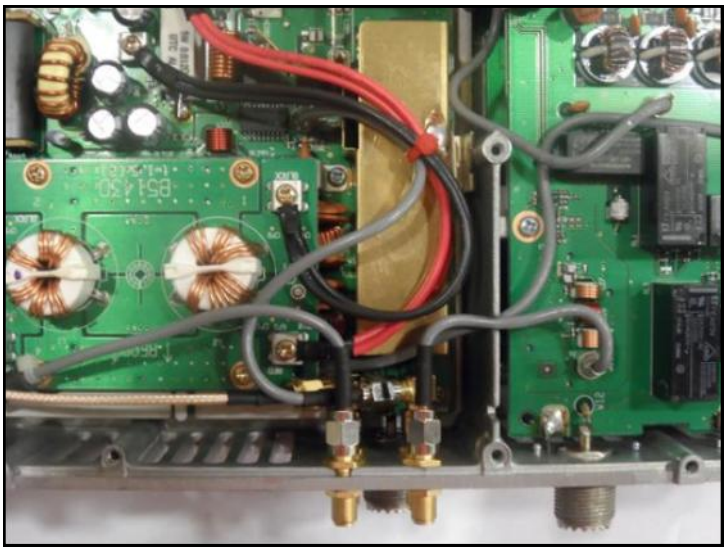


Figure 3: Icom HF/6m SO259 connectors and the 2m connections

the use of SMA jumpers I can easily put the radio back to a factory RX condition.

Figure 4 shows inside the top of the IC-746. The final cable connections and runs for the mod can be seen. Shown also is the FUNCube. In this configuration, a SMA Male to SMA Male jumper is used to connect to a small splitter. Then the IC-746 RX and the SDR RX will both be operational.

Figure 5 shows the modification done to my

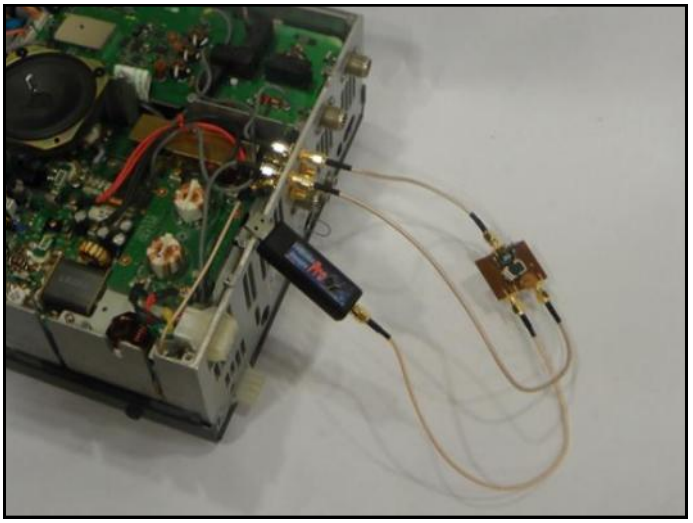


Figure 4: Inside top of the Icom IC -746PRO with FUNcube

746PRO without the barrel connectors. Note how I simply ran the RG316 coax cables out through the auto-tuner plug opening on the rear panel. The four leads are: 1) 2 meter antenna, 2) 2 meter radio RX, 3) 6 meter antenna, and 4) 6 meter radio RX.

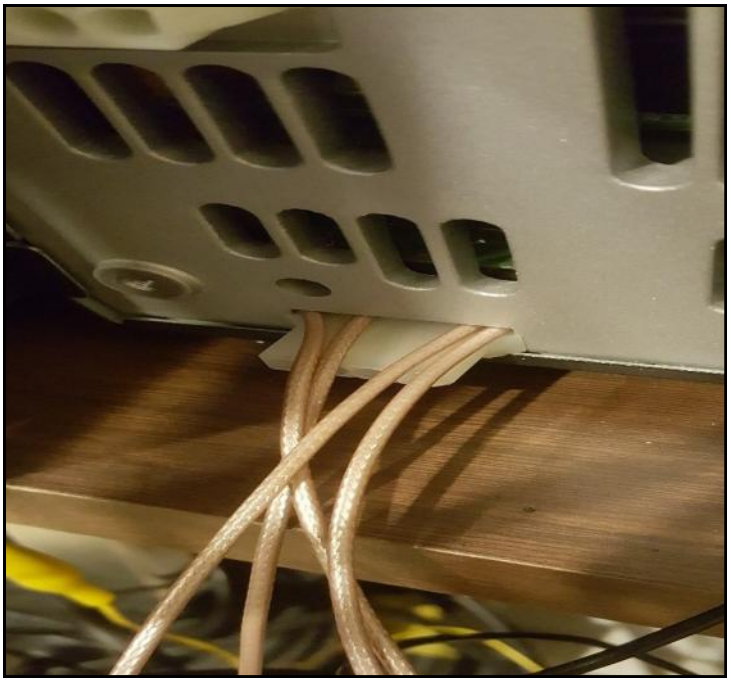
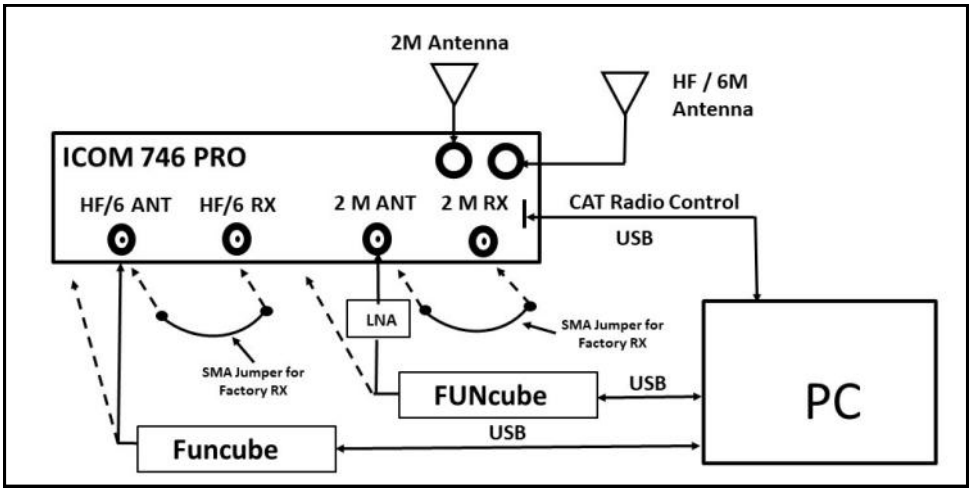


Figure 5: Icom IC-746PRO modification without barrel connectors

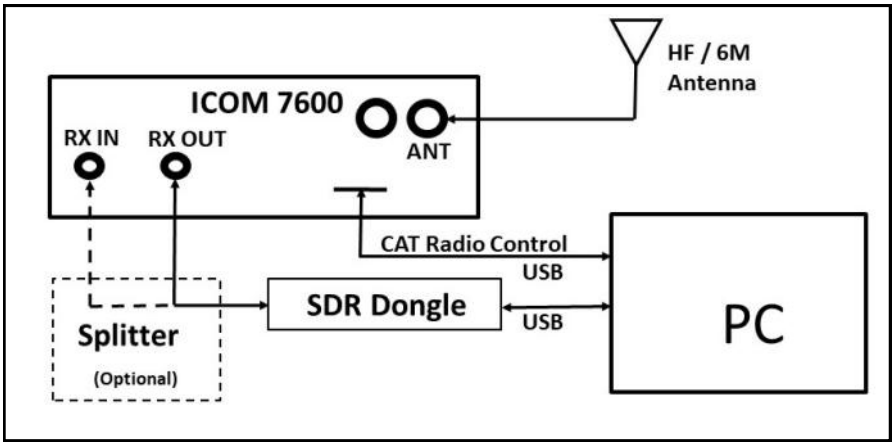
In doing this mod, I've been able to use my Icom IC-746PRO in dual RX with the use of a small splitter (SDR and Factory RX) but have found the SDR so much more enjoyable and flexible that I almost always use it SDR only. I've used each of my 3 SDRs with this mod. It's important to note I've been told that a similar mod can be done to the Kenwood TS2000. It likely can also be done to others.
If you choose to do the mod without drilling the case and come out of the remote tuner cavity, all that is required are two TMP Male to SMA Male RG-316 coax jumpers about 6-10 inches long. One is for the HF/6 meter mod and the other for the 2 meter RX.
You'll also want two SMA Female to SMA Female jumpers about 6 inches in length so you can use the radio in its original configuration (if desired).

Implementation Method 2- Using Standard RX in and RX out Jacks on Radio

The second method (see block diagram 2)was developed with the help of Ron, NØAT. I told him of my excitement using these receivers and during sweepstakes I brought over my FUNcube Pro for him to play with on his laptop. He promptly purchased one! We wanted to find a way to add these SDRs to the Icom IC-7600 just as I had to the Icom IC-746PRO. Ron determined from a photo online and looking over the 7600 schematic, that the FUNcube could be easily made functional by taking the RX signal from the 7600's RX ANT OUT jack and feeding it into the FUNcube connected to the PC. This way you're using the 7600s TR relays and protecting the



Block Diagram 1: Icom IC-746PRO modification method



Block Diagram 2: Using RX out and RX in method

front end of the SDR receiver. It doesn't get much easier than that! It worked flawlessly. To activate, turn on the RX antenna via the front panel antenna button. You can switch back and forth from the stock Icom to the SDR.
You can also add a small splitter in the RX ANT OUT line splitting the signal between the SDR and the RX ANT IN jack. You can now copy both radios at once.
After getting this to work on Ron's 7600 we encouraged Al, KØAD,

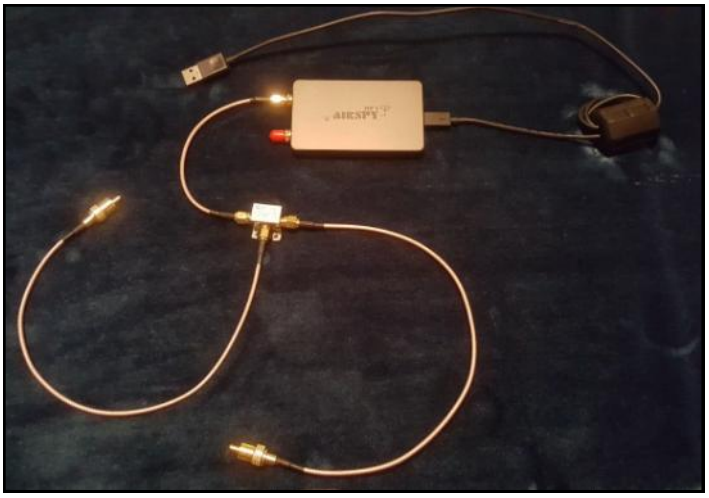


Figure 6: Using a splitter so both SDR and ICOM 7600 RX can be used at same time

to give this setup a try on his 7600. Al added the FUNcube Dongle PRO+ to his station in the same way. He also found this configuration worked well on his FT-2000D. If you have a radio with the RX ANT OUT jack you may have the ability to add this RX to your setup!

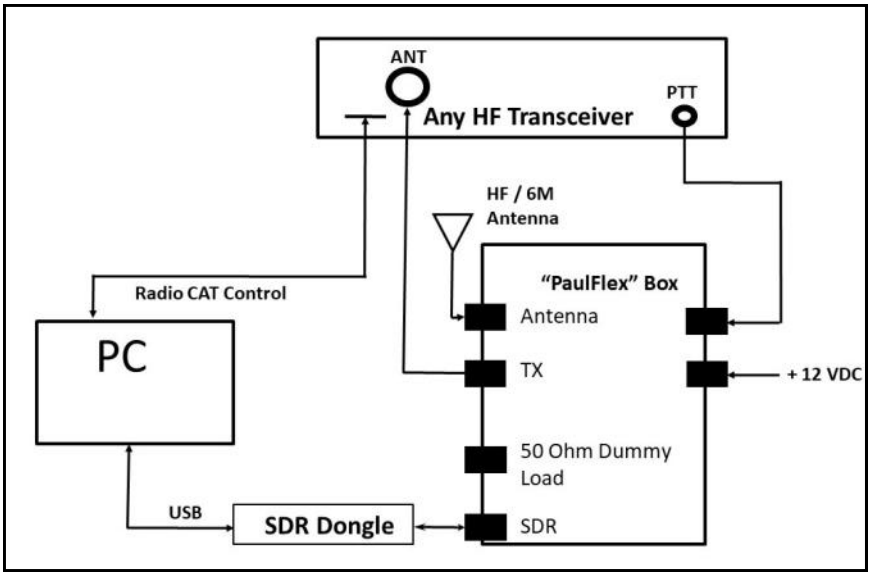
Implementation Method 3: Using the External "PaulFlex" Box

The third method came about after further experimenting by Paul, N2EME. He put together a very small external sequencer box, the "PaulFlex", that allows the use of SDR radios with ANY off the self "brick" radio.

Using this "PaulFlex", you can easily place a splitter in-line with SDR radio and have dual RX. Or, as I have at my station, use various antennas on both antenna ports on the "Brick" radios for comparison of signals.

Paul states, "*The switch is a simple PCB that switches the antenna via a pair of relays to the SDR RX when in RX (NC) and to the Rig when in TX (NO) whilst at the same time switching the input to the SDR RX into a 50 ohm dummy load. Most rigs have a built in PTT ground loop circuit, usually an RCA, to key an external amplifier. The SDR Switch is designed to switch from RX (NC) to TX (NO) when this PTT goes to ground. In simple terms, when your rig keys to TX the SDR Switch goes into TX, and when you un-key your rig the SDR Switch goes back to RX.*"

As most HF/6m radios are nominally 100W output, 100W relays are used in the SDR switch. (Higher power relays are available at an increased cost if more headroom is needed.)



Block Diagram 3: Using the "PaulFlex" Box Method

You will install the SDR Switch in between your rig and your antenna but before any external ATU's or amplifiers. It is just a matter of connecting your antenna to the ANT BNC on the SDR Switch and the SDR RX BNC to your SDR RX (RTL, FUNcube Pro+, Airspy HF+, etc). Then a small BNC dummy load is connected to the D/L BNC. The Rig TX BNC plugs into the antenna in-

put (usually an SO-239) on the back of your radio. The PTT RCA on the SDR Switch goes to the PTT connector on the back of your radio. Again this is usually a RCA connector making a simple RCA to RCA audio/video cable the obvious choice. 13.8 VDC is applied to the power RCA on the SDR switch.
All that is needed is a 13.8 VDC supply, a PTT line, a small 50 ohm coaxial terminator and your antenna. The parts cost about $50.00. Paul is willing to make up some of these if people are interested and sell them for about $95.00 shipped.
This is the most costly mod of the three but by far the easiest to implement! It took about 5 minutes to hook it all up and be QRV.

Figure 7: Top of "PaulFlex" box

Figure 8: Back of "PaulFlex" box

STEP 3 – Let's Talk Software

When it comes to any SDR platform it is all about the software! Let's say that again… It's all about the software!
There are many SDR software packages on the market. I personally have used 4 of them: SDR# (SDR-sharp), HDSDR, SmartSDR and Simon Brown's SDR Console V3. Information is available on the last one at http://www.sdr-radio.com/. I feel SDR Console (SDRC) is without a doubt the best SDR software package available to hams. (It is Donation Ware.)
The other packages I tried worked and functioned. They interfaced well with WSJT-X, for example, without much hassle using VAC (Virtual Audio Cables) lines. Other than SDR Console and SmartSDR, they were more for SWL hobbyists than for DXers or contest operators.
SDR Console has a well laid out interface. Its functionality is superb. There is no lack of filtering, color palettes, audio recording, and other features.
SDRC interfaces with CW Skimmer and has an excellent satellite interface that allows you to work the birds or download WX sat information.
SDRC handles all your radio interfacing providing tracking and mode switching. The filter options are endless for both SSB and CW modes. With this software you'll now have FlexRadio-like SDR RX using your current radio.

Getting my Icom radios to track frequency and mode took all of a few minutes using SDRC built in Omni-Rig feature. It is as simple as setting up tracking with any logging program. Pick your COM port, Baud rate etc. and go have fun. It's just as easy to sync with Write-Log contest software with the application's built in features.

One really neat feature is the multiple receivers function. This feature allows you to have multiple RX windows open at one time making listening to pileups easy. You'll see in photos below the six separate RX windows on the bottom of the screen layout. You can have more open if you wish.

Speaking of the windows, they can be floating or docked allowing you to con-

Figure 9: CQWW RTTY 2017 SDR Console V3 (Note FT8 signal near center of waterfall)

figure to fit your own layout preferences.

Here are a few shots of my SDRC screenshots:

Let's talk performance; hearing is believing!

None of what I'm sharing is worth your time to try if it does not work.

Figure 10: 20M SSB on SDR Console

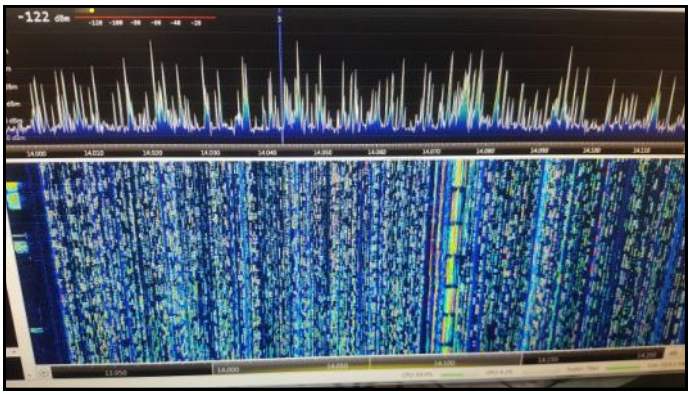


Figure 11: CQWW CW 2017 (Note FT8 signals in middle)

I mentioned in the beginning that I'd share my opinion as well as others opinions on how these dongles, paired with SDRC software package perform. I also said I'd include a few photos. None of what is stated is to discredit any manufacturer or product. It's simply stated as on the air comparisons by everyday hams in various locations with various setups.

My opinion? I've been so impressed that I want to share this information with others. My radios now function at a very high RX level using Software Defined Radios and SDR Console. The filtering is superior to my stock radios. There is an added level of flexibility in operation. I can see the whole band and more, depending on which SDR I place in-line.

I can personally point to two recent QSO's I've made using SDRC that I had no chance of making with just the 7600. Remember, it's about what your receivers are NOT hearing! I worked YB on 40cw and 4X on 80m cw. Both stations were above the noise enough to copy using SDRC. On the ICOM receiver they were ESP signals at best to down in the noise most of the time. Add to that I was able to find them with the visual aid of the SDR screen.
When it comes to using the SDR on FT8, I routinely see more decodes. Without question I have more decodes using MSK144 meteor scatter and JT65b EME on 2 meters. My Icom's RX has yet to outperform the SDR/SDRC combo.

Performance Comments from Others

Several other hams have run extensive side by side comparisons using RTL, FUNCube and Airspy HF+ SDR receivers vs. their own ANAN, FlexRadios, Kuhne transverters, SDRplay radios and others. They have performed these comparisons on both HF and VHF, and even higher bands, with overwhelmingly positive results leaning towards the $150.00-$200.00 SDR receivers listed in this article.
Those operators provided some photos, Figures 12 through 16, where you can see a few of these side by side comparisons.
Paul, N2EME notes: "*Figures 12 – 16 show the relative effects of rain static on the Flex 6700 and SDRC and RTL Dongle. The fuzz you see every so often is from my wired network and is about 15 dB. While it is totally buried on the Flex during the rain, SDRC was totally unscathed and continued to detect meteor scatter pings*."

And this from Rich, KB7IJ:
"Figure 16 represents a comparison between the FUNCube PRO+ Dongle side by side with a Kuhne Transverter on 2m at KB7IJ. FC is shown on the left and the Kuhne is shown on the right. The signal source is an HP-8657A signal generator fed into a mini circuits ZSC-2-1 - 2 port splitter. The FC has a bit of an advantage as shown."

Ron, NØAT Wrote: *I decided to make a small investment to see what all the SDR dongle fuss was about. I purchased a FUNcube Dongle Pro and plugged it into my Windows 10 computer. All the software drivers are part of Windows, so I didn't need to download any driver software for the FUNcube. For casual listening I installed SDR Console (V3) which provided all the interface needed to listen around the bands. My IC-7600 has an RCA jack on the back to pick off the signal from the antenna. An RCA to SMA Cable is all that is needed to connect the FUNCube.*
Being close to a number of broadcast stations, I had trouble with intermod from the broadcast stations. It was cured with a BCI filter https://www.amazon.com/gp/product/B076CVW6LC ref=oh_aui_detailpage_o05_s00? ie=UTF8&psc=10).
I especially like the panadapter and all the flexibility of the SDRC program. The signals seem to pop out of the noise better, and SSB signals have better fidelity.
I also experimented with using the dongle with my contesting software, WriteLog. With an SDR dongle on my computer, WriteLog can display a panadapter on its Band Maps. I didn't enable the Skimmer function. Having the panadapter displayed didn't slow down the computer, but took up a bit more monitor real estate.

Figure 12: FlexRadio, normal conditions

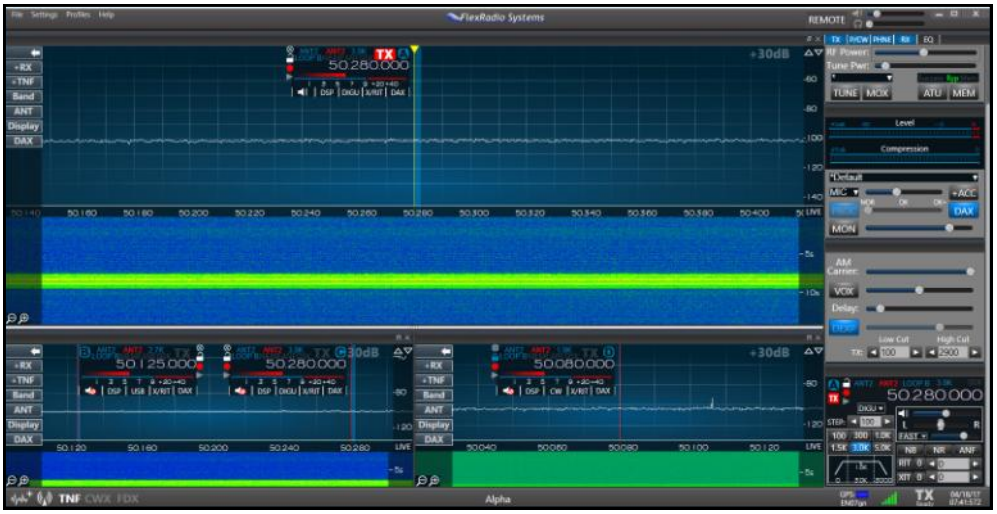


Figure 13: FlexRadio during rain event

Another piece of software that helps get everything talking together is Omni-RIG. This free program by Afreet Software allows multiple programs, written by different authors in different languages, to control the radio via Omni-RIG at the same time. Now my logging software, SDRC software, and rig can all talk to each other at the same time."

Final Comments on Performance

I recently used my Airspy HF+/IC-7600 SDRC Combo for the ARRL DX CW contest. It was the first time I used the HF+ solely for RX while contesting. Everything synced up nicely with the contest software. I mostly did S & P and only had one hiccup all weekend.

I run an older Intel Pentium PC with Windows 7 and only 4 Mb RAM. This all runs much better on my Intel Core i5 Windows 7 laptop though performs it well on less. While testing, I had many programs running. I think I'm going to be upgrading my shack PC to (as a minimum) an i5 or i7 with Win7 and 16 Mb of RAM.

So how much do you have to spend to do this? A cost of $160.00 to $200.00 is typical for your choice of SDRs. Although the $25.00 RTL doesn't come close to the others for HF use, it performs very well for 6 and 2 meters. You'll need a few SMA connectors and a small splitter if you want to have dual RX. This would come to a total of maybe $50.00. But as Paul told me, "Cut the cord, you won't look back!"

So for no more than about $250.00 you'll have a heck of a SDR RX for your station! I absolutely love the changes it has

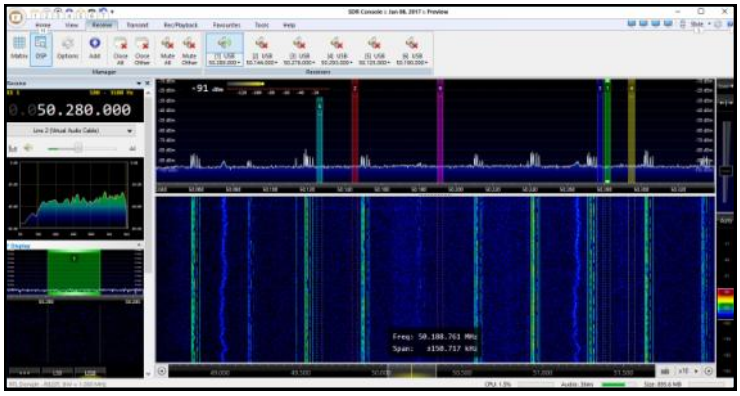


Figure 14: SDRC and RTL Dongle Under Normal Conditions

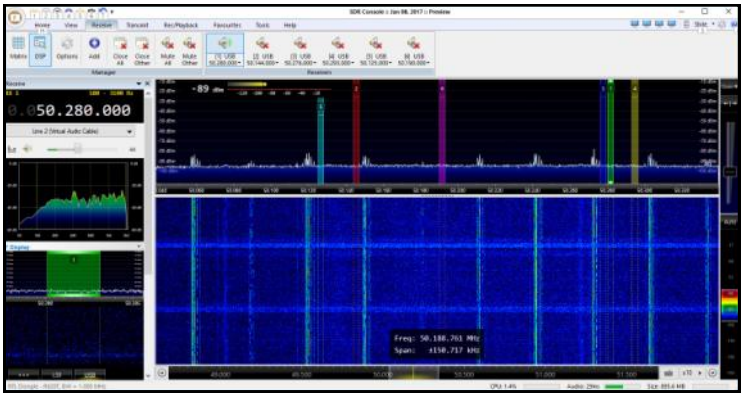


Figure 15: SDRC and RTL Dongle During Same Rain Static Event

made to how I do radio and the added flexibility it has given my

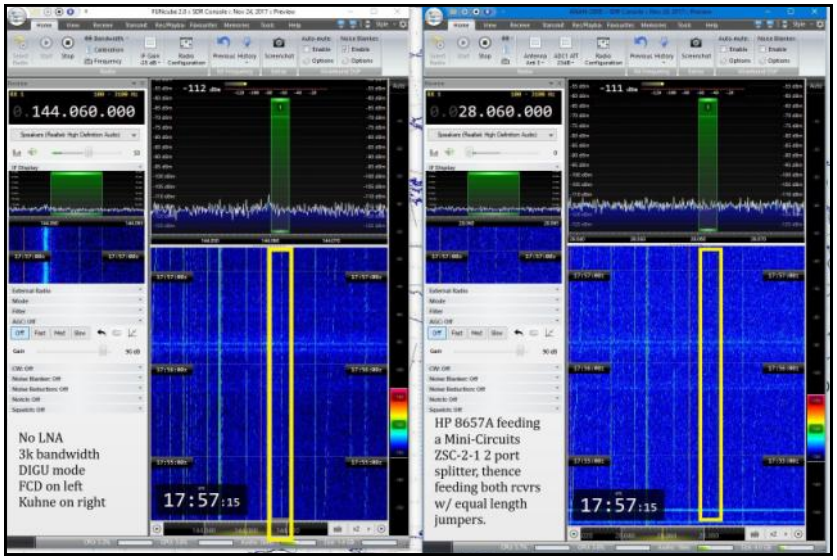


Figure 16: Comparison between FUNCube Dongle PRO+ side by side with Kuhne transverter on 2 meters.

home station.

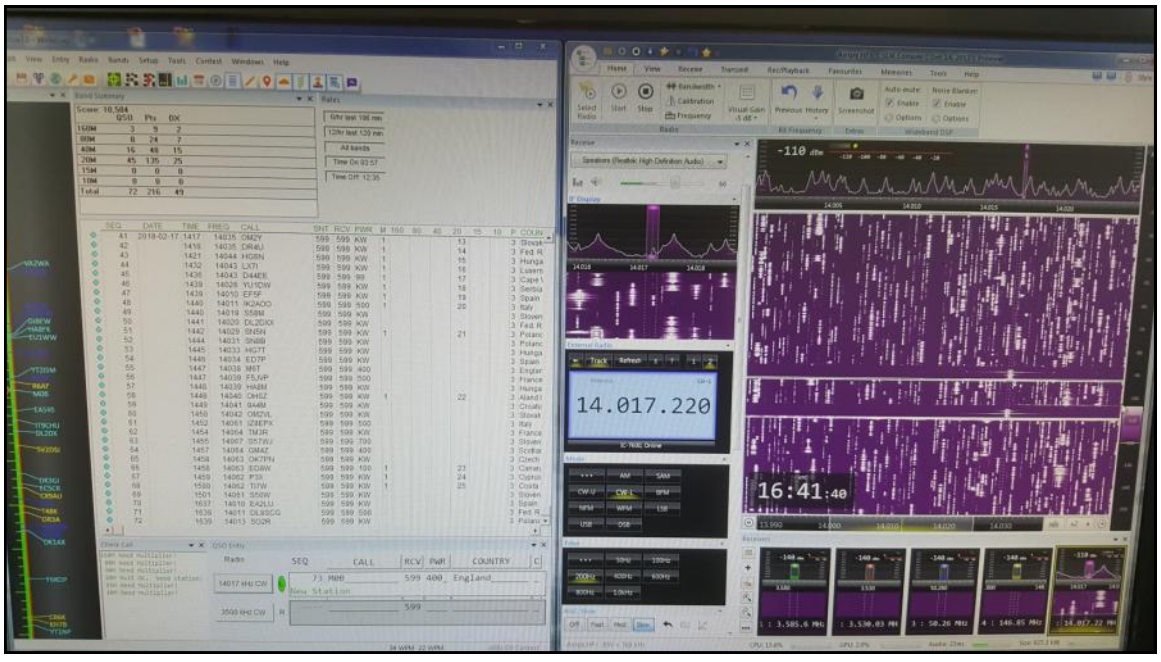


Figure 17: SDRC synced with WriteLog during ARRL CW contest.

Three TCDXA Members Achieve Five Band DXCC

Al, KØCN

I started out in 1963 as WN9KQG in Hudson WI. My novice license arrived on Christmas Eve day of that year. What a great present. As a young ham, I had a book about QSLing and DX awards. I poured over this book like a Sears Christmas catalogue. I dreamt about DXing and receiving QSL cards from those distant lands. My first real DX contact was with ZL3IS in Christchurch, NZ. That was a shocker! I could hardly send, I was shaking so hard. My rig at that time was a Heath Kit Apache and a Hammarlund HQ-145 with wire dipoles. Needless to say DX didn't come easy. In 1965 I enrolled at North Dakota State University. in Fargo. The NDSU club station had a Collins S-line and a tower with a 3 element beam. Stations could hear us and were interested in working North Dakota. DXing took on a new light. The summer of 1968, I moved to Lake Ashtabula, about 20 miles North of Valley City ND. There I was a research worker with the US Department of Interior. More importantly I had my first beam, a Mosley TA-33-JR at about 30 feet with a Galaxy V transceiver. The Solar cycle was just peaking that year and propagation was great. Again, being in North Dakota didn't hurt. I remember regular QSOs with the Pacific. I was living the dream.

I moved to Minnesota in the early 70's, changed my call to WBØMAE and built a modest station in Brooklyn Center. I had a Kenwood TS820 and a homebrew linear running a pair of 3-500Zs. I remember buying the finals at Electronics Center from Mark, KØKX. That year I also put up a 60 ft tower and a KLM KT-34XA beam. I continued chasing DX and also

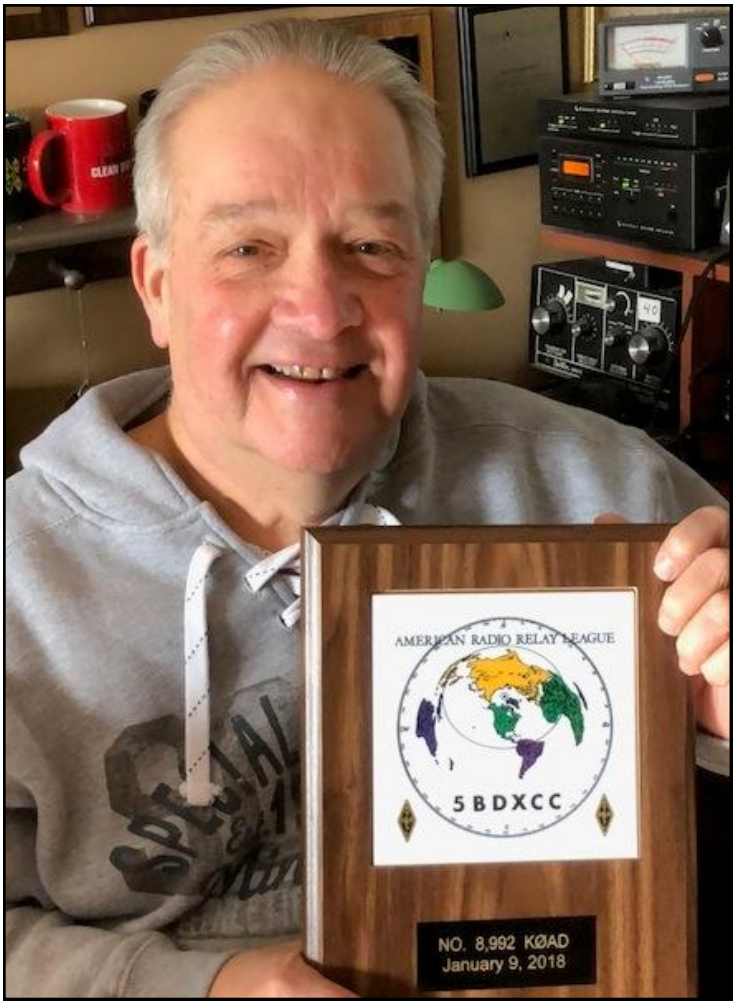
started developing an interest in contesting. I especially remember contest logging on paper in those years. In the spring of 1978, I received my Extra Class license as KØCN, I reached 100 countries confirmed and, in May, and I joined the TCDXA. In those days, you were nominated by a member (in my case, Ted Schmidt, WA9FXJ - SK) and elected into membership. I was active in the club for 4 years when in 1982 I received a fellowship offer from the US Dept. of Health and went off to the U of Minnesota as a grad student. At that time I was still interested in DXing, and had reached the 200 countries confirmed mark, but being a student took all of my attention and I became inactive as a ham. During this time, I remained involved in ham radio serving as a VE with the Bloomington Emergency Communications Group. During those off the air years I missed a lot of DX opportunities, but the family and career came first.

My ham radio path took another turn on Christmas day of 2008. My wonderful wife Joyce, on her own, picked out and surprised me with a brand new Icom 756 Pro III transceiver. She likes to remind me of the expression on my face when I saw the printing on the box. That's all it took, the fire was again lit and away I went. I was back on the air, with simple wire antennas at first. Since then, I have erected a 90 ft. tower at my cottage on Mille Lacs Lake and topped it with a SteppIR DB18E. I now run two 6000 series FlexRadios with Alpha linears, both at home in Corcoran and at Mille Lacs Lake. Through contesting and DXing, I have reached 338 total countries and 326 current countries confirmed for DXCC. As for 5 Band DXCC, I quickly reached the 100 country mark on 40, 20, 15, and 10 meters, but I always struggled with 80 meters because of power line noise in my area. Now with the FlexRadios, I have been able to manage those noise issues on 80 meters and my DX engineering 55 ft vertical has become much more effective. I have been slowly whittling away at my final 10 countries needed for 80 meters. In the fall of 2017, FT8 came along and not only does the mode play well on noisy bands, but a lot of DX hangs out there too. Within one month, in December of 2017, I was able to work and confirm those last 10 countries needed for DXCC on 80 meters. On January of 2018, I was awarded 5B-DXCC Certificate Number 9001.

Now on to the final hand full of DX needed for the DXCC Honor Roll!

Al, KØAD

My pursuit of DXCC and, ultimately, 5BDXCC was very sporadic. Although I had made many DX QSOs ever since getting my license, I never really got motivated to apply for DXCC. When I think back, I believe it was the VKØIR DXpedition back in 1997 that really got me motivated. For some reason, knowing that one of our own (KØIR) was on the other end peaked my interest. At the time, there was all kind of chatter on the local repeater asking "Have you worked them yet?" I remember actually cutting back my 40 meter inverted V so it would load on 30 meters which is where I worked them. This was one of the first expeditions where you could go on-line and confirm that you were in their log. I thought that was pretty neat. About this same time, I started attending TCDXA meetings. At the time, there was still a requirement for achieving DXCC



Al, KØAD

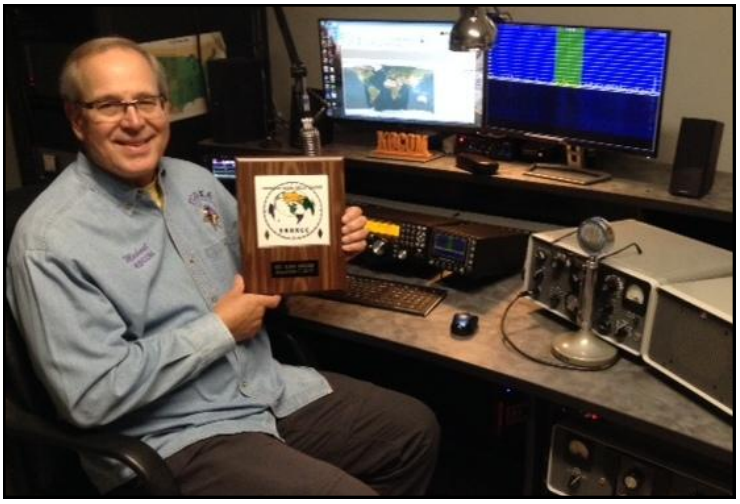
before becoming a member. So I buckled down, organized my cards, set up a logging program (Logger 32), and started counting countries. I was issued DXCC # 36,380 on March 17, 1999. Now that I had the bug, and a good logging program, I started collecting cards and seeing how many bands I could get DXCC on. Twenty meters came first followed by 15, 10 and (after a while) 40 meters. I learned some tips on how to wring that QSL out of DX stations. Of course, when Logbook of the World came into being in 2003, things became easier. It was fun to log on and see if I had any "new QSLs" that would help me in my DXCC pursuits.

Like many, 80 meters was the real challenge for me. I know that conventional wisdom dictated that I put up a vertical if I wanted to work DX on 80. However, I was more interested in domestic contesting so I stuck with my 80 M inverted V. Another challenge was that I restricted myself to low power from 2007 to 2016 due to interference issues in the neighborhood. New countries on 80 seemed few and far between. But they did ultimately come. By the middle of 2017, I was at about 95 confirmed. The WSJT craze was in full swing and several of the local digital guys like NØKK, WØJMP, and WBØN told me that lots of DX was available on 80 on the digital modes. Sure enough, I got going with WSJT and quickly got VK and ZL confirmed on 80. I picked up one more country in a contest so just needed two more. Toward the end of 2017, the J5T and 3CØL DXpeditions were in full swing. I was able to work them both on 80 CW but now just needed the QSL. Using Club Log, I applied for their QSLs. The J5T conformation arrived on LoTW on November 29th. Finally, I signed onto LoTW on December 9th, checked my 80 meters status and there sat a pending credit for 3CØL which was #100 for me on 80M!

Going forward, I don't have any pressing DXCC objectives. I am not a band country guy but I will try to get my total country count up a bit. I'm about 5 countries away from my 300 sticker. I don't get on the WARC bands much so I guess 160 would be next. Maybe the latest SDR technology (see NØKK's article elsewhere in this issue) will help me there.

Mike, KØCOM

I was first licensed in March of 1993. My first DXCC award was earned in November, 2000. I finally had up a great station in Plymouth with a Hy-Gain TH-11 @ 70 feet. The twenty through ten meter bands came fairly easy. With the move to Colorado in 2002, DXing slowed



Mike, KØCOM

way down. I started with attic antennas and then went with low dipoles.
After the move back to MN in 2011, I was able to secure the use of a 65 ft vertical (i.e. the "swamp noodle") designed and built by KØSF. It went up in the back yard here in Bloomington four years ago. My focus was first to complete 40 and then 80 meters. Well the Q's came easily with the vertical! (Thanks Steve) and it was down to QSLing. I relied on LoTW for the great majority and filled in the rest with a batch of direct cards sent out in the spring of 2017. The final two came in via LoTW!

	DXCC Credits Awarded	Total (All)	Total (Current)
Mixed	304	305	301
80 meters	102	102	101
40 meters	119	121	120
20 meters	208	209	205
15 meters	172	172	169
10 meters	154	154	152

My band total were as follows:

Next up, WARC bands and 30 meters. Last on the list will be 160.

Join TCDXA

Our mission is to raise *Dollars for DX*, used to help fund qualified DXpeditions.

Our funds come from annual member contributions (dues) and other donations.

TCDXA is a non-profit organization, as described in Section 501 (c) (3) of the Internal Revenue Code. All contributions from U.S. residents are tax-deductible.

Becoming a member is easy. Go to http://tcdxa.org/ and follow the instructions on the home page.

All contributions (including annual dues) may now be paid on our secure site, using PayPal or credit card.

DXers Have a Choice!

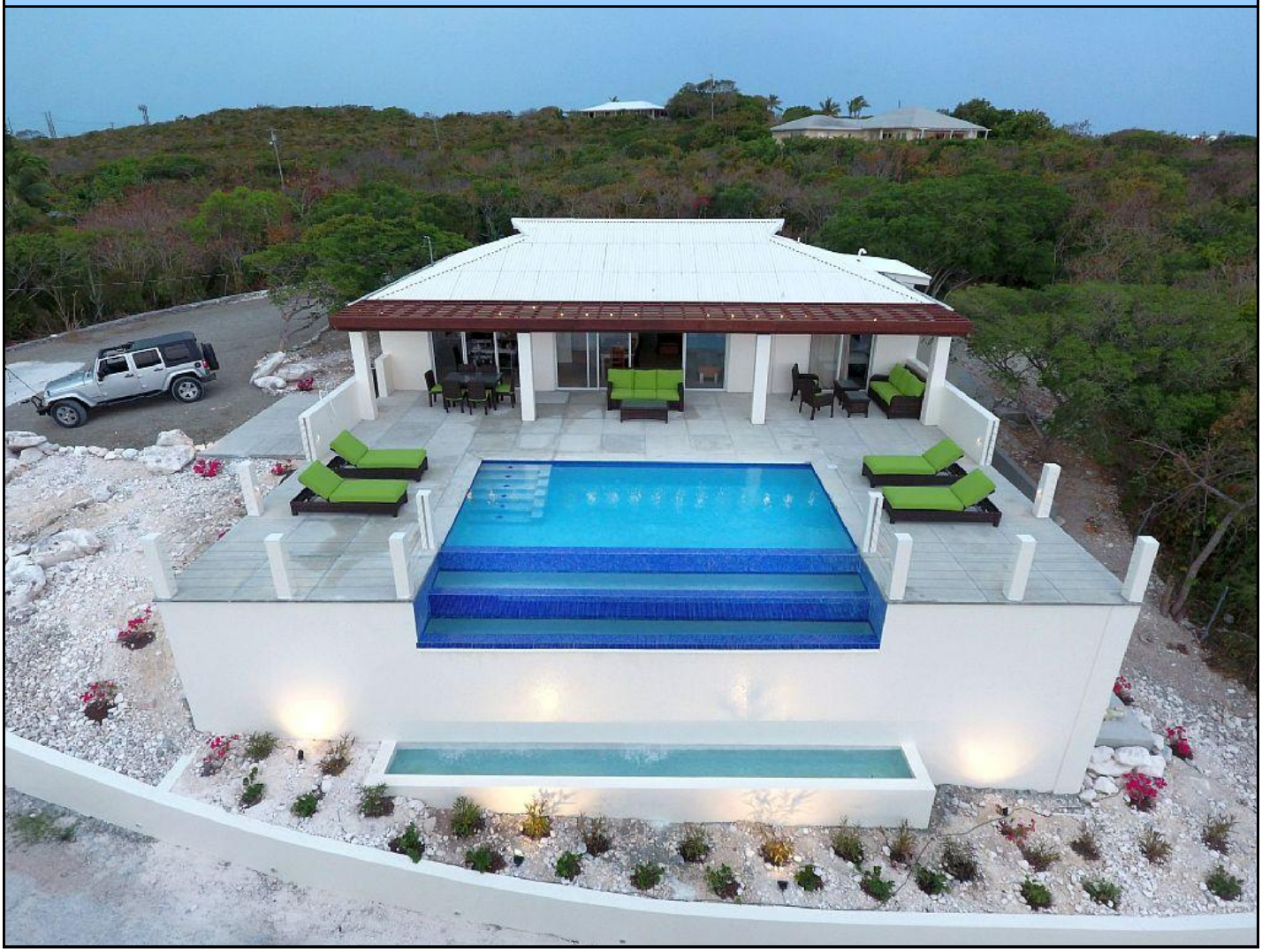
The Daily DX - is a text DX bulletin that can be sent via email to your home or office Monday through Friday, and includes DX news, IOTA news, QSN reports, QSL information, a DX Calendar, propagation forecast and much, much more. With a subscription to The Daily DX, you will also receive DX news flashes and other interesting DX tidbits. *Subscriptions are $49.00 for one year or $28.00 for 6 mos*.

The Weekly DX - is a product of The Daily DX that can be sent weekly to your home or office via email in the form of a PDF (portable document format). It includes DX news, IOTA news, QSN reports, QSL infor-

Get two weeks of The Daily DX or a sample of The Weekly DX free by sending a request to bernie@dailydx.com, or at http://www.dailydx.com/trial.htm.

VP5K Team QSYs to New Digs

By Pat Cain, KØPC



Minnesota Crew "Camping" in this Turks & Caicos "Shack"

For the past several years a group from MN has been going to VP5-Turks & Caicos for the ARRL DX CW contest in February. This year we changed things up a bit. We always stayed at the Hamlet owned by Jody, VP5JM. Recently, Jim, K4QPL, has renovated a house about a quarter mile east of Jody's place and offered it for vacation rentals. It is called Harbour Rock. It is much larger than the Hamlet, with four bedrooms, 3 1/2 baths, and a full kitchen. Did I mention it also has a pool?

40 Over 9 Noise on 160 Meters

Break between Shifts

At the end of the 2017 contest Bill, ACØW, and I met Jim and went out to dinner together. We also got a tour of

Tower with SteppIR

Harbour Rock. Bill and I talked about it and decided it would be nice to bring our wives down in 2018 and rent Harbour Rock for the contest. It is always tough to take off for the Caribbean in February (often over Valentine's Day) and leave your wife at home. They smile and say "It's fine" but we know better. 2018 is my 40th wedding anniversary so it seemed like the perfect time.

This turned out to be a fortuitous decision as Jody's place suffered significant damage in the hurricanes of last year. The antennas were destroyed and the tower is twisted and lost the top section. The roof on Jody's home was damaged and the Hamlet had to have some repair on one wall. Harbour Rock also suffered some roof problems and damage to the SteppIR but Jim was able to get it repaired quickly. His military surplus push-up tower survived in the

Group Photo
Foreground left to right, KØPC, Pat's XYL Marlyn. Cindy (Bill's XYL) and ACØW. Background KØMD

Operating Position, ACØW

lowered position.
Bill and his wife Cindy spent about ten days on the islands and my wife Marlyn and I were there for a week. Scott, KØMD was able to join us for the contest week-end but his wife Jann wasn't able to be with him.

It wasn't all perfect; we had incredible noise (20 to 40 over S9) on 160M & 80M the first night of the contest. It was so bad that we didn't make a single QSO on 160. But the sun came up in the morning and the second night was much, much better with noise about S3. We ended up with the most 160M QSOs ever, all in one night. However, 10M never did open for us. We saw other Caribbean stations spotted on 10 M but we couldn't even get a single RBN spot for our signal.

We have called it a success and look forward to a return in 2019 (along with a few sunspots we hope).

A Note from the New TCDXA President

By: Bill Mitchell, AEØEE

I am fortunate to be serving as president of an association that has had good leadership over the last few years (as far back as my membership goes), and I thank all of the officers, volunteers, and members who have made this organization what it is. I am looking forward to working with you all in the year to come.

At our December meeting, President Mike Sigelman asked us all what the club does well, and what needs improvement. I had already been thinking about that, and I hope you have given it some thought too. As I see it, we have a few different, complementary objectives as an organization:

-Fostering interest, education, and research into long-distance radio propagation

-Sharing knowledge which improves the skills of operators and the art of radio communication

-Promoting goodwill among radio amateurs

-Funding and participating in DXpeditions

Between our meetings and the email reflector, I believe we do very well on the last three points. Although we do well on fostering interest, education, and research in propagation—I have certainly found myself interested by topics raised by speakers at the meetings and over email discus-

sions—I think we can do more to broaden the effects we have on the amateur radio community both personally and as an organization.

One way we can have a larger impact would be to increase our visibility in the local amateur radio community. Having representatives at hamfests would be a good way to reach hams who have yet to discover the thrill of inter-continental communications. Presentations at local club meetings about DXing, aimed toward the casual operator, could also be effective.

Another way to broaden our impact would be to give serious thought to the barriers facing under-represented groups in amateur radio and what can be done to remove those barriers. For instance, the cost of establishing a personal station is quite high, and keeps many people away from the hobby in general and DXing in particular. One-on-one mentoring, remote radio, and portable operations would help foster interest in long-distance communications, and support from club members as mentors or multi-operator hosts would increase access to DXing.

We can also do more to advance research in radio propagation. A number of academic scientific investigations use PSKreporter, WSPR, and Reverse Beacon Network data to better understand propagation conditions. However, because many hams ignore the higher HF bands during solar minimum, data there are sparse. Even by establishing receive-only stations for WSPR or FT8 on 10, 12, or 15 meters we can contribute to scientific efforts to better model the ionosphere and predict propagation conditions. Of course, calling CQ on CW, FT8, or RTTY is still scientifically useful.

I look forward to working with you on these projects and to hearing you in the pileups!

Dollars for DX Report

Mike Cizek WØVTT
DX Grant Manager

Greetings from one of the new kids on the block. Susan and I have only been Minnesotans for three years now, so I still feel like a new Novice in this club. I discovered DXing about 30 years ago and during that time have been a member of three different DX clubs as we moved around the country; the Northern Illinois DX Assn., the National Capitol DX Assn., and now TCDXA. "The Cities" are by far the smallest of those three metropolitan areas and yet we have the largest and most active DX club.

Some of my east coast friends encouraged me to check out TCDXA when we moved here and I'm very glad that they did. Since we live over 100 miles from the Cities, I would not have done this on my own. The two things that impressed me the most were

(and still are) the first rate newsletter and the amount of money we spend supporting DXpeditions.

"The Gray Line Report" is truly a first rate publication. Our newsletter paints a nice picture of what our members are doing, and what we do as a group. Giving money to DXpeditions is the other way we can make a difference and is what will give our club the most "street cred". The cost of going to remote, far-away places has become ridiculously high and the only way these DXpeditions can happen is with contributions from the DX community. This is where TCDXA can make the most impact. I consider it an honor to be a part of this process and will do my best to be a good steward of our club funds.

Our donation process became a little backed up during the transition from Matt to me. Matt felt it wasn't proper for him to start processes that wouldn't finish until the following year, and it certainly wasn't proper for me to start before being elected. We talked a lot about the donations process and how he handled things. Matt had an excellent system in place and I see no need to make any changes.

On to the real business. At the beginning of the year we had requests from four groups; 3D2EU Rotuma, 6O6O Somalia, KH1/KH7Z Baker & Howland Islands, and VP6D Ducie Island. 6O6O and VP6D were given the amounts recommended by club guidelines based mainly on their positions in Club Log's global most needed list.

Finding Rotuma at #52 on the Club Log list was quite a surprise to me. There were major expeditions there in 2011 and 2013, and the island has been activated almost every year since Club Log began keeping records in 1989. Rotuma is only #93 on the North American most needed list, and the group going there appeared to already have sufficient funding. Based on this, my recommendation to the TCDXA board was that we not support this operation and spend our money elsewhere.

Baker & Howland seemed like a good place to spend our money, and based on the recent vote, you all agree; the vote was unanimous in favor of our $2000 donation. KH1 is currently #5 on the most needed list and was last activated in 2002. USF&WS, who control access to the island, have stated they will not allow another operation to Baker & Howland for at least another ten years. Giving extra support to this expedition just seemed like the right thing to do.

TCDXA has donated just over $4000 to DXpeditions so far in FY 2018, which is $1000 over our budgeted amount for the year. Although we have no pending requests at this time, it is possible we may receive some before the end of the fiscal year in October. Club members with strong feelings on how we spend our money are encouraged to contact me, or any of your other board members, and make your feelings known. Of course, one of the best ways to express your opinions is with your check book.

73,
Mike WØVTT

Treasurer's Report *from Pat Cain, KØPC, treasurer*

TOP LINE SUMMARY

TCDXA OPERATING BUDGET FY 2018
(Sep 2017 - Aug 2018)

INCOME		ACTUAL	BUDGET	*Actual 2017*
Surplus from FY 2017 (balance 8/31/2017)		**2689.68**		***5200.20***
Member Dues 2018 by Cash/Checks/ PayPal		4439.33	4500.00	***4649.36***
Door Prize Ticket Sales club share		413.00	500.00	***602.00***
Donatons (estates, wills, etc.)		0.00		
Refunds and Reversals		0.00		***5.79***
TOTAL INCOME		**7542.01**	**5000.00**	***10457.35***
EXPENSES			**BUDGET**	***Actual 2017***
Member Recruitment/Retention		0.00	(300.00)	***0.00***
Website ISP & Domain Name		(65.69)	(70.00)	***(65.88)***
Office Supplies, Miscellaneous expenses		(23.57)	(150.00)	***(87.96)***
Flowers <SK> and Hospital gifts		0.00	(200.00)	***0.00***
Holiday Party 2017		(528.64)	(500.00)	***(433.15)***
ARRL Spectrum Defense Fund		0.00	(100.00)	***(100.00)***
NCDXF Donation		0.00	(250.00)	***(250.00)***
MWA Plaque		(75.00)	(75.00)	***(75.00)***
DXpedition Contri-butions Total		(4,002.51)	(3000.00)	***(6755.68)***
#1 Dxpedition - VK9MA Mellish Reef	(500.00)			
#2 Dxpedition - 3B7 St. Brandon	(500.00)			
#3 DXpedition - 3C0L Anonbon	(251.26)			
#4 Dxpedition - KH1 Baker Island	(2,000.00)			
#5 Dxpedition - 6O6O Somalia	(251.25)			
#6 Dxpedition - VP6D Ducie Island	(500.00)			
TOTAL EXPENSES		**(4695.41)**	**(4645.00)**	***(7767.67)***
NET		**2846.60**	**355.00**	
Checking balance		**2689.85**		
PayPal balance		**120.75**		
Cash / Checks on Hand		**36.00**		
NET BALANCE		**2846.60**		

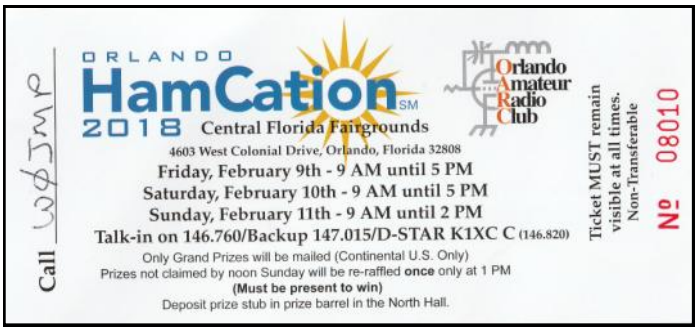
Backscatter: Miscellaneous, Assorted and Sundry Items of Note

by Dan Dantzler, WØJMP

Remote operating:

In the last issue, we had an article about remote operating. During the recent Minnesota QSO party, I had the opportunity to utilize remote operating. I was in Florida and operated a remote station in Maine. I worked Jeff, WØJM. Jeff was home in Minneapolis and operating his remote station at his cabin near Grand Rapids, Minnesota. Remote to remote.

Orlando HamCation:



This year, since I was in Florida at the right time, I decided to attend the Orlando HamCation. It was about an 8 hour drive so I drove to Orlando a day before it opened and stayed in a nearby hotel. I was there for the opening bell at 9 AM Friday, February 9th. I knew this was not as big as the Dayton Hamvention, but it is billed as the second largest hamfest in the country. When I arrived at about 8:45 AM, I was able to park very close to the opening gate, a bit different than Dayton. After two hours, I had seen everything in the main exhibition buildings including the woodworking and jewelry displays. The main players in the industry were in attendance but with greatly reduced booth size and staff. I found no significant new products. I took another hour to walk the show a second time and, by then, I had seen it all. I did not go into the flea market but it was mud free.

The Orlando Amateur Radio Club gives attendance figures at more than two thirds the attendance at Dayton. I am not going to dispute their numbers (although some have), but the hamfest "felt like" about a fourth the size of Dayton. I am glad I did not fly down from Minnesota!

Bouvet Island DXpedition:

We are all disappointed that the Bouvet DXpedition was aborted. None is more disappointed than the DXpedition members. After 13 rough days at sea, the island was in sight. Three days of rocking and rolling within sight of the island and the ship developed engine problems. On February 3rd, the captain of the vessel declared it was unsafe to continue the project. The ship arrived at Cape Town, South Africa on February 17th. We salute the valiant effort of DXpedition and are thankful for their safe return. Two of our members are part of this team including Ralph Fedor, KØIR (team leader) and Glenn Johnson, WØGJ. To paraphrase Arnold Schwarzenegger, "They will be back!"

Joe Taylor and Team keep Improving WSJT-X:

As most of you know, WSJT-X is a program that enables JT65, JT9, MSK144 and WSPR among other modes. These weak signal modes have revolutionized amateur radio. FT8, in particular, has spread like wildfire. The latest general release version is available here:

https://physics.princeton.edu/pulsar/k1jt/wsjtx.html

The team recently announced WSJT-X 1.9.0 RC2. The "RC" means it is a "release candidate" that is in beta test. You are welcome to use the release candidates but, if you do, you are expected to report back to the developers on your experiences. You are also expected to upgrade to the general release version when it becomes available.

WSJT-X 1.9.0 RC2 incorporates the following changes:

1. New FT8 DXpedition Mode to facilitate high QSO rates in pileup situations.

2. Optional Auto-Sequencing in JT4, JT9, and JT65 when VHF/UHF/Microwave features are enabled.

3.Automatic real-time forwarding of logged information to N1MM Logger+

4. Various other bug fixes and tweaks.

Of most interest to us the new DXpedition mode. We will see who employs it first and how successful it will be.

New Entity- Kosovo:

We seldom get the opportunity to work the number one most wanted DX entity. On January 21st, we had that chance but we had to be quick! A change in the ARRL entity definition allowed Kosovo to become the latest new entity. Because past QSOs did not count, Kosovo instantly became the number one most wanted. Within days, it slipped to number two and has continued the tumble. As of today (March 5th) it is number 14 and still dropping. DXers were quick to activate the new number one. Z6ØA in particular, was the first Kosovo station in many logs.

Visalia, the 2018 DX Convention is Near

April 20, 21 and 22, 2018 will be the Visalia International DX convection. If any TCDXA members will be in attendance, please take notes and photos. Coverage in the next (June) newsletter would be informative.

The TCDXA is Pleased to Welcome the Following New Members:

-Patrick Woodruff, NØPWK, Elk River MN

-Art Woods, K6AFW, Oak Grove MN

T C D X A M E M B E R P R O F I L E

Jim Junkert
KØJUH

My first recollection of Ham radio was in the early 50's when I stopped by **WØYNZ's (SK)** and watched Ernie operate his station. He had a Collins 75A-4 radio, B &W 5100B transmitter, and several towers with monoband yagis. I was impressed.

The Ham radio bug didn't bite me, however, until years later when I went to work for Uncle Sam and was serving with the U.S. Army in Germany.

Before going overseas, Uncle Sam sent me to school at the ASA, (Army Security Agency) training center, Fort Devens, MA, and taught me the Morse code. After graduation, my next stop was Herzogenaurach, Germany for a 26 month tour of duty.

I married my high school sweetheart before leaving, and Epha (*not a typo*) later joined me in Germany where we lived off-post with German families in Straubing and Herzogenaurach. Our daughter, Kim, was born in Regensburg in 1956.

(WII history note: Regensburg - Schweinfurt was a strategic bombing mission carried out by B-17 heavy bombers on August 17, 1943. Messerschmitt 109 fighters were being built in in Regensburg, and Schweinfurt had a ball bearing factory. The mission crippled the Luftwaffe, but at a high cost. 60 B17s and 55 crews were lost during the raid).

Herzo Base was Headquarters for the ASA/NSA in Europe, and was equipped with the latest Collins receivers and miles of antennas, all used for intercepting Soviet Military radio transmissions. Also on base was **DL4NUR**, a MARS station (Military Auxiliary Radio Service) that was available for use by licensed Hams as well as providing phone patch service to the states.

The MARS station triggered my interest in amateur radio so we applied for a Conditional license (General by mail) and was issued **KØJUH**. Shortly after I received my German call, **DL4WN,** and my MARS call **AE1WN.**

DEUTSCHE BUNDESPOST
AMATEUR RADIO STATION AND OPERATOR LICENSE
for Allied Personnel in the US Zone of Germany and US Sector of Berlin
SP2 James P. Junkert K Ø JUH
HQS Co 302 ASA Bn,APO 66,Herzogenaurach, Bldg 1583
DL4 WN
is authorized to install and operate an amateur radio station under the licensing provisions given by Military Government (Bipcom) for a period of one year from the date of issuance, unless sooner terminated or suspended by the appropriate authority.
Deutsche Bundespost
26.7.1957 Oberpostdirektion Nürnberg, 26 Juli 1957
For the President

In December 1957 my tour of duty was coming to an end, and we started planning for our trip back home which included shipping our German Shepherd back to Minnesota. Two weeks before our scheduled departure, Cora was stolen!

We boarded our plane in Frankfurt for the flight back, happy to be going home, but broken hearted over Cora's loss.

After returning to civilian life, I took on a full load and than some. From 1958 to 1962, we were working full time at Coca-Cola 5 days a week, attending Brown Institute four nights a week, raising a family, and squeezing in an occasional fishing and hunting trip. I had a Mosley TA-33 on the roof of the apartment we lived in, but there was very little time left over for Ham radio.

In 1962 we purchased our first home, and the thought of getting more involved with Ham Radio crossed my mind. But, that's as far as it went. Once again, radio was taking a back seat to everything else going on in my life.

From 1962 to 1982 KØJUH was QRT. I did renew my license when it came due as I knew one day I'd get back on the air and I didn't want to give up my first and only call!

In 1976, I purchased property at Big Point, on the east side of Mille Lacs Lake. At the time I was living in a condo in Edina, which eliminated any possibility of getting on the air from that location.

My property up north had 300 feet of lakeshore and plenty of room for antennas. Why not have a station at the lake? The only negative with the plan was my operating time would be limited to the weekends when I was at the cabin.

When I decided to go ahead with the plan, I got in touch with Dave, KØIEA, for help in selecting equipment for the station. I'd been away from Ham radio for 20 years, so I was totally out of touch with what was available from the manufactures.

Until the log cabin was built in 1989, the station was located in a converted 10'x16' fish house that had all the comforts of home; bunks, carpeting, heat, toilet, TV, and more.

In late 1989 I took an early retirement at Coca-Cola, and left the city life behind. We moved up north to the log home and became a full time resident on the shores of Mille Lacs Lake.

My country count shot up on all the bands, and the wall in my shack was starting to fill up with various DX awards. Most prized was ARRL's #1 DXCC followed closely by CQ's WAZ.

In addition to a few trips to Dayton, we made it to the Visalia International DX convention on two occasions. If you're a serious DXer, this is one event you shouldn't miss!

It's a gathering of DXers from all over the world, and an opportunity to visit with some of them. Most memorable was the night I sat next to Lloyd, **W6KG, (SK)** and Iris Colvin, **W6QL (SK),** at dinner. Visiting with them was a real honor as they had traveled the world activating many rare countries and giving yours truly and many others an ATNO. The photo was taken in 1993.

After chatting with Force 12 Antenna's Tom Schiller, N6BT, at Visalia, I returned to Minnesota full of ideas for new antennas. It was time to retire the TH-7DX and put up some "real" antennas.

Over time, two 80 foot Titan self supporting towers with stacked Force 12 antennas appeared above the tree line. Closest to the lake was the 80m rotatable dipole over 9 interlaced elements on a 54 foot boom for 20m/40m. The 2nd Titan was home to a 2 element/30m beam over 4 elements on 10m-17m.

The Force 12 antennas opened up a new world of DXing for me. I was hearing and working stuff I could only dream about before. Life was good!

Force 12 Interlaced 6el on 20m and 3el on 40m under construction.

As the years went by, I found myself making frequent trips to the cities for meetings, doctor visits, grandsons hockey games, and other activities. The two hundred mile round trip drive was starting to get old.

In the summer of 1999 I bit the bullet, and put my beloved log cabin on the market, thinking It would take until the following summer to sell, giving me plenty of time to find a place closer to the cities. It sold two days after it was listed!

Again I got lucky. A friend of mine in the real estate business found a newly built model home in Ham Lake, which was just what I wanted. Something *near* the cities, but *not in* the cities.

I closed on the property and moved to my new QTH in September of 1999. The location had buried power lines along with fiber optic cable, so things were looking up. I knew it would probably be a low noise environment, and that's exactly how it turned out.

Fast forward to 2018. To this day I don't regret leaving the lake and moving to Ham Lake. It's been a great location for DXing, especially on the low bands. I'm pushing 240 confirmed on 160 *without* a Beverage or low-noise receive antenna, so you can see it's a quiet QTH.

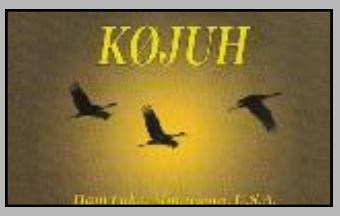
After 82 trips around the Sun, I no longer have that roaring fire in the belly for chasing DX. I still get on, but not as often. I'm afraid the roaring fire has died down to a few glowing embers.

On his very first Muskie trip with the Old Man, Terry C&R this 50 inch beauty fishing out of Malmo on the north end of Mille Lacs.

My son Terry lives with me, and takes care of all the chores which allows me to remain in my home. He also keeps an eye on the "old man". I thank the good Lord everyday for all my blessings.

73, Jim, KØJUH

The KØJUH PHOTO GALLERY



JA3CZY and Family

Several times in the 90's I had the pleasure of hosting DX friends at the Mille Lacs Lake QTH. Elvin Miura, JA3CZY was from Osaka, Japan. Don McCall, YB8ASX was from Australia. Don was a missionary on an Island near Indonesia, hence the YB call.

YB8ASX and Family

The Black Bear den was located a few miles east of my cabin. When hibernating, their eyes remain wide open. I took this shot holding the camera a few feet from his head. The Big Boy didn't even blink! Don't try this in March when they're starting to wake up.

The Junkert Gang
Tim, Michele, Terry, Kim

Fishing Blue Marlin in Hawaii when I should have been fishing for DX back in Minnesota.

KØIEA, G3BWN, KØJUH
Dave, Ian, Jim

Too much time napping in the recliner, too little time sitting in front of the radio.

THREE REASONS WHY I MISSED AN ATNO ON THE LOW BANDS.

Hunting Ducks and Geese in Saskatchewan when I should have been hunting DX in Minnesota.

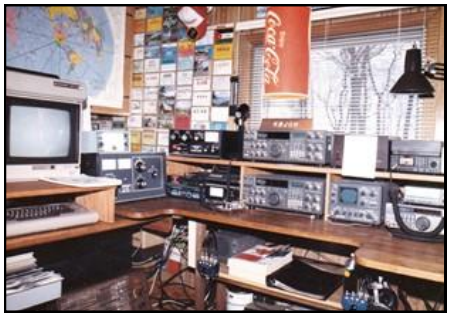
KØJUH EQUIPMENT INVENTORY PAST & PRESENT

TRANCEIVERS	AMPLIFIERS	ANTENNAS	TOWERS
FLEX 6700, MAESTRO	ACOM 2000A	HY-GAIN TH11	TRI-EX 70 FT
ICOM 7800	ALPHA 89A	HY-GAIN HT18	MOTORIZED CRANKUP
ICOM 7000	ALPHA 87A	TRI-EX MONOPOLE 160	ROHN HBDX 56 FT
YAESU MARK V	AMERITRON AL-1200 (2)	GLADIATOR 160 VERTICAL	TITAN 80 FT (2)
ICOM 706	AMERITRON AL-80B	HY-GAIN TH-7DX	HY-GAIN HT18
YAESU 1000D (2)	AMERITRON AL-600	CUSHCRAFT A3	
ICOM PRO III	HALLICRAFTERS HT9	FORCE 12 3el/40M & 6el/20M	
ICOM 765		FORCE 12 4el/10M-17M	
KENWOOD TS 940		FORCE 12 2el/30M	
KENWOOD TS 830		BUTTERNUT HF6V (2)	
HAMMARLUND PRO 600		MOSLEY TA33	

BED & RADIO IN HAM LAKE
We had to stop climbing stairs (bad knees) so the upstairs bed room was placed off-limits and a small bed squeezed into the shack.
ICOM 7800, ICOM 7000, FLEX 6700, ACOM 2000A
TRI-EX Crank Up and TH-11

Awards Wall in Ham Lake Shack

Fish House Shack in 1982
Kenwood TS830, TL922, and Hy-Gain TH7



Fish House Shack in 1987
Yaesu 1000D (2), AL-1200, Hy-Gain TH7

Log Cabin Shack in 1993
Yaesu 1000D (2), Alpha 87A
Force 12 Stacked Yagis

The MWA Contest Corner

Contesting as We Age

By Al Dewey, KØAD

Like many in TCDXA and MWA, I have been contesting for a long time. First licensed in 1961, I started out operating some state QSO Parties, the old Novice Roundup, the old CD Parties, and ARRL Sweepstakes during 1960s. Now, almost 50 years later as I am well into my seventies, I am still plugging away. I got to thinking the other day about how contesting has changed for me over the decades. Certainly, contesting technology has changed. Better radios, computer logging, online log submittal and results, station automation, on-line spotting assistance, and SO2R are just a few of the areas where great strides have been made... almost all for the better. However, what I have been thinking more about is how I have changed and how it affects my contesting today.

First the Good News

Despite some drawbacks which I'll get to later, there are some really positive things about contesting as you get older. First of all, I've got more time to do it now that I am retired. Granted, contests are almost always on weekends which I had available when I was working. But having Monday through Friday available to prepare really helps. I can take my time getting the station, antennas, and computer all ready to go. I can operate the CWTs on Wednesdays or the NS Sprints on Thursday to keep me sharp. I can do those weekend errands during the week now leaving more time for contesting on the weekend. And, of course, I can take Monday (or longer) to recover for contests where I go all out. Secondly, with the house paid off and the kids long gone, I find myself with a little more disposable income I can devote to my hobby. I'm certainly not flush with cash but I can often buy that new accessory or radio without having to agonize over it like I used to.

People say that doing things to stay mentally alert can help slow down the aging process especially as it applies to the mind. I don't know if contesting qualifies, but I would like to think it does. The way I figure, learning new technologies like the new digital modes and software defined radios certainly can't hurt either.

Finally, I believe the old adage that wisdom comes with age applies to contesting as well. For one thing, there are certain call signs that I have been copying into my contest log for a long, long time. Their name and location are burned into my brain. It's like having a "call history" data base in your head. Conversely, the fact that my call has been out there for so many years helps people "recognize" my call. When I am trying to do an all-out contest effort, I have

Figure 1: Not much room for more plaques

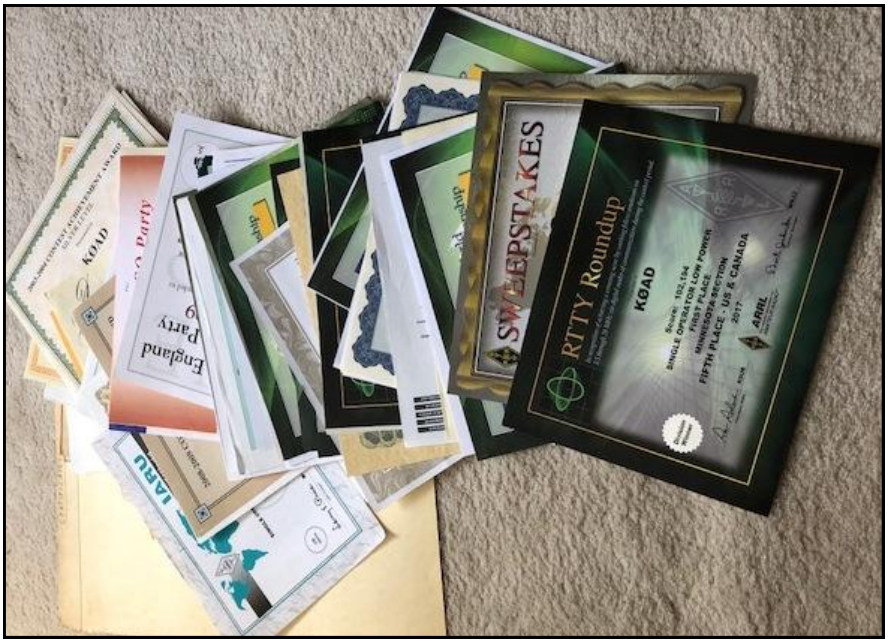


Figure 2: Well over 100 certificates sit in a file drawer unseen

also learned over the years to never give up. If I am struggling with the bands, I can almost be assured that my competition is, too. I remember one ARRL Sweepstakes contest a number of years ago where the bottom dropped out of the bands about three hours before the contest was over. Signals were like ESP and I was only making a few QSOs an hour. However, I stuck with it and that was the difference between winning the Division and ending up in second place. Over the years, I have learned many, many contest tips and techniques. Taken individually, each of the techniques I have learned is not that significant. However, I believe that the cumulative total of these things I have learned over the decades actually gives me an edge in my golden years.

Certificates and Plaques

When I first started out in contesting, winning a certificate or even a plaque was really fun. However, as I look at my wall, there really isn't much room for more plaques. Also, I have a folder about an inch thick of certificates which will just be tossed when I go SK (along with the plaques probably). Several years ago, a field was added to the Cabrillo file which asked if you wanted to receive a contest certificate. The default was NO which seems right. Don't get me wrong – I think these tangible symbols of your success have value especially for those early in their contest career. But getting one more certificate or plaque no longer has much of an appeal to me.

Now the Downside

Of course, there are certainly some things that make it more difficult for me to contest as the years go by. For me, difficulty in sleeping takes a toll on my contesting efforts. I'm just not able to sleep like I used to. That makes it difficult to stay up as late as I have in the past. This means that my efforts (and multipliers) often suffer on the low bands. For example, doing a serious effort in ARRL Sweepstakes requires staying up to at least 2:00 AM the first night and then trying to sleep for 4 to 5 hours. I am finding this really hard to do. When doing multi-op, it's usually necessary (to be fair) to take at least one graveyard shift. That is harder for me to do each year.

Besides getting tired, sitting in the chair all weekend really takes a toll on my body. Although I play Pickle Ball five days a week, sitting in a chair all weekend is much harder on my body. Bouncing back from a full contest effort gets harder and harder to do. I usually feel lousy for days.

Although I hate to admit it, I sometimes find myself reacting a little slower than I used to. Every once in a while, my mind knows what to do but my fingers have a slight delay in responding. It doesn't happen that often but, when it does, it really surprises me.

Finally, and this may sound a little morbid, there is the propagation cycle. In the past, we just sort of worked through the cycle minimum knowing that better days were just ahead. Around the clock propagation on 20 meters and lots of activity and DX on 15 and 10 meters would return. At this point, however, I often wonder how many "top of the cycles" I have left. One, two, maybe even three? Certainly no more than that.

Goals Going Forward

So what still appeals to me as I contest during my golden years? I still enjoy the competition and recognition that comes from a good contest effort. I enjoy sharing my contest effort on the MWA reflector and reading about how others have done. In certain contests like ARRL Sweepstakes, ARRL RTTY Roundup, IARU, etc., I still take pride in the recognition that comes from making the Top Ten box from time to time. I enjoy doing multi-ops with my contesting colleagues and still have a soft spot in my heart for Field Day. I enjoy getting a "dit dit" in the middle of a run from a friend. As I have indicated in previous columns, I much prefer shorter contests. I would much rather do a full effort in a 1 hour, 2 hour, or 24 hour contest than a partial effort in a 48 hour contest.

I have learned, also, to put my results in perspective. While I still like to compete against others, especially for national recognition, I find myself more and more interested in how well I did against my OWN previous scores. Getting what is called a "personnel best" in a particular contest is just as rewarding to me as beating out my competition. One of the reasons I post my scores to 3830 (i.e. www.3830scores.com) is the historical feature that allows me to look at a summary of my contest results for many years back. I find this data valuable as I prepare for a contest.

So that's my plan as I proceed through my golden years. Full efforts in shorter contests, less plaques and certificates, and striving for personal bests.

See you in the pileups.

TWIN CITY DX ASSOCIATION (TCDXA)

CLUB FACT SHEET

Who We Are:

The Twin City DX Association (TCDXA) is a 501(c) (3) non-profit amateur radio organization, whose members have an interest in DXing and in supporting the club mission: ***Dollars for DX***. Bylaws and Articles of Incorporation govern the club's operation.

Club Mission:

The club mission supports major DXpeditions with financial donations. The source of operating income for this activity is an annual contribution (dues) of $25 from each member.

DX Donation Policy:

The policy supports major DXpeditions that meet our requirements for financial sponsorship. All requests must be approved by the Board of Directors. Final approval is by vote of the full membership. Over 70 DXpeditions have been sponsored since 1997. Details are available on the website at: http://www.tcdxa.org/sponsoreddxpedtions.html

Club History:

The club was formed in the early 1970s by a small group of DXers from the Twin City area. Over the years, the club has changed; most notably by opening its doors to anyone interested in DXing - from the casual to the very serious operator. Our membership now resides in numerous states and several countries.

Requirements for Membership

We welcome all hams who have an interest in DXing and hold a valid FCC Amateur Radio License. It doesn't matter whether you're a newcomer, or an old-timer to DXing; everyone is welcome!

Meetings:

The club meets on the third Monday of each month (except July & August) at PUB 42 Restaurant in New Hope, MN. Members gather early in the bar for Happy Hour, and move into a private room at 5:00pm for dinner and a short business agenda, followed by a program. If you enjoy a night out on the town with friends, you'll enjoy this get together. Meeting attendance is NOT a requirement for membership.

Club Officers:

Four officers, plus one additional member make up the Board of Directors; currently: Bill Mitchell, AEØEE, President & Director, *wsmitchell3@gmail.com*, Bert Benjaminson, WBØN, Vice President & Director, Pat Cain, KØPC, Secretary/ Treasurer & Director, *k0pc@arrl.net*, Mike Cizek, WØVTT, Director & DX Donation Manager and Doug Arnston, KØPX, Director.

Website:

We maintain a website at www.TCDXA.org that provides information about a variety of subjects related to the club and DXing, The site is maintained by our webmaster Pat Cain, KØPC.

Newsletter:

The ***Gray Line Report*** is the club newsletter, which is published on a quarterly basis. We're proud of the fact that 99% of the content is "homegrown" – written by our members. Past issues are on the website at: http://www.tcdxa.org/newsletter.html.

How to Become a Member:

An application for membership can be completed and submitted online, or printed and mailed in. (See http://www.tcdxa.org/Application.html) Contributions may be made by check or via the PayPal link on the homepage at www.TCDXA.org.

Visit us at a Meeting:

You are most welcome to attend a meeting, and look us over, before joining. Meetings are held at the PUB 42 Restaurant at 7600 Avenue North in New Hope (http://pub42.com/). Join us for happy hour at 4:00pm with dinner at 5:30pm, followed by the meeting at 6:30pm.

VKØIR	K5D	AHØ/NØAT	3W2DK	K4M	XU7MWA
ZL9CI	VK9DWX	5X8C	FT4TA	TX3A	S21EA
A52A	FT5GA	K9W	VK9MT	KMØO/9M6	J2ØRR
T33C	3D2ØCR	XRØZR	VK9DLX	YS4U	J2ØMM
3B9C	E4X	T3ØD	VU4KV	YI9PSE	BS7H
TX9	CYØ/NØTG	3W3O	EP6T	ZL8X	N8S
CP6CW	VP8ORK	3W2DK	VP8STI	4W6A	3B7SP
3YØX	VU4PB	FT4TA	VP8SGI	T32C	3B7C
K7C	STØR	VK9MT	TX3X	HKØNA	5JØA
5A7A	3D2C	VK9DLX	VP6DX	7O6T	K5P
VU4AN	3CØE	VU4KV	TX5C	NH8S	FT4JA
VU7RG	TT8TT	EP6T	9XØR	PTØS	PZ5W
VK9DWX	9M4SLL	3GØZC	9U4U	FT5ZM	ZL9A

TCDXA DX DONATION POLICY

The mission of TCDXA is to support DXing and major DXpeditions by providing funding. Annual contributions (dues) from members are the major source of funding.

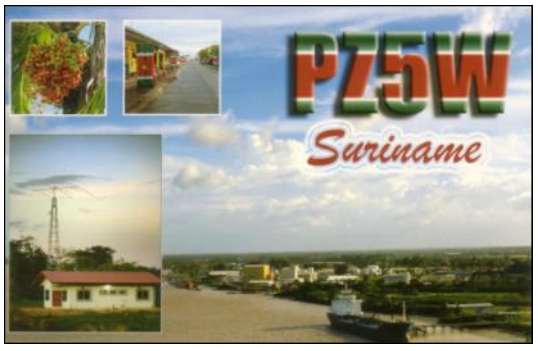
A funding request from the organizers of a planned DXpedition should be directed to the DX Donation Manager, Mike Cizek, WØVTT. He and the TCDXA Board of Directors will judge how well the DXpedition plans meet key considerations (see below).

If the Board of Directors deems the DXpedition to be worthy of support, a recommended funding amount is presented to the membership for their vote. If approved, the TCDXA Treasurer will process the funding..

Key Considerations for a DXpedition Funding Request

DXpedition destination
Ranking on *Most Wanted Survey*
Most wanted ranking by TCDXA Members
Logistics and transportation costs
Number of operators and their credentials
Number of stations on the air
Bands, modes and duration of operation
Equipment: antennas, radios, amps, etc.
Stateside and/or foreign QSL manager
Website with logos of club sponsors
QSLs with logos of club sponsors
Online logs and pilot stations
Up front cost to each operator
Support by NCDXF & other clubs
LoTW log submissions
Previous operations by same group
Valid license and DXCC approval
Donation address: USA and/or foreign

To join TCDXA, go to http://tcdxa.org/.



- end –r9