

# Faire de la radio en FT8

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# Le mode FT8

- Inventé par le prix Nobel, Joe Taylor, K1JT
- Existe depuis 2017
- Implémenté dans le programme WSJT-X
- Mode le plus populaire en 2023
- Largeur de bande d'un signal: 50 Hz

Common Frequencies for FT8 & JS8Call			
Band 	Frequencies (MHz)		IARU Region 
	FT8	JS8Call	
160m	1.840	1.842	All
80m	3.573	3.578	All
60m	5.357		
40m	7.056		Region 1
	7.071		
	7.074	7.078	All
30m	10.132	10.130	Region 1
	10.133		
	10.136		All
20m	14.071		
	14.074	14.078	All
	14.090		Region 1
17m	18.100	18.104	All
15m	21.074	21.078	All
	21.091		
12m	24.915	24.922	All
10m	28.074	28.078	All
6m	50.310		
	50.313	50.318	All
	50.323	50.328	All / Intercontinental DX 
4m	70.100		Region 1
4m	70.154		(Countries without access to 70.100)
2m	144.174		All
1.25m	222.065		
70cm	432.065		
70cm	432.174		
23cm	1,296.174		

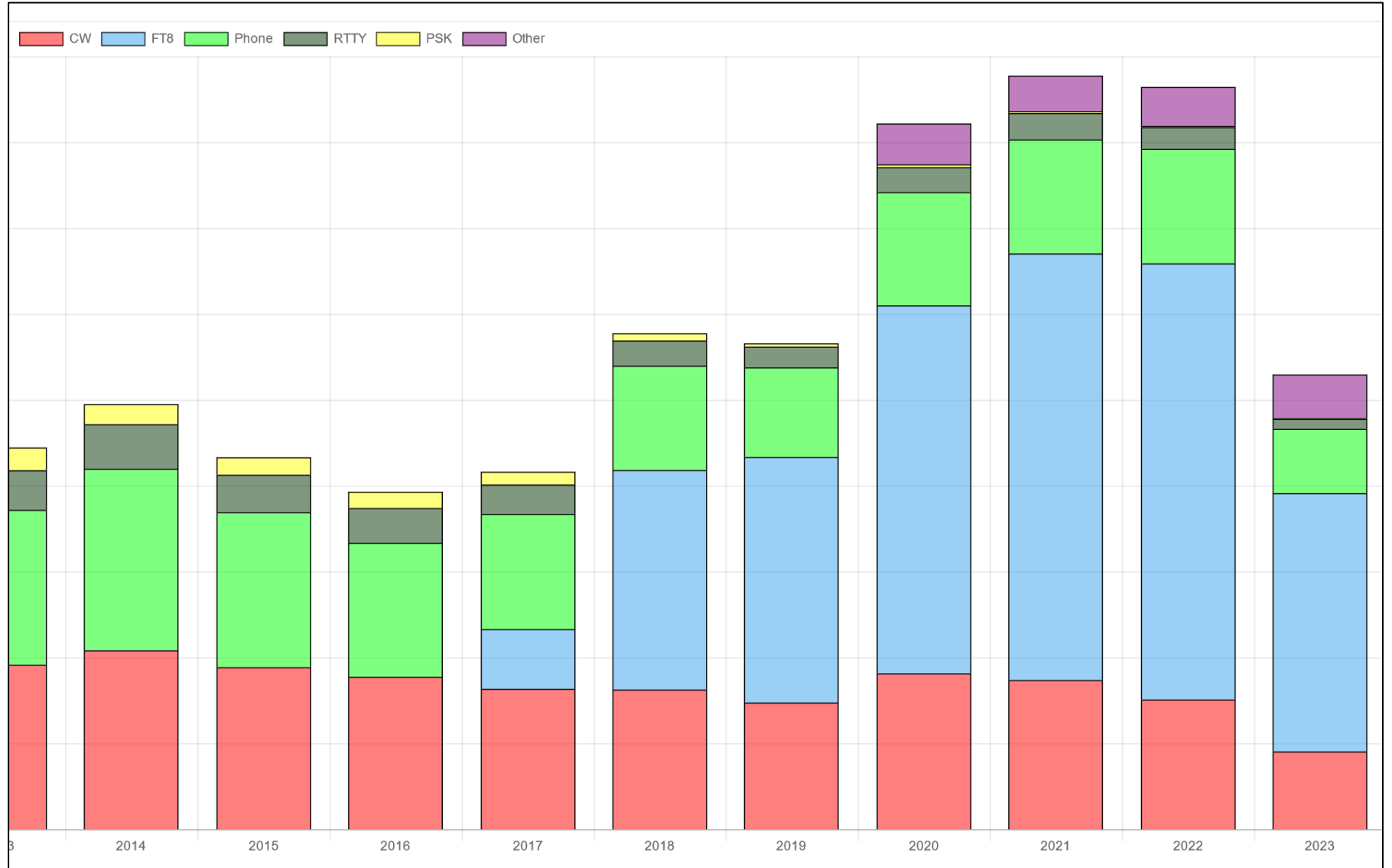
# Le mode FT8

- Efficace
  - +6 dB par rapport à la CW
  - +30 dB par rapport à la SSB
  - 100W FT8 → 400W CW
  - 100W FT8 → 100kW SSB

## Lowest copiable signal-to-noise ratios in 2.5 kHz bandwidth

SSB	+10ish dB
MSK144	-8 dB
CW	-15 dB
<b>FT4</b>	<b>-17½ dB</b>
<b>FT8</b>	<b>-21 dB</b>
JT4	-23 dB
JT65	-25 dB
JT9	-27 dB
QRA64	-27 dB
WSPR	-31 dB

- Clublog stats:



# Avantages

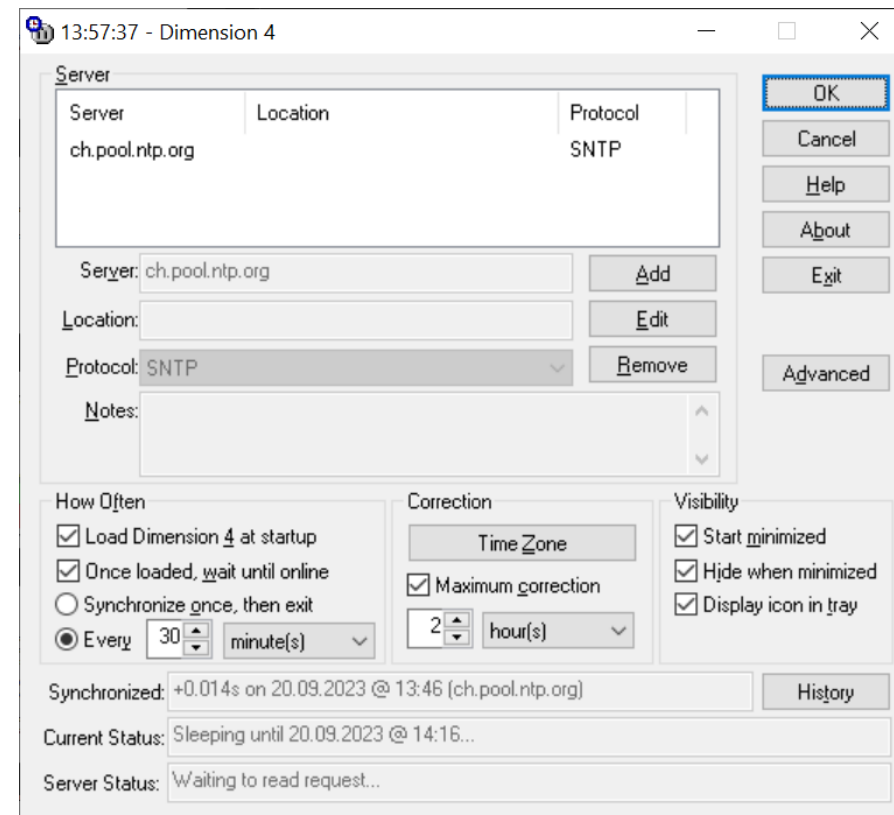
“As someone who has a very limited location for antennas (they are all in the loft!) and for DX (I live in a valley), I’ve found FT8 a brilliant way of achieving QSOs that would be quite impossible with most other modes.”

*Bryan G4KRO*

- Les petites stations peuvent aussi faire du DX
- Pas besoin de beaucoup de puissance pour faire de beaux DX
- Plus facile de faire des nouveaux pays sur les bandes «difficiles» (p.ex. 160m, 6m)
- Moins de dérangement par les QRM/DQRM/QRN
- Mode facile à utiliser (peu de skills, beaucoup de technique)
- Pas de barrière des langues
- Ne dérange pas dans le shack, pas de bruit (vs. SSB, CW)
- On peut faire autre chose pendant les QSO ;-)

# Désavantages

- On a besoin d'un PC
- Installation et réglages initiaux peuvent être compliqués
- Réglages à faire:
  - Niveaux audio (pas de surmodulation)
  - Heure (doit être très précise)
    - → Dimension 4 (NTP server: ch.pool.ntp.org)
  - Connection PTT/CAT avec le transceiver
  - Connection avec le programme de Log
- Compliqué pour les calls spéciaux
- Moins sensible que JT65 / JT9



# Programmes

- WSJT-X <https://wsjt.sourceforge.io/wsjtx.html>
- JTDX <https://sourceforge.net/projects/jtdx/>
  - (pas d'update depuis 1 ½ année)
- MSHV <http://lz2hv.org/mshv>
- WSJT-Z <https://sourceforge.net/projects/wsjt-z/>
- **WSJT-X improved** <https://wsjt-x-improved.sourceforge.io/>
- JTDX improved <https://jtdx-improved.sourceforge.io/>

# Séquence standard en FT8

Typique

Optimisée

Court

CQ HB9HFN JN36  
HB9HFN HB9DX JN47  
HB9DX HB9HFN +01  
HB9HFN HB9DX R+05  
HB9DX HB9HFN RRR  
HB9HFN HB9DX 73

CQ HB9HFN JN36  
HB9HFN HB9DX JN47  
HB9DX HB9HFN +01  
HB9HFN HB9DX R+05  
HB9DX HB9HFN RR73  
*(HB9HFN HB9DX 73)*

CQ HB9HFN JN36  
HB9HFN HB9DX +05  
HB9DX HB9HFN R+01  
HB9HFN HB9DX RR73



# Séquence standard en FT8

- 1 période = 15 sec
- RRR:

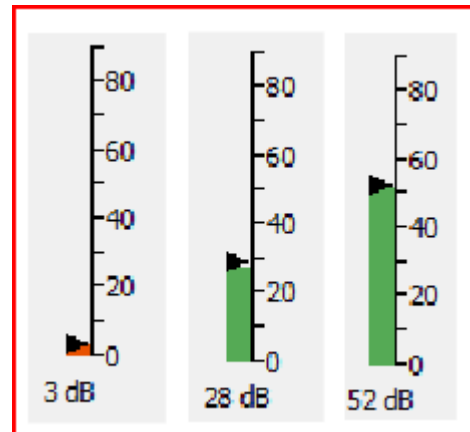
Generate Std Msgs	Next	Now
T22T HB9HFN JN36	<input type="radio"/>	Tx 1
T22T HB9HFN -15	<input type="radio"/>	Tx 2
T22T HB9HFN R-15	<input type="radio"/>	Tx 3
T22T HB9HFN RRR	<input checked="" type="radio"/>	Tx 4
T22T HB9HFN 73	<input type="radio"/>	Tx 5
CQ HB9HFN JN36	<input type="radio"/>	Tx 6

- RR73:  
*Double-click  
sur le  
bouton Tx 4*

Generate Std Msgs	Next	Now
T22T HB9HFN JN36	<input type="radio"/>	Tx 1
T22T HB9HFN -15	<input type="radio"/>	Tx 2
T22T HB9HFN R-15	<input type="radio"/>	Tx 3
T22T HB9HFN RR73	<input checked="" type="radio"/>	Tx 4
T22T HB9HFN 73	<input type="radio"/>	Tx 5
CQ HB9HFN JN36	<input type="radio"/>	Tx 6

# Niveau RX

- Sur une bande sans signaux,  $\sim 30$  dB



# Le mode FT8 Fox & Hound: « Renard, Chiens »

- Un mode opératoire particulier qui permet aux Dxpéditions de réaliser des QSO en FT8 à un rythme très élevé
- En mode FT8 Dxpédition, les QSO entre la Dxpédition (**Fox**) et les stations appelantes (**Hounds**) peuvent être réalisés avec rien de plus qu'une seule transmission par QSO du **Fox**
- Les **Fox** peuvent émettre jusqu'à 5 signaux simultanés
- 1 transmission = ~100 QSO / heure, 5 = ~500 QSO / heure
- Le mode Fox & Hound ne doit pas être utilisé dans les sous-bandes FT8 habituelles.

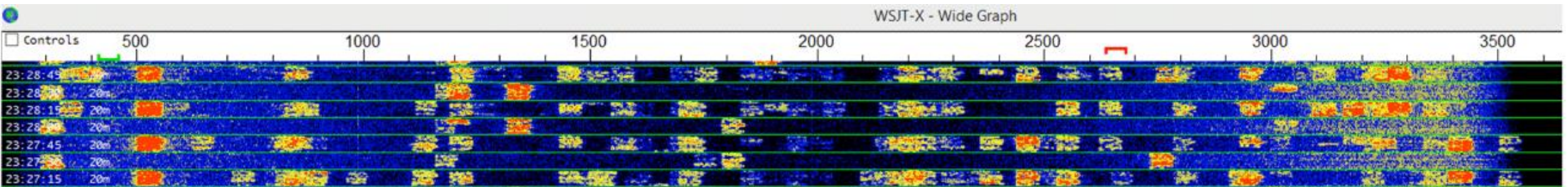
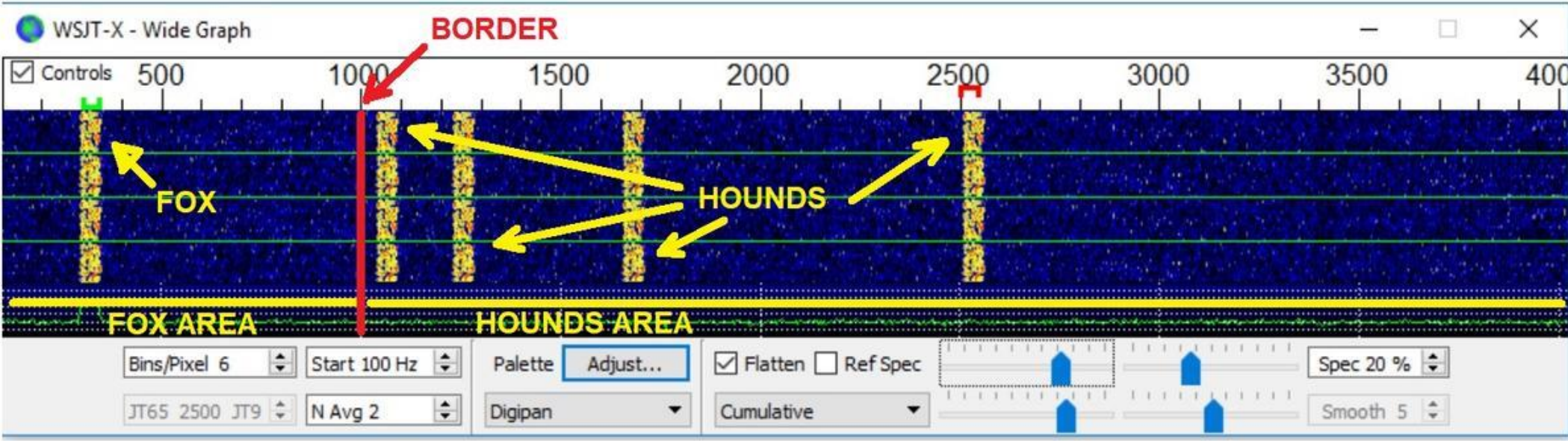
# Le mode FT8 Fox & Hound: « Renard, Chiens »

- Le **Fox** transmet sur des fréquences audio **entre 300 et 900 Hz**
- Le **Fox** transmet pendant les périodes paires (« even / 1st»)
- Quand il transmet plusieurs signaux simultanés, ceux-ci sont espacés à des intervalles de 60 Hertz
- Les **Hounds** lancent leur appel initial n'importe où dans la gamme 1000-4000 Hz → **Tx > 1000 Hz!**
- Après 3 minutes il faut réenclencher le « Enable Tx » car il y a un timeout dans WSJT-X (6 minutes dans WSJT-X improved)
- Ce n'est pas le watchdog standard!



Runaway Tx watchdog

# Le mode FT8 Fox & Hound: « Renard, Chiens »



Fox (even times)
GAP
Hounds calling (odd times)
--> to 4000  
Hounds in QSO (odds)

# Le mode FT8 Fox & Hound

- Bouton «H»

The screenshot shows the WSJT-X v2.7.0-rc2 interface. The main window is titled "Band Activity" and contains two tables of received messages. The left table shows a list of messages with columns for UTC, dB, DT, Freq, and Message. The right table shows a list of messages with columns for UTC, dB, DT, Freq, and Message. The frequency display shows 10.136 000. The control panel includes buttons for "CQ only", "Log QSO", "Stop", "Monitor", "Erase", "Decode", "Enable Tx", "Halt Tx", "Tune", and "Menus". A blue arrow points to the "H" button in the control panel. The interface also displays a date and time "2023 sept. 21 14:11:02" and a power level "41 dB".

UTC	dB	DT	Freq	Message
141045	0	0.1	1450	~ T22T UW2ZM KN57
141045	0	0.4	2068	~ T22T LA1TV JO49
141045	12	0.4	835	~ DL6LBI PG5FRL JO22
141045	13	0.4	1193	~ DL6LBI <F/OT4N> +10
141045	-9	1.1	654	~ C21TS R5RC -11
141045	-13	1.0	2827	~ C21TS UB4Y LO36
141045	17	0.1	1770	~ EA1FQC DM9BJF RR73
141045	-9	0.4	1904	~ T22T RX6CC KN96
141045	-4	0.4	1326	~ I2WSG DH8TOM R-13
141045	-8	0.3	932	~ CQ IS0YHV JM49
141045	-16	0.3	904	~ C21TS UA6EC LN14
141045	-12	0.2	1591	~ CQ CT2FFC IM59
141045	-3	0.4	829	~ T22T OH6VC KP10
141045	-8	0.4	1800	~ C21TS UT5ZC 73
141045	-11	1.9	2294	~ T22T N6TA CN72
141045	-5	0.6	1981	~ CQ HA3PT JN96

UTC	dB	DT	Freq	Message
140115	-3	0.5	2732	~ C21TS RA1WU KO47
140145	4	0.5	2732	~ C21TS RA1WU KO47

# Le mode FT8 Fox & Hound

- A savoir!

If the **fox** responds to your call with his Tx 2 message (your callsign and report), **your system will automatically QSY your Tx to a frequency below 1000 Hz<sup>35</sup>** to send him your Tx 3 message (both callsigns, R and his report). If you don't have CAT control, you should QSY manually below 1,000 Hz to make the QSO unless the DXpedition op is alert enough to complete it manually.

# Le mode FT8 Fox & Hound

- Attention:
  - K3: toujours sur «Fakelt» !
  - FLEX: rien

The screenshot shows the WSJT-X interface with a log of QSOs. A dialog box is open with the following text: "Operation in FT8 DXpedition mode normally requires \*Split\* rig control (either \*Rig\* or \*Fake It\* on the \*Settings | Radio\* tab.)". The log shows several QSOs, with the following entries highlighted in green:

Time	Offset	Power	Mode	Call	Grid
15 -1	0.4	2068	~	T22T LA1TV	JO49
15 -3	0.4	2120	~	GM4ZMK	EA1IOK 73
15 -14	0.3	2377	~	C21TS UA3GX	R-23
15 -3	0.3	1722	~	C21TS RW1CW	KO59
15 -21	0.7	1447	~	T22T RZ6HNP	LN14
15 -17	0.4	1529	~	T22T YB2TS	OI52
15 -17	0.3	1150	~	ES4RTK	SA7GBS R+
15 -22	0.3	229	~	C21TS R6FIT	LN13
15 -6	-0.5	939	~	C21TS RX6AM	KN84
15 -16	0.4	982	~	T22T UR1HR	KO60

Below the log, the interface shows a frequency of 10.136 000 and a signal strength of 41 dB. The DX Call field contains "T22T HB9HFN JN".

control-E  
shift-E

The screenshot shows the WSJT-X interface with a log of QSOs. A dialog box is open with the following text: "Operation in FT8 DXpedition mode normally requires \*Split\* rig control (either \*Rig\* or \*Fake It\* on the \*Settings | Radio\* tab.)". The log shows several QSOs, with the following entries highlighted in green:

Time	Offset	Power	Mode	Call	Grid
30 -14	1.5	531	~	CQ SP9DPM/P	KN09
30 -14	0.4	188	~	CQ 4X1UF	KM72

Below the log, the interface shows a frequency of 10.131 000 and a signal strength of 41 dB. The DX Call field contains "T22T". The DX Grid field contains "2023 sept. 21 15:00:17". The Hound field contains "Hound".

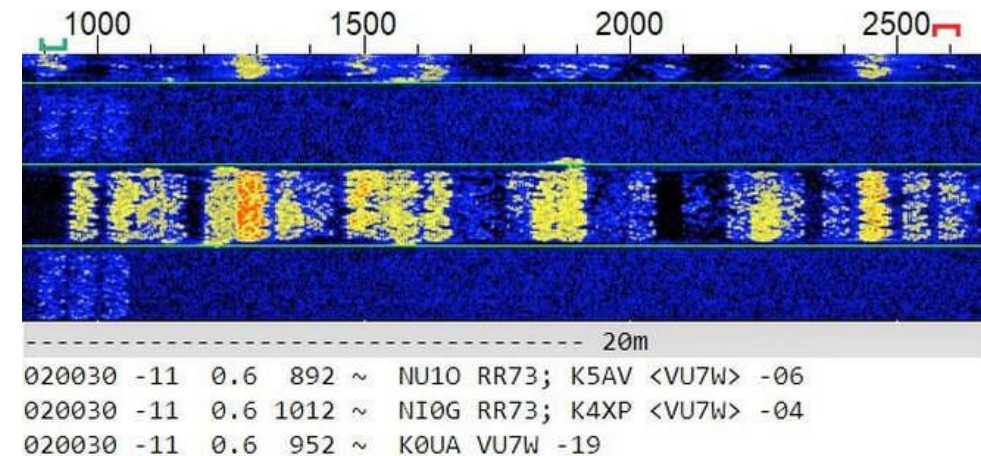
- Cas 3Y0J:
  - Heure fausse (+ 15s)
  - → Mauvaise période



# Le mode FT8 Fox & Hound

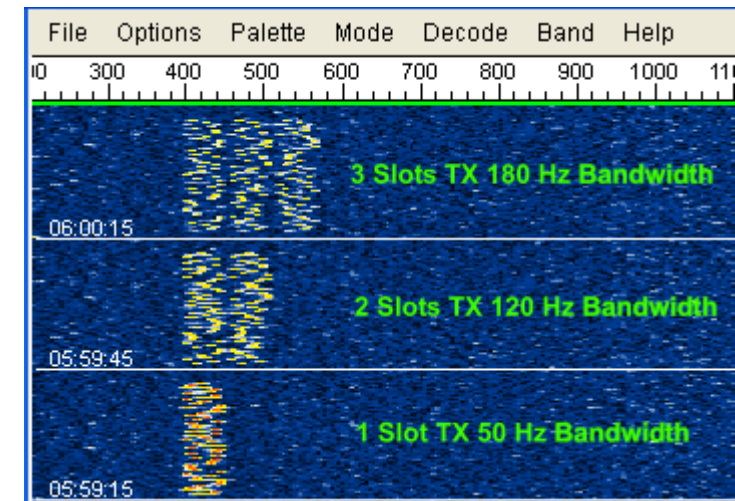
- Séquence typique:

Fox	Hounds
1. CQ KH1/KH7Z	
2.	KH7Z K1ABC FN42, KH7Z W9XYZ EN37, ...
3. K1ABC KH7Z -13	
4.	KH7Z K1ABC R-11
5. K1ABC RR73; W9XYZ <KH1/KH7Z> -17	
6.	KH7Z W9XYZ R-16
7. W9XYZ RR73; G4AAA <KH1/KH7Z> -09	
8. ...	



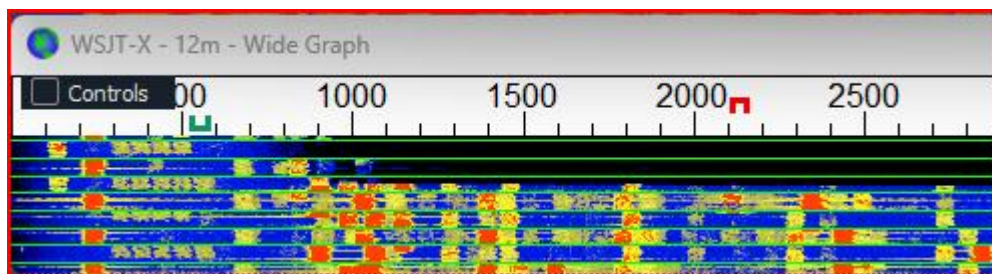
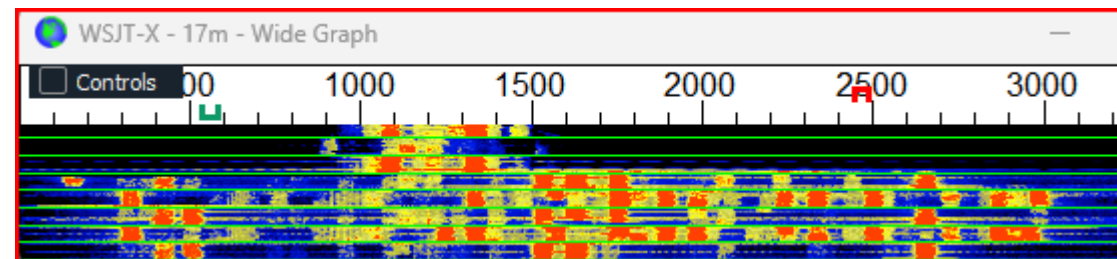
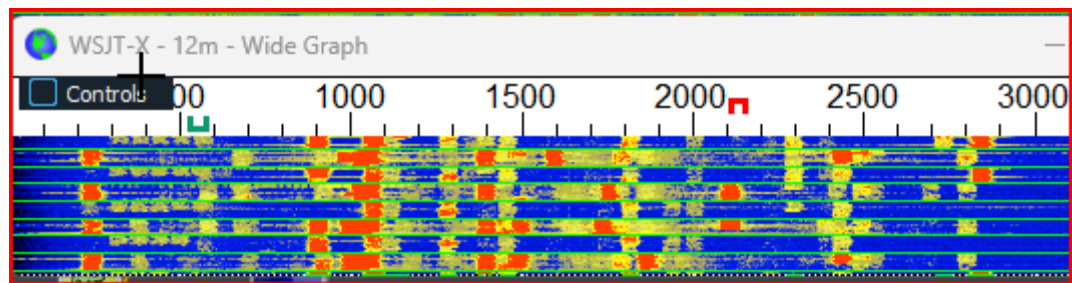
# Le cas de MSHV en mode multistream

- «Multi Answering Auto Seq Protocol FT8»
- 1 à 5 QSO en parallèle
- Peut utiliser les bandes standards (?)
- Utilise le protocole d'un QSO en FT8 standard → 1 message par slot
- N'importe quelle période (even,odd)
- N'importe quelle fréquence audio du spectre
- On peut répondre n'importe où
- Cause de confusion!



# Trucs et astuces

- Utilisation des filtres de votre radio



# Trucs et astuces

The screenshot displays the WSJT-X software interface. At the top, a 'Wide Graph' window shows a frequency spectrum from 500 to 3500 Hz. Below it, the main window title is 'WSJT-X v2.7.1-devel by K1JT et al.' with a menu bar including File, Configurations, View, Mode, Decode, Save, Tools, and Help.

The interface is divided into two main sections: 'Band Activity' on the left and 'Rx Frequency' on the right. Both sections contain tables with columns for UTC, dB, DT, Freq, and Message.

**Band Activity Table (Left):**

UTC	dB	DT	Freq	Message
104000	-13	0.1	702	~ CQ 7Q7EMH KH67
----- 10m				
104030	-2	0.1	702	~ CQ 7Q7EMH KH67
104030	-20	0.3	479	~ JT1BV F4DXX RR73
----- 10m				
104100	10	-0.4	634	~ G3XWH R6FFB LN14
104100	-11	0.2	702	~ CQ 7Q7EMH KH67
104100	-17	0.4	380	~ CQ DX S57ZS JN65
----- 10m				
104130	6	-0.4	634	~ G3XWH R6FFB LN14
104130	-16	0.4	380	~ CQ DX S57ZS JN65
104130	-13	0.1	702	~ CQ 7Q7EMH KH67
----- 10m				
104200	-11	0.1	702	~ CQ 7Q7EMH KH67
104200	-15	0.4	380	~ CQ DX S57ZS JN65
104200	-17	-0.1	365	~ IW9GDC RR73; HB9HFN <T22T> -08 a2
----- 10m				
104230	-4	0.4	613	~ HL5NTR LW7DXQ -15
104230	-15	0.4	380	~ CQ DX S57ZS JN65
104230	-10	-0.1	304	~ R7LV T22T +07
104230	-7	0.1	701	~ CQ 7Q7EMH KH67
104230	-13	0.1	548	~ TA8H DO3NN JN59
104230	-20	0.2	773	~ SP5DFG PT2ND -13
----- 10m				
104300	-10	1.1	729	~ <...> EA1FCF R-22
104300	-14	0.4	380	~ CQ DX S57ZS JN65
104300	-11	0.2	701	~ CQ 7Q7EMH KH67
104300	-11	0.1	549	~ TA8H DO3NN JN59

**Rx Frequency Table (Right):**

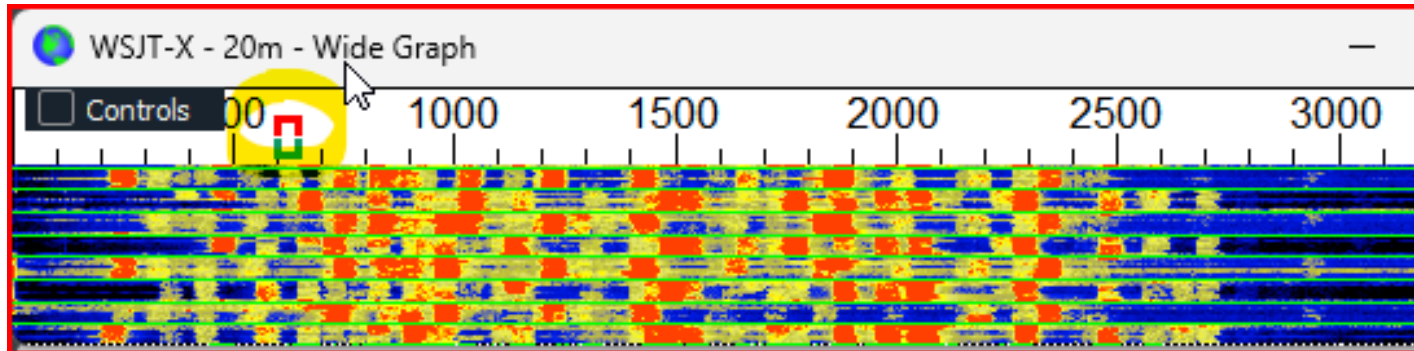
UTC	dB	DT	Freq	Message
103815	-2	0.4	307	~ T22T I4SJZ R-22
103830	-13	-0.0	305	~ SV1IW T22T -04
103845	Tx		2232	~ T22T HB9HFN JN36
103952	Tx		2232	~ T22T HB9HFN JN36
104000	-15	0.0	306	~ CQ T22T RI91
104015	Tx		2232	~ T22T HB9HFN JN36
104045	Tx		2232	~ T22T HB9HFN JN36
104115	Tx		2232	~ T22T HB9HFN JN36
104145	Tx		2232	~ T22T HB9HFN JN36
104200	-17	-0.1	365	~ IW9GDC RR73; HB9HFN <T22T> -08 a2
104215	Tx		365	~ T22T HB9HFN R-17
104245	Tx		665	~ T22T HB9HFN R-17
104315	Tx		665	~ T22T HB9HFN R-17

At the bottom of the interface, there are control buttons: Log QSO, Stop, Monitor (highlighted in green), Erase, Decode, and Enable Tx. Below these buttons, a frequency display shows '28.074 000' and a mode dropdown is set to '10m'. A 'Tx 665 Hz' indicator is also visible.

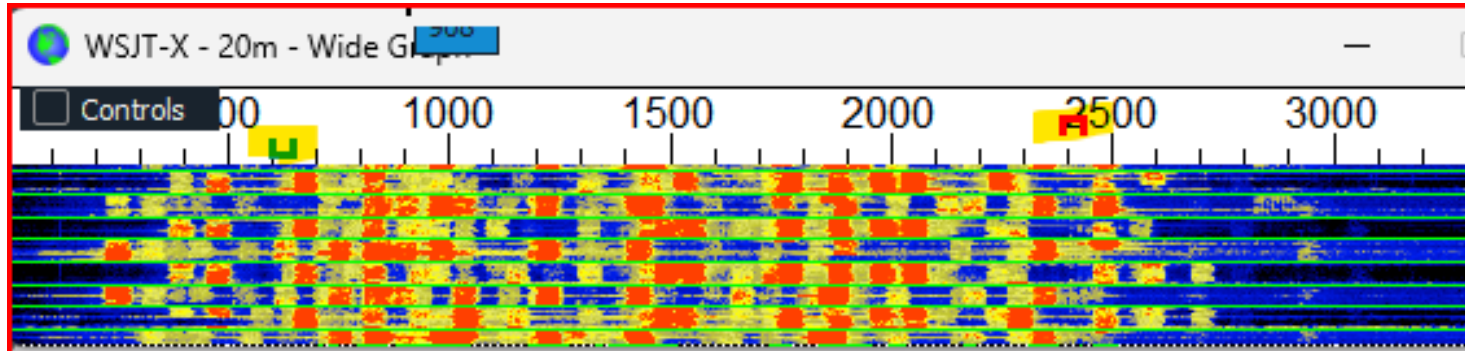
# Trucs et astuces

- Toujours faire du split!

- Non:

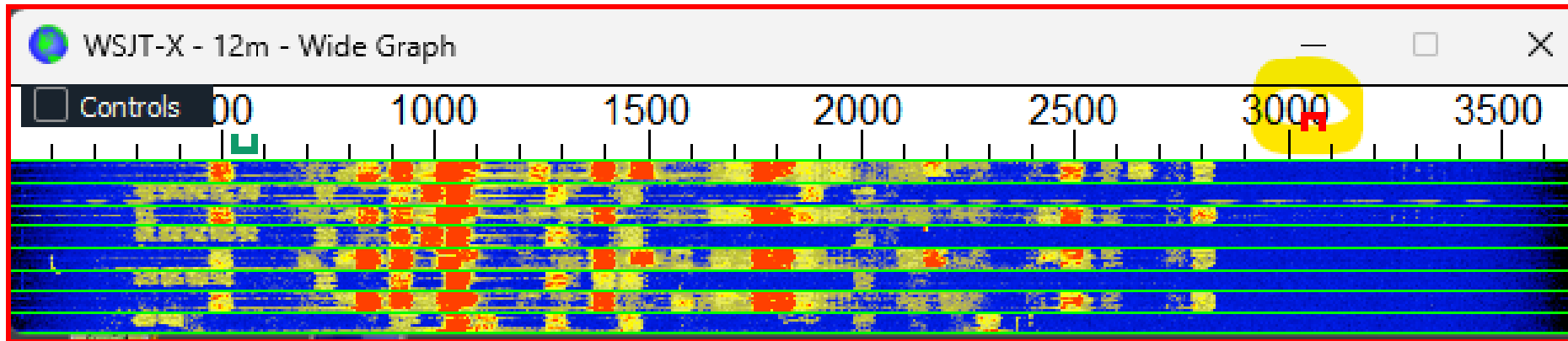


- Oui:



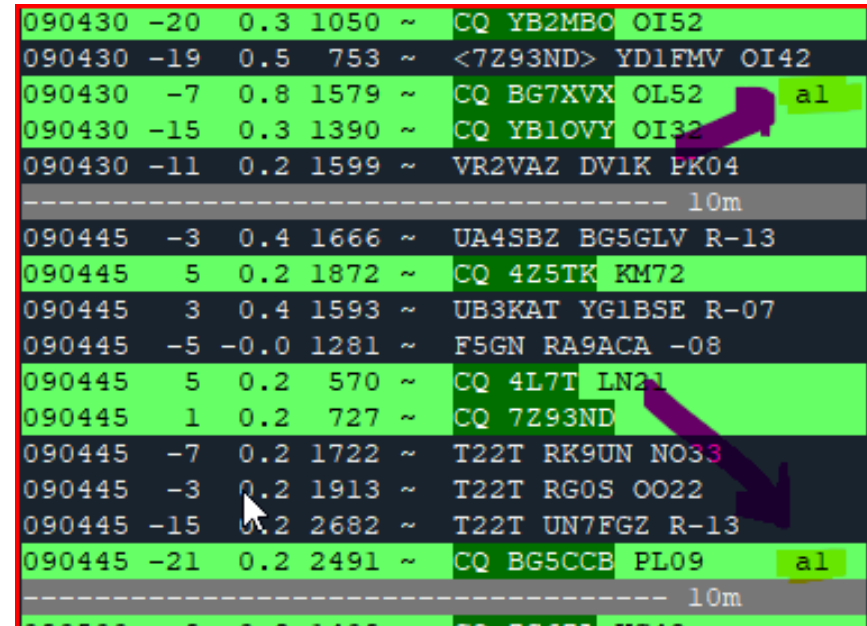
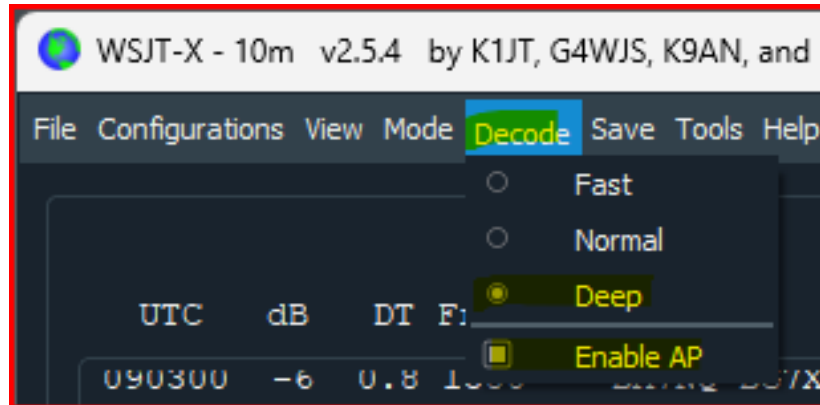
# Trucs et astuces

- Appeler haut en fréquence  
→ Mais être sûr que la station DX nous entend!



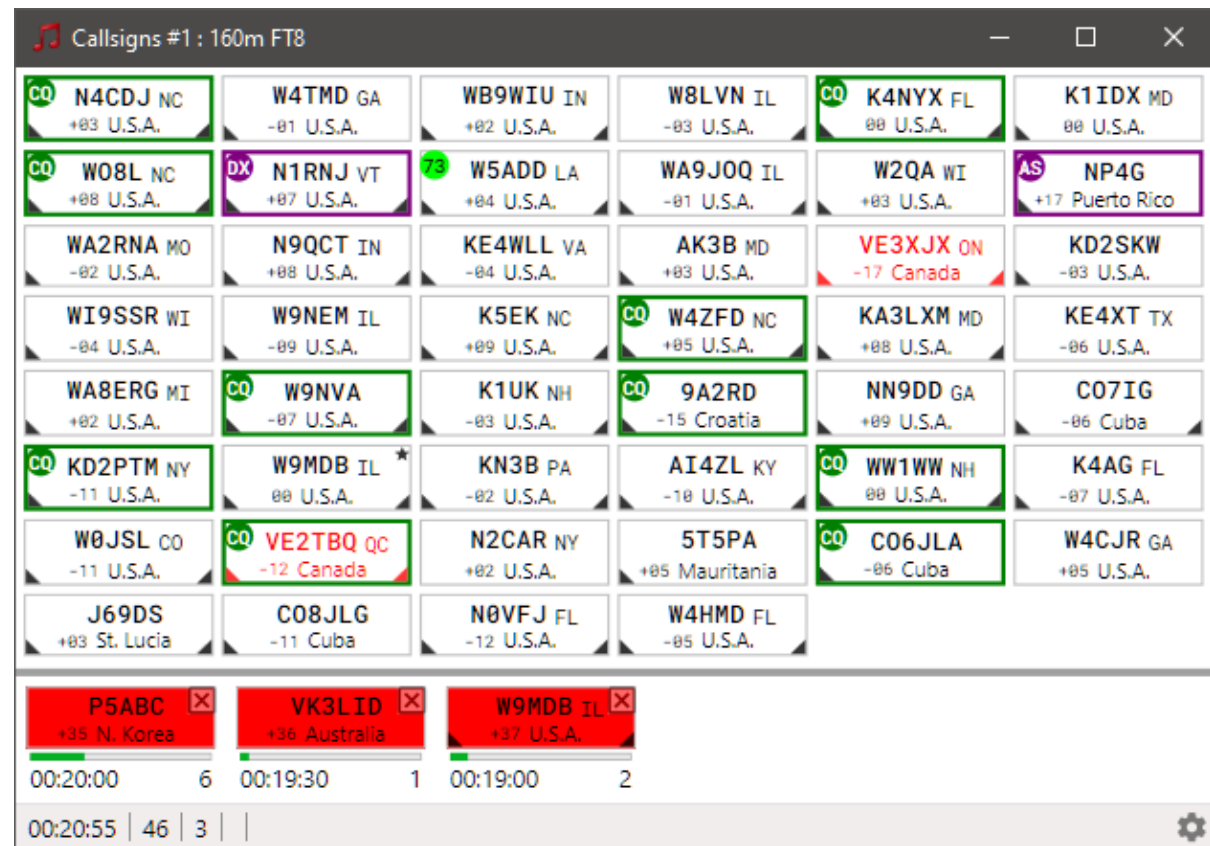
# Trucs et astuces

- AGC: ON / Slow
- WSJT-X: Deep / Enable AP (A Priori)



# Alarmes et Log

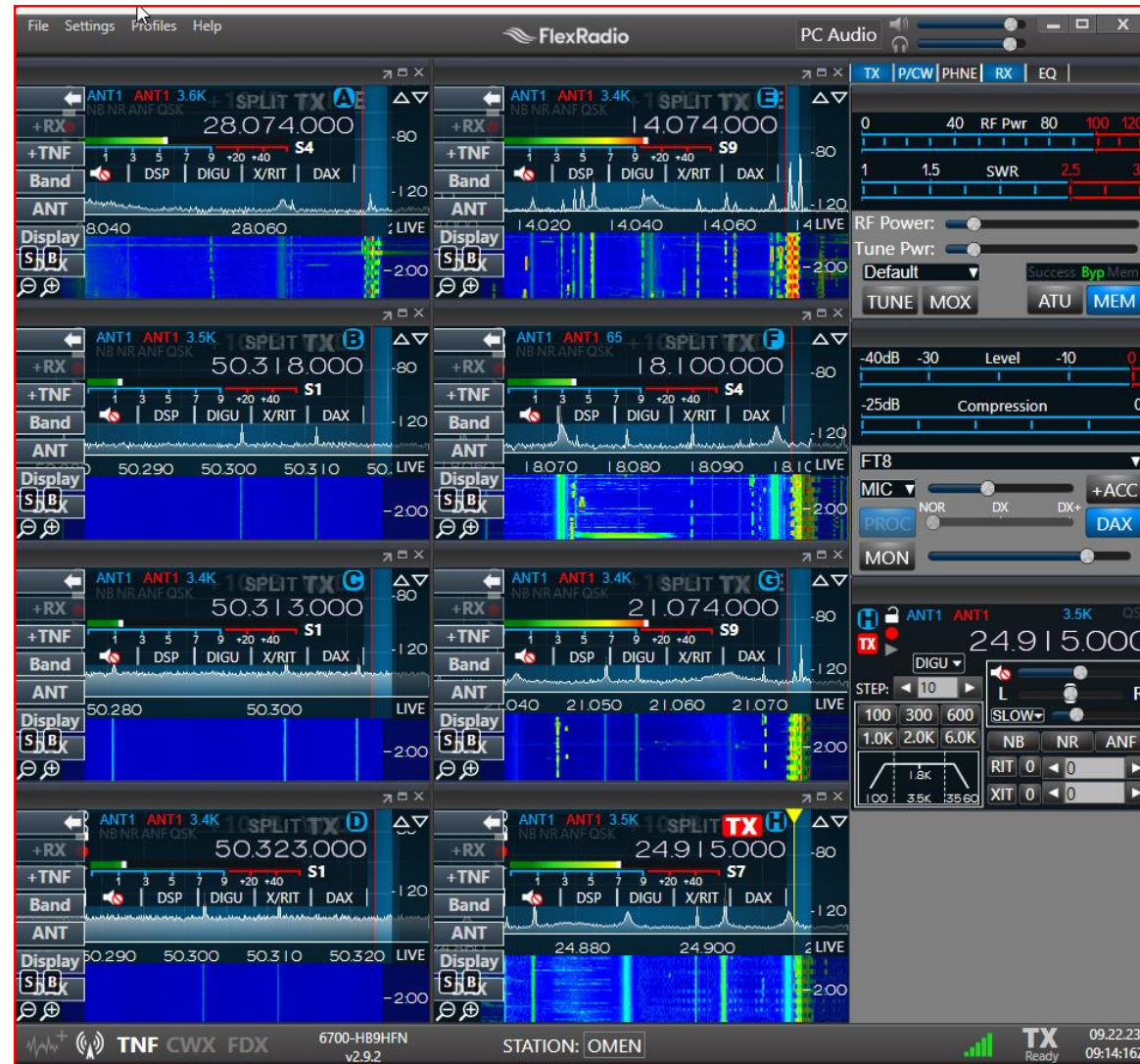
- JT-Alert: <https://hamapps.com/JTAlert/>
- Interface avec:
  - DXLab DXKeeper
  - HRD v5/v6
  - Log4OM
  - ACLog





# Multiple récepteurs

- FLEX-6700
  - 8 RX
- FLEX-6600
  - 4 RX



# Multiple récepteurs

## Démarrage des applications (Windows) (1)

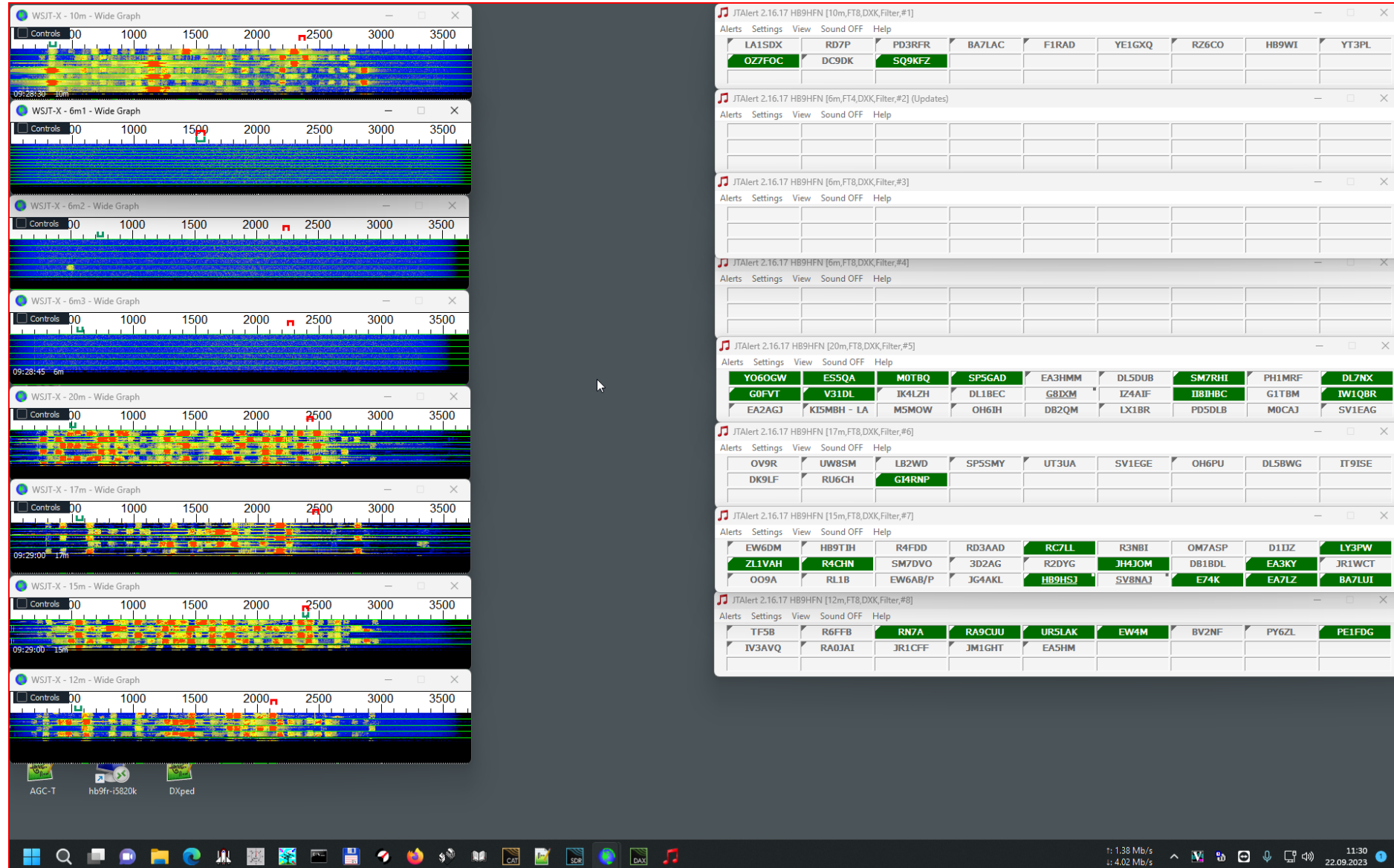
```
taskkill /im JTAlert.exe /t /f
taskkill /im JTAlertHelper.exe /t /f
taskkill /im JTDecodesHistory.pl /t /f
taskkill /im jt9.exe /t /f
taskkill /im wsjtx.exe /t /f
```

```
start "" /d "c:\ham\wsjtx\bin\" wsjtx.exe -r 10m
timeout 6
start "" /d "c:\ham\wsjtx\bin\" wsjtx.exe -r 6m1
timeout 6
start "" /d "c:\ham\wsjtx\bin\" wsjtx.exe -r 6m2
timeout 6
start "" /d "c:\ham\wsjtx\bin\" wsjtx.exe -r 6m3
timeout 6
start "" /d "c:\ham\wsjtx\bin\" wsjtx.exe -r 20m
timeout 6
start "" /d "c:\ham\wsjtx\bin\" wsjtx.exe -r 17m
timeout 6
start "" /d "c:\ham\wsjtx\bin\" wsjtx.exe -r 15m
timeout 6
start "" /d "c:\ham\wsjtx\bin\" wsjtx.exe -r 12m
```



# Multiple récepteurs

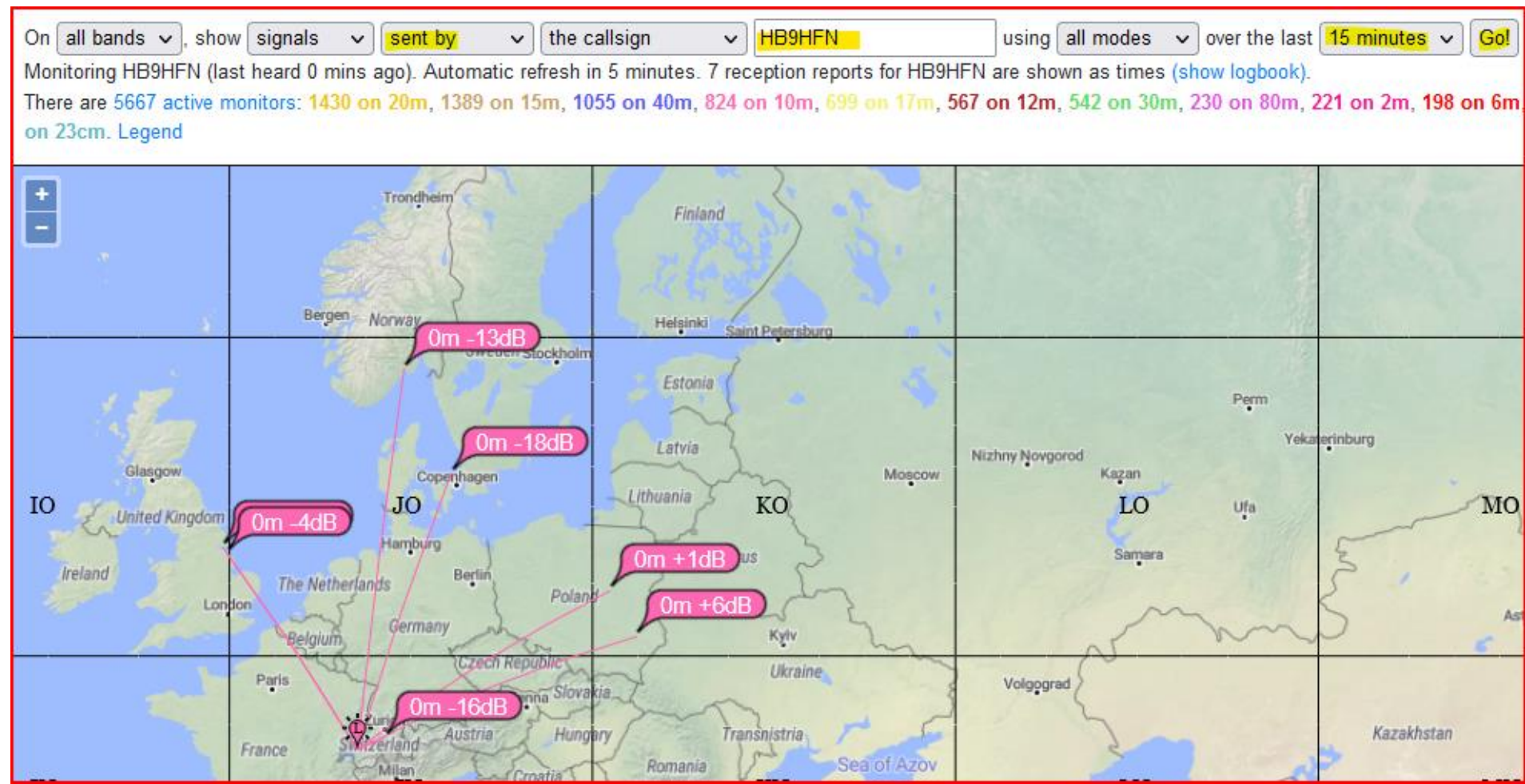
- Résultat final



# PSK Reporter

- <https://pskreporter.info/pskmap.html>

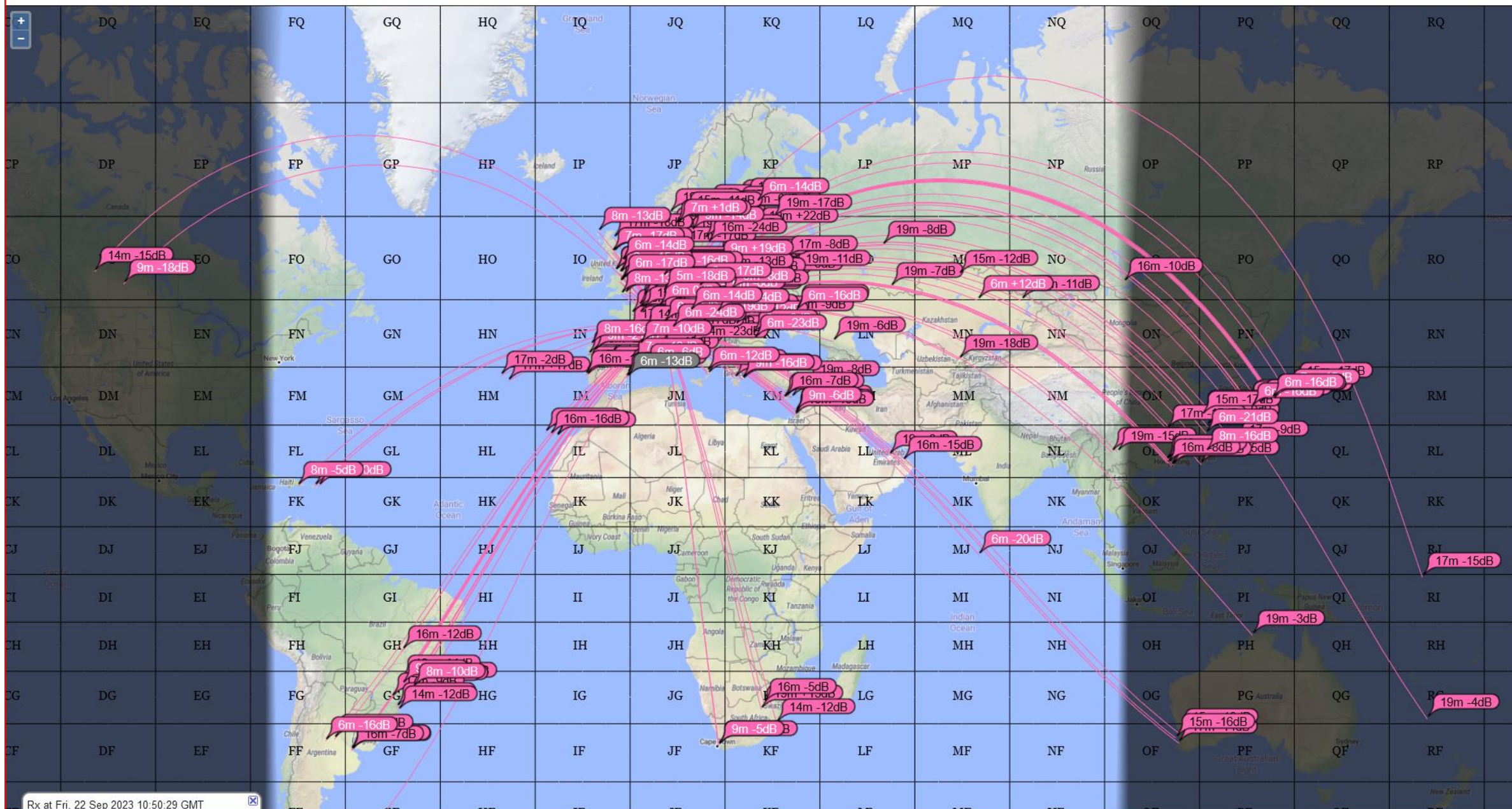
Où est-on reçu?



On **all bands** , show **signals** sent by **the callsign** **HB9HFN** using **all modes** over the last **30 minutes** Go! [Display options](#) [Permalink](#)

Monitoring HB9HFN (last heard 5 mins ago). Automatic refresh in 5 minutes. 282 reception reports for HB9HFN are shown as times ([show logbook](#)).

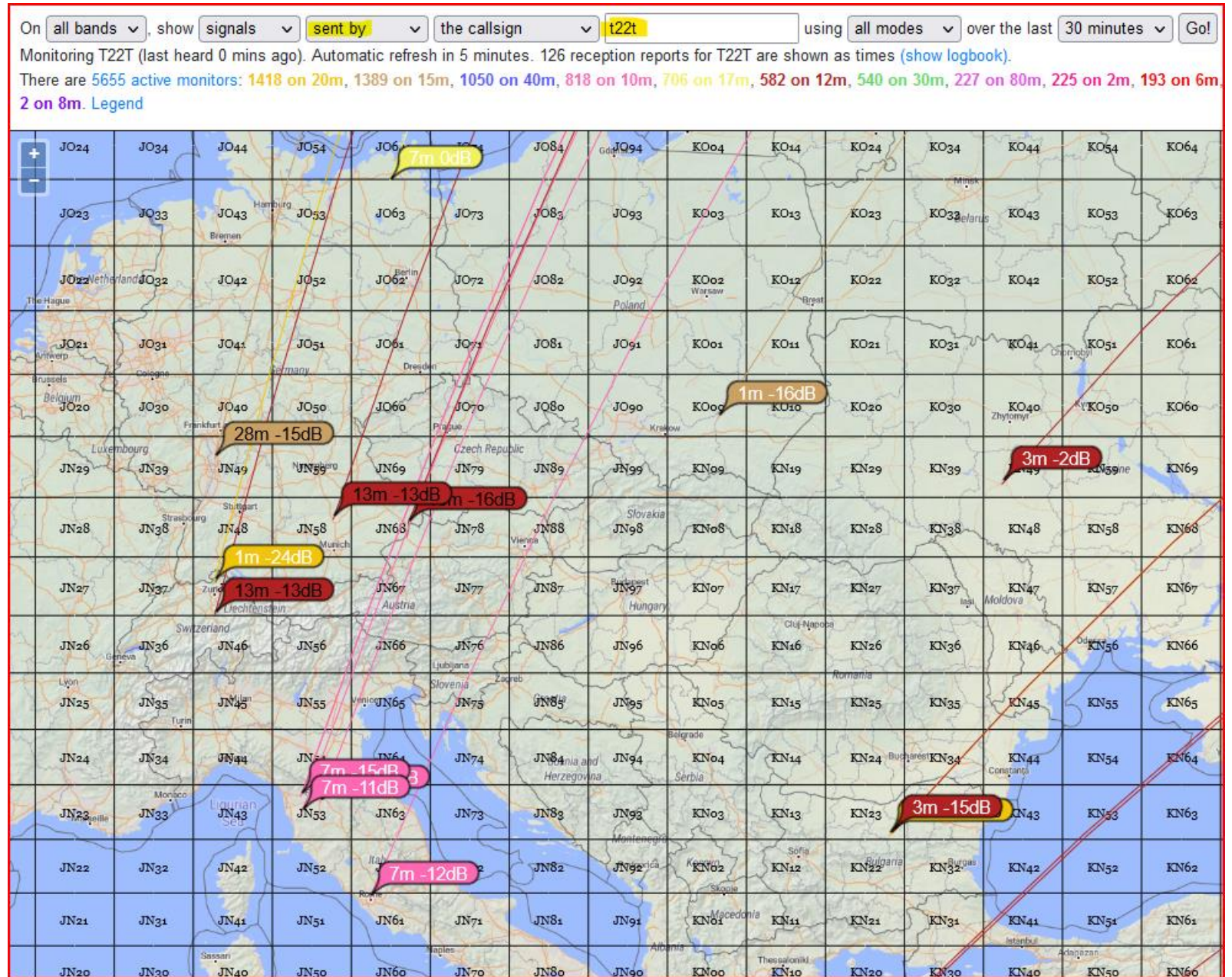
There are 6103 active monitors: 1479 on 20m, 1349 on 15m, 1076 on 40m, 941 on 10m, 718 on 17m, 550 on 12m, 535 on 30m, 317 on 80m, 271 on 2m, 270 on 6m, 100 on 160m, 80 on 60m, 62 on unknown, 54 on 11m, 31 on 70cm, 23 on 2.4Ghz, 11 on 600m, 8 on 2200m, 3 on 8m, 3 on 10Ghz, 2 on invalid, 1 on 4m, 1 on 23cm. [Legend](#)



# PSK Reporter

Chasse au DX

p.ex. T22T sur 10m



# Source

- La bible: [https://www.g4ifb.com/FT8\\_Hinson\\_tips\\_for\\_HF\\_DXers.pdf](https://www.g4ifb.com/FT8_Hinson_tips_for_HF_DXers.pdf)



# THE END

- Q & A
- Questions / réponses
- Frage / Antwort

