



INDEXA

Helping to Make DX Happen Since 1983

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A 501(c)(3) non-profit organization for the enhancement of amateur radio, worldwide peace, and friendship

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Editor Note:

Special 3Y0J Newsletter in the works and will be released soon!!

STAY TUNED

Steve Molo KI4KWR
Newsletter Editor



inside... In this Issue we cover TN8K / S21DX and Youth DX Trip Reports

S21DX 2022 Trip Report

After our S21DX activation in 2021 (Char Kukri) we planned to make a larger one. Though last time we operated only one station and antenna was a single multiband vertical GP and one 80m dipole hanging low from tree, this time we started planning earlier and started making all the antennas.

As we had small budget, we plan to homebrew most of the items apart from the Radios. Locally RF parts are not available thus the Toroid, Coaxial, capacitor all had to be bought from abroad mainly AliExpress and eBay. LDMOS for the homebrew were ordered several times (I got a lot of expensive magic smoke during the course) from US and board comes from Greece, from DXWORLD-E as gift. I spent the whole 2022 making, testing, fine tuning the following:

BPF for 80, 40, 30, 20, 17, 15, 12 and 10, LPF for 160m, RX LPF for 160m

Four Square Hybrid Coupler for 40m.

9 Large CMC choke for all the antennas.

600W LDMOS HF PA

RX antenna transformer for Beverage and LoG antenna

Hexbeam for 20 to 10m

Vertical antennas (Counterpoise radials etc.) for 160 to 30m

From the beginning of 2022, our website has the plan and we asked local hams if anyone is interested to join, our plan was to take several new hams (new in the sense of HF operation, as Most ham here are limited with UHF and Echolink/DMR). Several of them showed interest and we did some initial training for them. Unfortunately, few of them dropped in the last moment for unavoidable circumstance. We requested support from many clubs and organization around the globe, some of them were with us and some declined as S2 is not a rare entity. Thanks to all the supporting organizations and individuals, without their support we couldn't have done the expedition.

About one individual everyone should know - Kensuki Nakajima (**JN7FAH**)

Kensuki San started communicating with us and asked for our plan for 160m. I replied that we are planning to make one 80m GP with Capacitive loading using our 12m pole and have no plan to activate 160m at all. He keeps persuading us to make one antenna for 160m and receive Beverage. Later he sent us his own 18m Glass Fiber pole and the Binocular cores needed for the Beverage and LoG. He also simulated the TX antenna design and tested in his qth.

Thanks, Kensuki San, for helping us making the 160m antenna.

Team:

S21RC, S21AM (Voice and FT8) S21OM, S21BK, S21D (FT8), where S21OM and S21BK never operated HF before – so couldn't help us in SSB. S21D was a bit sick and only tried to help us attending the FT8 stations whenever he could.

S21OM was a great asset for us, he joined with us last year as a volunteer and by this time he got his callsign. He single handedly managed our power, installed most of our antennas and also helped me during my homebrewing of different elements. He also made the Hexbeam for us from scratch. In addition, two volunteer was in the team, Raka (XYL of S21RC) was the camp manager and Robi was the logistic expert. With their support we never had to worry about food and other logistics.

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INDEXA

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From the Editor:

If you have an article that you would like to share with INDEXA please pass along and I will get it in the Summer 2023 Issue.

73,
Steve KI4KWR

Operating

As we had 3 stations and 5 operators, and among them only two of us had the experience of voice SSB, we tried to run the stations from everyday 0700 local to 0200 next day, between this break we did some small maintenance of the single generator we have and took rest. We missed most of the NA short path as 0400 we were in sleep. Few days S21AM tried short path early in the morning but the result was not that good.

Hours:**The Antennas:**

- 160m GP with Capacitive loading (18m pole)
- 80m GP (18m pole)
- 40m Four Square (Which failed the first day – later a 40m GP was used)
- 30m GP (12m pole)
- 20/15/10 Spiderbeam towards North (EU/JA)
- 20/15/10 Spiderbeam towards South (LP-NA/VK)
- 20/17/15/12/10 Hexbeam Armstrong Rotatable
- 200m long RX Classic beverage Pointing North
- 80 feet Square RX Loop On Ground

The QO-100 was not activated due to some technical difficulties.

Rigs:

- IC7300 with DXworld-E 600w Linear
- IC7000
- FTDX10

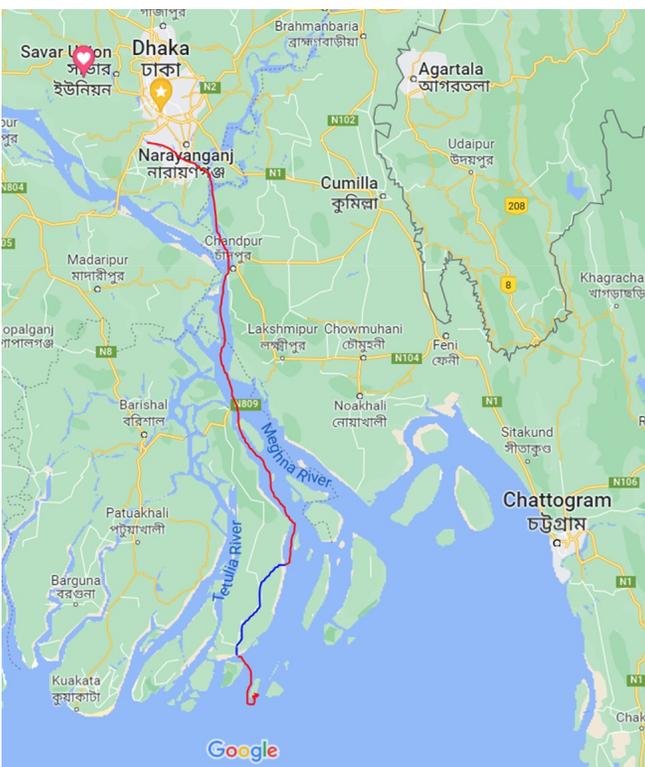
Power:

- Honda EU30is (2.8KW Gasoline generator)
- 2x Lead Acid battery
- Portable 800VA spare Genset

**Operating Conditions:**

There was a bunch of trees which made some shades – and we set the stations under it with some Tarp overhead, few small tables and chairs we bought with us. The area was sandy with limited grass. The backside of our camp has the mangrove, the water was some 500m away on our South-west direction. Next to the stations area we each had our small camping tents for accommodations. Farside we had our small makeshift kitchen with a gas stove.

There was a small establishment for local tourist near the main landing point – 1.5KM away from our camp, Drinking/ cooking water was brought from there every day.

**Route:**

Dhaka (Capital city) to Bhola Island by Motor Launch (10 hours over night journey – RED-Top)

From the Motor launch jetty to another fishing jetty by road (2 hours by Minivan- BLUE)

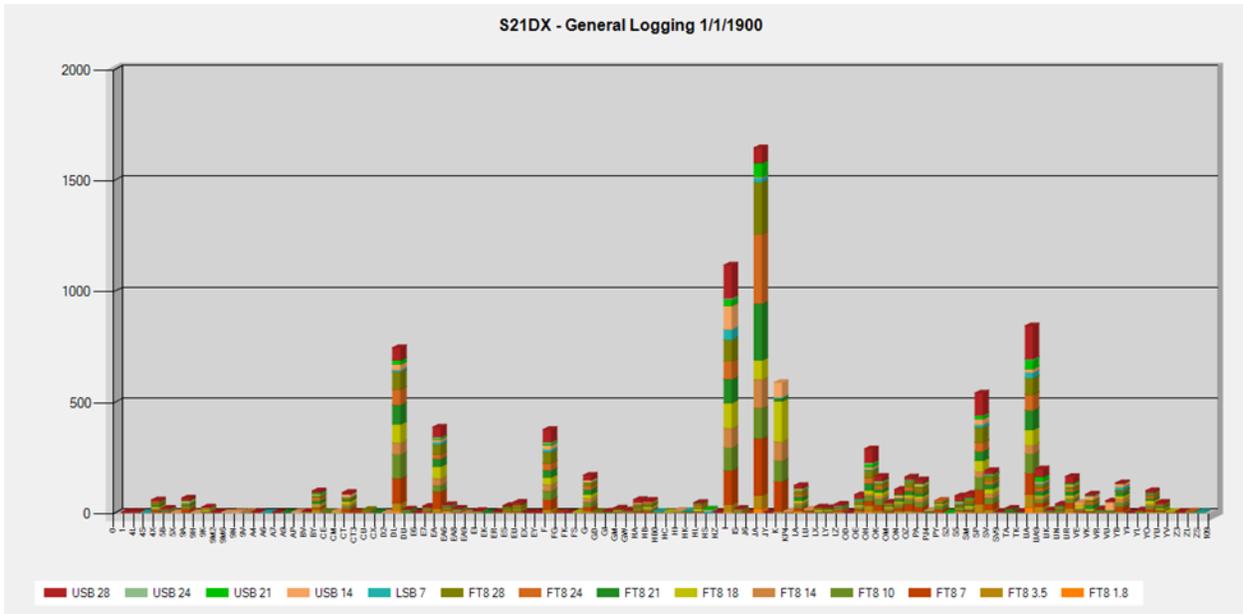
Trawler journey for 5 hours to reach Dhal Char Island (RED-Bellow)

Antennas, mast, Generator, Supply (including some tables) etc we sent from Dhaka to the fishing Jetty (and vice versa) directly using a small Truck. From the truck we unloaded to the Trawler.

(Continued on Page 4...)



Statistics		Graph		
Band	FT8	LSB	USB	Tot
1.8	110			110
3.5	475			475
7	1406	216		1622
10	1059			1059
14	720		511	1231
18	1029			1029
21	1040		291	1331
24	898		57	955
28	1007		1090	2097
Total	7744	216	1949	9909





IDXC

74th International DX Convention

April 21-23, 2023

Visalia, CA



The International DX Convention (IDXC) is back for 2023!

Dear fellow DXers and Contesters,

After a three-year hiatus due to Covid, the International DX Convention is back in Visalia, CA in April 2023. This is a great opportunity to see old and make new friends while we enjoy all things DXing and Contesting. Our vendors are also enthusiastically returning as are the great raffle prizes.

IDXC 2023 is being co-sponsored by the Northern California DX Club (NCDXC) and the Central Arizona DX Association (CADXA) and will be held at the beautiful Visalia Convention Center in downtown Visalia, CA.

IDXC has become the premier DX Convention in the United States and is attended by hundreds of serious DXers and Contesters world-wide.

Many attendees are looking to attend various forums on DXing, Contesting, Station Building etc, while others are looking to improve their skills, upgrade their stations and spend some quality hands-on time with the vendors as they showcase their new equipment.

IDXC 2023 takes place from Friday April 21-Sunday April 23rd. There will be 15-20 DX and Technical Seminars on both Friday and Saturday. DX University and Contest Academy are optional events on Friday the 21st. We are very excited to announce our keynote banquet speakers; Glenn Johnson W0GJ will tell us about his participation in the upcoming CY0S Sable Island Dxpediton, while Ken Opskar-LA7GIA will tell us about the upcoming 3Y0J Dxpediton to Bouvet in January 2023. This will be one of the first opportunities to hear the 3Y0J story!

IDXC 2023 will host 35-40 Exhibitors in the large Exhibit Hall offering all the latest gear on Friday and Saturday. We have a truck load of great raffle prizes, many of them from ICOM, Yaesu, Elecraft and others.

Be sure to attend some of our Saturday forum sessions, Contest Forum; DX Forum; ARRL Forum and the YL Forum. For those who want to see all that Visalia has to offer, there is an optional Saturday Visalia by bus tour. Your non-ham guests will be sure to enjoy that.

IDXC Registration is open and Hotel rooms are available at our website: www.dxconvention.com

IDXC 2023 will be the biggest and best International DX Convention yet and we hope to see you there!

Best 73,

Paul N6PSE

Co-Chair, IDXC 2023.

John K6MM

Past Co-Chair



PJ2Y Youth DX Adventure 2022 Curacao - Trip Report

After the 2008 CQ WW SSB contest at TI5N in Costa Rica, Keko Diez (TI5KD), Don DuBon (N6JRL), Todd DuBon (KD4YHY), Dave Kalter (KB8OCP), and Jim Storms (AB8YK) were reviewing the contest. The discussion evolved into what it would be like to have youth on the team. That birthed the Youth DX Adventure. When Dave Kalter becoming a silent key, we renamed the effort the Dave Kalter Memorial Youth DX Adventure.

Could you add Cliff Mikkelson N0ZUQ to the article as a co-founder

In 2010, the first trip to TI5N hosted six youth, one parent, and leaders. A lot has happened since then. Additional trips to TI5N in 2011 and 2012 consisted of six youth. In 2013, our host, Keko, had a stroke and was no longer able to accommodate our effort. A search was conducted for a new site and there was no 2013 trip. The Caribbean Contesting Consortium (PJ2T) came to our rescue, and we were able to have the 2014 trip to their site. Unfortunately, there is limited housing so we had to downsize the effort to three youth. In 2015, there was not a site available so we cancelled that trip. 2016 saw us able to travel to Saba Island to the site owned by Jeff Jolie (NM1Y). Again, the housing is such that three youth were able to make the trip, and we operated at PJ6Y. Byron Swainey (TI5/WA8NJR) hosted the 2017 trip to Costa Rica on top of a mountain. Again, we were able to take three youth on the trip. For the years of 2018 and 2019, PJ2T was once again the location for the trip, and we operated as PJ2Y. Of course, everyone knows that the years 2020 and 2021 were the COVID years and no trip was possible due to travel restrictions.

That brings us to 2022. Once again, the fine folks of PJ2T agreed to host us. Three youth made the trip and operated again as PJ2Y. The team quickly gelled and set their sight on breaking the all-time QSO record for our trips. The 2019 trip had set the record at 6,583 QSOs including FT8. It became evident quickly that this 2022 team was exceptional. They took off running and never looked back. Overcoming power outages and other issues, they ended making 8,216 contacts without any FT8 due to technical problems.

That is a lot of history and the effort required for these trips is big. The participants must pay for their way to our US departure site and varies depending on their home location. From the US departure site and back, is paid for by us. So, a lot of fund-raising is required and there are many organizations, clubs, and individuals that contribute making it successful. As everyone knows, costs continue to increase. We continue to look for additional sites where we can operate. Why do we do this? Several of us take our vacation time to oversee this effort. Our host provides the site at a reduced or expenses-only cost. However, the biggest reason is the youth! Several participants have gone on to advance in their Amateur careers. There have been a number of Amateur Radio Newline Young Ham of the Year winners, ARRL Youth awards, presenters at Carole Perry Youth Forums, leaders in College Ham Radio Clubs, involvement in AMSAT, and many other areas of Amateur Radio clubs. One trip even resulted in an all-youth team operating in a contest from Tim Duffy's (K3LR) station.



What does it mean to the youth that go on these trips?

TJ Hardin (KO4FFA) writes, " I am really thankful for the opportunity to have gone on the trip to Curaçao with the Dave Kalter Memorial YDXA. Not only did it give me more experience in a contesting-style environment, but it connected me with more youth in the hobby. It strengthened my vision for the future of amateur radio, and it is my hope that this legacy will continue. Even after my time in Curaçao, I still connect often with Brennan and Candace, and I am very grateful to have met them. Jim, Ron, Don, Geoff, and Uli were all great hosts and Elmers guiding us throughout the entire trip. I hope that many more youth operators will continue to have as much fun as we did on this trip and develop bonds of their own."

Brennan Long (K6BFL) writes, "It is easy to say that the YDXA trip to Curacao changed my life. Coming back from the trip, my passion for amateur radio reach an all-time high, I met TJ and Candace, who I am still in contact with today, and learned more from the short trip than I have in my entire ham radio career. The trip opened many doors for me, and I am very grateful to have been selected to go and was able to go, despite the challenges with the coronavirus."



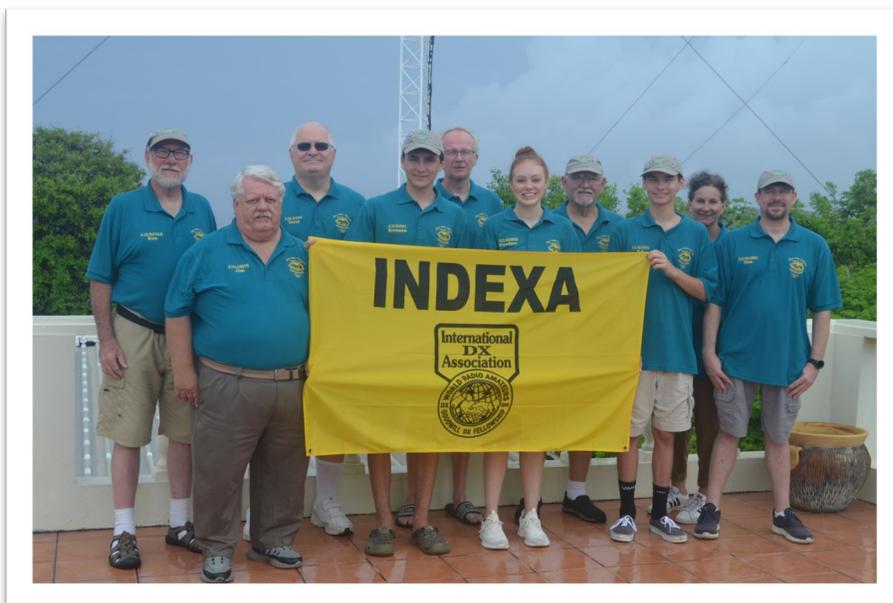


Candace Scott (KE8MMS) writes, "I had a wonderful time in Curaçao! I met Brennan and TJ who helped me feel more in my realm. I didn't have a lot of contesting experience, but everyone helped me get better and better. There were so many times I didn't want to get off the radio! From dealing with a solar flare and power outage, to enjoying the view and pool, we had a blast! I appreciate the Dave Kalter Memorial Youth DX Adventure and would recommend it to any youth (especially girls!) looking to advance their hobby of ham radio."

Bryant Rascoll (KG5HVO) writes, "What an amazing event you guys put on for us youth! After reflecting on last week, I realized I experienced some things that I wouldn't normally experience operating from the states. On CW, I learned that when the pileups grew too big for a single frequency, narrowing the filter to about 100hz-200hz and fine tuning for callers with the RIT made sorting out calls much easier than waiting for some randomly loud station. It was also really cool to experience propagation on bands that I normally don't operate on like 30, 17, and 12m. The 12m opening on Thursday was surprisingly productive with callers from both coasts. Before the trip, I think I had only made about 20 QSOs on 12m. I normally operate only low power so experiencing the intensity of a big DX station really helped me gain knowledge and confidence." His mother, Lauren, wrote that since the trip, Bryant has been on fire for Amateur Radio and was a turning point in his Ham career.

The Dave Kalter Youth DX Adventure is fully supported by donations from clubs, individuals, and businesses. Many clubs donate to the effort and there are a few that make significant contributions. The Dayton Amateur Radio Association has and continues to support us in a major way with the largest amount and advice. Dayton Hamvention provides us booth space. Major clubs also support us such as INDEXA, XWARN, PCARS, SWODXA, and many others. We do not desire to leave anyone out of the list and appreciate all donations both large and small. All clubs, businesses, and individuals that donate are listed on our QSL card each year regardless of amount. We appreciate and value all donations and don't want to leave anyone out of the list but space here does not permit us to list all. Please see our website at qsl.net/n6jrl for a complete listing. Another source of funding are items given to us by several businesses, specifically ICOM, MFJ, and DX Engineering, each year to raffle at the Dayton Hamvention. Again, there are several, so please thank them by visiting their website or store to purchase their fine products. Again, thank you to all who support our efforts and please continue to help us make the trip possible. Finally, we thank the Caribbean Contesting Consortium for providing the PJ2T site for our use. Also, our thanks to Uli Thielke (DL8OBQ) for his selfless support and guidance as the CCC representative. Visit our booth at the 2023 Dayton Hamvention!

Again, we are very appreciative of INDEXA supporting our 2022 trip. As this is an annual trip we look forward to INDEXA continued support of our efforts.



The CW Receiving Machine

Ralph Fedor, M.D. - KØIR



Decades ago I purchased a new accessory for my ham shack called the CW Sending Machine. It was a marvelous piece of equipment. You pushed a button on it to send a CQ; another to send your name, QTH, and other information you wanted in your QSO; another for contest exchanges; and so on. Numerous upgrades and improvements occurred in the following years and continue in today's contest and logging programs. There is also a CW Receiving Machine. It has unimaginable capabilities and has not required

any upgrades or modifications for at least 5,000 years.

This marvelous device is surrounded by a cushion of membranes, a thin layer of fluid and a hard protective case. Its only visible components are our external ears, which are designed to capture sound in our environment and channel it into our external auditory canal and on to our tympanic membrane (eardrum). The brain contains more than ten trillion junctions and functions 24 hours a day to keep you alive, breathing, warm, in pH balance and provide you with both short and long term memory. Its outputs control our external and internal muscles, allow us to speak, keep us in balance, regulate our heart rate and blood pressure, coordinate problem solving, and manifest themselves in our social behavior and emotions. The brain's inputs allow us to visualize the world around us, experience touch, taste foods, smell, determine body position, and most important to us in this discussion; hear auditory stimuli and understand language by assembling the components of syllables and words.

There are 44 discrete sounds in the English language. We call each of these discrete components a phoneme. Consider a phoneme to be one "bit" of information. The word "dog" has three phonemes: *dah - au - ga*. The number of possible combinations of the 44 phonemes is 2.658×10^{54} . The longest word that I could find in the English language is ***Pneumonoultramicroscopicsilicovolcanoconiosis***, a lung disease caused by the inhalation of quartz or silica particles. The word contains 27 syllables, and by my count, 39 phonemes. So, if this is our longest word, then our brain needs to be able to deal with at least 2.04×10^{46} possible phoneme combinations. This is the awe-inspiring power of our brain that permits our understanding of language.

By comparison CW consists of just two "bits", a dit and a dah, which we combine to form letters, syllables and words. Just as we send phonemes to our brain for processing, we likewise send CW to it. But the level of complexity in assembling CW input into meaningful information is many, many orders of magnitude less than assembling and understanding language.

Now, let's introduce some sound: A 600 Hz tone that is 600 msec. in length, a pause of 600 msec, four 600 Hz tones each 200 msec in length and spaced by 200 msec., another pause of 600 msec., and finally a single 600 Hz tone of 200 msec. duration. This is six bits of information and the letters; T, H, and E.

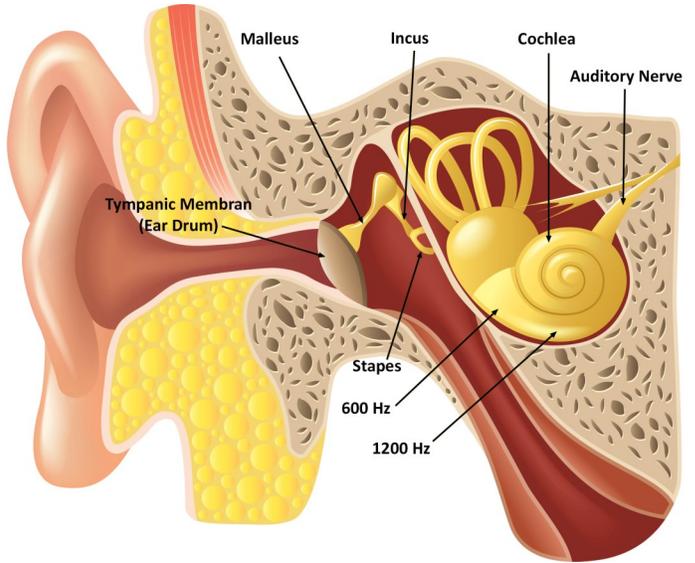
When each of these sounds occurred, your tympanic membrane vibrated at, you guessed it, 600Hz. On the inside of our tympanic membrane there is an attachment to a small bone called the malleus. It picks up the vibrations and through articulations, passes them on to two other bones, the incus and stapes. As a point of interest, and for your next trivia game, the stapes is the smallest bone in the human body. Everything up to this point has been conductive. Our 600 Hz tones are about to leave the middle ear chamber, enter the inner ear, and switch to fluid hydraulics and neurosensory mechanisms to convey their information.

The dominant structures of the inner ear are the cochlea and vestibular systems. The vestibular system (semicircular canals) have to do with balance and sensing acceleration. Our 600 Hz tones have little to do with this system, so we'll ignore this anatomy and physiology for now. The cochlea, where the action is, is a closed, fluid filled, snail-shaped chamber lined with tiny, hair like cells called the organ of Corti. This cochlea is topographically mapped with low frequency sound stimulating receptors near the base of the cochlea and high frequency sound stimulating receptors near its apex.

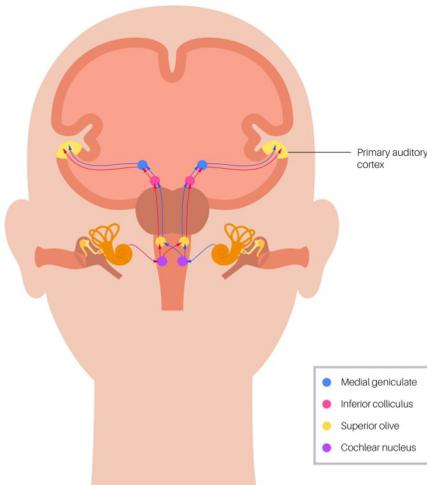
(Continued from Page 8...)

The stapes is fixed to a membrane over an oval opening in the cochlea and acts like a hydraulic piston sending 600 Hz shock waves through the cochlear fluid. This causes a membrane separating two chambers of the cochlea to ripple like a rope being snapped. The movement stimulates the hair cells of the Organ of Corti that are sensitive a frequency of 600 Hz and they in turn stimulate the auditory nerve.

Fibers of the auditory nerve sense the vibrations of the organ of Corti and send electrical impulses along neurons by sodium, potassium, calcium, and chloride ions moving across electrical and concentration gradients at nerve cell membranes. Chemical neurotransmitters relay the impulses between neurons as our 600Hz bits make their way to our brainstem. Along the way the neurons encounter several nuclei which process and relay information, and importantly, send nerve fibers to the opposite side of the brainstem. Therefore, information from both ears reaches both sides of our brain. This route and process is not unique to our 600 Hz tones. All sound: CW, music, background noise, and language behave in exactly the same manner.



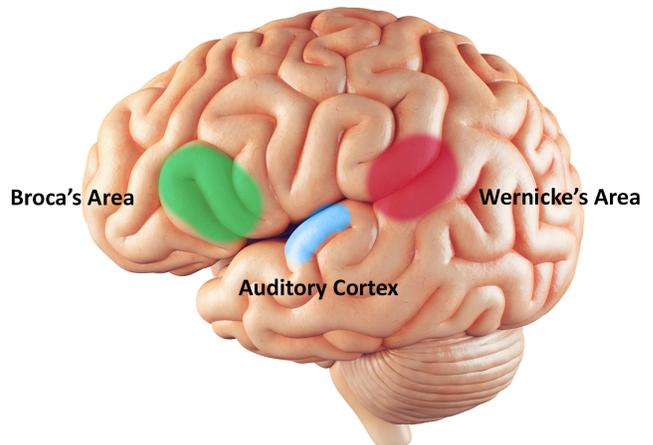
AUDITORY PATHWAY



The cochlea is filled with a fluid that moves in response to the vibrations from the oval window. As the fluid moves, 25,000 nerve endings are set into motion. These nerve endings transform the vibrations into electrical impulses that then travel along the eighth cranial nerve (auditory nerve) to the brain.

Sound waves strike the eardrum, causing it to vibrate (like a drum) and changing the acoustic energy into mechanical energy. The malleus (bone), which is attached to the eardrum, starts the ossicles into motion. The stapes moves like a piston in the oval window of the cochlea creating a mechanical-hydraulic energy.

The nuclei in the brainstem act like internet or network nodes, sorting and directing information flowing to them from the auditory nerve. They also send some nerve fibers from each auditory nerve to the opposite side. This is a backup system and assists in sound localization. After the last nucleus, our 600 Hz tones are on their way to the CPU of our CW Receiving Machine, our brain..



(Continued on Page 10...)

(Continued from Page 9...)

The auditory cortex of the temporal lobes of our brain collects all the input from the auditory nerve and topographically sorts it. All the phenomes and the dits and dahs are then relayed to Wernicke's area, just posterior to the auditory cortex. This is an assembly area where the input is decoded and enters our consciousness. We "hear" sound and now make sense of what we hear. Just as we instantaneously hear and understand words, we "should" instantaneously hear and understand CW characters. Just as we fuse phonemes to create syllables and words, our brain is capable of creating syllables and words from CW characters.

Once recognized and brought into consciousness, this CW information is relayed to other areas of the brain as necessary. For example, if we wish to speak the letter we received, information is sent to Broca's area, the speech center, and we speak the letter. If we wish to type the letter, our motor cortex is stimulated to engage our fingers. Or, a CW phase may be sent to our short term memory, or if we judge the information to be really important, it may go into our long term memory center.

This is how our brains are wired. The entire capacity of our brain can handle 11 million bits of information per second. Our conscious mind, that part of the brain with which we hear language, can deal with 40 to 60 bits per second. We learn language by assimilating information from our environment and by being taught — nature and nurture. However, we only learn CW by being taught. How we are taught is therefore critically important. Practice is important to learning both language and learning CW and it is optimal if we start with a blank slate with no old, erroneous methods cluttering up our auditory cortex or Wernicke's area.

A toddler's language develops by fusing phenomes and syllables. When these become fused into words, this is the turning point in the comprehension of language. The "phenomes" of CW are dits and dahs. They need to be fed into the brain as meaningful, discrete bundles representing letters. The bundles should not be dismantled and then consciously reassembled, rather they must erupt into our consciousness without a voluntary effort on our part. When we hear the word (sound), "balloon," we instantly recognize this discrete bundle of sound and know what it represents. To duplicate the way we learn language, we need to tell the student, "This **sound** represents the letter ____." Focus on the sound rather than its composition.

As in language, when we begin to fuse the sounds of letters into words, we have reached the turning point and have an impedance match with the wiring of our brain. If this is true we should be able to decode CW at a rate similar to that with which we can decode language, 40 to 60 bits per second. Let's put this to the test.

At the 2019 ITU CW competition, two individuals copied code at 195 words per minute. If we use the word "Paris" as a standard five-letter word, made up of 14 bits, 195 words per minute equates to 2,730 bits per minute or 45.5 bits per second. It correlates!

Can everyone learn CW? No.

There is a condition known as auditory dyslexia.. Individuals with this problem may hear sounds but are unable to interpret them. They may decode sounds out of sequence or need constant repetition of instructions. The condition is most often discovered in childhood.

There are also multiple forms of aphasia. Most are the result of a stroke or trauma, and may leave the affected individual unable to understand, speak, read or comprehend. Since hearing is a bilateral process and we have those cross-over areas, hearing is seldom compromised.

However, if you are able to read this article, understand normal speech, speak normally, and follow instructions; then your CW Receiving Machine is likely in good condition, and with the proper teaching methods and practice, you can master CW.

TN8K Trip Report

The Congo (prefix TN, full name: the Republic of the Congo) - is located on the west coast of Africa in the equatorial region. It is very similar in size to Germany, but for how big it is, it has just under 5 million inhabitants. Although the official language is French, the inhabitants speak the Kituba language. The country is quiet from a security point of view, unlike its "related" neighbor, the Democratic Republic of Congo - 9Q. TN is ranked 80th on the Clublog's "Most Wanted" list.

The Congo is a country we have been thinking about activating for years. But only now we have managed to implement a rather difficult project. It did, however, turn out a little differently than initially planned, but let's not get ahead of ourselves.

The basis of every expedition is always a ham radio license. Unless there is a license, or at least advanced negotiation, there is no point in taking any further steps. The first emails to the authorities in the Congo to obtain the license were sent in December 2021. The actual expedition was then planned for September 2022, time enough, it seemed. But, as it often happens with African institutions, communication was slow and for a long time, we were unable to get it.

In the meantime, we were looking for a QTH. As usual, several hours were spent pouring over maps and doing Internet searches for a location that would be optimal for our needs, yet not too far from the airport. We finally succeeded.

On June 23rd, 2022 we concluded that we would be able to get the license in time and took a risk by buying flight tickets for September. As fate would have it, after many urgings and e-mails, on June 18th we received two individual licenses for TN/OK2ZI and TN/OK6DJ which were unusable for the expedition. It was clear that obtaining the club license as we requested would drag on, so we re-booked the flights for January 2023. It took another two months until the club license with the TN8K callsign finally arrived! The very next day on September 16th, 2022, the expedition was officially announced and featured in amateur radio newsletters and on Facebook.

Time passed and in our minds, we were slowly drawing the setup that we would bring with us to the Congo. It was clear that in terms of equipment, this expedition would be the biggest we had ever undertaken and also that it would be the most expensive project. On November 15th, 2022 the regular pre-expedition meeting took place at Peter's QTH in Ritka. All of the antennas had been checked and packed in the four special bags and the passports of all participants were sent to Paris for visas. They returned in a reasonable amount of time on December 19th with the visas pasted in.

The meeting of the whole team consisting of Petr OK1BOA, Palo OK1CRM, Petr OK1FCJ, Pavel OK1GK, Ruda OK2ZA, Ludek OK2ZC, Karel OK2ZI and David OK6DJ took place on the morning of January 5th at Ruda's QTH. Since we didn't want to risk the morning traffic on the D1 highway, we all arrived in Moravia during the previous evening and spent the night partly at OK2ZA's place and partly at OK2ZI's place. The final packing and transporting of trunks and cabin baggage took place on the morning of January 5th and shortly before noon, everything was ready. In total, seventeen 23kg pieces of baggage and eight 12kg cabin bags were prepared. At noon, we then set off in the hired minibus to the Vienna airport. Check-in was relatively smooth, as were the flights from Vienna to Paris and then two hours later from Paris to Pointe-Noire, with a stopover in Luanda (Angola).

The first major problems came after our arrival in the Congo, where we passed through health and passport control without any problems, but were held up because of our "suspicious baggage." Although we had all of the necessary documents and the support of an official at the airport, it was not without nearly two hours of complicated negotiations. Pierre, the owner of our QTH, who was waiting for us at the airport and was present during the negotiations with customs, helped us a lot. In the end, our baggage was released, except for one trunk that didn't arrive at all and contained, among other things, 350m of coaxial cables, a very important piece of equipment, which was also almost half of everything we were carrying.

(Continued on Page 12...)



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In front of the airport, we got into the prepared cars and started the 20 km-long journey to the QTH. It took almost an hour through the clogged city both downtown and along rural muddy roads. The QTH was located in Pointe Indienne – a shark fin-shaped promontory that juts out into the Atlantic Ocean. The rented house was in the northern part of the promontory, 500m from the coast, where there was an open profile with no elevation on any side. The direction to the EU, NA, and JA even sloped gently towards the coast. The house had a large garden (100×60m) surrounded by meadows and pastures, with the possibility of building antennas arbitrarily in the garden and "reasonably" in the surrounding area. There

was no power connection in the QTH, but with the powerful 30kW diesel generator this was not a problem. As it turned out, the generator worked perfectly, except for one glitch, and it consumed altogether 1,200 liters of diesel during our stay. We had a cook and his family at the lodge who took care of our meals and provisions, so we could concentrate solely on our objectives.

We arrived in the QTH on January 6th at 13:00 local time. Since we wanted to be QRV on the lower bands already on the very first night, we immediately unpacked our bags with the antennas and started building. During the afternoon we had built a vertical for 160m, a vertical for 40m, a vertical for 30m, two Spiderbeams, and in deep darkness we finished also the vertical for 80m. All of the verticals had ten quarter-wave radials. The 30m and 40m antennas were temporarily set up near the house, just for the first night, knowing they would be relocated later.

After dark, we then converted the main room of the house into an operator's room and installed eight workplaces: a K3+Expert 1.3K-FA, a SunSDR2DX+JUMA, a SunSDR2pro+JUMA, an FT-DX10+JUMA, an IC-705+JUMA, another IC-705+JUMA, and finally the remaining two TS-480HXs, which were primarily intended for 6m and FT8/FT4.

The first contact under TN8K was made by Petr, OK1FCJ on 20m CW. We were working all evening on several bands, but the fatigue from the hard 24 hours of travel and building antennas was evident in our traffic. We still made almost two thousand contacts by midnight. The pile-ups were huge on all bands, so it was clear that we would not be bored.

January 7th, 2023

In the morning, part of the team was working on the antennas. First, we moved the 40m antenna away to a meadow outside our property and upgraded it from a simple vertical to a two-element phased array. Then, we also moved the 30m vertical up to the fence for the final position and upgraded it to a two-element phased system. We erected mast #3 with a trio of two-element dur aluminum Yagis for 17m, 15m and 12m and then mast #4 with five element for 6m and four element for 10m. We couldn't build the last fifth mast because of the lost trunk which contained the center of the last Spiderbeam.

We stretched a receiving loop on the ground, which we hoped would help us listen on the lower bands. Suddenly a thunderstorm and windstorm came in the afternoon. Fortunately, all of the antennas survived, except for the 40m vertical which fell to the ground. Thankfully the repair only took a few minutes.

At 1600 UTC the storm was over, all damages had been repaired, and the SWR of the antennas checked. After that six stations were in operation simultaneously – 30m+6m on FT8 and 20m+17m+15m+10m on CW.

The last thing we managed to do that day in daylight was to build an RX-point behind the fence, to which all of the beverage antennas were connected. We stretched the first one, 150m long towards the EU later that day. During the day we took turns at the radios and although we spent a lot of time working on the antennas, we managed to make over 10,000 contacts thanks to the brisk CW traffic. The pileups were massive. The familiar "big guns" we worked during the start of every expedition were calling. The joy was spoiled a bit by unusual number of the undisciplined callers, which slowed down the traffic considerably. The beverage antenna was tested at night, and it worked well, but atmospheric QRN from nearby thunderstorms made listening extremely difficult.

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January 8th, 2023

In the morning after dawn, we put up another antenna, a 20m wire dipole, which was pulled through a pulley to the middle of the 160m vertical. Thanks to this the coax cable from the 160m antenna did not "slack" during the day and was connected to this antenna. This helped increase the work efficiency on the 20m. This also allowed all of the Spiderbeams to be on the upper bands during the day. The 20m band behaved typically for the area, with conditions gradually deteriorating during the morning and not working at all by midday. Even on the FT8 frequencies, nothing was heard and the band only started to open up in the afternoon. Progress was also made with the receiving antennas and two more 150m beverages were stretched towards JA and NA. Some of the team then also went to test the local sea. The beach was sandy and beautifully clear, the water relatively warm but somewhat murky. We also learned that our lost trunk had arrived, but as it was Sunday and the special desk at the airport for such cases was closed we had no choice but to wait until the next day. The number of contacts was increasing rapidly and by midnight there were almost 30,000 QSOs in the log.

January 9th, 2023

The event of the day: they retrieved the lost trunk. We immediately unpacked it and took what was missing to complete our station. We assembled the eighth workplace, which was missing a power supply with wiring for the K3, and began preparing the Spiderbeam, which was the only one of the three tuned to the SSB parts of the bands. However, it could not be completed by dusk and so we postponed it until the next day. As far as possible one station was in operation permanently on SSB, three to four stations on CW, and two on FT8. Then during the day one of the stations was allocated to 6m FT8 and although we weren't very hopeful of making any contacts, we still logged the first 19 stations on this day. When we got information from the VK hams that our signals were passing into their area we gave short-term CQ VK/ZL to allow them to make contacts, as their signals were weak, and breaking through the EU or NA pileups was almost impossible for them. Unfortunately, here too we have often encountered a lack of discipline on the part of the callers who simply did not respect our directional CQ. We did our best and by the evening there were over 40,000 QSOs in the log.

January 10th, 2023

This time the whole night was very quiet. Almost no QRN on the lower bands. Unlike the previous nights the 80m band worked great and conditions were good. On the contrary, surprisingly, 160m didn't work at all. The conditions were similarly miserable also on the upper bands in the morning. During the day we finished the remaining antennas. We put up the last Spiderbeam for SSB and set up a quarter-wave vertical for 60m band in a meadow far beyond the property line. There was a lot of interest in the contacts on this band, and we made over a thousand contacts there on the first night. The only nuisance was that we had to disassemble and modify the IC-705 TRX, as it had the 60m band blocked from the factory and we had to modify the setting following the instructions on YouTube. Later in the afternoon, when it was not so hot, we built a two-element vertical system for the 40m band pointing to NA and another vertical for the 30m band. These antennas were planned, but without the coaxial cables from the lost trunk, there was no point in building them earlier. We have also managed to establish the first satellite link via QO-100, which was our premiere on this band and certainly a premiere in the Congo. We had asked the owner of the facility to purchase a satellite dish antenna for us in town. In the meantime we had been transmitting provisionally only with the feed pointed at the inverted lid of a large pot. In order to maximize our potential we also installed the last "backup" workstation with IC-705+JUMA and so that evening the call TN8K appeared for the first time 9 times simultaneously on the air, with seven stations working in "human" modes and two on FT8. These FT8 stations were operated by operators in parallel with CW or SSB traffic on their tablets.

January 11th, 2023

Every day in the morning the upper bands worked fine to JA and so we gave these stations plenty of space. We tried the simultaneous operation of three stations on the 15m band – CW, SSB and FT8. With minor problems, it worked, mainly because FT8 was transmitting into the vertical antennas for 40m. This antenna works satisfactorily on 15m and thanks to vertical polarization there was no problem with mutual interference. After lunch, we stretched the last beverage 150m towards VK and decided to extend the JA beverage by another 100m. But that was easier said than done, as it turned out, what looked like a meadow was actually a swamp covered with grass, and pulling 100m of wire and quarter wave radials took over an hour. If we had known what kind of terrain we were getting into, we might have changed our minds. We also took a commemorative photo to mark the 60,000 contacts in the log that day. The afternoon conditions were very good on the upper bands and lasted until midnight when the 10m band was still full of stations. Unfortunately towards the evening, there were heavy thunderstorms which swirled around our QTH and so listening in the storm QRN was very tiring. After midnight the storm was so intense that we had to make QRT for a while and disconnect all antennas to prevent possible damage to the equipment by static electricity.

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January 12th, 2023

As soon as the storm subsided we got back to the stations, but shortly after the traffic had started it was over again because there was a power outage. The generator stopped working unexpectedly and did not start again. Just after dawn, the staff started working on the repair. It was found that the V-belt had broken. Fortunately, we managed to get it in town, but even so, the repair took almost the whole morning. As a result, our "unwritten" goal of 10,000 contacts per day was not met that day. We were also told that the dish antenna could not be found in any shop, so the owner of the building allowed us to dismantle his satellite dish from the wall and use it for QO-100, of course on the condition that we put it back at the end of our expedition. We also moved the RX loop further away from our facility, using the last piece of coaxial cable we had. At night, traffic continued on the lower bands and the beverage antennas were also used on the 60m workstation, where we worked on CW for a few hours, and many new stations were logged on this band.

January 13th, 2023

The conditions were weaker on the upper bands in the morning. Then another cloudburst came through and mother nature showed us her power. The floodgates of heaven opened and the rain drummed on the tin roof of the house with such force that even the reception in the headphones was heavily distorted. We had to cut off SSB traffic entirely because the microphones were picking up the noise so intensely that the operator's voice was almost lost in it. On the other hand, the conditions were excellent in the afternoon and evening after the rain. Yesterday's 60m traffic lured us in, so we continued CW that day, but listening on the vertical was difficult due to equatorial QRN. Virtually every mark was broken by the crackle and we had to have everything repeated at least once. We also had to accommodate the CW speed which further impacted the rate. Despite this, there were over 90,000 QSOs in the log at midnight. We were enjoying amazing conditions with all bands open at once, from 160m to 10m. This is something that is very difficult to experience in Europe.

January 14th, 2023

The first technical fault occurred – the band-pass filter on 15m was gone. We had three complete sets of 200W band-pass filters with us, so losing one was not a significant problem. Each workstation is always equipped with the appropriate filter and in case of extreme interference, we connect two filters in series, albeit knowing that it causes a bit of attenuation in the RX path. We experienced interference, especially when using the antennas on the same mast, just above each other. Performance-wise the filters didn't do any harm as they were connected between the TRX and the PA, and the TRXs had always enough power to drive the PA. Another significant goal was reached on this day - 100,000 contacts in the log. We briefly interrupted the traffic and took a few commemorative pictures, which we posted on our Facebook page.

January 15th, 2023

There was rain again in the morning, sometimes very heavy. There was so much water that it did not even soak into the sand that was in the yard next to the house. Streams of water flowed under the antennas and disappeared somewhere behind the fence. Fortunately, it didn't affect the propagation conditions. The 10m band was working nicely since the morning and so we gave FM operation on 29.050 a try, which we had never done before. It was an interesting experience for everyone. Even during the morning, the number of contacts from our most successful S9OK expedition so far in 2021 was surpassed. After lunch, we had a visitor – two neighbors on whose land our verticals for the lower bands stood. Getting along with them was absolutely smooth, the gentlemen were knowledgeable and listened with interest as Karel, OK2ZI explained in French that we were a non-commercial group promoting amateur radio and advertising the Congo to the world. With a promise that the antennas would be gone from the property within a week and everything would be cleaned up, they thanked us for the explanation and left with a friendly nod. The thing almost unprecedented for Africa is that someone would allow you to do something for free.

January 16th, 2023

The lower bands were working well at night, but there were not as many stations in the log as there could have been, again due to the greatly undisciplined callers, especially on 80m and 160m. Even the Japanese stations, which are usually very disciplined, would lose their inhibitions on the lower bands and call over each other. In the morning the upper bands worked nicely and there, on the other hand, the traffic of JA stations was exemplary. Europe was of course a mess as usual. More and more often we were encountering the annoyance of calling stations putting their callsigns twice in a row on CW. This was extremely annoying because the operator usually gets the callsign the first time and thus transmits in "stereo" with the caller when sending the report. As a result, the caller does not respond to our report and we have to repeat the entire session unnecessarily. There's no reason to do that, especially on bands from 40m upwards where the signals tend to be stable and are not significantly affected by the atmospheric QRN. On the other hand, on the 80m and 160m bands, stations that call with their callsign twice gain an advantage. There's more time to exactly tune on their signal and receive the callsign on the first go.

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January 17th, 2023

There was another goal reached on this day – 140,000 QSOs in the log. We were thrilled with how the number of contacts was increasing and how the callers were checking the empty fields on Clublog. However, our joy was somewhat spoiled by the fact that the expedition was fast nearing its end. The pileups may have been a little weaker at that time, but there were still so many callers at the opening peaks that we would have had plenty to do even if the expedition had lasted a month. Today was the last day of the QO-100 operation, with over 1,500 contacts in the log. We were regularly monitoring propagation conditions. The report showed aurora and A=14 that day which made upper bands almost non-existent. We had another unexpected visitor this afternoon, a large herd of cows came in over the pasture and messed up our radials for the 80m and 160m verticals. It might seem like bad luck, but we should rather say lucky that they came only once and only towards the end of the expedition. We had studied YouTube videos of the area before selecting the QTH and knew that herds roamed freely in the surrounding pastures and were concerned if verticals could even be installed there beyond the fence.



January 18th, 2023

The end was near, it was the last day of full operation. More and more stations were now devoting themselves to SSB at the expense of CW, where there were already nearly 50,000 contacts in the log. Once again we encountered the annoying nuisance of stations on SSB calling with just a suffix instead of the full callsign. This causes unnecessarily delaying and annoyance for the operator. This behavior is typical for stations from South America and Europe, especially from its southern part. It is not the case in the USA and certainly not in Japan. In the morning the conditions were poor, so we took time to take pictures for our sponsors and re-tuned the 80m vertical to the SSB part of the band. We also posted the information that this night would be fully dedicated to SSB traffic on both 80m and 60m, which we were often asked

about on the band. Both bands had beverage antenna available for better RX. The RX loop barely worked this time, probably because it was too close to the transmitting antennas. On both of our previous expeditions to S9 and HK0/A the loop was far from everything and worked very well.

January 19th, 2023

We worked all night on the lower bands. It was the last night there. We could feel that many callers were nervous as they knew if they didn't make the QSO now, they never would. A lot of well-equipped stations tried the "trick" and although they couldn't hear us properly, they called repeatedly and even gave the report right along with the callsign foolishly thinking we would log them. Naturally, when we called these stations they didn't respond because they couldn't hear us. Of course, they are not in the log because the QSO has not been mutually confirmed. Unfortunately, we have to say that even some well-known OK amateur stations also resorted to this ugly practice and we were saddened by this.

In the morning the packing of antennas started. First the beverages, then verticals for 160m+80m+40m. From phased pairs, only one pair on 30m and one on 40m remained standing. Before dusk, we packed two Spiderbeams. By morning only one Spiderbeam and two masts with duraluminium Yagis remained. On our last night, we were QRV from 40m to 6m with at least one antenna on each band. It rained heavily during packing. On the previous expeditions, the weather was always good for packing, but this time mother nature decided otherwise.

In the meantime, we had received a warning about the transport strike in France which could affect our air transport. Indeed many flights were canceled, but fortunately, the plane that we were due to return on departed from Paris. We continued to operate, albeit limited, all evening, with over 160,000 contacts in the log. After checking the table on the GDXF website it looked like we might be able to reach 6th place.

In the morning Karel and David briefly activated their valid TN/OK2ZI and TN/OK6DJ personal licenses and made about 200 CW contacts just for fun before they fell into their beds with fatigue.

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January 20th, 2023

At 6:20 in the morning, we made the final QRT. TN8K was history. The log showed a fantastic 164,939 contacts. We quickly lowered all the remaining masts and the whole team, although very tired, started dismantling them. By noon everything was packed and tidied up and a photo shot of the whole group took place including the staff who looked after us magnificently. In the afternoon the hired cars arrived and the whole group moved to Pointe-Noire, where Pierre booked a restaurant and invited us to lunch together. Then it was time to say goodbye and move to the airport, where Pierre arranged for a helper from Air France to help us check in. However, once again it was not without problems. The check-in took almost three hours. Two of our bags with antennas were allegedly over the size limit, no explanation or persuasion helped. We had to pay an extra fee for oversize baggage, a total of 600,- EUR. The airport staff is corrupt. When checking the baggage by X-ray they were openly demanding bribes. The highlight then was the uniformed police officer who was doing a "check of cash exported out of the country" before passport control and wanted to see all of our wallets. She unscrupulously told each of us to give her some money. Although she claimed not to speak English, she knew the phrase "give me money" very well. She was not interested in the Czech crowns offered, though. We've seen a lot of things on our travels in the world, but nothing like this. We were also surprised by the double check of the contents of our cabin baggage, first at passport control and then again just before boarding. As much as we had a good time in the Congo and liked it the bureaucratic buffoonery at the airport was so frustrating that we wanted to be all out of there. Fortunately, the plane left on time and after a short stopover in Angola and an hour's wait on the airport tarmac, continued on to Paris for a night flight. Everyone, even those having trouble with it, fell asleep on the plane from fatigue.

January 21st, 2023

The plane landed in Paris while it was still dark. The transfer to the next flight was without any problems, as well as the flight itself. All baggage arrived in Vienna, but one was damaged and a claim had to be made. The hired minibus was waiting for us and the journey to Rudy's QTH was also smooth. There, we were warmly welcomed by Rudy's wife with a cauldron of delicious sirloin steak with cream sauce, which we all devoured with great gusto. In the course of the afternoon, we then went our separate ways home, and at 10 pm the last member arrived. This was the real end of the whole adventure.

We would like to thank all of the stations that called and made a contact with us. We couldn't have done it without them and we believe it was fun for everyone. At least the feedback on Facebook speaks unanimously that it was. Thanks to our host Pierre, who adapted the interior of his house for our needs and provided us, a strange gang from Czechia, with ideal conditions plus allowed us to do literally whatever we wanted with the antennas on and around the property. Thanks to the couple Giselle and Rene who were in charge of our food and safety and took absolutely great care of us. Thanks to Murphy who was in our favor this time. The equipment worked as it should, nothing broke except one filter. Most importantly, all of the antennas worked as they were supposed to.

We would also like to thank the sponsors, both the organizations and the individuals. Without their help, this costly mission would not have been possible.

Our sponsors: Northern California DX Foundation, European DX Foundation, International DX Association, Greater Milwaukee DX Association, German DX Foundation, Swiss DX Foundation, DX-news, Clipperton DX Club, Far East DX Ploitiers Foundation, Oklahoma DX Association, Mediterraneo DX Club, CDXC UK DX Foundation, Danish DX Group, SDXG, Minnesota TCDXA, Southeastern DX Club, Lone Star DX Association, GM DX Group, OH DX Foundation, Northern Ohio DX Association, National Capitol DX Association, East Tennessee DX Association, Northern Illinois DX Association, Araucária DX Group, Spiderbeam, Mastrant, DD-amtek.

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From among individuals we were supported by a large number of amateurs and we thank them all, especially K0GEO, N1HO, OG2M, OK5MM, HB9FPM A HB9JOE, OK6RP, AC0W, OK1NS, OK1ALX, OK1CF, OK1FPG, OK2MDC, OM3PC, OM5ZW, TF3SG, IK0AGU, OM4TW, OK2IT, OK1NP, N3OC, GM3WOJ, WO9I, ZL1IU, HB9BAS, KQ4DPH, TF3DC, OK2ARM, OK2NMA, WF8R, DK2CF.

The result puts us in 6th place in the official Megaexpeditions all-time ranking (<https://gdx.de/megadxpeditions/honorroll.php>). With thirteen days of operation and only eight operators, this is a spectacular achievement. By the time you read these lines, the QSL tickets are already in production. As soon as we receive them, the arduous procedure of distributing them will begin, which as usual will be taken care of in an exemplary manner by David OK6DJ. OQRS direct requests have already been confirmed at LoTW.

For detailed statistics see <https://clublog.org/charts/?c=TN8K#>

Equipment used:

TRX: 1x K3, 1x FT-DX10, 3x IC-705, 1x SUN-SDR2DX, 1x SUN-SDR2PRO, 2x TS-480HX.

PA: 6x JUMA PA1000, 1x Expert 1.3K-FA

Antennas:

160m vertical with capacitive hat + 10x quarter-wave radials
 80m vertical + 10x quarter-wave radials
 60m vertical + 10x quarter-wave radials
 40m 2el. vertical phased system + 2x10 quarter-wave radials to JA
 40m 2el. vertical phased system + 2x10 quarter-wave radials to NA
 30m 2el. vertical phased system + 2x10 quarter-wave radials to JA
 30m vertical + 10x quarter-wave radials
 20m - 10m 5-band Spiderbeam @10m
 20m - 10m 5-band Spiderbeam @10m
 20m - 10m 5-band Spiderbeam @12m
 20m inverted V-dipole @10m
 17m - 2el. Yagi
 15m - 2el. Yagi
 12m - 2el. Yagi
 10m - 4el. Yagi
 6m - 5el. Yagi

RX antennas:

3x beverage á 150m (NA, EU, VK)
 1x beverage 250m JA
 RX loop

Written by the TN8K team, English translation by OK1DIX

First QSO: 2023-01-06 18:46:00
 Last QSO: 2023-01-20 06:20:00

Band/Mode breakdown

Band	CW	FT8	FT4	SSB	RTTY	FM	Total	Total %
160	1954	1465	14	0	0	0	3433	2.1%
80	3675	2271	539	315	0	0	6800	4.1%
60	660	2978	320	96	0	0	4054	2.5%
40	4799	6943	2467	1741	0	0	15950	9.7%
30	5238	7066	2300	0	1197	0	15801	9.6%
20	5093	8241	3199	4959	1625	0	23117	14.0%
17	7753	5954	3576	4662	0	0	21945	13.3%
15	9069	9437	3394	7174	0	0	29074	17.6%
12	8005	4865	3271	6164	0	0	22305	13.5%
10	5782	6179	2832	4812	0	1172	20777	12.6%
6	0	99	0	0	0	0	99	0.1%
2	0	25	10	0	0	0	35	0.0%
13	324	371	277	577	0	0	1549	0.9%
Totals	52352	55894	22199	30500	2822	1172	164939	

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Club Log DX Report

Band	QSOs	% DX	Graph
160M	7,022	5.97	
80M	32,712	18.74	
60M	6,495	36.37	
40M	114,575	26.80	
30M	61,967	52.31	
20M	181,700	45.46	
17M	71,777	61.91	
15M	146,771	65.03	
12M	147,560	75.77	
10M	319,659	77.36	
6M	35,211	77.40	
4M	7	0.00	
2M	2,677	8.93	

Rank	Prefix	Entity Name
1.	P5	DPRK (NORTH KOREA)
2.	3Y/B	BOUVET ISLAND
3.	FT5/W	CROZET ISLAND
4.	BS7H	SCARBOROUGH REEF
5.	CE0X	SAN FELIX ISLANDS
6.	BV9P	PRATAS ISLAND
7.	KH7K	KURE ISLAND
8.	KH3	JOHNSTON ISLAND
9.	3Y/P	PETER 1 ISLAND
10.	FT/G	GLORIOSO ISLAND
11.	FT5/X	KERGUELEN ISLAND
12.	YV0	AVES ISLAND
13.	VK0M	MACQUARIE ISLAND
14.	ZS8	PRINCE EDWARD & MARION ISLANDS
15.	KH4	MIDWAY ISLAND
16.	PY0S	SAINT PETER AND PAUL ROCKS
17.	PY0T	TRINDADE & MARTIM VAZ ISLANDS
18.	KP5	DESECHEO ISLAND
19.	VP8S	SOUTH SANDWICH ISLANDS
20.	KH5	PALMYRA & JARVIS ISLANDS

Most active modes

This chart illustrates which modes are being used most heavily during the period of this report.

Mode	% Use	QSOs	Graph
FT8	57.07	646,637	
FT4	18.57	210,424	
CW	10.66	120,845	
SSB	10.12	114,715	
RTTY	1.52	17,206	
PSK	1.13	12,808	
MFSK	0.42	4,757	
FM	0.19	2,167	
PKT	0.12	1,412	
DYNAMIC	0.04	397	
DIGITALVOICE	0.03	322	
SSTV	0.01	127	
MSK144	0.01	106	
PAC	0.01	100	
AM	0.01	100	
All other	0.09	1,032	



This report is sent to the [Club Log Google Group](#) every 7 days.

It's also available daily at 14:30Z from <https://clublog.org/dxreport.html>

It contains a summary of band conditions and activity, based on the data that you and other Club Log users have uploaded. If you have any suggestions or feedback on this report, please email Michael G7VJR at michael@g7vjr.org

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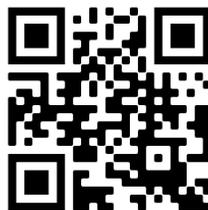
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