

TCDXA
TWIN CITY DX ASSOCIATION



Minnesota

Newsletter of the
Twin City DX Association

www.tcdxa.org

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Gray Line Staff

**KØAD
K9WAG
WØJMP**

The GRAY LINE REPORT

DXing from Minnesota - Land of 10,000 Lakes

TCDXA Members Share Experiences with Remote Operation

By Dan Dantzler WØJMP, Bob Garwood WØBV, Harry Cohen KØVZT, Pat Cain KØPC, Jeff Martin WØJM, Matt Holden KØBBC and Tom Rieff KØYR

As Bob Dylan said in 1964, "Times They are a'Changin'". At one time, nearly every amateur radio operator had the ability to put up antennas and put a station on the air. Neighbors were more tolerant, and there were very few Home Owners Associations (HOAs). People were not likely to spend long periods of time away from their primary residence. Most hams avoided living in apartments or condominiums. Today, many municipalities have regulations or ordinances restricting or prohibiting outdoor antennas. Here in Burnsville, MN, I have a 50 foot height limit. More and more new single family homes have CC&Rs (Covenants, Conditions, and Restrictions) that are tied to the title or deed. Many of these completely prohibit outdoor antennas for amateur radio.

As we age, at some point we consider downsizing and moving to restricted neighborhoods. Some hams simply prefer apartment or condominium living. Many of us are "snow birds" spending weeks or months during the winter in a warmer climate. This annual migration is driving me to look at ways to operate remotely.

Operating an amateur radio station remotely is not new. It has been done for decades. But years ago, the remote operation was done via a UHF link. Some of the early remote pioneers used motors to remotely tune their radios. Often the UHF link created its own problems. The FCC had strict regulations on how you managed the control and identification of the signal used for remote control. The UHF signal obviously had a range limitation. And sometimes, even installing a UHF control yagi was prohibited. You also had to be able to monitor your HF signal, so another receiver had to be set up at the location from which you were operating.

Today, the internet provides a powerful tool that greatly simplifies remote operations. With greater software integration for station control, remote operation is simplified. For example, at my station, I use Ham Radio Deluxe to control the rig, turn the antennas and log contacts. Since I operate mostly digital modes, I no longer sit in front of my radio but in front of a computer when operating. With Desktop Remote or TeamViewer, it is easy to control my computer from another location. But there are still wrinkles for me to overcome. I do not have computer control of my amplifier (but I do have a new Elecraft KPA1500 on order that will solve that problem). I cannot watch my power output or VSWR remotely. And occasionally, my SteppIR controller will “hang up”. So I need to have a way of knowing that (web cam?) and a means to reset it remotely. What if my computer crashes? How do I reboot? Many of our TXDCA members operate remotely. What drove them to do so and how they are achieving it?

Bob Garwood, WØBV, Goin’ Remote to Stay Afloat

Bob, WØBV, a self described “Low Band Junkie”, moved into a townhouse in 2004. Obviously, townhouses and low band DXing did not mix. So he built an off-site station in a rural area. The station was exactly 30 miles from his house. To work new “counters” on top band, Bob had to make many long trips in the middle of the night. By 2007, he had his fill of running back and forth so decided to try remote operating. He used an Alpha 87a auto tune amp and an Alpha Digital Antenna Selector (DAS). These were

controlled With Alpha’s “Alpha Remote” program. For the radio, Bob selected the Ten-Tec Omni VII. At the time this was the only radio that could connect directly to an internet router or modem without a host computer. With it, he used Ten-Tec’s “One Plug” software.

During the 2007 and 2008 low band seasons, he had great success with his remote 160 meter setup. For the full details of Bob’s remote station, see his article on page 9 of the July 2009 Gray Line Report. It is well worth reading.

<http://www.tcdxa.org/Newsletters/July2009Grayline.pdf>

Harry Cohen, KØVZT

Harry decided to pursue remote operation because of his winter travels. Using compromise antennas on a condo balcony and bringing a radio and power supply didn’t work out well. I have found the same thing! After some research into different methods of remote operation he decided to try Remote Hams, also known as RCForb. Remote Hams is a Windows software package comprised of a Server (base station end) and Client (remote end). Information can be found at <http://www.remotehams.com>. Since Harry carries a laptop when he travels, Remote Hams appeared to be an ideal fit.

Harry’s primary requirement was to have the ability to remotely control the 120 VAC power to the base station equipment in Golden Valley in addition to booting the computer, turning on the radio, switch antennas and rotating the beam. When the remote station was not being used, he wanted the 120 VAC power turned off.



Harry goes on to say:

“The radio used is my old all band, all mode mobile rig, a Yaesu FT-857. The CAT port of the radio is connected to a USB port of an old Dell desktop computer. Other USB computer ports are connected to a KMTronic eight channel relay controller used for antenna switching and power control of a second radio (Flex 3000 used for digital) and an “Easy-Rotor-Control” rotator controller that interfaces to the HAM IV control box. The mentioned equipment is compatible with the Remote Hams Server and can be configured using drop down menus in the program.

The AC power to the Astron power supply, computer, rotator control box and other



Operating screen on Harry's cell phone

equipment is controlled by an addressable Internet power switch feeding a power strip. When the Astron power supply turns on, it triggers a small relay for 1 second. The normally open relay contacts are wired across the computer on-off switch and that boots the computer. With Team Viewer installed on the base station computer and on the remote laptop and / or Android mobile device (cell phone or tablet) I have complete control of the base station computer and all of its applications. The above setup using the FT-857 allows me to operate HF, VHF and UHF from anywhere in the world

where cell service or Internet connectivity is available. Last year on a flight from Rome to MSP, I decided to try the Wi-Fi system on the airplane using my Samsung cell phone. From south of Iceland I was able to connect to my system, power up the equipment and made several contacts on some of the local twin city repeaters. When finished playing, I shut the power off at the home station.

The system has been operating for almost four years and has been rock solid. The system is password protected and being the system administrator, I can authorize whomever I choose to use the system.



Operating screen on Harry's laptop



The past several years I wintered in California where I used the system almost daily. Erv Grossman, KØIVO has wintered in Florida and has used the system to access all bands using his Android cell phone. Remote Hams software for Android devices is called “RCForb Client” and is available at the Google Play Store. The system only works with Android and not Apple.

Recently I have been operating JT65 and FT8 remotely using a Flex 3000. The power to the Flex can be turned on remotely and the HF antenna can be switched remotely from the FT-857 to the Flex. Using Team Viewer, I’m able to view the complete JT/FT display on my Android tablet and Samsung cell phone.”

Pat Cain, KØPC

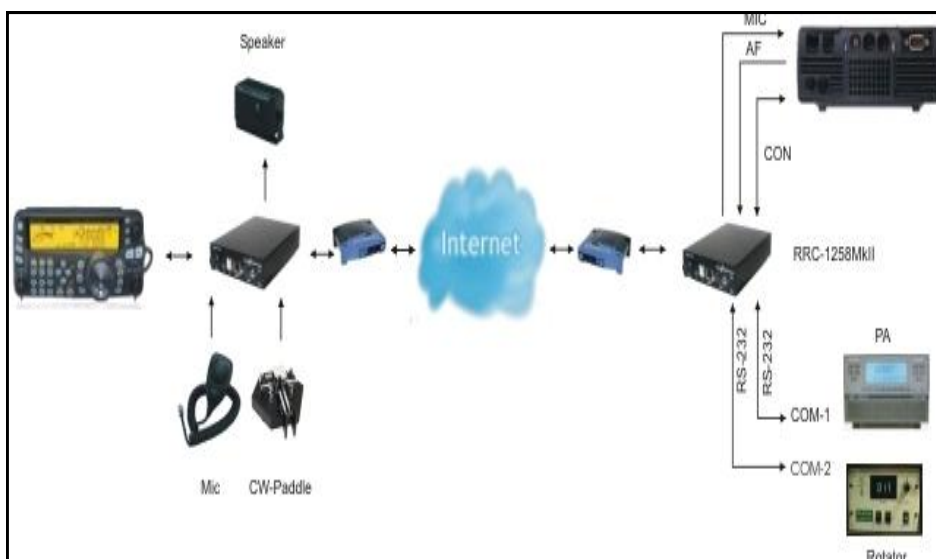
Pat used a different approach. He went with the RemoteRig boxes. These boxes allow you to operate remotely without computers, once you have them set up. They are nice for rigs with removable front panels. You hook one box up to your home radio after removing the front panel. You take your front panel with you and plug it into the second box. You operate using the same radio front panel that you would use at home.

Here is what Pat has to say:
“I played around with various simple methods for remote op-



RemoteRig Boxes

erating using remote desktop programs and a contest logging program. I didn’t find any good solutions, the audio was always a problem and the latency made it impossible to send CW with a key. I was at the Dayton DX Dinner in 2014 and happened to sit next to one of the designers of the RemoteRig boxes. This product interfaces with a K3 directly and allows you to run it remotely using either just a computer or another K3 or K3/0 as a remote controller. What really interested me was the ability to connect a paddle and send CW directly.



Typical RemoteRig Architecture



I started looking around for a set of the RemoteRig boxes on the used market and finally found a set in early 2015. There is one RemoteRig box at each end of the connection. They handle all the audio, radio control, and CW keying operations. I admit that it took me a while to figure out the setup of the RemoteRig boxes. After you get it going it really works great. With a second K3 or K3/0 (basically just the K3 front panel) it is just like sitting in front of the radio at the remote site. The final thing I have played with is the RemoteHamRadio.com stations. This is a subscription service that charges an annual fee and has per minute charges for operating their stations. They have some very impressive stations available in great locations. It's nice to be able to escape the "Black Hole" once in a while.

My first opportunity to really use the RemoteRig was a trip with my wife to Austin, TX during the ARRL DX Phone contest. I would be operating the contest from our hotel room so I thought it a good idea to use the voice recorder in the K3 for most of the exchanges. I set up my home station to work with the RemoteRig and took the other one with me. I did testing before I left and got everything working. At the last minute I decided to take a better microphone to have the best signal. The operation at the hotel started out great. It was not a serious effort so it was all search & pounce using the DX cluster. However my microphone refused to cooperate, it wasn't wired the same as the one I used for testing. When I ran across Glenn WØGJ operating VP5H in the Turks & Caicos, I hit the function keys to send my call using the voice recorder and Glenn came right back to me. He said hello and asked how his signal was doing. All I could do was press the recorded message

for 59 Minnesota. I'm sure Glenn thought I was pretty rude, I couldn't even say 73."

Jeff Martin WØJM

Jeff's approach is a little different than those we just read. Jeff has essentially NO home station but has a great station setup at his cabin "up north".

Here is Jeff's story:

Radio in the Twin Cities is not easy when you live with an Interior Designer. Towers and wires are not the esthetic that she appreciates. However, we made an agreement that should we buy a cabin "Up North" someday then I could put up whatever I wanted at the cabin.

That day came in 2004 when we bought our cabin near Grand Rapids, MN. After a few years I was back on the air at the cabin. But I could only operate while I was at the cabin. That was when I started getting interested in remoting.



Jeff's SteppIR DB-36 atop his 75 Foot Crank-up Tower "Up North"



My first foray into remoting was with an old Kenwood TS-940 and a GAP Titan DX vertical antenna. I controlled the station using a computer and TeamViewer and Skype for audio. This was all done through a slow internet link on both ends.

Later, I upgraded to a Flex-5000 and multiple antennas (4 square and SteppIR DB-36 Beam) I still used the TeamViewer and Skype. The pan adapter was close to useless on the Flex at slow internet speeds.



Jeff's setup at his cabin. Notice the web cam in the foreground to monitor the station from home.

The most recent incarnation is now with the Elecraft K3, K3/0 remote connected with Remote Rig modules. Antenna Switching was also done until recently with a remote rig modules. I now use the Rig Expert 1.3K-FA now to accomplish the antenna switching based upon the band. The antenna rotator had also been controlled by a Remote Rig module as well. The benefit of these little modules is that they provide their functionality through a web interface, which is great for remote operation. Most recently, the internet connections at both the cabin and home have been upgraded to fiber with a speed of 250Mbit/sec speed.

Lessons Learned and recommendations

1. Start simple! Don't give yourself a hard time. It's always easier to build on a solid foundation.

2. Look at your station and find your failure points. For me PC issues were the bane of my existence until I configured an Internet power switch to turn the PC off and on. I also bought a module from West

Mountain Engineering that allows me to cycle power on various 12v appliances including the Remote Rig modules.

3. Find a way to test your station BEFORE you drive off from your remote location. Microbit, which manufactures the RemoteRig modules sells a RRC Nano Android app which has paid for itself many times over.

4. Be willing to learn about diverse topics. You will need to learn about port forwarding, which is the means by which you enable your devices to route through your router to get to your control sta-

tion. You will also need to learn about RS-232 and USB com ports.

5. If things don't work the way you want, don't be afraid to try something different.

6. There is no one right way to do remoting. You will find that there are many ways to accomplish remoting, each with its' own plusses and minuses.

What's next? I have a laundry list of items to play with to refine the station. I am putting up 2 reversible beverages that will be remotely controlled. I am also looking to set up LP-PAN to work with Win4K3Suite. I miss the panadapter from the Flex-5000!

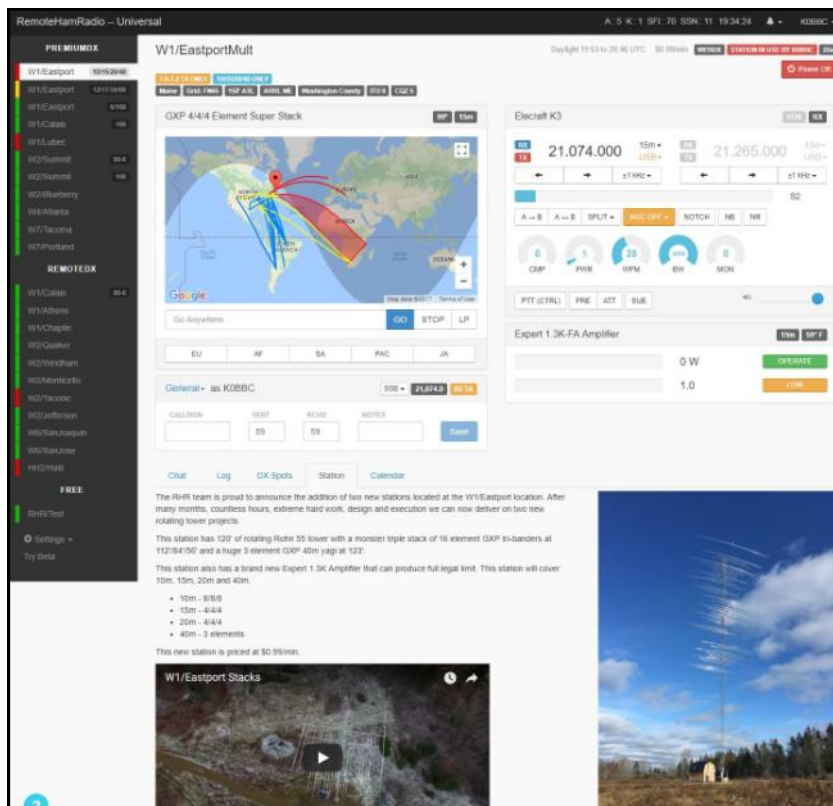


Matt Holden, KØBBC

Matt has a different approach. He lives in a high density neighborhood near the Minneapolis/St Paul airport. Having a station set up in his apartment building would be very difficult to say the least. Here is his approach:

“I live in a high-rise condominium near the Minneapolis airport. Remote operation has allowed me to chase DX while living in a unique building. My condominium has no windows that open. There are two panes of tempered glass that are designed to soundproof the unit because were so close to the airport. In addition, the outer pane of glass is has a metallic film on it to reduce UV radiation. That metal film has also meant that all attempts at indoor HF antennas have resulted in most of the RF bouncing back at me instead of the DX station. I enjoy setting up my Buddipole and Yaesu FT-991 in the park. In the summertime, it's a great way to enjoy some outdoor time and get on the HF bands. My enthusiasm for operation wanes in the other six months of the year... Winter.

My quest for a remote site to operate started a few years ago. Friends like WØZF and NØAT have invited me in to operate in contests and chase some rare DX from their QTH. But, I was still looking for a remote operation that wouldn't require me driving to another location. Remotehamradio.com is the ideal solution for me because I can connect to a station from just about anywhere in the world there is an Internet connection. There are 17 USA stations and one station in Haiti to choose from. Even with a growing



Remote Ham Radio operating screen

membership base, there is usually a station open. I have worked 302 DXCC countries on phone. WSJT-X has opened my eyes to FT-8. I have recently been chasing DX on 30 and 80 meters using this new digital mode. I can control the station's radio (K3), amplifiers and antennas from a web interface. When I travel I use a Bluetooth connected headset for phone operation. “Virtual” audio cables allow me to connect digital mode software to the remote radio. When I'm at home I prefer the feel of a real radio. I have K3/0-mini that allows me to control the remote radio as if I were sitting in front of it. I use a Heil headset and foot switch for phone operation. There are key and paddle inputs in the K3/0-mini for CW operation.

<http://www.remotehamradio.com/>



I would like to try some other remote operating strategies too. Perhaps there is a local K3 owner who would let me connect to their radio via a K3/0 and Remote Rig interface. I'm also fascinated by the capabilities of the FlexRadio line of radios and their remote capabilities."

Tom Rieff, KØYR

Tom approaches remote operation as a con-tester.

"My quest for operating remote was piqued by recent discussions of various methods and changes in technology. Everyone is talking about it! I wanted to be able to operate from the office before I went home for the day. A lot of different technologies have been put forth by some extremely smart individuals. Their expertise in the various technologies required is duly noted and provides a framework for building upon. Most have taken a certain path whether it is hardware, software, or server based. My approach was somewhat contest based as I like N1MM+ and use it as my main logger (engine) Whether working a contest, dx, or domestic contacts on the many different modes currently available, N1MM+ is an extremely versatile piece of open source software.

The primary goal of this exercise was being able to operate from any computer without having to drag ancillary hardware along or being restricted to a certain QTH.

Second goal was to use open source software.

Third goal was to use N1MM+ as my logging program and main operating engine.

The fourth and final goal was to use the N1MM+ Voice Keyer remotely and being

able to record messages on the fly from the remote location.

There are a lot of different pieces to this puzzle, some very easy, while others can present some real stumbling blocks.

The main software parts of operating remote are...

VPN - Virtual Private Networking, for this I used IPsec and OpenVPN through my existing IPCop routers. This was relatively easy as we use this at work.

VNC - Virtual Network Computing with Tight VNC for access to the remote PC.

Virtual Comports - The different pieces of software all want access to the radio comport. In order to share this and split it, VSPE proved to be an acceptable choice.

TS-590 Radio Menu Software - This allows you access the menu items within the radio and make changes.

N1MM+ Logging Software.

Audio - I tried many approaches, Mumble, Skype, RemAud, RCForb, and other server based options, but most were not clean and neat for both SSB and CW. I finally settled on Asterisk, which is an open source phone server. We use this at work for our phone system so I was familiar with it. This was setup on a separate Ubuntu Linux PC. Access was through a Linphone soft phone on both ends. This product is available in both windows and Linux versions.

VAC-Virtual Audio Cable - A VAC was needed to combine the mic audio from the soft phone and N1MM+ Voice Keyer and feed it to the mic in on the soundcard. This allows me to record on the fly remotely and proved to be the most difficult part of the



project. VoiceMeeter worked nicely for this task.

IP Power Control - In order to turn things on and off remotely, I broke down and purchased a Digital Loggers product.

Works nice to turn the radio and the different computers on and off.

Antenna Automation - Is a key part of any station control. The radio has 2 antenna ports so my options are limited at this point. This is one of my next items on my remote access bucket list.

Rotor Control - I have a small tri-blander beam with a tail twister rotor. Vibraplex sells an ERC-USB kit for rotor control. This takes a minimal amount of time to build and install in the tail twister box. Works slick! Anything that makes your station more automated is a plus for operating remotely.

Windows 7/10 - Originally tried Windows XP, but this proved to be problematic with sound cards and N1MM+, so made the switch to Win 7 at the home QTH.”

Initially my remote endeavor has been limited to my home station in North Mankato. As I play and developed my approach I wanted to be able to control any adverse effects at my station and more easily correct situations where lockups may occur. Until stability is achieved, being in control is a critical part of the development process. A lot of the time the distance between the operating computer and the remotely connected computer was a whopping 3 feet. This allowed me to try different things and make changes readily.

With a test bed in North Mankato under my belt, my next step will be to provide remote access to my station in Pine City

where I have multiple towers and a better selection of antennas. In Pine City, I have different radios, which are 2 - K3's in a SO2R configuration, so this will present a different dynamic in audio and radio software control. Automation is the main play in making a versatile remote station.

Whatever works for you to improve your station will also benefit a remote station configuration.

Switching back and forth from remote operation to fixed base operation can also prevent configuration problems between the 2. A lot of times rather than reconfigure for fixed base, I will operate remotely even though it is only 3 feet.

Another key aspect of having remote access is allowing others who are not as fortunate to operate a station with enhanced capabilities, without having to travel to a distant location.

A major plus of remote operation, is that people are busy these days and have limited opportunity to participate (play radio) within their time constraints. This allows them to broaden their horizons.

Some of this is not for the faint of heart, but it is still fun just the same.

So there you have it TCDXAers: five different approaches to working remotely. It is like a smorgasbord; walk past and pick out what works for you. There are lots of choices and a lot of products, hardware and software, that will help you decide how to work remote.

Since I will not be at my home station during the upcoming Bouvet activation. I will be following Matt, KØBBC's lead.



Six Meter DXCC

On the Road to 10-band DXCC

by Bob, WØBV

In May, 2000, Wayne Mills, N7NG joined the ARRL staff as Membership Services Manager. Wayne oversaw implementation of the DXCC Challenge award. The DXCC Challenge was established as a result of the work and recommendations of the DXCC 2000 Committee. The DXCC Challenge grew out of that initiative, as an overall competitive award for DXCC.



I had been collecting DXCC band entities during the late 1990s, as a means of gaining single-band DXCC awards. So, the DXCC Challenge award caught my attention. I did some Peter Rabbit math, and determined that I would need some band entities on 6 meters, if I was to be serious about joining the DXCC Challenge 3000 Club.

In July, 2000, I bought a 5-element Cushcraft 6 meter Yagi, and mounted it on my tower mast. Sunspot Cycle 23 was nearing its peak at that time, and I realized that I was a little late to the party. I started by working NA states and provinces, using my IC-746. That was fun, but I wanted to work DX.

I soon ran into Chuck Munce, KØSQ (SK) on the band. He and I became fast friends, and he became my 6 meter Elmer. Chuck had been focused on 6 meters since 1958. He taught me how, where and when to look for DX on the band.

I decided to add "boots" to my IC-746, and ordered an ACOM 1000. At the time, there was a long wait for that model. When it finally arrived in October, 2000, it came with a defective vacuum relay. With the help of Krassy, K1LZ at ACOM, I replaced the relay, and was finally off to the races. During the remainder of the Cycle 23 peak, I collected 90 DXCC entities on 6 meters. I then refocused my bucket list goal towards 6 meter DXCC.

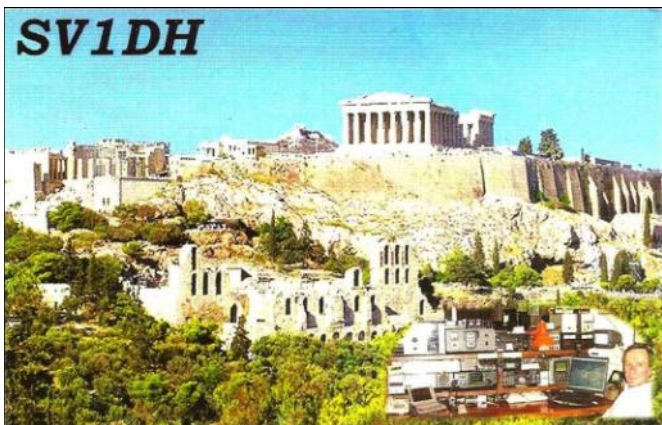


As Cycle 23 faded, and the F-layer propagation disappeared, I worked with Chuck to find sporadic E (Es) opportunities for working DX. Between 2003 and 2005, I added just two more DXCC entities on 6m.

In 2005, Kate, KØYV and I decided to downsize and move into a townhouse. As you've guessed, there were no outdoor antennas allowed. I put the Cushcraft 5-element Yagi in the attic of the townhouse, and pointed it at Europe. That got me nowhere in the pursuit of 6 meter DXCC. I did, however, work some DX during Es seasons - just no new counters.

In 2013, we moved to our retirement QTH in "Coloradio." I put up a tower and a Step-IR that gave me 6 elements for 6 meters on a 32-foot boom. Between 2013 and 2016, I added five new entities on 6 meters. I was getting close, with 97 confirmed.

SV1DH



To Radio: **WØBV**

Confirming our QSO

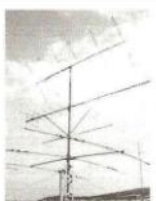
DATE	UTC	BAND	2WAY	RS(T)
20/6/2017	1703	50MHz	JT65	-15dB

Tnx for his long Es QSO, Bob

☐ Pse QSL ☐ Tnx QSL

GRID LOC: ☐ KM18VA ☒ KM27AW

SV1DH
 Costas Fimerelis
 Aristofanous 41
 HALANDRI 152-32, GREECE



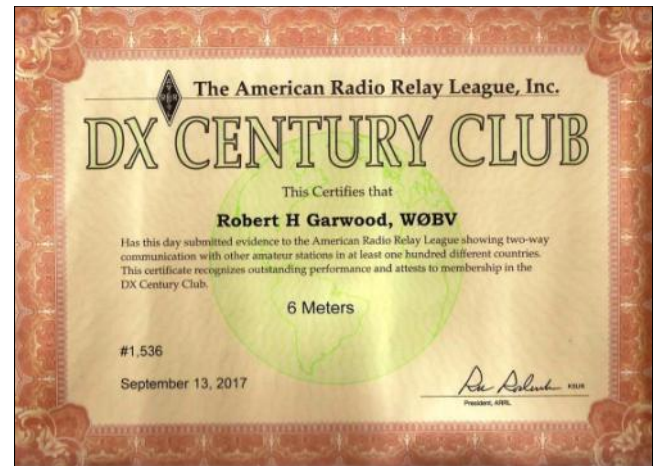
73

Costas

RIG: TS480

ANT: 2x CLC Dxx

LINEAR: 11cm
(500W on JT65)



This year in June, I was dismayed to find the CW portion of 6m largely void of DX signals during Es season. I soon discovered that 6m DXers were now all up the band using the JT65 digi mode. Es season peaks in June at the summer solstice, and FT8 was not released until late July. See Dan, WØJMP's article on the FT8 mode in the September *Gray Line Report*.

<http://www.tcdxa.org/Newsletters/June2017GrayLine.pdf>

As you probably know by now, QSOs made in the JT65 mode take a few minutes to complete. This becomes a problem with long haul contacts on 6m Es. The Es path often lasts for a very short time, and JT65 QSOs don't always complete. FT8 QSOs can complete in as little as 60 seconds. The trade-off is that JT65 is able to decode much weaker signals, as compared to FT8. Nevertheless, FT8 will become DXer's mode of choice during the coming 2018 Es season.

I completed my quest for 10-band DXCC on June 20th of this year (right at the summer solstice), when I connected on JT65 with Costas, **SV1DH**. Costas is not a user of LOTW, but he sent his QSL card directly to me, for which I'm deeply appreciative. I can now move on to another bucket list goal.

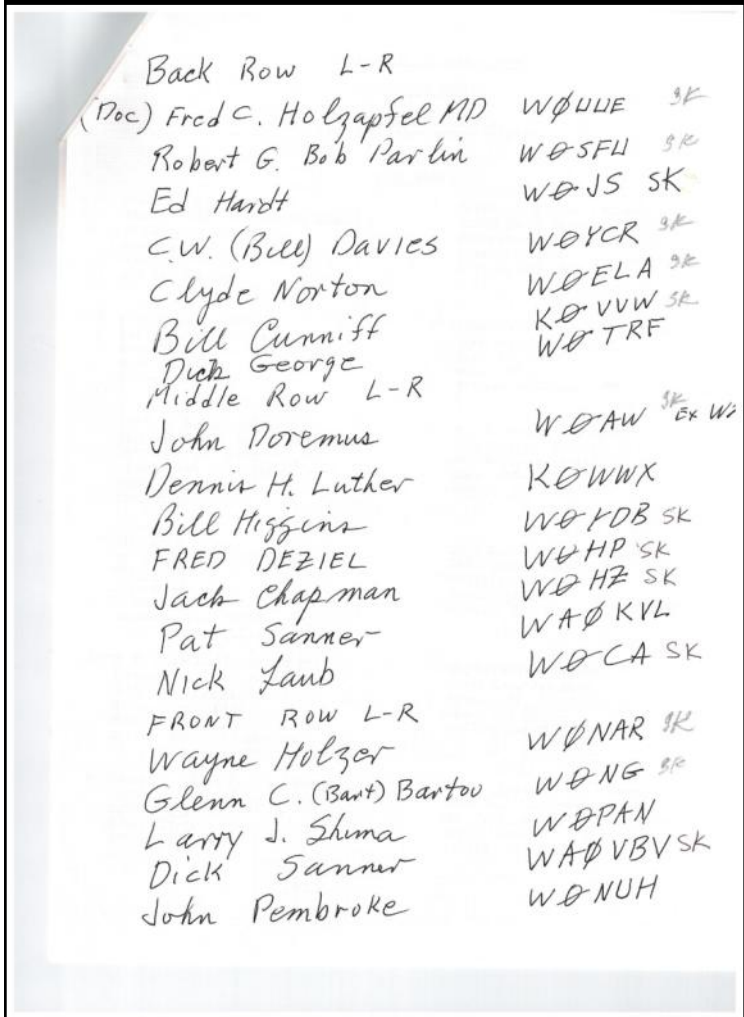


The History of the Twin City DX Association

by Dan Dantzler, WØJMP

Little did I know when I started this article, but the TCDXA has an interesting and tumultuous history!

The club inspiration came not from a Twin City native, but from a new resident. In 1970, Don Tyrrell W8AD (originally W7AZG), moved from Arizona to the Twin Cities. He was a Motorola sales rep newly assigned to the territory. After driving around a bit, he spotted the antennas at Dennis Luther's WØWWX (now KØFZ) house and went up to ring the doorbell. "You look like a DXer," he said, "What is the local DX club?" Don was shocked to learn that there was none and responded, "We should start one." The first planning meeting was held at the now defunct Wong's Chinese restaurant. The first membership meeting was held on October 7th, 1970. Charter members were Fred Deziel WØHP (SK), Dick George WØTRF, Bill Higgins WØYDB (SK), Don Johnson WØKHI (SK), Ted Kirst KØEKR/W1GL, Nick Laub WØCA (SK), Dennis Luther WØWWX, Ed Martinson WØGYH (SK), Hal Newall WAØKDI (SK), Clyde Noton WØELA (SK), Bob Parlin WØSFU (SK), Larry Shima WØPAN, and Don Tyrrell W8AD (Formerly WØMYK). You will notice that only a few of the founding members are still with us, but the club was formed nearly 50 years ago and the charter members were all accomplished DXers at that time. During the organization of the Twin City DX Association in late 1970, Bill Higgins, WØYDB (SK), suggested that the



Early TCDXA Meeting with
hand written list of
those in photo



THE TWIN CITY DX ASSOCIATION

April 1, 1974

KØIEA
David W. Wester
1810 N. E. Hayes
Minneapolis, Minnesota

Dear Dave,

The membership of the Twin City DX Association is pleased to extend to you an invitation to join our group. All of the present members feel you would be a distinct asset to the organization and encourage you to accept our offer of membership.

As you know, we meet monthly (usually at Jennings Red Coach Inn) maintaining a loose and informal atmosphere.

Member's obligations include an initial fee of \$3.00 and annual dues of \$6.00. Since we keep books on the calendar year, your pro-rated dues for April through December 1974 would amount to \$4.50.

Our April meeting is set for Tuesday evening, April 23rd, and to keep you posted we will be sending you the meeting announcement and newsletter. I'll be happy to answer any questions you may have prior to the 23rd (938-2965).

We all look forward to seeing you at the April meeting.

73,

Dick

R. I. George WØIRF
15245 Lynn Terrace
Hopkins, Minnesota 55343



Jack Walsh WØLYI, President of Dunwoody Institute. This photo taken at a January 1973 meeting about ten minutes before Jack suffered a non-fatal heart attack. Jennings Red Coach Inn.

were required to at least have DXCC or WAZ and be prepared to prove it with cards. But first, you had to be sponsored and invited to join. You were required to attend two meetings as a guest. Then, you were subject to a (secret) vote of the membership. Qualified DXers were evaluated on their "DX operating habits, techniques and other qualifications deemed to be pertinent". Approval had to be 100%! That is right; one negative vote would scuttle the new potential member. This was later amended to a 4/5 vote.

Early acceptance letter. Notice the high cost of dues (\$6) plus initial fee of \$3.

Minnesota Vikings football team logo with headphones added would be an ideal logo for the club. Bill obtained approvals for the use of the modified log from Max Winter, the president of the Viking's football team at the time. That logo continues to serve us well.



Bill Higgins,
WØYDB (SK),
1st President

The original club was an elite organization. To become a member you

At one of the recent club meetings, I mentioned to Pat KØPC how much I enjoyed being a member of this club and wished I had joined twenty some years ago when I first moved to the twin cities. He said, "You would not have qualified". Now, I get that.





Club picnic, August, 1977. Dave KØIEA, did not have much hair even 40 years ago!
Do you recognize anyone else?

THE TWIN CITY DX ASSOCIATION

MEMBERSHIP
MEETING ANNOUNCEMENT
WEDNESDAY, OCTOBER 7, 1970
BOULEVARD CAFE
5530 Wayzata Boulevard *

Social Hour	6:00 P.M.
Dinner	7:00 P.M.
Business Meeting	8:00 P.M.
Program	9:00 P.M.

* The Boulevard Cafe is located on Wayzata Boulevard (Highway 12) West of the Highway 100 Belt Line. It is next to McCarthy's Restaurant and across Highway 12 from the Cooper-Cinerama Theater.

The time schedule above allots one hour for a business meeting. We will run under that, if possible, but we need to cover some proposals, including our charter, that will be a one-time only requirement. All have agreed, we normally won't be big on business meetings.

We are planning a program but the circumstances do not permit publicity at this point. Be advised, however, it is pure DX and it will be generated from a most honorable source.

The food at the Boulevard is excellent but we must pre-order our menu choice

1/2 Chicken	\$3.95
Prime Ribs	\$4.75
Filet Mignon	\$5.45

Please call in your reservation and menu choice to one of the listed phone numbers by Sunday night, October 4.

73,

Bill Higgins
Home - 922-0122
Office - 331-4141 Ext. 4709

Dennis Luther
Home - 938-2160

Invitation to First TCDXA Meeting, October 1970

Dinner meeting attendees usually wore coats and ties as can be seen in the opening photograph. Early meetings were held at the Boulevard Café in St Louis Park. Each member was required to pre-order their meal (Chicken, prime rib or filet). Later, a club officer called all of the members to get their dinner order before the meeting! Eventually, the club moved to Jennings Red Coach Inn in St Louis Park and a few other places before landing at our current location, Pub 42 in New Hope MN. The Twin Cities was fortunate to have many technology based companies including Medtronic, Honeywell, 3M, Unisys and Northwestern Bell, to name a few. The TCDXA drew many members from those companies. The organization had no stated goal or purpose other than for elite DXers to get together and have a fun evening.

The early days of the TCDXA were not without turmoil. As is often the case in a group of high-achievers and passionate people, personalities clashed. There were shouting matches at meetings. One individual went so far as to mail his grievances to other members. The conflict was primarily between newer members and the "old guard". Eventually, things were resolved and the club continued to do well. By 1994, the club had 56 full members.

By the early 2000's, the club was in decline. Membership was dwindling and the very future of the club was





April 2006 social hour. How many members do you recognize?

in question. A group of members led by Jim Junkert, KØJUH, decided that something needed to be done to preserve the organization. Their approach was three pronged; one, develop a mission, two, have a membership drive and three, revive and improve the newsletter. The new mission of the club was to be “Dollars for DX”. This became the purpose of the club’s existence; to raise money to help worthy DXpeditions.

The second prong was the membership drive. Up until this time, members were required to have a certain level in DXing (DXCC or WAZ). That gave the club an “elitist” image. The decision was to welcome any hams who were interested in DX, even if they had not achieved the needed awards. Many of the members believed that drop in requirements would lead to the utter ruin of the association. With the elite requirements dropped, new members started joining the TCDXA. Jim KØJUH suggested that the goal was to get membership up to 100! Some scoffed at that lofty goal.

The third prong was to revive the newsletter. The old newsletter was a few typewritten (as in typewriter written) pages and it had faded away. The new newsletter, The Gray Line Report, was a very slick and professional publication. Volume one, Issue one of the new

Gray Line Report was published in March of 2004. <http://www.tcdxa.org/Newsletters/>

March 2004 [GrayLine.pdf](#) This issue set the standard that the current Gray Line staff is still trying to maintain. Who put out that first issue? Jim Junkert KØJUH, Dave Wester KØIEA, and Bob Garwood, WØBV. Those three dedicated hams continued to publish that excellent newsletter un-

til very recently. Use the link above to go back and look at that first issue. Does it look familiar? We still use the same format today. I would never have realized how much sweat and love went into that newsletter if I were not one of the people currently helping publish The Gray Line.

The goals set out for the club’s revival were met and then some. Membership continued to grow with a peak of over 150 members. Today, The Twin City DX Association is at another crossroads. We are experiencing a crisis of leadership. In most organizations, 10 percent of the members do 90 percent of the work. But the 10 percent are aging and some, suffering with poor health. Right now, we are having difficulty recruiting members to serve as club officers. Tom Weigel ABØJ who has done an excellent job arranging some fantastic programs for the club meetings, cannot do it for another year. Do not underestimate the importance of this role. The high quality presentations that Tom was able to secure for our meetings are a major driver in the success of our club.

So here we are: we have a great organization that is nearly 50 years old, but we have a crisis of leadership. The TCDXA has had its ups and downs but always managed to come up with solutions. What can you do to help? What

WILL YOU do to help?



Challenging Weather At C6ARW for CQWW Phone Contest

By Rich Westerberg, NØHJZ



Rich, NØHJZ took his radio to C6ARW
for the 2017 CQWW Phone Contest

I arrived in Grand Bahama on Monday and started setting up. The rotating dipole for 10-15-20 meters and the vertical for 40 and 80 meters were in surprisingly good shape considering it was four years since I was last here. They loaded up just fine. I brought an inverted L for 160 meters and could only get the vertical portion up 20 feet. Recent hurricane activity means there are no trees of significant height.

A Decent Start

Friday night the low bands gave me some decent numbers. I had a small pile-up on 160 meters and had fun. A quick two hour nap and I was ready for Saturday. Saturday was tough on the high bands with the Europeans CQing in my face. I guess that is the plight of stations with low power and small antennas. In the afternoon, I found some sweet spots on 15 and 20 meters and had some great rates. I had a 240 QSO hour in the afternoon. It was great to be in "the zone!" I never get tired of a thick pile-up.

Saturday Storm

Saturday night ended quickly. A tropical storm to the south sent wave after wave of rain, wind and lightning to our area. I pulled the plug and went to bed. The storm brought more than six inches of rain, winds over 50 MPH and lots of lightning. My inverted L was knocked down and my vertical was bent to 45 degrees.





A view like this can make any contest a whole lot more fun



The Saturday night storm did a number on the 40 and 80 meter vertical bending it to almost 45 degrees



A rotatable dipole for 10-15-20 meters and a vertical for 40 and 80 meters made up the main antennas. Not visible is an inverted L for 160 meters.

multipliers. I also had some very nice runs on 20 and 15 meters in the late afternoon.

My goal for this contest was to set a new Bahamian record for low power, unassisted. I also wanted to see if I could make the Top Ten for low power. After my time off the air on Saturday night, I didn't think the record was a possibility. I was just too far behind.

Finishing with a New Bahamian Record

Sunday I immediately went to 20 and 15 meters, searched for multipliers, ran when I could, and moved stations to other bands. The strategy worked for additional

With about an hour to go, I set the new Bahamian record! People kept calling me in the pile and I had 5T, FR, VP8, KH2 and others calling in. When the contest was over, I had entered just over 2700 QSOs in the log including 78 on 160 meters. I had 84 zone multipliers and 241 country multipliers for a total score of **1,928,550**. I operated for 37 hours. My final score may make the Top Ten. Thanks to everyone who called in during the contest. It's always fun to hear your friends call in from thousands of miles away!



Adding 30 and 40 Meters to the 3 Element SteppIR Antenna

By Dan Dantzler, WØJMP



Photo 1: Start of the Project, 3Element SteppIR

I was in the antenna business from 1967 until my retirement in 1999. During that time, I had two choices for antennas: Homebrewed and Hy-Gain. We did not have a firm rule forbidding the use of another brand; I just felt it would be disloyal. From 2000 on, I was free to use any brand of antenna.

We, and every other antenna manufacturer, were always searching for designs that would cover a broad range of frequencies. The log periodic dipole array (LPDA), invented in 1958, does provide broad coverage but is heavy, complex and the forward gain is not super impressive. The amateur radio service did not require continuous coverage as our allocations are slices of frequencies.

The yagi-uda array was invented in 1926 by Shintaro Uda. A minor role in the design was played by his colleague, Hidetsugu Yagi. Obviously, the minor assistant was a better marketer and the design simply became known as a yagi. It became the most popular design for upper band HF amateur radio use. The downside is that it only

covers a fairly narrow range of frequencies.

Since amateur allocations are arranged in “bands” of frequencies, methods were developed to make a single array play on more than one band. The ubiquitous tri-band beam became a favorite embodiment. The typical configuration covers 10, 15 and 20 meters. The traps provided a convenient way to cover specific bands with a single yagi. When the WARC bands were added, things became more complicated. The common method of covering 20, 17, 15, 12 and 10 meters was to either have two antennas or add interleaved elements. Traps themselves had some drawbacks including losses, power constraints and wind loading.

During the 1980s, we (Hy-Gain) build a lot of what we called CIM antennas, which were antennas for commercial, industrial and military applications. Many of these services had very broad frequency allocations and required nearly continuous coverage. The LPDA and “fat monopoles” like conical monopoles and discones filled most applications. During this time, we developed a vertical antenna that used a copper tape which could be extended to any length within a large fiberglass radome. We used a rope to pull the element up and a optical counter to keep track of how much of the tape was extended. This was a high power antenna (50 KW if I remember correctly) and we fought a lot of issues because of this. The corona would burn off the rope used to pull the tape up and arcing at the contacts occurred if the copper tape was moved with power applied. But the Hy-Gain 4220 did serve a niche.

At the Dayton Hamvention in 2001, SteppIR introduced their antennas I was impressed by the cleverness. Like our 4220, the antenna covered a continuous range of frequencies, in this case, 13.9 to 54 MHz. With the radio interface, the antenna retunes itself whenever you move the dial



on your radio. I wanted one but was afraid of the mechanical complexity. I waited to see if the antennas would hold up in the field.

After two years, in April of 2003, I installed my 3 element SteppIR. The service record has been pretty good. The antenna has not been off the tower since it was installed. The original boots did not hold up to UV and were replaced about 5 years ago. A nearby lightning strike disabled the control unit. The EMP took out our garage door opener, intercom and several other items in the ham shack. Rather than repair the control unit, I upgraded to a newer one that had a few more features.



Control cable damaged at top of tower

Early this summer, the antenna quit working. I suspected that a stepper motor had failed. But after trouble shooting it with SteppIR service, they thought it more likely that the problem was a control cable as they have had a very low failure rate with the motors. I no longer climb and I cannot get a bucket truck up to the tower.

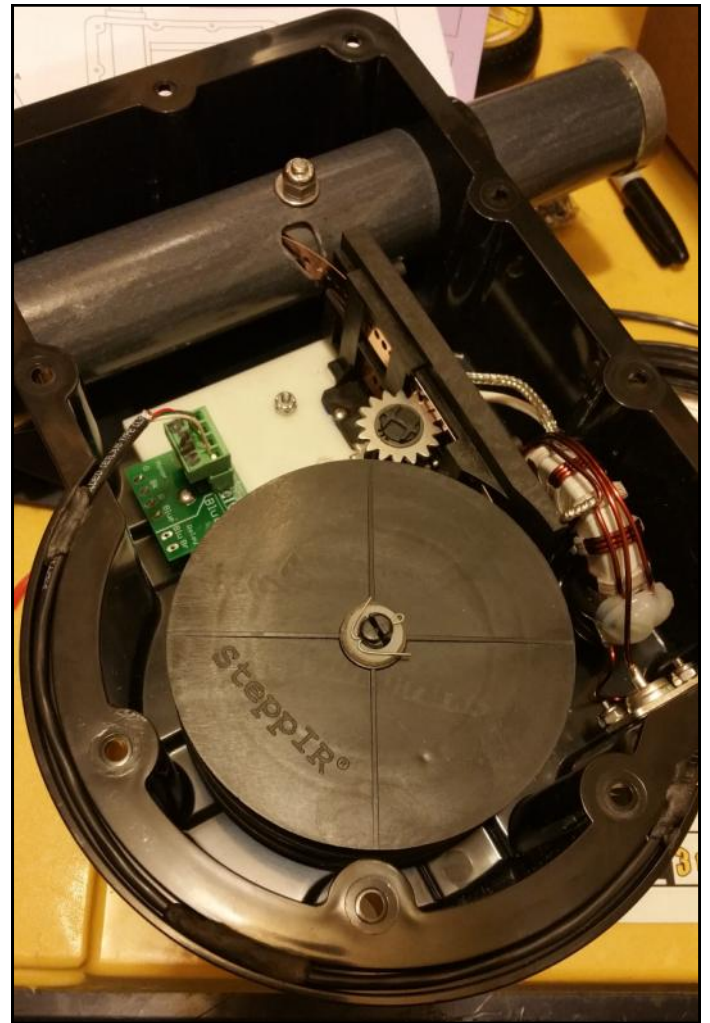
Very heavy heat shrink tubing with sealant used to secure fiberglass joints

Scott Stangler, WAØPLR who had done the original work is recovering from back surgery but several club members recommended Denny Moe, KØTT. Since I needed someone come out and do the tower work, I took the opportunity to add 30 and 40 meters to the antenna with the “trombone element”. This element replaces the original driven element with a trombone driven element. The beryllium copper tape inside the fiberglass radome extends and retracts to match the operating frequency. If you wanted full sized element on 40, the radome would need to be 33 feet long. So SteppIR has the tape return back to the boom through a U-shaped tube which they call it a “sweep tube”, and back through a second fiberglass tube.





Sweep Tube with fiberglass cross brace



Inside Element Housing Unit
The Fiberglass tube at the top supports the elements. Spool contains the beryllium copper strips. Balun is on the right.



Ends of fiberglass elements prepped for installation of "sweep tubes"

(For those of us of a certain age, "sweep tube" had another meaning entirely.) The two tubes are 30 inches apart. On forty, the tape comes back almost all the way to the boom. The return tube is 30 inches from the outgoing tube. This is a form of linear loading. On 30 meters, the tape barely starts on its journey back to the boom. Conveniently, on 40, the impedance is near 25 ohms which is transformed to 50 by the balun. On 30 meters the SWR is dependent on height and is about 2.2 to 1 in my case.





In this view of the EHU, you can clearly see the perforated beryllium copper strip. The sprockets are on the shaft of the stepper motor

My antenna is just over 40 feet above ground. On 30 meters, the gain is about the same as a full size dipole. SteppIR claims the forty meter dipole is about 0.37 db down from a full size dipole. As an added benefit, it is rotatable. The early trombone elements had a fairly high failure rate. SteppIR has made a lot of improvements to minimize these problems.

The antenna arrived in two boxes and I excitedly unpacked them. The fiberglass radomes are extended and “jam fit”. On the original antenna, the joints in the fiberglass section were secured and sealed with self-adhesive silicone tape. That tape has held up nicely. But SteppIR has since switched to the heaviest shrink tubing I have ever seen. The inside of the tubing contains a waterproof adhesive that is activated by the heat. I have a trusty little heat gun but it was no match for this uber heat shrink tubing. It took me nearly 20 minutes to shrink one piece! I did not want to buy a more powerful heat gun for this one project so I slowly and carefully used a propane torch.



Old Driven Element: The silicone tape held up well but there is some cosmetic damage to the fiberglass from UV





Old Driven element removed

As long as you keep the flame a suitable distance from the tubing and keep moving the flame, it works fine. But care and attention are required. On the regular elements, the fiberglass tube tubes may vary by an inch or more. That does not create any problems. However on the trombone elements, they must both be very close to the same length. So after the tubes are extended and the heat shrink tubing applied, they must be trimmed insuring that they are all the same length. Next the “sweep tubes” are assembled and used to connect the outgoing and return tubes together. The ends of the fiberglass tubes are carefully prepared using a small friction band similar to non-slip strips one might use in a bathtub. Next to the non-



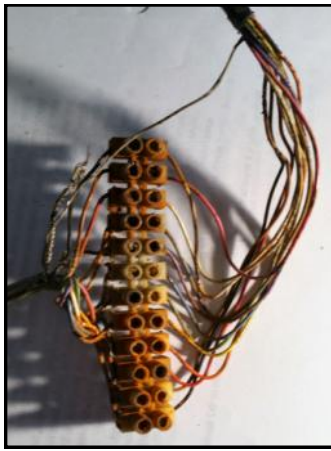
Elements in vertical position



First half of the trombone driven element installed

slip tape, a blue silicone tape is used for water proofing. I have included some photos of the inside for the motor housing. SteppIR calls them EHUs; Element Housing Units. In the photos, you can see the perforated beryllium copper tape and the stepper motor.





Euro connector
corroded by
water



Temporary work-
around to test unit
while waiting for con-

the control cable and the coax, Denny suggested that we raise the antenna a few inches to minimize a repeat of the same damage.

Denny removed the old driven element. The silicone tape was in good condition but the fiberglass itself was showing some damage from UV. (See photos) The EHU also showed some minor deterioration from the UV exposure. I believe the damage to the tubes and the EHU are only cosmetic.

Next, Denny had to drill holes to mount the element return bracket. Finally, we were ready to install the trombone elements.

The trombone elements were just too heavy to lift up and into the EHU and return bracket while the elements were in their normal horizontal position. So we had to twist the boom 90 degrees (elements pointing straight up and down). After the first one was installed, the added weight made it impossible to twist the boom 180 degrees and install the trombone on the other side. Denny made a lever using a boom to mast bracket to allow him to muscle the first half of the trombone straight up in the air. He then installed the second side. My 220 yagi was in the way for all of this and it also needed new coax so we took it down. After the antenna was back in its operational plane, Denny raised it up a few inches and connected the 12 connector control cable to the wires from the three EHUs. This connection is made with European style terminal strips. The entire connection is then installed in a housing made from PVC tubing and strapped to the boom with stainless steel hose clamps. As sunset ended work on the tower for the day, I routed the control cable into my shack. Although I was waiting for a DB-25 connector that had not arrived, I wanted to connect and try the antenna.



Its Alive!

Controller showing the antenna tuned
to the low end of 40 meters

Once I assembled the tubing and the EHU, Denny Moe, KØTT came out to assess the project. My tower is a Rohn HDBX series and is not fun to stand on for a long time (Denny would end up spending about 15 hours on the tower before all was said and done.). He fabricated an aluminum step to make the job easier and safer. An investigation at tower top confirmed what the SteppIR service person suggested, the antenna control cable was badly damaged. The rotor loop was insufficient or had slipped over the years and the control cable and coax were snagging on the corners of the tower. Besides replacing



There was another Euro-style connecting strip in the cable inside my shack so I thought I could use it for a temporary connection. The joint was tightly wrapped with multiple layers of 3M super 88 electrical tape. I unwrapped the joint and, as I got down a few layers, water ran out! I had heard stories about water migrating down compromised cables but this was first time I experienced it firsthand. There must have been a couple teaspoons of water under the tape and the connector was damaged beyond use (photo). But I still wanted to try the antenna out so a dozen small wire nuts worked for a temporary trial. (Photo) I held my breath and fired up the control unit...it worked!!

So far, I am pleased with the performance of the SteppIR on 40 meters. It seems to be just a little better than my dipoles and is only a few feet higher. The directionality is noticeable and being able to rotate is helpful. There is significant interaction between the SteppIR and my dipoles. I may take down my dipoles but I always like having backup options. The one thing that surprised me is the amount of time it takes to spool the tape out far enough to cover 40. It takes 37 seconds to go from 20 to 40 meters. That doesn't seem like much when I write it but seems like a very long time when I am operating.

Bottom line: I am satisfied with the long term durability of the SteppIR. Adding the 30 and 40 meter bands was worth the time and money and will simplify operating my station remotely. Now, one antenna covers 40, 30, 20, 17, 15, 12, 10 and 6 meters.

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.

Gary Grivna KØGX

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

TOP LINE SUMMARY

TCDXA OPERATING BUDGET FY 2018 (Sep 2017 - Aug 2018) December 14, 2017



INCOME		ACTUAL	BUDGET	Actual 2017
Surplus from FY 2017 (balance 8/31/2017)		2689.68		5200.20
Member Dues 2018 by Cash/Checks/ PayPal		2963.59	4500.00	4649.36
Door Prize Ticket Sales club share		239.00	500.00	602.00
Donatons (estates, wills, etc.)		0.00		
Refunds and Reversals		0.00		5.79
TOTAL INCOME		5892.27	5000.00	10457.35
EXPENSES			BUDGET	Actual 2017
Member Recruitment/Retention		0.00	(300.00)	0.00
Website ISP & Domain Name		0.00	(70.00)	(65.88)
Office Supplies, Miscellaneous expenses		0.00	(150.00)	(87.96)
Flowers <SK> and Hospital gifts		0.00	(200.00)	0.00
Holiday Party 2017		0.00	(500.00)	(433.15)
ARRL Spectrum Defense Fund		0.00	(100.00)	(100.00)
NCDXF Donation		0.00	(250.00)	(250.00)
MWA Plaque		0.00	(75.00)	(75.00)
DXpedition Contribu- tions Total		(1251.26)	(3000.00)	(6755.68)
#1 Dxpediton - VK9MA Mellish Reef	(500.00)			
#2 Dxpediton - 3B7 St. Brandon	(500.00)			
#3 DXpedition - 3C0L Anonbon	(251.26)			
#4 Dxpediton -	0.00			
#5 Dxpediton -	0.00			
#6 Dxpediton -	0.00			
#7 Dxpediton -	0.00			
#8 Dxpediton	0.00			
#9 Dxpediton	0.00			
TOTAL EXPENSES		(1251.26)	(4645.00)	(7767.67)
NET		4641.01	355.00	
Checking balance		2883.98		
PayPal balance		1632.03		
Cash / Checks on Hand		125.00		
NET BALANCE		4641.01		

When required, Wells Fargo & PayPal online statements can provide detail not shown in this report.



Backscatter: Miscellaneous, Assorted and Sundry Items of Note

by Dan Dantzler, WØJMP

Congratulations to TCDXA member Matt Holden. KØBBC is the new Dakota Division Director!

From the ARRL website:

“11/17/2017

The votes are in, and the ballots have been tallied at ARRL Headquarters in contested Director and Vice Director elections.

In a two-way race to fill the Dakota Division Director's chair being vacated by Kent Olson, KAØLDG, the Division's members have elected Matt Holden, KØBBC, of Bloomington, Minnesota. Holden, the current Vice Director, received 698 votes, while Dean Summers, NØND, of Dickinson, North Dakota, got 345 votes. Holden had been appointed as Vice Director in February 2016 after former Director Greg Widin, KØGW, became ARRL First Vice President. Olson announced earlier this year that he would not seek another term.”

BITX update

Two issues back, Keith Freeouf, K9WAG and I wrote an article on the BITX 40. We also promised a “part two” to the article. The BITX 40 is a 40 meter LSB QRP kit sold by Ashhar Farhan, VU2ESE. Keith and I both planned to hack the BITX 40 to use it on digital modes, CW and, perhaps, other bands. We also considered using it to acti-

vate some SOTA locations. As often happens with the best laid plans, life got in the way for both of us and neither did much more with the BITX 40.

But now, Farhan has made our hacking plans obsolete. He just introduced the µBITX (Pronounced micro bi tex or micro bit ex). This new kit is a general coverage, 10 watt HF SSB/CW transceiver. It works from 3 MHz to 30 MHz and has a very sensitive receiver. It features digital tuning, dual VFOs, RIT, CW keyer and more. This will make the digital modes such as FT8 directly accessible. It is now available for \$109 with free shipping from India. That price is good until December 25th. After that, the price will be \$129. Keith and I have each ordered a kit.

UPDATE: 12/11/17, the entire first run of 1,000 of µBITX kits sold out in less than one day! Keith and I have received our kits in less than 5 days using DHL. Next run should be available about the first of next year.

<http://www.hfsignals.com/>

Also of note; Dave Schmidt, KEØKHA, has a computer business in Ely, MN. Dave got started in 3D printing producing parts for the model airplane hobby. Now he is also 3D printing stock and custom cases for the BITX. There has been enough demand for these cases that Dave recently added extra 3D printing capacity. His business is called Wolfland Computers and Hobby.

<http://www.wolfland.net/>

FT8 Updates

In the last issue of The Grey Line Report, we mentioned FT8. At that point, Release candidate 2 (RC2) of the software had just been released. Since then, RC3 was released and, the final version is available.



If you are using an older version, please upgrade to the latest version. Besides better performance, the final release has some minor incompatibilities with earlier releases. You can find it here:

<https://physics.princeton.edu/pulsar/k1jt/wsجتx.html>

Within less than a month of FT8 use, I easily worked and confirmed all fifty states. More recently, my FT8 entity count has reached 103. The ARRL has a WAS endorsement for FT8. No award for FT8 DXCC is available from the League, but that's ok with me.

Bouvet

Every month, Tom Weigel, ABØJ has found an interesting presenter for our meeting. October was even better than usual. Glenn Johnson, WØGJ was the live presenter. Glenn is one of the leaders of the upcoming Bouvet DXpedition. His presentation detailing all of the tremendous preparation that goes into a DXpedition of this magnitude is nearly overwhelming. Considering all of the donated equipment, this may be the first DXpedition to top \$1 million in cost.

This DXpedition will be an all time new one for me and many other hams around the world.

<https://www.bouvetdx.org/>

New members since last newsletter:

Edward Ballard Jr., WD8JVV, Sherwood OH
Dan Hausauer, WØCN, Alexandria VA
Corey Strong, KEØNSC, Blaine MN
Mark Johns, KØMDJ, Brooklyn Park MN
Veronica Miron, YO4HYL, Bloomington MN
Remo Miron, YO4FKO, Bloomington MN

Silent Key since last newsletter:

Dick Kleppe, KØMN, Dresbach MN

Congratulation to the newly elected 2018 TCDXA officers:

President - Bill Mitchell, AEØEE

Vice President - Bert Benjaminson, WBØN

Secretary/Treasurer - Pat Cain, KØPC

DX Donation Mgr/Director - Mike Cizek,
WØVTT

Director - Doug Arnston, KØPX



Bill Mitchell, AEØEE, 2018
TCDXA President



John Rusciano, NGØZ



John, NGØZ in his shack in Minnetonka, MN

I grew up in Orono, west of the Twin Cities. I have many fond memories of listening to and playing with old radios; whether it was at a grandparent's home, or most notably, resurrecting my father's old Knight KG-221A FM police band and Knight Star Roamer shortwave receivers from a high shelf in the closet or out of the workshop in the garage. I remember being mesmerized by all the little components and circuits, and even the string and tiny pulleys that moved the needle behind the dial. The idea that all of these dusty and cryptically labeled little metal boxes, barrels and vanes pulled voices out of the air was fascinating to me. Getting them to work was even better. Listening to cold war era foreign language broadcasts, spy numbers transmissions, ham radio operators, oceanic aircraft transmissions and the Hennepin County Sheriff dispatch broadcasts made me feel connected to the rest of the world. Listening to amateur radio operators made me want to be one someday.





This Knight Police Receiver provided some interesting listening for John.

Getting Started with CB and Scanners

When the Citizen's Band radio craze of the

80's exploded, my whole family got involved and we each had our own "handles." We had a CB in every car and a base station with a big roof antenna. I had a portable CB "walkie-talkie" to talk to my friends as I cruised town on my bicycle. We got licensed, call sign KAMC-8555, before the FCC relaxed the requirement. My brothers and I would often get on the base station and talk to my Dad in the car on his way downtown to run our family's restaurant until his 5-watt signal faded. Many nights were spent falling asleep while talking to friends on the CB well into the night.

Whenever the new Radio Shack catalog came out, I spent a fair amount of time planning my purchases, down to the penny. I spent a lot of money (for a kid) on radios, audio equipment and scanner radios throughout my childhood and young adult life. I was a regular at Schaak electronics and Action Radio. The first radio of my own was a Realistic CB-60 with which I would monitor FM public service and AM aircraft communica-

tions. Next, I added a Realistic DX-100 HF receiver. In high school, I had a Bearcat 250 programmable scanner, a very expensive "toy" for a kid. I worked, sold anything of value, and saved for months to buy it. In college I had a Kenwood R-2000 receiver with a long wire hidden in the trees behind the house I rented. I also had a Realistic PRO-2004 digital scanner that I modified to listen to things we weren't supposed to listen to. In college, my knowledge of radios, public service communications, frequencies, jargon, call signs, and squad numbers impressed Bruce Hagerty (NØBK) enough to hire me to fill an opening he posted at the University of Minnesota

for a weekend news dispatcher for KSTP-TV. I ran and monitored probably the most advanced array of public service receivers in the Twin Cities at the time to dispatch film crews to local news events and hopefully scoop the competition. I ran the joystick for the microwave link to the KSTP helicopter that filmed the opening video to one of the home games of the 1987 World Series.

My interest in radios also influenced my early professional career. In the late eighties, I entered the wireless phone business right out of college and sold quite a few people in the Twin Cities their first wireless cellular telephones. I had a cellular fax in my car and was

part of the team that launched the Sprint PCS network in the Twin Cities.

Zero to Extra in 100 Days

I remember ordering the materials twice to start the process of acquiring my amateur radio license. In both instances, life (and regrettably, the Morse code requirements) derailed my efforts. It took me forty years to the age of 49, to finally make the time to get it done.



The Knight Star Roamer was available for \$40 in the early days.





NG0Z started listening to HF on his dad's Knight Star Roamer receiver

The early snow and cold of the winter of November 2013 motivated me to find another activity to pursue. I spent weeks at the kitchen table studying and went from zero to Extra in about 100 days. Even more interesting, is that a desirable (at least to me) extra class vanity call sign became available in January 2014. I was the sole applicant and went from KDØYRC to NGØZ before I had even started to build my HF station. It would have to wait. We were snowed in early that winter.

Getting on HF

In April of 2014, I couldn't wait to get on HF any longer. Checking into FM nets and chit-chatting in the car was really only practice for what I really wanted to experience and achieve in the hobby, chasing DX. I raced up to Radio City, having spent the winter researching radios and gear, and loaded the trunk of my car with the first elements of my station. In snow up to my knees, I strung a G5RV between two trees that hang over the lake we live on. I ran coax across the top of the snow and into the house through the sliding walkout door, connected it to a LDG AT-1000Pro II Autotuner and an Icom IC-7600 wired to a power supply on the bar in our basement. Minutes later, I made my first contact on April 5th, 2014. I spent nearly the en-

tire weekend on the radio, breaking only for dinner and other necessities.

A month later I replaced the G5RV with an NI4L custom made doublet. Chris (NI4L) asked me "Why 200 feet long?" I answered "Because that is how far apart the other two Oak trees are!" It's a great wire antenna, at least with a tuner. It's up about 50 feet, fed by about 40 feet of ladder line into an MFJ 912 4:1 balun. To this day, my farthest contact, Mauritius Island (3B8HC), was on that antenna – just over 10,000 miles away and on 12 meters no less. I currently use this antenna as a primary on 80 and 160 meters and a backup for the rest of the bands.

Adding a Vertical and Hex Beam

A month after that, my son and I poured a small footing and erected a DX Engineering MVBE-1, 43 foot vertical. It sits down by the lake and has 48 radials, from 20 to 75 feet long, totaling about 1900 feet of wire. One radial runs about 60 feet into the lake. As the snow piles up, I have to sweep it away from the base or it grounds the antenna to the radial plate. For a vertical, this antenna is pretty quiet and does especially well on 40 meters. I can often put a signal out on 40 and get 5 by 9 reports from Canada to Mexico and from coast to coast, which often results in a little pileup. I would love to have something directional for 40, but I don't have the space for another tower. In any case, this antenna has a special place in my heart as it represents a fond father-son memory.

In April of 2015, one year into my HF career, I ordered and assembled a K4KIO Hex Beam. I then recruited local ham heroes to put it up 51 feet on a Yaesu G-450A rotor and a Rohn 25 tower. The tower is attached to the back of our home and anchored by a large concrete footing. The Hex Beam has probably been the most impactful addition to my station. While I





John's QTH: 43' vertical in foreground, doublet overhead and Hex Beam in the background

have never had another beam antenna to compare it to, I think it's a wonderfully capable and versatile option. I achieved my "Worked All States" with the vertical and the wire within about six months of getting on the air. I was 90 countries into my DXCC when we put up the Hex Beam, and the whole world seemed to open up for me. The next ten countries, including a previously unattainable contact with China, came quickly and I had my DXCC.

Along the way I've added switches, microphones, a computer, monitors, amplifiers and speakers. I now have a private radio room in the basement, wired with dedicated 110 and 220 circuits so the lights would stop flickering. For local FM, I have a Yaesu FTM-400DR and its HT equivalent, the FT1DR.

I still have the IC-7600, soon to be upgraded to an IC-7610, driving an Icom IC-PW1 amp.

DXing and Contesting

Since April 2014, I have logged over 9,000 QSO's, almost 3,000 QSL's and have 180 countries all logged or confirmed on Logbook of the World, my preferred QSL method. I will eventually learn code out of respect for those that have gone before us and explore exciting non-voice modes like FT-8.

For now, I love to find an open frequency and hang a shingle out to rag chew or start a pileup, but mostly to fill in when there isn't DX to be found. The joy and wonder of hearing your call sign come back from thousands of miles away, is indescribable. Trying to explain the art and skill of bringing the RF gain down, the AF gain up, adjusting the pass band filters and feathering the noise reduction and notch filters to pull out a weak and rare station is lost on "civilians" as well. Breaking through a pileup is a thrill (life is too short for QRP – sorry) but even better is nabbing a DX contact before it hits the cluster. I try not to rely too much on the cluster to chase DX but it's another useful technological enhancement of the hobby. Contesting is something I think I will have an increased interest in when I retire in the next fifteen years and can devote more time and contribute more to the club scores. To me, the most fascinating aspect of a contest, is that there are thousands of operators in hundreds of countries "on the air" vying for contacts with each other. Imagine if politicians could harness the goodwill generated worldwide by amateur radio operators in a contest – the world might be a better place.





48 radials give NGØZ's vertical
a great ground

Those Who Have Helped Along the Way

I am very thankful for the help and friendship I have received from many amateur radio operators around the world but especially Paul Staupe WØAD, Rich Westerberg NØHJZ, Allen Grundmeier KEØAHU, John Faughn KDØCAC, Dick Auld WØDIK, and Don Rice NØBVE. My first "Elmer" was Chuck Stroud KA8HDE. These guys, one way or another, have helped me build and fine-tune my station, it's operation, and the joy I get from all of the above.

I've come to acknowledge that not everyone sees a moonraker antenna as the proud display of art and science that I do. My wife, who is also my business partner, has been very tolerant of my hobby and the impact it has made to the sightlines and landscaping of our home in Minnetonka. We have had a financial planning practice since 2001 in Edina, and have raised three children. Our son, is an Electrical Engineering graduate of Iowa State and also a (currently inactive) General Class licensee. We have two daugh-

ters in college, one a junior at the U of M, the other a freshman at UW Eau Claire. When I'm not on the radio or in the office, I am reading, riding my Harley, snowmobiling or traveling. I'm also a published co-author of a career management book titled "*Fire Yourself.*" I am a Skywarn volunteer and manager as well as a Volunteer Examiner. I also volunteer for the Minnesota Fire Service Foundation assisting in the efforts to collect federal and state death benefits for fallen Minnesota firefighters. I have a deep and heartfelt respect for all who have served our country not only in the armed services but as first responders. They are all heroes to me. I love the friendships I have forged around the world through amateur radio, the discipline, the comradely and the challenge. I love the glow of the screen and running the knobs and dials. I love the sport of contesting; of adding another entity or another band. I love the technology and the science but at the same time the art, the romantic and old-fashioned notion of bouncing analog signals off the sky and contacting someone I could just as easily phone, Skype or text, half way around the world. I have enjoyed reading and studying the history of radio and all its facets. I would love to help plan, fund and join a DXpedition team someday. I love the fact that most operators are happy to hear your voice, and you theirs. We all have different lives, challenges and careers, we all come together on the air, around the world, to share a warm conversation or a brief and sometimes miraculous acknowledgement of our signal, heard faint or booming into a far and foreign land.

To me, being an amateur radio operator is so much more than a nerdy hobby. It's an honor, a joy, a responsibility and for me the realization of a childhood dream.





by Al Dewey, KØAD



The MWA Contest Corner

KØMD Becomes Third Midwest Wireless Association member to be Named Editor of the *National Contest Journal*

For the third time in its 45 year history, a member of the Minnesota Wireless Association has been named editor of the *National Contest Journal*. Beginning with the January / February 2018 issue, Scott Wright, KØMD will become the new NCJ editor. NCJ's founder and first editor was Tod Olson, KØTO (SK). The first issue with Tod as editor was January, 1973. As Tod reminisced in a recent Gray Line interview, initial issues of NCJ were folded and stapled on his dining room table with his kids helping out. Subscriptions were about \$2.00 a year just to cover costs. Like many of the pursuits in our hobby, NCJ was a labor of love by Tod. Scott, KØMD plans to dedicate NCJ in 2018 to KØTO's memory.

I had the honor of being NCJ editor from 2008 thru 2011 and was of course, the second NCJ editor from MWA. NCJ editors typically serve a term of 3 to 5 years. This is done deliberately so the publication will have a continuous influx of new ideas.

KØMD reports that in a break with tradition, he will assign a Deputy Editor. Fred, K4IU will assume this responsibility and will work with Scott to recruit material, organize each issue, and creatively plan the content.

Scott also reports that he wishes to expand the focus of NCJ by focusing on efforts to promote Younger Adults / Youth in contesting as well as highlighting contesting activity outside of the USA as a means of stimulating ideas and innovation for our own contest efforts.

Please join me in wishing Scott and Fred the best of luck in their new roles.

High Scoring MWA Members Recognized at Fall Meeting

Besides promoting and encouraging all aspects of radiosport in



Scott Wright, KØMD has been named the new editor of the *National Contest Journal*.



Minnesota and western Wisconsin, a primary goal of the Minnesota Wireless Association is to compete against other contest clubs throughout North America in major contesting events sponsored by the ARRL and CQ Magazine. In previous columns, I have described how a friendly



MWA SILVER level recipients present at the MWA Meeting were (l to r) K4IU, KØMPH, WBØN, NAØN, AAØAW, and NØIJ. (Photo by W9LHG).

pizza competition between three teams (North, Hennepin, and South) in Minnesota helps get members on the air during contests. That effort increases cumulative scores to drive up MWA's overall club score. Another motivator to compete is the recognition that members receive at the Fall Meeting for reaching a certain "threshold" of points during the previous contest season. Certificates are awarded to those meeting the SILVER level (1 to 2 million points), the Gold Level (2 to 4 million points), and the DIAMOND level (over 4 million points!).

Those receiving certificates for reaching the SILVER level were KØTG, WBØN, KØMPH, KIØF, KØCN, K4IU, NAØN, WØGJ, NEØU, AAØAW, NØIJ, and WØBM.

Those receiving certificates for reaching the GOLD level were KMØO, NE9U, KØAD, NØAT, WØOR, KØMD, and KØPC.



MWA GOLD level recipients present at the MWA Meeting were (l to r) KØAD, NØAT, and KØPC (Photo by W9LHG)



MWA DIAMOND level recipients present at the MWA Meeting were (l to r) KØKX and ACØW (Photo by W9LHG)

Those receiving certificates for reaching the DIAMOND level were ACØW and KØKX.

Congratulations to all recipients of MWA Silver, Gold, and Diamond certificates! Your efforts are why Minnesota Wireless Association continues to be in the upper tier of contest clubs in North America.

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/sponsoredexpeditions.html#MenuBar1>.

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: President Michael Sigelman, KØBUD; Vice President Mark Endorf, WAØMHJ; Secretary-Treasurer Pat Cain, KØPC; DXpedition Funding Manager Matt Holden, KØBBC and Director Scott Wright, KØMD.

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, Matt, KØBBC, k0bbc@arrl.net. 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/>.

