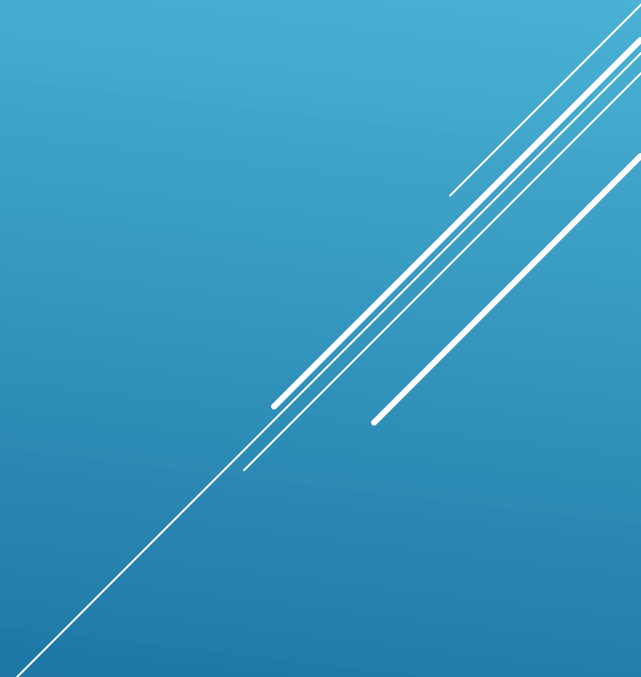


DXING 101:

**BASIC CONCEPTS AND PRINCIPLES
FOR SUCCESSFULLY WORKING DX**

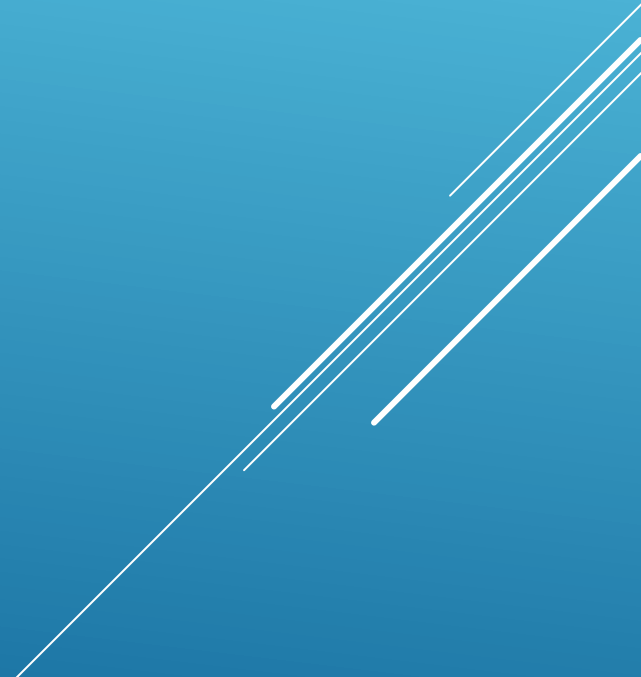
*RANDY SHIRBROUN
NDØC*

BUT FIRST, A QUICK SURVEY!

- License class?
 - Technician
 - General
 - Advanced
 - Extra
 - Do you chase DX?
 - No
 - Occasionally
 - Actively
 - Do you participate in any DX contests?
 - No
 - Occasionally
 - Often
- 


SURVEY!

(CON'T)

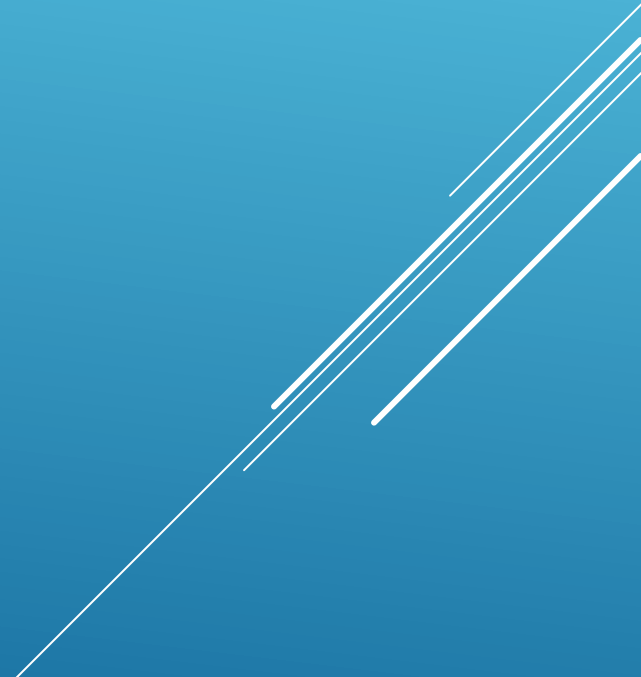
- How many DXCC entities have you worked?
 - Less than 50
 - More than 50 but less than 100
 - At least 100
 - Over 150
 - Over 200
 - Over 250
 - Over 300
 - What modes do you use?
 - SSB
 - CW
 - Digital (FT4, FT8, etc.)
 - RTTY
- 

SURVEY!

(CON'T)

- How much power do you typically run?
 - Five watts or less (QRP)
 - 100 watts or less
 - 500 watts or less
 - Legal limit
 - What antennas do you have for 20-10 meters?
 - Wires (inverted vee, dipole, EFHW, etc.)
 - Vertical
 - Rotatable, directional antennas
 - Rotatable dipole
 - Yagi
 - Quad
 - Hex, Moxon
- 

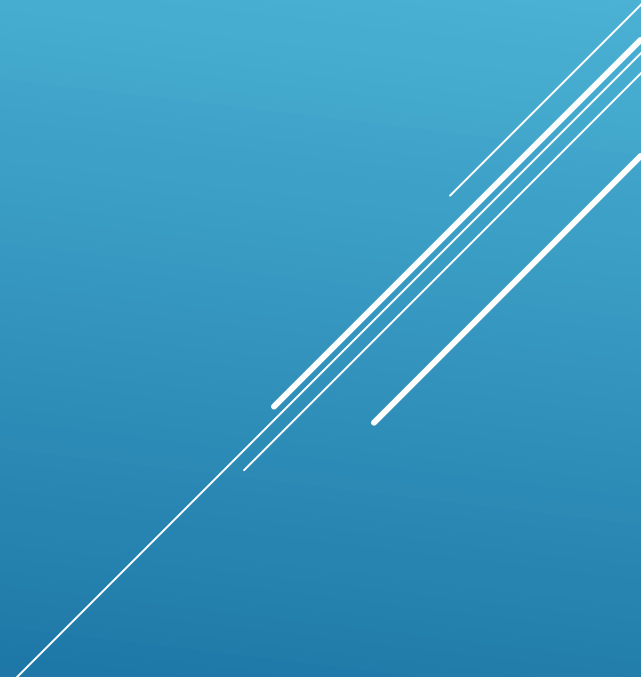
TODAY'S DISCUSSION

- Basics
 - Propagation/characteristics of the bands
 - General tips
 - Pile-ups
 - DXpeditions
 - Packet cluster spotting
 - Split frequency operation
 - Contests
 - Awards
 - Keeping informed
 - QSLing - options
- 
- A decorative graphic consisting of several parallel white lines of varying lengths, slanted upwards from left to right, located in the bottom right corner of the slide.

DISCLAIMER

- I am not a hot-shot operator or “the DXing king”!!!
- Focus on DXing for less experienced operators
 - All license classes and regardless of how long you’ve been licensed
- Tips and philosophies from personal experience
 - Concepts not unique
 - YMMV

NDØC BACKGROUND

- First licensed in 1968
 - Interests/activities:
 - QRP DXing and contesting
 - Summits on the Air (SOTA)
 - Satellites
 - 6 meters
 - Relatively simple station
- 

Recent Contacts

Index	Call	Date	Time	Band	Mode	Power	Time On	Sent	Rec	Country
0000	W4WPD	27Aug2024	18:57	20 CW		5.329	145	18:57	USA	CA, Peter
0006	W4USAP	27Aug2024	18:03	20 CW		5.304	179	18:04	USA	CO, Devon
0007	ZK7	27Aug2024	16:46	15 SSB		5.57	65	16:41	North Mar.	A, ILLU2
0008	CO4E	27Aug2024	15:43	16 SSB		5.35	33	15:44	Costa	Jose
0005	W4YS	27Aug2024	15:29	15 CW		5.329	306	15:28	USA	Ind
0004	ME3A	26Aug2024	22:36	20 USB		5.35	51	22:28	USA	CO, Jedid
0002	V3KCF	26Aug2024	22:12	20 SSB		5.56	55	22:11	Canada	Shaun
0003	T0WVR	26Aug2024	21:58	15 SSB		5.58	57	21:54	Costa Rica	Mario
0011	UT3BA	26Aug2024	21:50	17 SSB		5.35	33	21:50	USA	WA, John
0000	N7R9B	26Aug2024	21:49	17 SSB		5.33	33	21:49	USA	WA
0008	CYRC	26Aug2024	21:41	15 SSB		5.59	39	21:41	28, Paoli	
0009	NCP1	26Aug2024	17:58	20 CW		5.424	589	17:58	USA	AZ, Michel
0002	W0F7E	26Aug2024	17:02	20 CW		5.329	309	17:02	USA	ID, Bill
0000	K4LRJ	26Aug2024	15:31	20 SSB		5.54	54	15:32	USA	NC, John
0005	CYRC	26Aug2024	13:54	20 CW		5.589	589	13:56	28, Paoli	
0004	H4AA	26Aug2024	22:22	15 CW		5.58	58	22:22	USA	CA, Art
0003	3Y1CA	26Aug2024	22:21	20 SSB		5.58	58	22:21	Japan	
0002	NET	26Aug2024	22:26	49 SSB		5.58	58	22:27	USA	AK
0001	PH1	26Aug2024	22:23	20 SSB		5.59	59	22:24	Brazil	
0000	W4W	26Aug2024	22:26	20 SSB		5.58	58	22:26	USA	OH, John
0001	K7SD4	26Aug2024	20:41	20 CW		5.449	309	20:42	USA	AZ, Gary
0000	AD1DZ	26Aug2024	20:37	20 SSB		5.57	33	20:38	USA	WA, Tom

N3FJP Logging Program



Daiwa SWR & Watt Meter



MFJ Tuner



FTdx3000
5 watts



NDØC ANTENNAS

A large Yagi antenna structure is shown against a cloudy sky. The antenna consists of a central boom with several elements extending from it. The background is a blue sky with white clouds. The image is framed by a blue border on the left and right sides.

**Cycle 24* TX-38 tribander Yagi
at 40' - 8 full-length elements,
optimum spacing on 15' boom**

**2 el on 20 M
2 el on 15 M
4 el on 10 M**

* Acquired by DX Engineering – out of production

NDØC ANTENNAS


A tall, lattice-structured antenna tower stands against a sky filled with white and grey clouds. The tower has several horizontal arms extending from its top, with numerous thin wires or cables attached to them. The overall scene is a low-angle shot looking up at the tower.

- Cushcraft D40 40 M dipole at 42'
- Inverted Vee – apex at 38', fed with ladder-line
- M² 6M5X 6 meter Yagi

WHAT IS DX?

- DX = “distant stations”
 - Means different things on different bands
 - HF vs. VHF
- DXing = attempting to work distant stations, i.e. “chasing DX”
 - Fun, addictive, exciting
 - HF bands – involves sky wave propagation
 - Reflecting signals off the ionosphere (more later)
- Different motivation for each DXer

DXING MOTIVATION: WHY CHASE DX?


- An age-old pursuit
 - The thrill
 - Pushing your station to the limit
 - What can be accomplished
 - Bragging to your friends
 - Collecting QSLs
 - Awards
- 

MYTHS

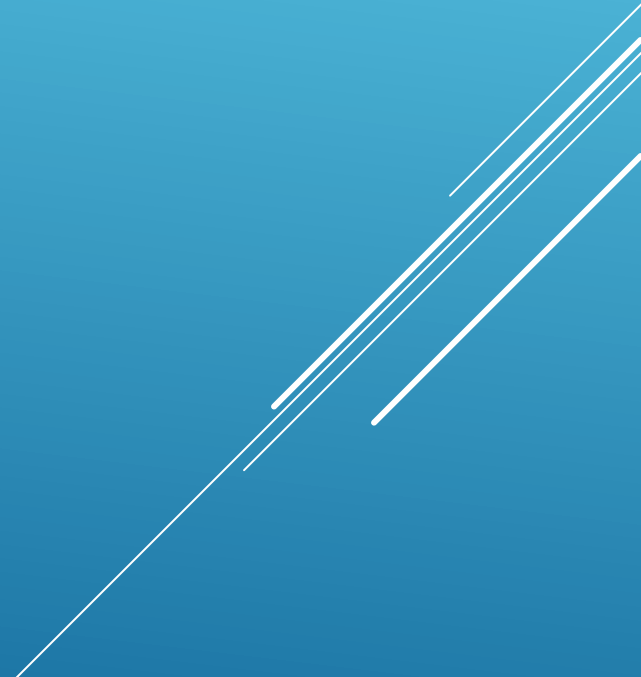
- “You can’t work DX without a big, high antenna”
- “You need a lot of power to work DX”
- “You need an Amateur Extra class license to work DX effectively”
- “You can’t work DX from ‘the black hole’ ”

What is “the black hole”? You are in it!

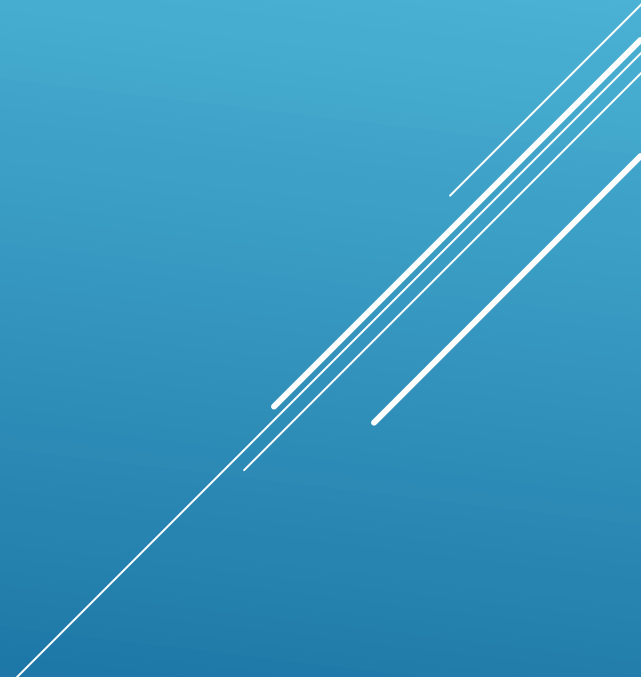
ANTENNAS

- Don't need to be fancy, big, etc.
 - High, in the clear – low SWR
 - Note: 10 meter antennas don't need to be as large/high....
 - Ideally exhibit gain
 - Yagi or similar
 - Dipoles and verticals will work
 - Efficient, low-loss feedlines
 - Good quality coax
 - Ladderline/open line feed for dipoles
- 

MODES

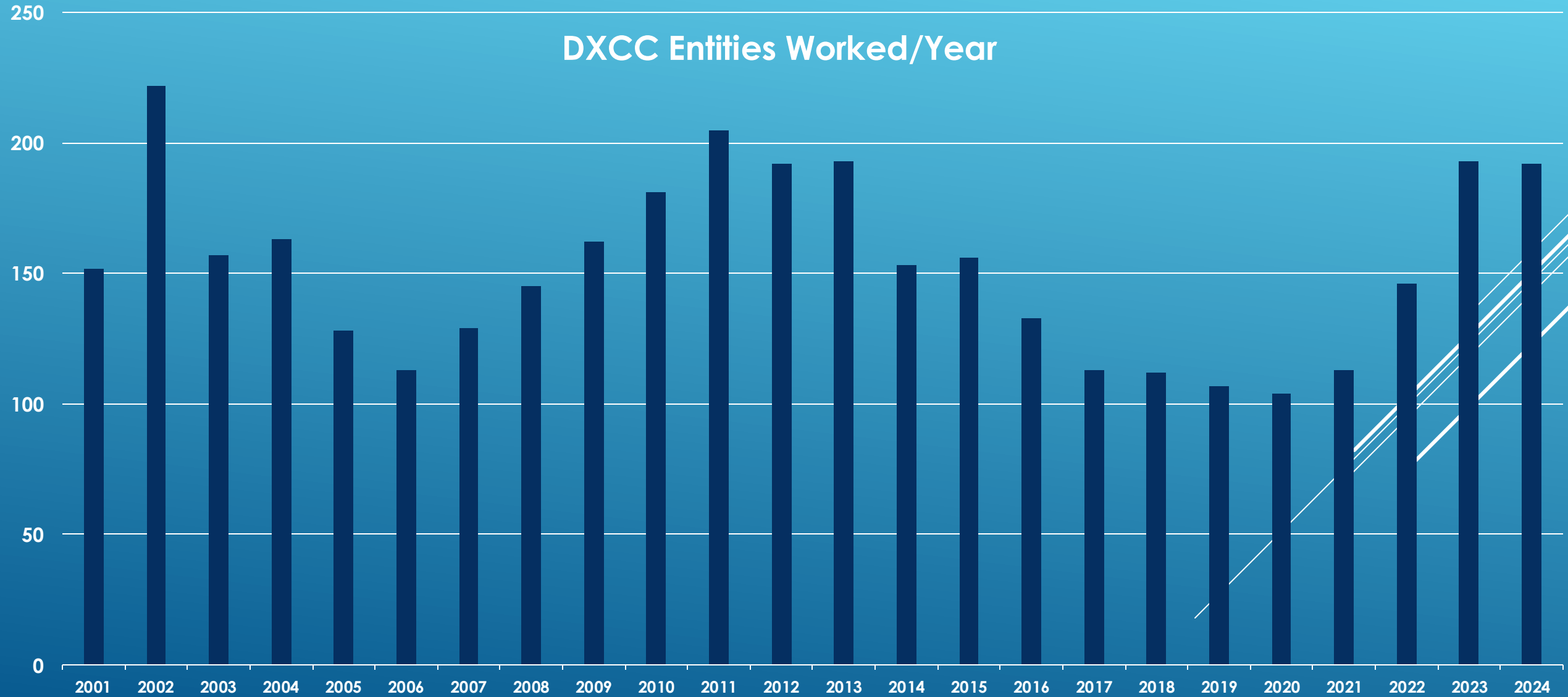
- CW – more efficient than SSB
 - SSB – can be surprising
 - Don't be intimidated!
 - Digital modes, e.g. FT4/FT8
 - Great for “weak-signal” work
 - Personal preference
- 

PROPAGATION

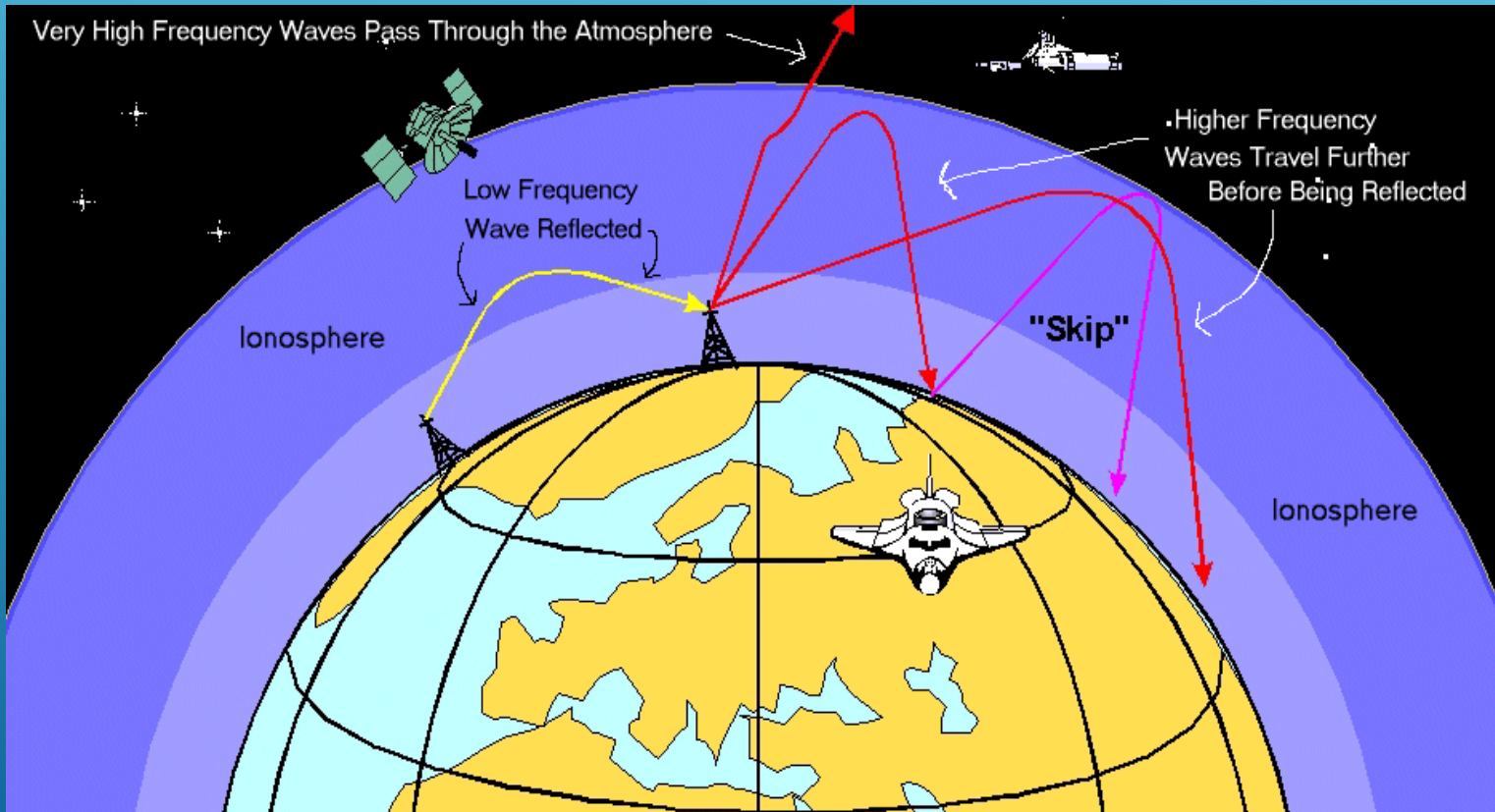
- Understand and utilize the propagation!
 - Which bands are open, when
 - Know what direction to turn the antenna
 - Maximum Useable Frequency (MUF)
 - Variables
 - Location (of both stations)
 - Season of year
 - Monthly variation
 - Daily variation
 - Sunspot cycle (11 years) – peaking now!
- 

THE SUNSPOT CYCLE

DXCC Entities Worked/Year



IONOSPHERIC PROPAGATION



- SIGNALS REFLECTED OFF THE IONIZED F2 LAYER
- "SKIP"
 - Skip zone

PROPAGATION


- MUF is dependent on solar and geomagnetic conditions
 - Solar flux
 - 50 to 300 – higher is better (higher MUF)
 - A index
 - 0 to 400 (major geomagnetic storm)
 - Lower is better!
 - K index
 - 0 to 9 (major geomagnetic storm)
 - Lower is better!

Just because the “numbers” don’t look “good”, don’t assume the conditions are worth getting on!!

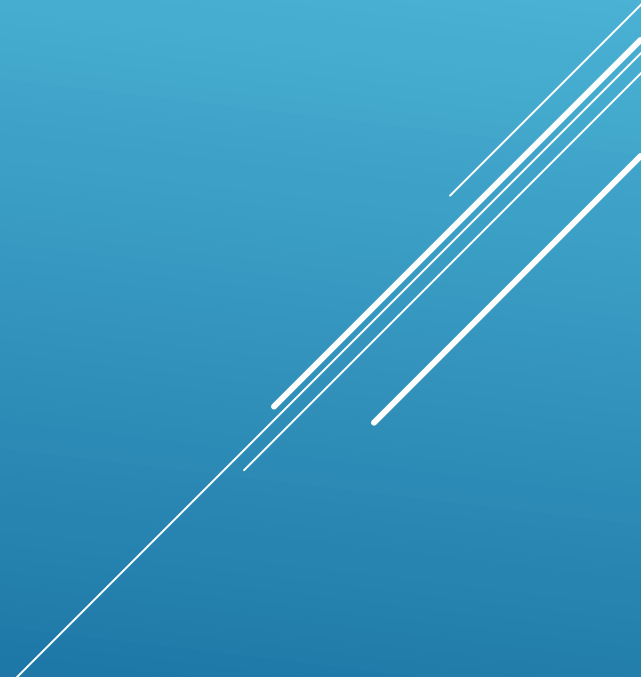
ASPECTS OF PROPAGATION

- Great Circle Bearings
 - Most logging software programs provide
 - Europe – 45 degrees (NE)
 - Japan & Alaska – 315 deg (NW)
 - Caribbean & SA – 120-160 degrees
 - Long path (vs. short path)
 - Echo??
 - Skew path
 - Arctic “flutter”
- 

GENERAL DX CHARACTERISTICS OF THE BANDS

- 10 meters
 - Only HF option for Technicians
 - VHF-like, sporadic E at times, subject to the sunspot number
 - Openings usually limited to daylight
 - “Magic band”
 - Plenty of room (SSB), no restriction on CW sub-band for non-Extras
 - Smaller antennas required
 - 12 meters – similar to 10 meters
 - 15 meters
 - Variable propagation
 - Fairly large band (SSB)
 - 17 meters – similar to 15 meters
- 


GENERAL DX CHARACTERISTICS OF THE BANDS

- 20 meters
 - Daytime and/or night time openings
 - Less “fickle” (as opposed to 10 meters)
 - More crowded
 - Traditional DX band
 - Lot of nets and POTA stations
 - 30 meters
 - Similar to both 40 and 20 meters
 - 40 meters
 - Nighttime band (for DX)
 - 80 meters
 - Nighttime band
- 

PROPAGATION

- General tips (from MN)
 - Europe
 - 10m or 15m in mornings
 - 20m in afternoon/evening
 - South America
 - 10m or 15m – mornings and afternoons
 - Japan, Australia, New Zealand
 - 10m or 15m – afternoon/evening
 - 20m – morning
 - Fall, winter and spring better than summer

DXING: BASIC CONSIDERATIONS

- Understanding/using propagation
 - Good conditions = equalizer
 - Search and pounce
 - More effective than calling CQ DX
 - Develop good skills
 - Suggestion: headset (with microphone)
- 
- A decorative graphic consisting of several parallel white lines of varying lengths, slanted diagonally from the bottom right towards the top right, located in the lower right quadrant of the slide.

CASUAL DXING



- Just “messaging around” – learn by listening!
 - “Garden variety” DX, e.g. western Europe
 - Chatting
- Checking things out
 - Propagation
 - Station
- Practicing skills: **listening, timing**
- Use phonetics on SSB!

CASUAL DXING



- Basic format of a DX contact
 - Calling the DX station
 - Signal report and location
 - Name/equipment/weather - optional
 - Be sensitive to the DX stations “pace”
 - Fast-paced or conversational?
- Manners/ethics
- Language considerations

CHOOSE YOUR BATTLES AND IMPROVE YOUR ODDS OF SUCCESS

- Know the propagation
 - What bands are open? To where?
 - (Being at the right place at the right time!)
 - Focus on the highest open band
- Listening skills, timing
 - Patterns of the DX station
 - Taking “tail-enders”?
- Know the geography and learn the prefixes!
- Call loud stations
 - E.g. S51DX
 - Indication of good propagation
 - Usually have good antenna systems

WHERE DO I HUNT FOR THE DX?

- **General guidelines**
 - CW: lower 30-40 kHz of each band
 - SSB:
 - 10 meters – 28.400 to 28.600 MHz
 - 15 meters – 21.200 to 21.360 MHz
 - 20 meters – 14.150 to 14.275 MHz
 - 40 meters – 7.135 to 7.200 MHz
 - 80 meters – 3.700 to 3.800 MHz
 - FT8 – designated frequency for each band



PILE-UPS!!

You may not be the only person trying to “work” the DX station!



- What is a pile-up?
- Some DX station operators are better at handling pile-ups than others!

“BREAKING” PILE-UPS : (NOT SO) SECRET TIPS AND TACTICS



- Give it a try!
 - Try a couple calls – propagation may favor you
 - SSB – enunciate; good phonetics, speed
 - CW – don't zero beat
- Listen carefully!
 - Responding to partials
- **Timing!**
 - Slight delay
 - “Hit the gaps”
- Don't be a lid!

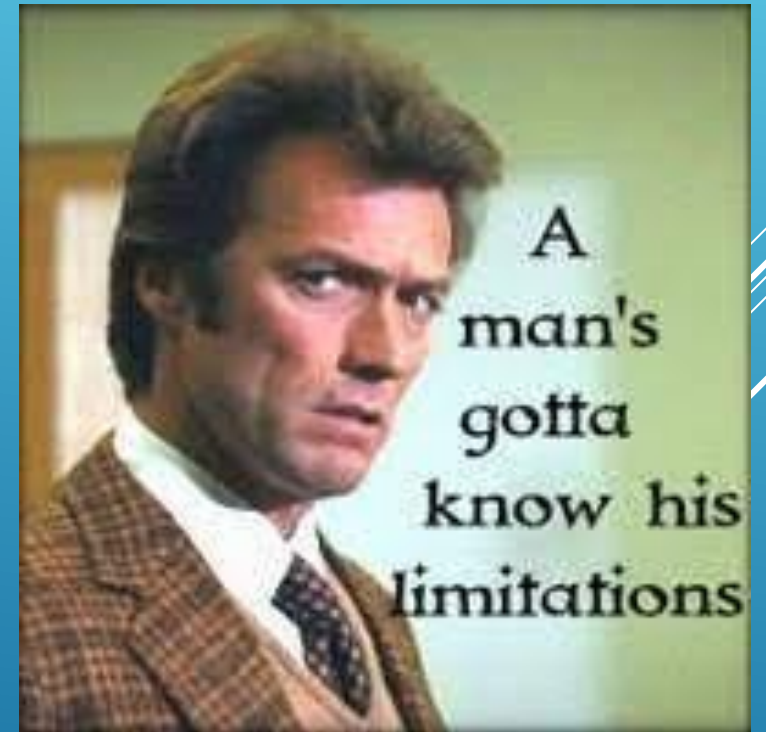


TRYING TO BREAK PILE-UPS : WHEN TO “BAIL OUT”?

There is a difference between being persistent and being obstinate

Sometimes there is a good one close by that hasn't been spotted!!!

- E.g. FR8 with big pile-up



WHEN NOT TO SPEND TIME IN A BIG PILE-UP

Talk
To
The
Hand...



- Huge pile-up & DX station is **not** strong
 - Propagation is not favoring you
 - The DX station is probably running high power
 - Note the frequency – come back later
- Early in a DXpedition's operation
 - 1st couple days

WHEN NOT TO SPEND TIME IN A BIG PILE-UP (CON'T)


- Unruly pile-up
- Packet cluster pile-ups
 - Especially in contests
 - Casual DXing
 - Most DX will have been spotted
 - Turn the big knob!
 - Use your ears and your fingers!

DXPEDITIONS



- One or more hams travel to another country
 - Usually an exotic location or island
 - Often “rare” and desired by DXers
 - Variety of locales
 - Dependable power?, cell service?, etc.
 - Generator power in a desolate location
- Duration of operation varies
- May generate big pile-ups
 - Especially in the first few days

PACKET CLUSTER SPOTTING

- Several websites
 - DXsummit
 - DXwatch.com
 - NG3K – Announced DX operations
 - Improves efficiency (time)
 - Packet cluster pile-ups
 - No replacement for “turning the big knob”
 - Filters (software and cerebral)
 - Propagation guide
- 

[main](#) [user: ND0C](#) [dx spots](#) [announces](#) [statistics](#) [tools](#) [about](#) [support us](#) [contact us](#) [no ads!](#) [logout](#)

Logged in as **ND0C!** *If you aren't ND0C, please [log in](#) or [register](#) if you are a new visitor.*

[show/hide my last filters](#)

band: [160m](#),[80m](#),[60m](#),[40m](#),[30m](#),[20m](#),[17m](#),[15m](#),[12m](#),[10m](#)




















[cancel filter selection](#) / [send a spot](#) / [search spot by callsign](#)

rows to show:

options:

[show/hide](#)

19:24:03 UTC

de	dx	freq	obs	time
SP3VSC	 8Z95ND	14080	FT4 -14dB 1741Hz	1923z 04 Sep
PY1FC	 FY4JI	21240	TNX QSO Thierry, 59 in Rio !!!!! :)	1923z 04 Sep
IW0EFI	 KD4IE	21074	[LoTW] FT8 JN61vp -> EM83	1923z 04 Sep
UR5HVR	 CW200DI	18100	KN69TA<>GF15WC FT8	1923z 04 Sep
W4MTO	 KD9VBP	14255		1923z 04 Sep
F5MNV	 AA5AU	21140	[LoTW] FT4 2432hz tnx	1923z 04 Sep
IU6RKQ	 CO2XN	21287	[LoTW] [NA-015] 59 one elem. delta loop home made	1923z 04 Sep
DL6UAA	 5Z4BU	14254	S9 +20db	1922z 04 Sep
IT9BEZ	 TM0S	14300	[LoTW] 5/9 in sicily	1922z 04 Sep
LU1EAF	 I6JEI	28074	[LoTW] FT8 73!	1922z 04 Sep
EA7IZ	 EG7SDC	3523	[LoTW] SANTNA 2025	1922z 04 Sep
ON4EDG	 F4IUZ	7041.5	[LoTW] PSK 599 JO20hx<>JN05pu	1921z 04 Sep
UR5HVR	 NE8Z	18100	[LoTW] KN69TA<>EN82BK FT8	1921z 04 Sep
EA7XJ	 EG7SV	7095	Diploma Solsticio de Verano	1921z 04 Sep
SQ7FZR	 K6ND	18100	[LoTW] Tnx For Short QSO 73	1921z 04 Sep
G3YPZ	 PP5WX	28010	[LoTW] [SA-026] CW JO02bs -> GG52	1921z 04 Sep
IT9ECY	 IK2JTS	3615	[LoTW] 19.20 DTMBA I 118 LC	1921z 04 Sep
IW0EFI	 K0YA	21074	[LoTW] FT8 JN61vp -> EN11	1920z 04 Sep
SP1MGM	 SW9IL	7014.1	[EU-015]	1920z 04 Sep
EA1EH	 I6PQE	18101.5	IN53SI<>JN63 FT8 Sent: -03 Rcvd: -17	1920z 04 Sep
5B4AIF	 CO8LY	24915	[LoTW] [NA-015]	1919z 04 Sep
EA8DJF	EG8SDC	14070	[LoTW] [AF-004] Santina XLI - PSK31	1919z 04 Sep

IMPORTANT CONSIDERATION

Find the rare/new ones **before** they have been spotted!

- Corollary: turn the big knob on the front of the radio!
- E.g. – lonely VR2XAN calling “CQ Contest” long-path on 10 meters (2024 ARRL DX SSB Test)

CHASING DX STATIONS RUNNING “SPLIT”

- First of all - listen!!!! (E.g. OY1R)
 - **Where is he listening?**
 - “Up 5”
 - Single frequency or a range?
 - Single frequency – techniques similar to simplex
 - CW – don’t zero beat
- Use cluster spots as a guide
 - But don’t trust them

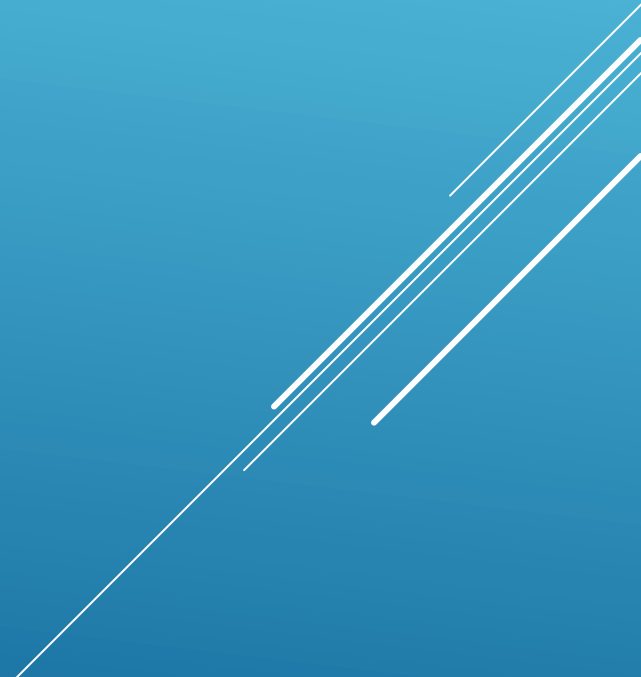
CHASING DX STATIONS RUNNING SPLIT (CON'T)

Receiving over a frequency range, e.g. “up 5-10”

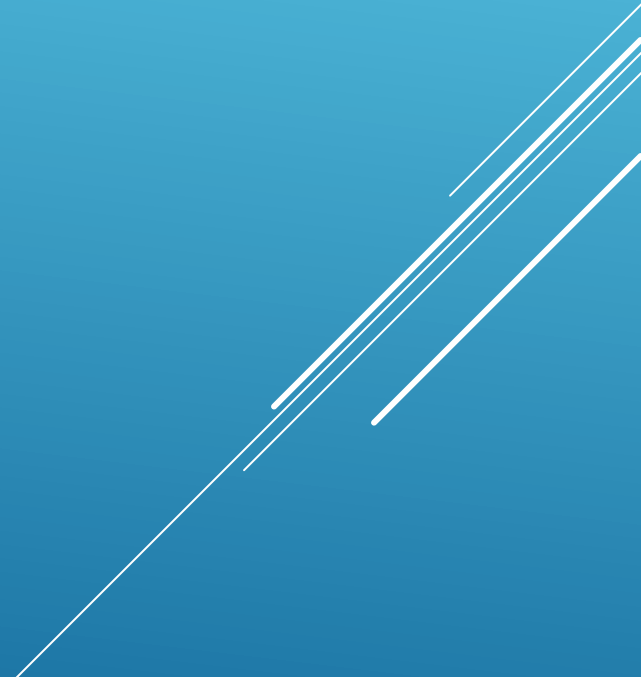
- What is his pattern?
- Zero beating his last contact?
 - Call away from the pile-up frequency
 - Usually higher in frequency

DXING AND CONTESTING: A GREAT MIX!

DX contests

- New DXCC entities
 - New band countries
 - Increased activity
 - The “big ones”
 - CQWW DX Contest
 - ARRL DX Test
 - ARRL 10 Meter Contest
 - CQ WPX Contest
 - Smaller ones, eg. SAC, WAE, AA, VK/ZL
- 

MAJOR DX AWARDS

- WAC (Worked All Continents)
 - 5BWAC
 - DXCC (DX Century Club) – ARRL
 - Endorsable: modes, bands
 - 5BDXCC
 - WAZ (Worked All Zones) – CQ
 - Endorsable: bands/modes
 - 5BWAZ
- 

KEEPING INFORMED - SOURCES:

What stations/countries will be active and when?

(especially DXpeditions)

- NG3K.com – announced DX operations
- ARRL “DX News”
 - Email update – subscription
- “The Daily DX” – subscription
- DX World.net

Announced DX Operations: 2025

[\[About ADXO\]](#) [\[ADXO Text Version\]](#) [\[Abbreviations\]](#) [RSS](#)

[\[Submit a Dxpedition\]](#)

iCal DXCAL: <https://www.danplanet.com/dxcal.ics> (Txn to [KK7DS](#))

Active/Upcoming	Expired	Previous Years
Expired Contest and Special Operations (1996+)		

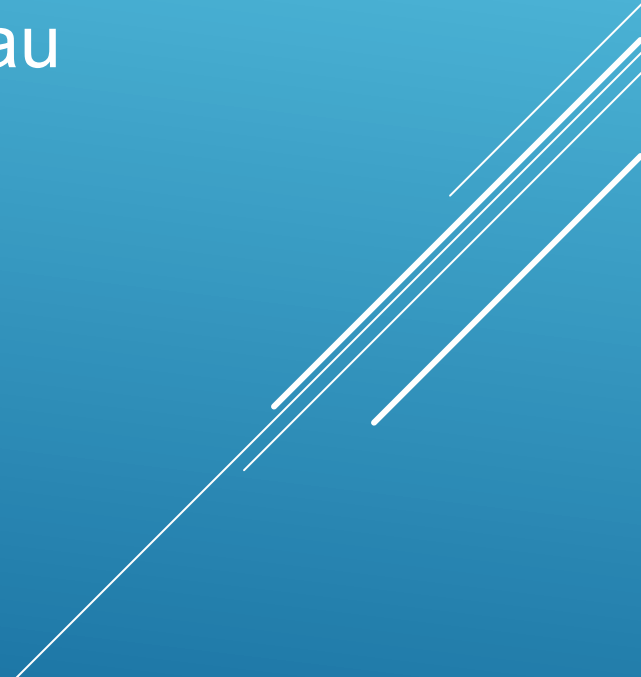
Last updated: Thursday, 04-Sep-2025 11:45:42 EDT

[\[Currently Active Operations\]](#)

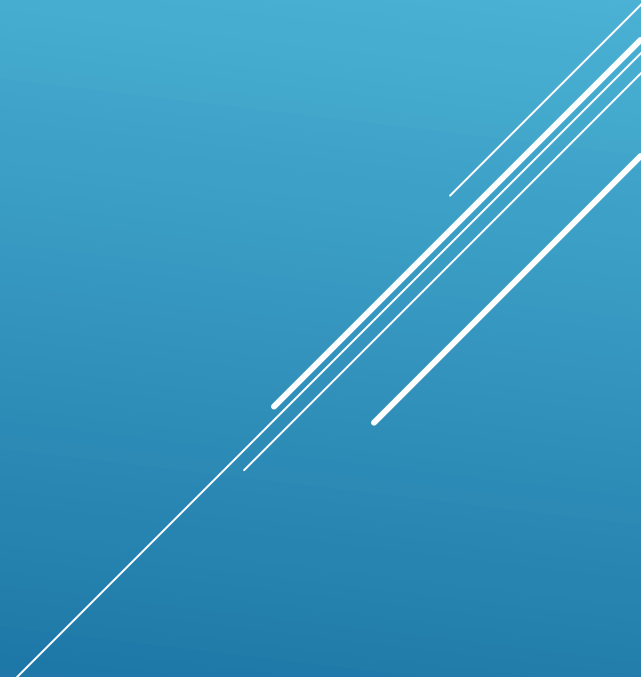
[Spots provided courtesy of [DX Watch](#)]

Start Date	End Date	DXCC Entity	Call	QSL via	Reported by	Info
2025	K	NG3K	NG3K	NG3K	NG3K	NG3K
August						
2025 Aug 18	2025 Sep 07	Benin	TY2AA [spots]	LoTW	DXW Net 20250722	By IK7WUL; 10m; SSB; spare time operation; QSL via I8KHC
2025 Aug 23	2025 Sep 12	Tonga	A35JK [spots]	LoTW	DXW Net 20250825	By JK1JXZ fm Nuku'alofa (AG28ju); 80-6m; QSL via JK1KXZ
2025 Aug 27	2025 Sep 13	Lord Howe I	VK2 [spots]	LoTW	DXW Net 20250726	By SP9FIH as VK2/SP9FIH fm IOTA OC-004 (QF98ml); 30-10m; SSB FT4 FT8
2025 Aug 27	2025 Sep 14	Bermuda	VP9 <small>NEW</small> [spots]	G4OSY	TDDX 20250830	By G4OSY as VP9.G4OSY; @VP9GE; 160-6m; SSB CW
2025 Aug 29	2025 Sep 11	Laos	XW4YY [spots]	LoTW	DXW Net 20250822	By OH7O fm OK18ff; 40 20 17 15 12 10m; SSB FT8; QSL via M0OXO
2025 Aug 30	2025 Sep 08	Dodecanese	SV5 [spots]	DJ5MN	TDDX 20250827	By DJ5MN as SV5/DJ5MN; 40-10m; CW SSB FT8
2025 Aug 30	2025 Sep 08	Faroe Is	OY <small>NEW</small> [spots]	TF1OL	DXW Net 20250830	By TF1OL as OY/TF1OL; HF; FT8
2025 Aug 31	2025 Sep 21	Tanzania	5H3DX [spots]	LoTW	TDDX 20250814	By NK8O; mainly CW, some FT8 FT4; 100w, 5w; spare time operation
September						
2025 Sep 01	2025 Sep 04	Honduras	HR9 [spots]	LoTW	OPDX 20241222	By K6VHF as K6VHF/HR9 fm Roatan I (IOTA NA-057, EK66rh); 80-6m; SSB CW RTTY FT8; 100w; QSL via Club Log OQRS or K6VHF (B/d)

QSLING

- Need to confirm QSOs for awards!
 - Options
 - Paper QSLs – direct/managers/bureau
 - On-line QSLing (OQRS)
 - Clublog, other managers
 - Logbook of the World (LoTW)
 - EQSL
 - Email QSLs
- 

REVIEW

- Basics
 - Propagation
 - General tips
 - Pile-ups
 - DXpeditions
 - Packet cluster spotting
 - Split frequency operation
 - Contests
 - Awards
 - Keeping informed
 - QSLing
- 



NØØC

A QRP Amateur Radio Station

Thanks!

Grid EN23fp Nobles County CQ Zone 4

*Minnesota
USA*