Special Edition – 2015 DXCC Year End Review – by Joe Reisert, W1JR - January 8, 2016

2015 Overview:
Compared with 2014, DX radio conditions in 2015 slowed down a bit especially near the end of the year. Propagation was up and down most of the year with unexpected peaks and the usual solar storms. Openings were much shorter and definitely decreasing on the upper HF bands. There were approximately 293 DXCC entities activated this year, several more than in 2014. There were approximately fifty (50) DXpeditions with two or more operators and many had between five (5) and twenty (20) operators. Two operations were from very rare entities. Some other operations were unexpected and available to "The Deserving" on all modes and all bands from 10 through 160 meters, some even on 6 meters and EME (Earth Moon Earth). Activity as usual was high from the Caribbean but also very high from the Oceania Islands.

2015 Review:
There were lots of unusual DX call signs in 2015. Some exceeded my twelve (12) maximum call sign box in my logging program (like those with Titanic suffixes!). Although not necessarily rare DX, there was lots of activity all year celebrating the 90th IARU (International Radio Amateur Union), anniversary on May 17th with 90IARU suffixes especially in December. Likewise, many call signs ending in YOTA (Youngsters on the Air). They are very important to our hobby as the average Amateur age is creeping up and we need new Younger Blood in our hobby. Amateur licenses in the USA rose to a new high of 727K, a good sign. The DXCC Challenge and the CQ Magazine DX Marathon activity were high as usual. There were more contests than ever, especially for DX.

K1N Team members K9CT, WB9Z, NA5U and K4UEE (L-R) operating from the lighthouse on Navassa Island. (Photo courtesy of K4UEE)

2015 saw two notable DXpeditions, K1N (KP1-Navassa Island) and P5/3Z9DX from North Korea, entities that were in the 2014 top 10 on the worldwide "Most Wanted Survey" in "The DX Magazine" by N4AA. A few smaller single operator operations in the top 20 also took place from VP8 (SG), SV/A and FT5X.

The DX Magazine has decided to discontinue their annual "Most Wanted Survey" after approximately 25 years due to sometimes being out of date since it is determined by inputs in September and October of the prior year. It is also costly and Club Log (WWW.ClubLog.org) by Michael, G7VJR is now readily available which is constantly updated based on users log entries. Club Log now has over 326M QSO records and 48K active users. The "Most Wanted List" on Club Log is now updated monthly. The December 2015 list shows the top 10 in the following order: P5, 3Y/B, VP8S (S. Sandwich), FT5W, VK0H, FT5/J, KH5K, VP8G (S. GA), KH5 and KH1. Only a few changes were noted this year and surely this list will change dramatically by next year since several on this list are scheduled for activation in 2016. P5 has just been activated in late December after being silent for 13 years. Hopefully the promised follow-on DXpedition will take place on schedule.

Unfortunately as frequently happens, several DXpeditions such as VK0/H were delayed, hopefully only into early 2016. Others were delayed or cancelled because of transportation problems, financial considerations or logistical problems (3Y0/B), shortened due to weather (TI9/3Z9DX), engine trouble, harassment and Medevac emergency (DX0P), political or environmental concerns, broken antennas (VK9WA) and one reason or another**. This clearly shows just some of the many problems in putting on a rare entity.**

Most entities activated in 2015 were available on SSB. Most large DXpeditions used digital modes. The newer JT65 mode is also becoming popular. CW still did not die as there were almost 280 entities active on CW. Of course the "599 TU" QSOs on CW or "59 thank you" on SSB are still ever present especially with DXpeditions. Operating CW at high speed (30 WPM or higher) has caused problems perhaps due to computer receiving and processing were very much in evidence. Serious DXers are using the DX Clusters and Reverse Beacon Network for spotting DX.

Band-by-Band Activity:
Despite poor propagation, 160 Meters is still generating LF DX activity especially by DXpeditions usually operating between 1810 and 1830 KHz. The FCC has upgraded 1900-2000 KHz to Primary in the USA. W8LRL now is the Top Band leader with 340 confirmed entities. That includes deletes.

80 Meters CW is often quiet except during contests and DXpeditions. The later often operate at either the low end of the band or near 3525 KHz. 75 Meter SSB however is often busier than 80 Meters.

Several new entities have received permission to operate on 60 Meters especially in Europe. Since the FCC relaxed mode requirements, CW and digital activity are now being used in the established fixed channels. Some of the DX entities outside the USA have different channels making it sometimes difficult to work them except by cross-band. Some frequency modifications may occur in the future after the recent IARU Conference. The ARRL DXCC program still does not recognize 60 Meters contacts.

40 Meters is still the nighttime breadwinner and was great all year. DXpeditions use to operate CW near the bottom of the band but nowadays many opt to operate near 7025 KHz to reduce QRM. The expansion of 40 Meter SSB from 7100 to at least 7200 KHz for many of the Worlds entities has generated lots more activity, especially during SSB contests with less emphasis on cross-band contacts. Remember that USA stations can't operate SSB below 7125 KHz. For safety sake stay above 7128 KHz.

30 Meters is very popular, especially for QRP and digital modes and is sometimes open 24 hours a day during the darker months. 20 Meters is still the daytime breadwinner along with 17 Meters where activity is increasing and there is less congestion. Signals strength on 17 Meters is often better than 20 Meters when those bands are both open. 15 Meters is sharing the load when the solar flux rises. During this past year 12 and 10 Meters are showing fewer and shorter openings as solar flux decreases. Some very isolated F2 and Transequatorial propagation DX were present on 6 Meters especially around the equinox periods but fewer as Solar Cycle 24 wanes. Sporadic E propagation especially from mid-May through early August and in December often enhances HF and 6 Meters DX but this was not due to increased sunspots.

2015 DX Activity Month by Month:
January: There was lots of DX activity as 2015 started but decreased as the month proceeded and solar flux decreased. It was possible to work over 100 DXCC entities in the first week of January and working 200 entities in the month was possible but difficult. It took me until February 1st! There were approximately 217 entities available in January, fewer than normal. As January started, 1A0C was active followed by VK9/N, CY0, C9, XW, S0, EP6T (68KQ), Z8 and XR0YJ to name a few.

February: K1N came on from Navassa Island after an absence of over 20 years. They made about 140K QSOs with 36K unique calls on all HF bands and modes including 60 and 6 Meters. Other active entities were E4 (2 locals are now active), 5A, ZL7, TI9, 9X, C2, VK9/L and XR0Z.

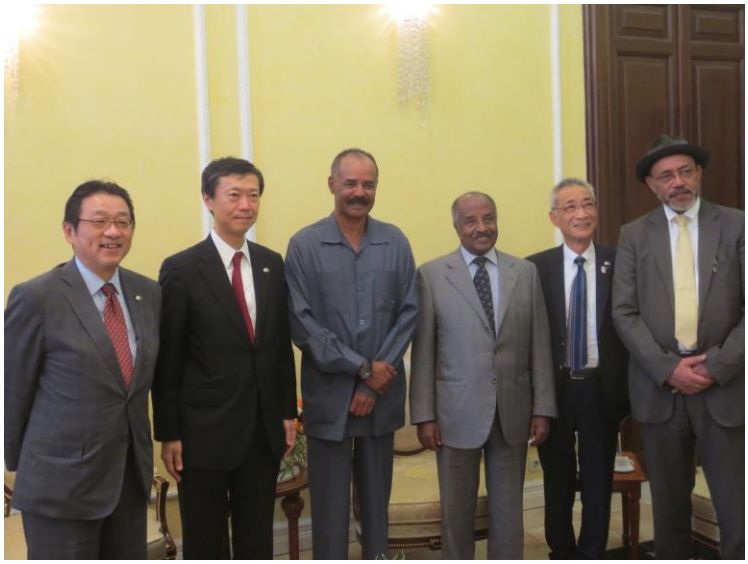
March: VP8DOZ put S. Georgia on 17 and 15 Meters SSB and made about 450 QSOs**.** E5/N, VU4A/I, E30FB (63KQ), 7QAA (yes, the call sign is correct) made 70KQ, 9Q0HQ (84KQ), and several 9N's assisting with earthquake relief.

April: PQ0T (Trindade) had a 2-day operation making 7KQ. DX0P came on from the Spratly Islands but only operated SSB and digital modes for about 8.8KQ. They also had a medical emergency. 5V, TL, 6O, 3XY and a surprise single operator FO/Clipperton Island operation as TX5P netting about 3.8KQ.

May: ZL7, VK9X, 5V, E6, *f*eh5VQ9, LU/Z (S. Orkneys) and TN were all active during May. An operation that was due from Mt. Athos by YL7A was cancelled for political reasons.

June: An operation by SV1RP/A from Mt. Athos in June was disapproved. OJ0B was active making 8KQ including 432 Q on 2 Meters EME. Also active were 4W, XT, 9X, 5U and PU0FDN (PY0/S).

July and August: Summer in the Northern Hemisphere is usually a quieter time for DX and so it was. We did see activity from HC8, T30 (mostly digital), 9X and TI9.



JH1AJT, Zorro Miyazawa (second from right) with Eritrean President Isaias Afwerki (third from right). Zorro was able to operate twice in 2015 as E30FB. Once with a multi-op team and once by himself. (Photo courtesy of JH1AJT)

September: D67GIA (10.5KQ), E6GG (48KQ) and T2GC (35KQ) were all active this month.

October: DX activity as usual increased in October. TX3A (50KQ) came on from Chesterfield Island (FK/C) but was faced with poor weather, rainsqualls and terrible propagation. Also active were E3, TT, TZ, 3B7FA (digital only and 550 Q) and XX9TIN/TIH (2.6KQ). The United Nations in NY permitted 4U70UN (5.8KQ) operation but only during the daytime on two days for the first operation from there in five (5) years.

November: VK9WA came on from Willis I. (61.5KQ) but had problems with wind, birds knocking down the guy lines and low band antenna failure. T2TT (9KQ), S9TM (3.5KQ) and SV2/A were active. S79C put on a new IOTA with 21.5KQ.

December: P5/3Z9DX was surely the surprise of 2015 making about 785 demonstration contacts mostly in Asia but a few dozen with North America, Europe and elsewhere. This was only a demonstration operation. More on this later. Many 90IARU stations were still active as well as PJ6, TZ, XW and 3D2AG/P (Rotuma).

<u>Pirates and Unauthorized Operations</u>:
2015 had its supply of pirates. Often DXpedition calls such as K1N and EP6T were pirated even before their DXpedition operators had arrived! Other pirates included P5s (except P5/3Z9DX), VP6AC, VP9AA, 3B7FA (all CW operations) and EH5SHL as well as many YI's and EP's to name a few. Several stations signed D0 or similar calls from Donetsk (Ukraine) but obviously don't count for anything. Often the supposed pirates were actually call signs that were improperly copied or entered incorrectly into the DX cluster such as 5T5C for HT5C and EZ1A for E71A etc. John, K9EL has a list of busted and pirate call signs on the CQ Magazine

Marathon website (http://www.dxmarathon.com). There are still those who post rare calls to thank people for QSLs after the operation is over. This is totally un-necessary and is often just a form of boasting. Furthermore, much confusion comes when people spot rare call signs for test purposes. This is a NO-NO. If you see a rare call sign spotted, first check to see if it is a busted call or a test spot. Of course sending a QSL to a pirated call sign is a waste of time and money. By the way, Z6 contacts with Kosovo still do not count for any DXCC entity at this time.

IOTA:
Some DXers also like to chase islands for the IOTA (Islands on the Air) program by the RSGB. This program is now over 50 years old. There are about 2,500 active and 15K more casual IOTA chasers. There are approximately 1200 IOTA Island Groups and over 100 are already DXCC entities. Also many groups have never been activated so there are lots of challenges. In 2014, ten (10) new IOTA's were added to the list and all but 3 of them have not yet been activated. A new IOTA, OC286 from ZL9 is scheduled in January 2016.

QSLing has been a problem for IOTA activations since they do not use an electronic version like LOTW (Logbook of the World). A committee is now addressing the confirmation problem and hopes to come up with an LOTW type program for IOTA by 2017. This will surely increase participation in the program.

DX Contesting:
DX Contests can often yield rare entities especially before the contest start as operators' setup and test their equipment and antennas. Recent surveys show that younger operators, those between 50 and 59 are more active in DX contests than 60-69 year old operators. The ARRL "Contest Update" has a free online newsletter for contesting which was edited by Ward, N0AX since 2002. It is now edited by Brian, N9ADG and often has tidbits that may be of interest to DXers. ZF2MJ (N6MJ) may have set an amazing new single operator record working over 10,000 QSOs in 48 hours in the November CQ CW Contest.

A Solar Review:
Solar Cycle (SC) 24 so far has had the fewest smoothed sunspots since SC 14 peaked at 107 in 1904 and is deemed pretty weak compared to SC 21, 22 and 23! Unlike other recent double peaked SC 22 and 23, this cycle's second peak was stronger than the first peak, a rarity. SC 24 peaked in April 2014 with about 116 smoothed sunspots. At the present time SC 24 is expected to end around 2020 but will probably be OK radio wise through 2017. NASA now predicts we are heading for weaker solar cycles in the future although not another Maunder Minimum as earlier predicted (http://solarscience.msfc.nasa.gov/predict.shtml). An August 2015 paper by Sheeley and Wang (http://aasnova.org/2015/09/02/witnessing-solar-rejuvenation) also seems to agree that future Solar Cycles will be similar to SC 24. Note that Aurora and disturbances typically come on the downward side of the Solar Cycle so look for them especially around the equinoxes.

Solar flux (SF) is a good indicator of improved propagation on 10 through15 meters, especially when the K Index is low (1-2). SF did stay mostly above 100 for the entire year 2015 with only short dips into the 80s in September and early October when it dipped to 80. SF was highest (165) at the start of 2015 but slowly declined staying between 100-150 most of the year. Aurora was often evident when the K index rose to 5 or above. The most affected stations are at high latitudes.

Finally, VOACAP version 2.0 beta (www.voacap.com/planner.html) is a user-friendly program for predicting band conditions. Another new interesting program "Realtime Band Conditions" (http://www.bandconditions.com) is now available. It is based on a new ionospheric sounding method called "HF Ionospheric Interferometry" and maybe of interest.

Equipment and Technology:
Some new equipment came on the market as well as upgrades to existing gear especially among the major radio manufacturers. Collins Radio phased out the manufacture of mechanical filters after 60 years! Remember the

Collins 75A4 receiver with the first mechanical filters? Vibroplex acquired INRAD and Bencher keys. Traffie Technology closed down its Hex Beam sales. Elecraft introduced the K3S.

One unusual piece of equipment was used on at least two DXpeditions. K1N and VK9WA both used drones to film their locations. It was a clever way to document their operation and later entertain other DXers. Some drones are now being used by Amateurs to construct antennas.

Ham Radio and the Internet:

2015 was no different than prior years. Computer programs, especially for logging were constantly being upgraded. Likewise the ARRL LOTW (Logbook of the world) is very popular. Club Log is now very popular especially with DXpeditions who often update their logs while still on location. One program that may affect some computer and Internet users is the introduction of Microsoft Windows 10.

Members of the Six G DXpedition Group (actually 7 op) put E6GG on the air from Niue confirming QSOs in LoTW within hours. Here is G3WGN, G3SVL, G4TSH and G4JKS (front-to-back). (Photo courtesy of G3TXF)

The Amateur Radio sites, DX clusters and of course use of emails etc. on the Internet are supplying lots of good services. Most major contest logs and some awards now must be submitted via the Internet or the ARRL LOTW often within several days after the contest is over.

Much has been said about the use and abuse of the DX Clusters so I will not bore you with more of the same. If interested, you can see my prior year end reviews on the K8CX website. The DX clusters are still an amazing tool for finding and spotting rare DX. "DX Summit" is surely one of the favorites. Also Reverse Beacon Networks, which use CW skimmers, are being widely used and rarer spots uploaded to the DX Clusters.

Be careful to correctly spot call signs and frequencies. Self-spotting is frowned upon. Just because a DX station is spotted doesn't always mean the call sign etc. are correct. Working an incorrect call may result in a NIL (Not in Log) to your QSL request. Obviously posting obscenities and negative comments on the DX Cluster is not acceptable.

QSLing and DXpedition Costs:

There is no denying that the cost of QSLing is becoming too expensive. Many European postage rates have risen again. IRCs are costly, seldom available (USA discontinuing same) and often can't be redeemed but are sometimes necessary where postal theft is a problem. The ARRL outgoing QSL Bureau or the QSL bureaus in many entities can lower QSLing cost. The ARRL Outgoing QSL bureau shipped approximately 628,000 QSLs during 2015, about 20% less than in 2014. I prefer paper QSLs since they may be needed for awards other than DXCC but I realize that I am now in the minority

To further offset QSLing cost, **LOTW** is extremely popular. The DXCC has been the prime user but other awards such as WAS, VHF, ARRL Centennial, Triple Play, and CQ awards are now available. There are now over 723 million LOTW QSO records, an increase of about 13% over 2014. Over 82,000 registered LOTW users and over 120 million QSO records have now resulted. LOTW use continues to increase and doesn't look like it will level off for many years. Contesters are often uploading their logs immediately after the contest ends. Many DXpeditions are now using LOTW, sometimes while still on location such as K1N!

Expensive DXpeditions to rare entities may cost $100,000 or more. They are now becoming common and experiencing difficulties raising the necessary funds for transportation etc. It now can cost between $10,000 and $25,000 per operator to participate and travel to the more difficult places for rare DX entities. The estimated cost per QSO from the upcoming VK0EK Heard Island DXpedition is $5.00! Some of the cost is covered by QSL donations. However this makes donations from clubs and DX foundations necessary to offset high cost and make these rare entities available. Support DXpeditions directly or through organizations such as NCDXF, INDXA, European and Asian DX Foundations etc.

A very popular QSLing trend is the use of OQRS (Online QSL Request Service) where for a donation no QSL need be sent. Club Log is very popular with many DXpeditions uploading their logs in short order and has streamlined the OQRS procedure by making it available on their website. This also allows DXers to check the log for their call sign even when the DXpedition is still on location thus preventing a NIL.

Operating techniques:
There are still many problems with operating and especially with DXpeditions. QRM and continuous calling or calling out of turn are common abuses. This subject was discussed in detail in last year's review so I will not repeat it here. It can be read on the K8CX website where prior reviews are available.

Some of the DXing problems were recently addressed by Dave Sumner, K1ZZ in his editorial "DXing: Fun and Frustration" in the January 2015 QST. He makes the point that DXpedition QSOs be made as quickly as possible with discipline. DXers must listen for instructions, keep the DX frequency clear, use split frequencies, not responding to other operators stupid mistakes etc.

Martti, OH2BH recently wrote a rather lengthy paper on learning and understanding the different DX operating cultures of the world. It can be viewed on the NCDXF (www.ncdxf.org) in the Fall 2015 issue.

Another problem noticed by K1N has re-occurred on SSB, namely speech processors and ALC being driven too hard and distorting the station calling the DXpedition. This makes copying the call sign very difficult. On CW some DX stations transmit at 30 to even 40 WPM. Some operators just can't copy their call sign that fast**. Some of the problems may be the limitations of code readers especially for newer operators.**

Try not to rag chew or tie up frequencies frequented by rare DX such as 3.795, 14.025 and 14.195 MHz as well as 14.040 and 14.260 MHz for IOTA. Other suggested frequencies to avoid are listed in The Daily DX. Transmitting on these frequencies will make it difficult for others who are experiencing better propagation than you are.

Review "The DX Code of Conduct" (for DXers), "The DX Code of Conduct for DXpeditions" (dx-code.org) and "Best Practices for DXpedition Operating" by DX University (www.dxuniversity.com). Let's hope that operators and DXpeditions will adopt these recommended procedures.

Silent Keys (SK):
DXers are aging as are DX Honor Roll leaders and Amateurs in general. Many 2015 issues of QST Magazine list an entire page with from 200-300 SKs call signs! This was typical all throughout the year.

It is sad to note that several well-known Amateurs became SK during 2015 and deserve to be mentioned. Many were well known DXers. A partial DXer SK list is: C21RK, CT3FT, 9Y4VU, K5LBU, PA0LOU, K4QI (noted VHF DXer), W6RJ (HRO owner and DXpeditioner), SP5IXI (VK6DXI, 9V1XE etc.), ZS5LB, W9GW (DXpeditioner), ZL2AL, W6AXX (A9XDO), HS0ZDZ/G3NOM, W6RR, KL7RA and DK1II to name a few. Also well know propagation program writer Sheldon, W6EL and Peter Dodd, Perry, W1UED former staffer at ARRL, G3LDO, the RSGB antenna author became SKs. Wes Schum, W9DYV the designer of the Central Electronics 10A which was one of the first commercial SSB transmitter became an SK. This means that we

Amateurs have to be more active to recruit new members especially youth into our hobby. Kids Day and YOTA programs are good examples.

2015 DXCC and ARRL Matters:
Bill, NC1L had to resign from the ARRL DXCC Desk due to medical difficulties. Dave, K1ZZ the current CEO of ARRL and an active DXer and Contester has announced his retirement effective in May 2016.

The DXCC active entity list still stands at 340. If you add the 61 deleted entities, the DXCC List total is still 401 entities. Therefore, until more entities are created, 400 will be an elusive number. Kosovo, presently using the Z6 call block is still a possible new entity and now is a member of the IARU. However Z6 is not an ITU sanctioned prefix for Amateur Radio and IARU membership no longer qualifies an entity for DXCC.

The ZL9 listed name has been officially changed to "New Zealand Sub-Antarctic Islands" and now includes the Antipodes and Bounty Islands along with Auckland and Campbell Islands. More on this later

Some DXCC rules have been modified regarding "remote base" operating. See DXCC rules section 1, subsections 8 & 9 etc. Individual ethics apply as well in a new subsection rule 11 etc.

The 2015 DXCC Yearbook, usually published annually in August, is now available on the ARRL website. Note that the DX listings in same only list those who submitted a DXCC update during 2014. Nowadays the ARRL website has the present listings updated daily. Hence the DXCC Yearbook is now somewhat irrelevant and the 2015 issue maybe the last in this series.

And now the Drum Roll:
These are approximately forty-seven (47) entities that were NOT believed to have been active during 2015 as follows:*
Africa (12): 3C, 3C0, 3Y/B, 9L, 9U, FT/G, FT/J, FT/T, FT/W, FT/Z, VK0/H and ZS8..
Antarctica (1): 3Y0 (Peter 1).
Asia (8): 7O, BS7H, BV9P, EZ, VU7, XZ, YK and ZC4.
Europe (2): JX and R1F
North America (4): CY9, KP5, XF4 and YV0.
Oceania (17): 3D2/C, H40, KH1, KH3, KH4, KH5, KH5K, KH7K, KH8/S, T31, T33, VK0/M, VK9M, VP6/D, ZK3, ZL8 and ZL9.
South America (3): CE0/X, HK0/M and VP8/S. Sandwich.

*Please note that some rare entities may not be on this list for 2015 because some operations were short, set up schedules or only on VHF etc.

The DXCC entities that are not believed to have been activated in ten (10) or more years includes: BV9P, CE0X, KH1, KH3, KH5K, VK0/H and VP8 (S. Sandwich). This means that an avid DXer working hard at DXCC may take at least 8-10 years to make the DXCC Honor Roll. This list also serves as a guide to those planning DXpeditions to rare entities. As for me, the top of my need list for the DX Challenge has not changed and not surprisingly goes to P5, BS7H and FT5/W in that order.

Upcoming DXpeditions:
Mark your calendars. January should be a great month with 3D2AG/P (Rotuma) still active and ZL9A from a new IOTA group OC286 counting for ZL9 (see above). Several large scale DXpeditions from very rare entities are also presently scheduled such as VP8STI from South Sandwich, VP8SGI from South Georgia and K5P from Palmyra. The later had to scale down the team from 12 to 9 operators since the airstrip is now degraded. February lists, EP2A and 3XY1T. The long delayed operation from VK0EK on Heard Island is now scheduled

for March as well as 3C7GIA and FT5JA, CY9 in August and VP6AH in September. P5/3Z9DX is now scheduled for late summer. Stay tuned. DX is alive and well. Check out the Daily DX calendars at: HTTP://WWW.DailyDX.com/calendars.HTML for future operations.

Future DXpeditions are having more barriers to overcome. New Zealand has designated a vast marine reserve affecting access to the Kermadec Islands (ZL8). Likewise an executive order by USA president Obama may create a 490,000 square mile marine protected area around 7 islands and atolls south and west of Hawaii. This could make DXpeditions to these areas more difficult to access. The government of Puerto Rico is considering a move to re-incorporate Desecheo Island, KP5 into their territory thus creating a deleted entity.

Looking ahead to 2016 and Beyond:
Solar Cycle 24 sunspots will be slowly decreasing although sporadically. This will affect propagation on the higher HF bands, especially 12 and 10 meters. Look for good propagation when the solar flux goes above 100 with low A (<20) and K (<3) indices. Solar wind below 350 KM per second and dynamic pressure less than 0.5 nPa as shown on NOAA Space Weather (www.swpc.noaa.gov) are good indicators of improved HF propagation. January is usually a good month for Low Frequency operation.

DX means many different things to many people. Some DXers are only interested in the ARRL DXCC Honor Roll and soon run out of interest and challenges. Others pursue the never-ending ARRL Challenge competition. Fernando, EA8AK is now in the lead with an amazing at 3251 entities. This award includes all the bands from 160-6 meters. 6 meters is a tough band for stations outside of Europe. More than 60 stations in Europe have worked over 200 entities on 6 meters while 185 entities is the maximum for North America with only 15 above 150! Hence the Europeans will probably dominate the top of the DXCC Challenge award for the foreseeable future.

The DL Bavarian Contest Club will sponsor WRTC 2018. Also don't forget to support the various DX Foundations around the world that help make DXpeditions possible! For the last several years, CQ Magazine has reinstituted the yearly CQ DX Marathon to see who can work the most entities in each calendar year. This program has a few more challenges by also adding seven (7) entities recognized only by CQ Magazine but not on the ARRL DXCC list as well as working all 40 zones. And there are the never ending DX Contests. There are lots of things to do. Don't let the airways die for lack of activity. HF radio conditions are still fair. Stay active and join the fun.

Finally:
We hope this review has been informative. Using DX publications and the Internet are a great asset to keeping us up to date on what is happening now and in the future. There was so much news in 2015 that I can't possibly fit it all in. Once again I am honored to be asked by Bernie, W3UR to write this review for the 11th year and for his valuable inputs and critique. Thanks also to John, K9EL, Rich, K2RR and Dave, NN1N for their valuable inputs and to my son Jim, AD1C for all his computer help! Previous Reviews can be read on the K8CX Ham Gallery website.

NOTE: Obviously all the opinions etc. expressed are solely mine as are any errors that I have made. I hope there aren't many! **This write up is copyrighted**. Therefore Bernie, W3UR, MUST first approve copies or use of this review and then a courtesy copy of the reprint sent to Joe, W1JR. Best of DX to you in 2016 and here's hoping to see you in the pile ups. 73, Joe Reisert, W1JR