



Digital HF Operation

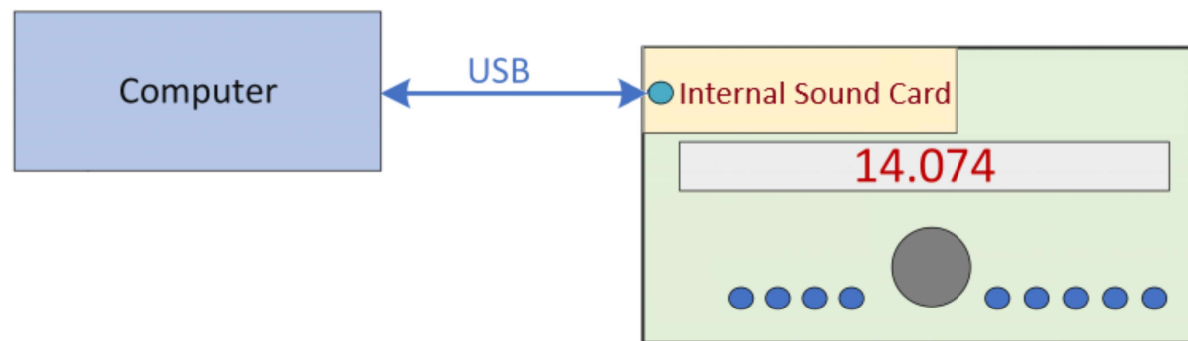
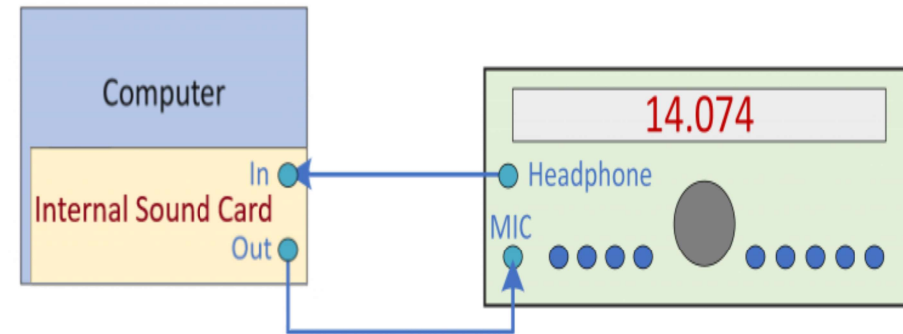
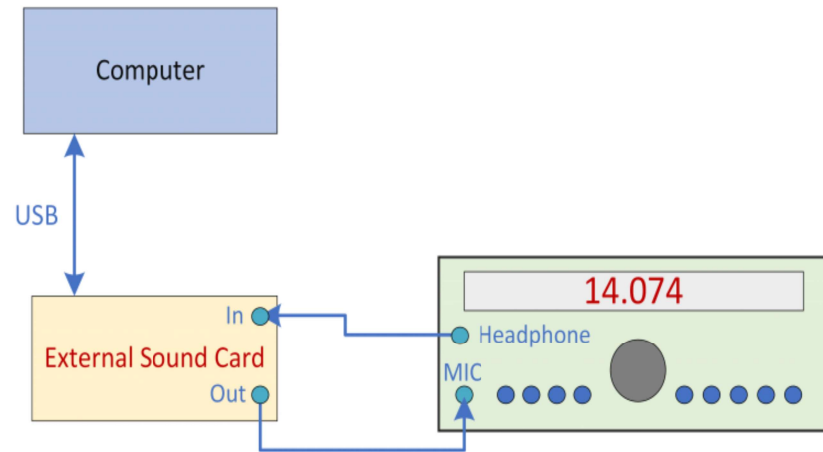
1. Hardware setups
2. Software options
3. Software setup
4. Operation

Basic Requirements

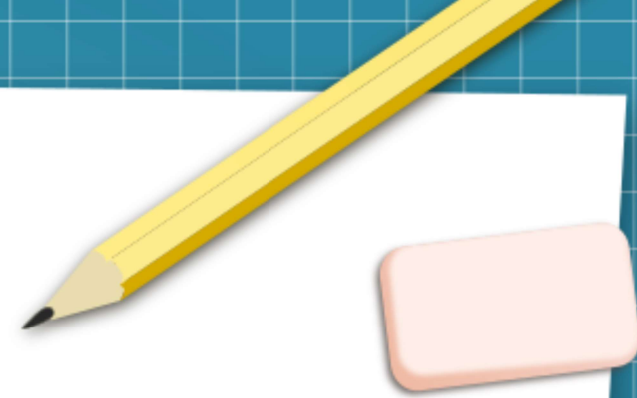
- Amateur radio license
 - General covers all; Technician covers 10 meters and up
- SSB Transceiver
 - with antenna, feedline, etc...
- Computer with audio and/or USB
 - Windows 7+, macOS 10.13+, Linux



Audio Routing Examples



Required Software



WSJT-X v2.6.1 by K1JT et al.

File Configurations View Mode Decode Save Tools Help

Band Activity Rx Frequency

UTC	dB	DT	Freq	Message	UTC	dB	DT	Freq	Message
193230	-14	-1.1	1428	~ LU8HJL U7EZZ RN78					
193230	-4	-0.1	1300	~ OP9T LW2EY R-13					
193230	-13	0.0	1339	~ CQ DX FY2FWL GG67					
193245	0	0.1	2700	~ CQ CA3TSK FF46					
193245	1	-0.5	1332	~ SF2GPU LUIDFW 73					
193245	-7	0.1	1554	~ DO1SHK LU3XCC FD58					
193245	-4	0.2	1006	~ CQ PY2MIG GG66					
193245	1	0.3	1653	~ CQ PU1FAP GG99					
193245	7	0.4	767	~ CQ D2UY JI64					
193245	-9	0.7	1752	~ CE4HG PUSMVO R-14					
193245	-2	0.1	1298	~ F6BNK LUSVV RR73					
193245	-9	0.3	1044	~ ON7DY LU7ARS R-09					
193245	-6	0.1	1395	~ CQ HC3RG FI06					
193245	-14	-0.1	2123	~ CQ HA3MQ JN95					
193245	-9	0.0	1693	~ F6JTK PY2VZ GG58					
193245	-10	0.3	1695	~ CQ LU6DTJ GF01					
193245	-13	0.1	1645	~ IK3ORE IS05WW RR73					
193300	4	0.2	1243	~ G8IHT PY5TD R-14					
193300	7	0.1	1291	~ EA3W HI8MLV RR73					
193300	0	0.3	1680	~ S59MA CA3SDL -10					
193300	-2	-0.2	2313	~ CQ 7Q6M KH67					
193300	-9	0.3	2484	~ UT7UV CX7BBR RR73					
193300	5	0.1	1746	~ PUSMVO CE4HG RR73					
193300	-7	-0.2	1069	~ OP9T PY4ZDC -08					
193300	-11	0.8	1007	~ CQ FY2SAQ GG66					
193300	-9	0.6	2039	~ SO6R PY1WL GG87					
193300	-12	0.1	529	~ 9X2AW PY2GJ GG49					
193300	-2	0.1	2230	~ IS0DDL PY2GZ GG66					
193300	-17	0.1	470	~ UR4WWT CX4DZ +09					
193300	-14	-1.1	1427	~ LU8HJL U7EZZ RN78					
193300	-4	0.2	1300	~ OP9T LW2EY 73					
193300	-15	-0.2	952	~ K5CEW LU6XQB FD66					
193300	-19	0.1	1945	~ 9X2AW N9GB EM28					
193300	-20	0.0	1338	~ CQ DX FY2FWL GG67					

WSJT-X

Log QSO Stop Monitor Erase Decode Enable Tx Halt Tx Tune Menu

10m 28.074 000 Tx 2028 Hz Rx 1968 Hz Report -15 Auto Seq CQ: First

DX Call: J88BTI DX Grid: FK93 Az: 107 2520 mi

2024 May 03 19:33:19

Receiving FT8 17 4/15 WD:6m

Network Time

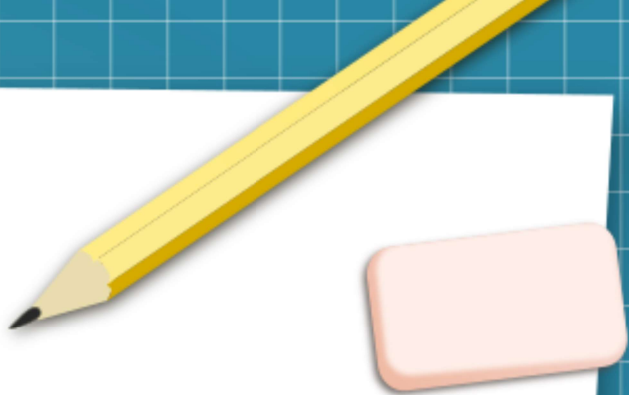
Time: 5/3/2024 2:38:31 PM
Last Attempt: 5/3/2024 10:59:34 AM
Last Sync: 5/3/2024 10:59:35 AM +656ms
Next Attempt: 8h 22m 58s
Time is synchronized.
Mode: Windows Service

Individual Time Servers:

Server Name	Status	Offset	Lag	Last Error
0.nettime.pool.ntp.org	Good	+656ms	131ms	
1.nettime.pool.ntp.org	Not Used			
2.nettime.pool.ntp.org	Not Used			
3.nettime.pool.ntp.org	Not Used			

Last Error: 5/3/2024 8:00:51 AM (Network Down)

Optional Software



Callsigns #1

All decodes

NZ2X GA U.S.A.	N4TRF TN U.S.A.	K8VM IA U.S.A.	KD7YQX AZ U.S.A.	K4KZM FL U.S.A.	NZ5U NM U.S.A.	HI8WJI CQ Dominican Rep.
KC2NJ NJ U.S.A.	WD8DKY IL U.S.A.	KB2M FL U.S.A.	KD9ZON U.S.A.	WK4X SC U.S.A.	K4NU NC U.S.A.	NT1J NC U.S.A.
W4AAN TN U.S.A.	WB0RXQ NC U.S.A.	WA4ZD FL U.S.A.	W3WDK PA U.S.A.	W0JAY CT U.S.A.	KX8T WV U.S.A.	N2PGJ PA U.S.A.
K3KT CA U.S.A.	KC8ZKS OH U.S.A.	A150S TX U.S.A.	KF0PAY CQ U.S.A.	WA1ED NH U.S.A.	KG5EIU TX U.S.A.	

JtAlert

US State : Alert

DXCC : Alert

19:45:49 27 0 0 DT+0.1 J88BTI 20m FT8 default

GridTracker 1.24.0104 (Band: 20m Mode: FT8 Layer: Grids)

GridTracker

GridTracker
14.074.000 Hz (20m) FT8
Fri 03 May 2024 19:47:46 UTC
St. Vincent 2517m 107

RECEIVE

630 160 80 60 40 30 20 17 15 12 10 8 2

Rx Calls (100) QSO (3110)
Rx DXCC (13) QSL (2474)
(Clear Live) (Clear Log)

Map View Filters

Band Auto
Mode Auto
Prop Mixed
Data Live

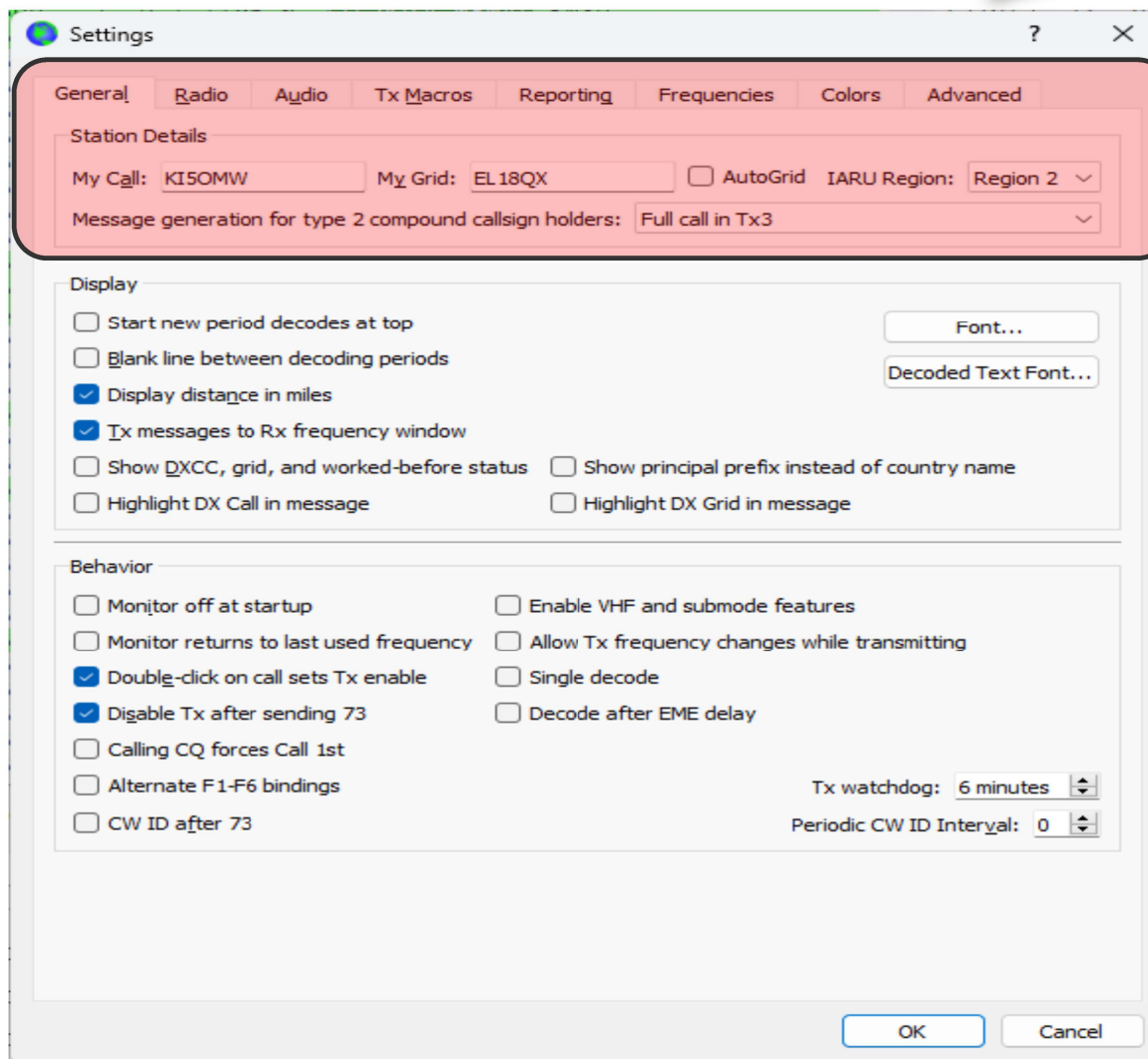
Spots: 0 No recent TX
Max Aqs: 15m

20m / FT8
10m / FT8
GridTracker
v1.24.0104

WSJT-X Configuration General

Enter station details
here

Optional
settings



Settings

General | Radio | Audio | Tx Macros | Reporting | Frequencies | Colors | Advanced

Station Details

My Call: K150MW My Grid: EL18QX AutoGrid IARU Region: Region 2

Message generation for type 2 compound callsign holders: Full call in Tx3

Display

Start new period decodes at top Blank line between decoding periods Display distance in miles Tx messages to Rx frequency window

Show DXCC, grid, and worked-before status Show principal prefix instead of country name

Highlight DX Call in message Highlight DX Grid in message

Font...
Decoded Text Font...

Behavior

Monitor off at startup Monitor returns to last used frequency Double-click on call sets Tx enable Disable Tx after sending 73

Calling CQ forces Call 1st Alternate F1-F6 bindings CW ID after 73

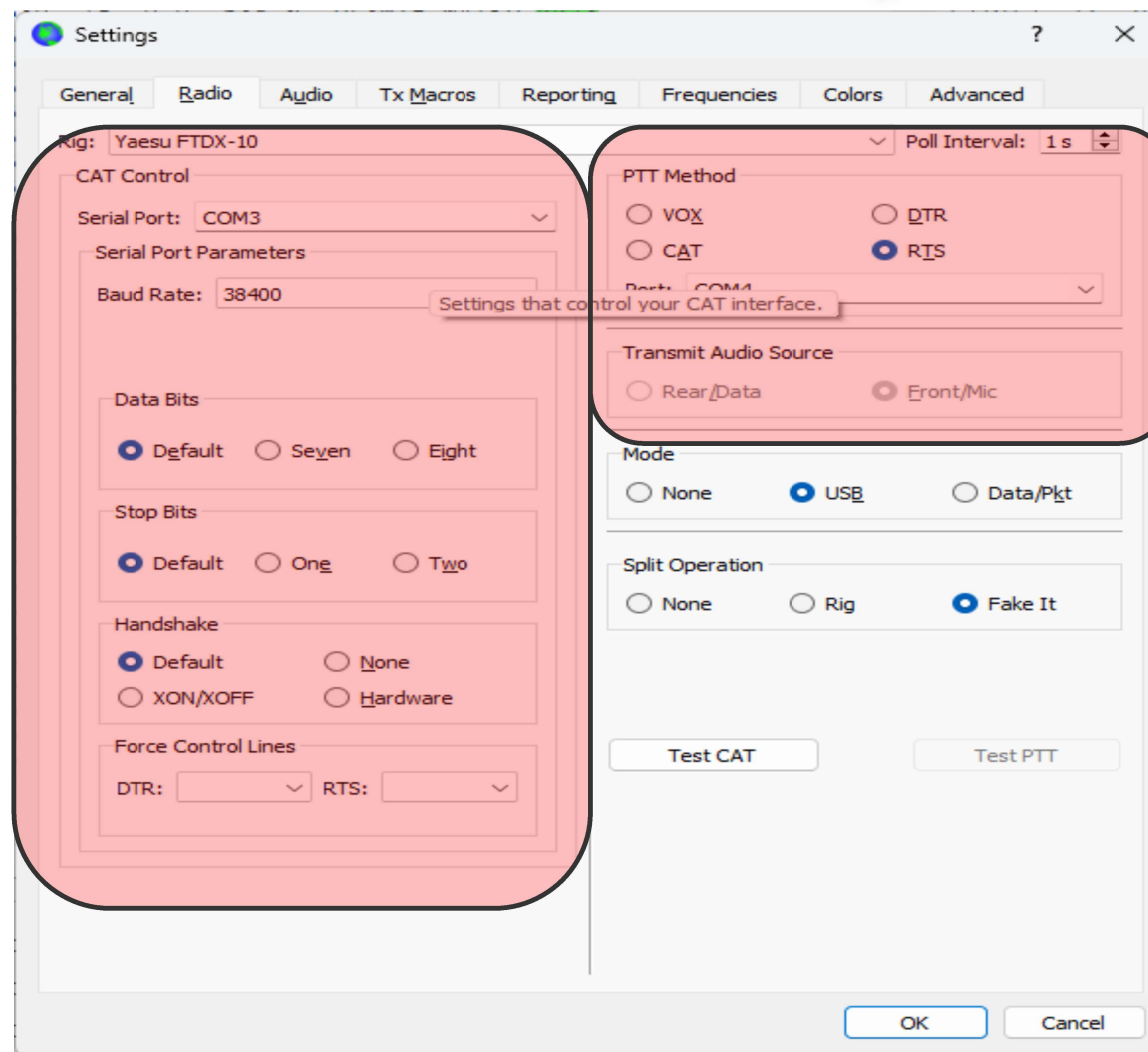
Enable VHF and submode features Allow Tx frequency changes while transmitting Single decode Decode after EME delay

Tx watchdog: 6 minutes
Periodic CW ID Interval: 0

OK Cancel

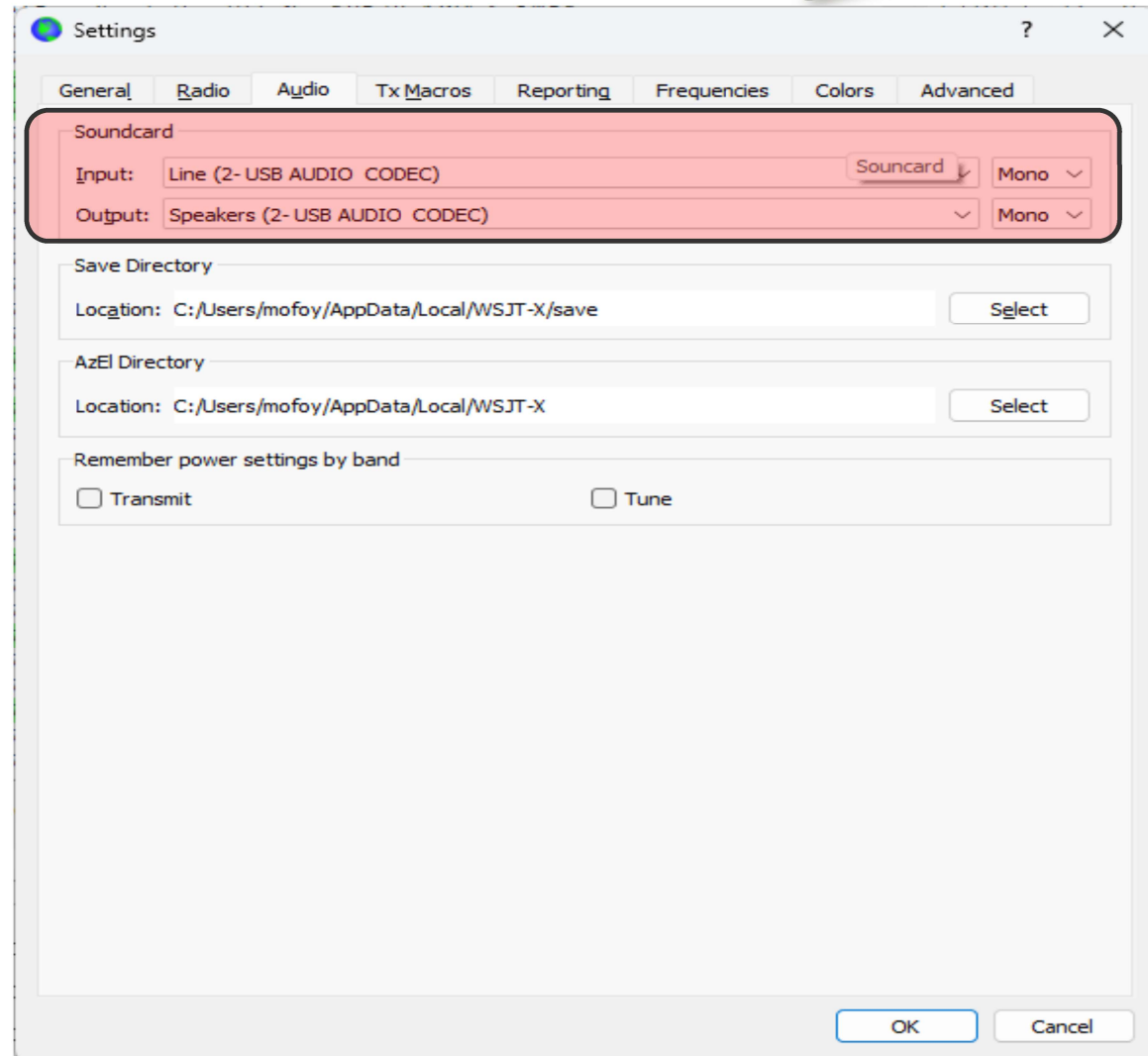
WSJT-X Configuration Radio

Enter radio
specific settings
here

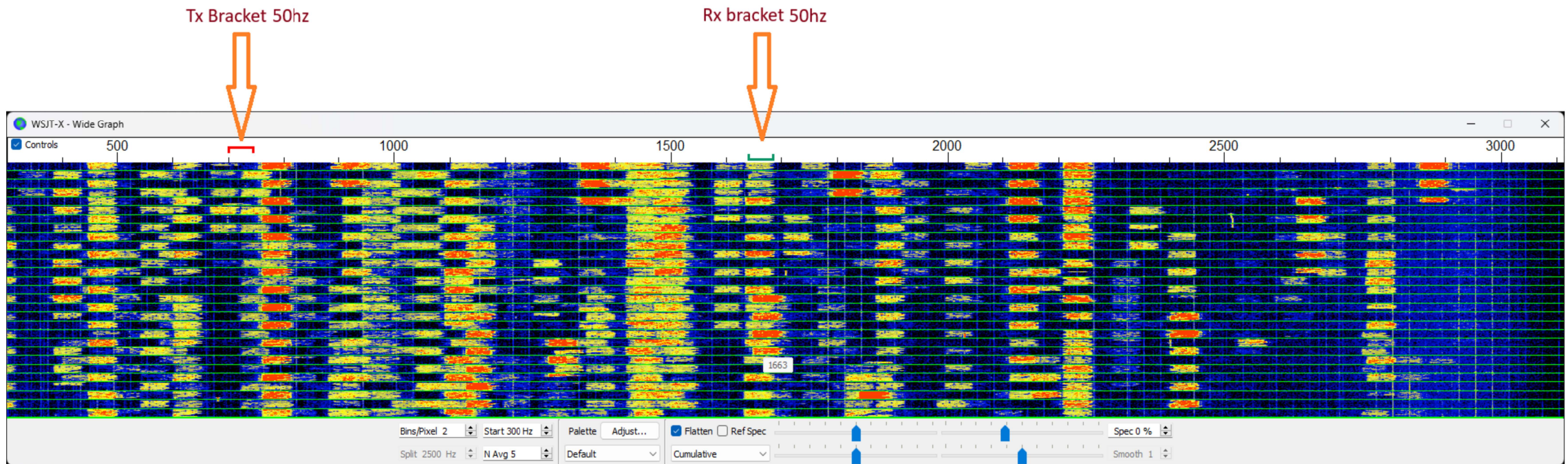
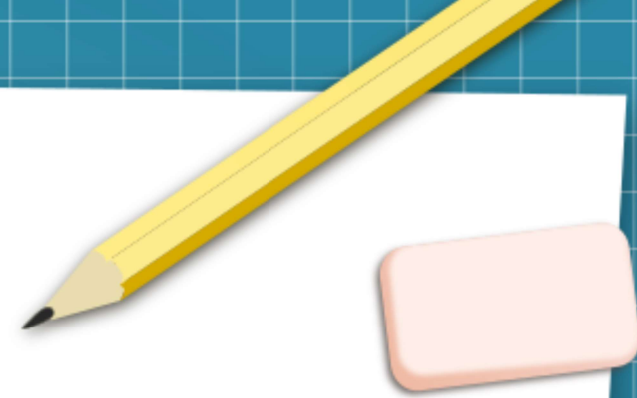


WSJT-X Configuration Audio

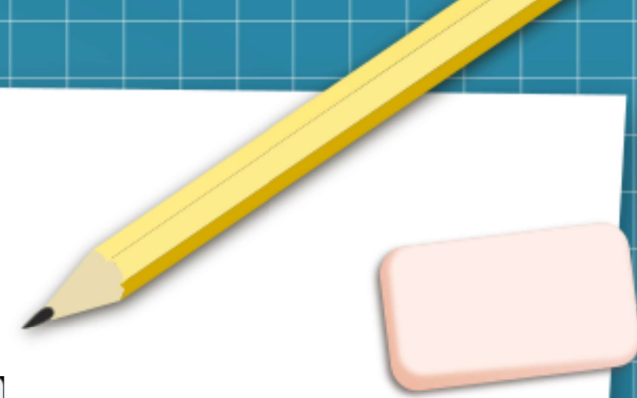
Enter setup specific audio settings here



WSJT-X The Waterfall



WSJT-X The Main Window



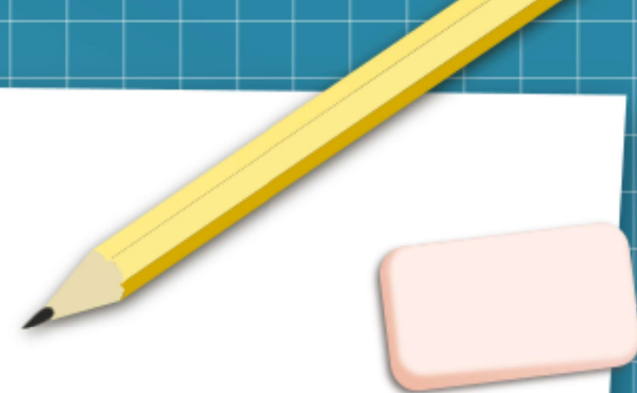
The Band activity window on the left shows all of the decoded text in the entire sideband!

The Rx Frequency window on the right shows only the text decoded at the Rx frequency (the green bracket)

The bottom portion is where we control the band, audio levels, Tx and Rx locations in the sideband, and more.

Band Activity					Rx Frequency				
UTC	dB	DT	Freq	Message	UTC	dB	DT	Freq	Message
205915	-1	0.1	973	IU4DAF KC5SM -19	202345	-9	0.1	1977	ARDYF WORL DM78
205915	-9	0.0	2013	GD6DX KD4YLX FM16	202345	-9	0.1	1977	KD9RNA WOML DM78
205915	-8	-0.5	1288	<...> LZ1BJ	202415	-10	0.1	1977	KD9RNA WOML DM78
205915	-9	0.2	1919	W4XEN WA2PCN -16	202445	-16	0.1	1977	KD9RNA WOML -01
205915	-10	0.1	1641	DL4DCW KC3AHR RR73	202515	-12	0.1	1977	KD9RNA WOML RR73
205915	-6	0.4	767	OH6B WB3JUV -16	202645	-17	0.1	1977	CQ VE WOML DM78
205915	-14	0.0	2714	WE2M JW9DSA R-15	202715	-12	0.1	1977	CQ VE WOML DM78
205915	-13	0.2	677	CQ KDOYVA DM67	202745	-10	0.4	1977	VE4RA/P WOML DM78
205915	-16	0.2	1198	IU5PTB NKLI FN43	202815	-11	0.2	1977	VE4RA/P WOML DM78
205915	-18	0.3	1045	W7STS KESIGK EM15	203400	-14	0.1	1976	K9PVE WOML DM78
205915	-9	0.0	1251	N1AAI AD9AR EM69	203430	-12	0.1	1976	K9PVE WOML DM78
205915	-18	0.0	1735	K1JAK NG9W EM57	203500	-11	0.1	1976	K9PVE WOML DM78
205915	-18	0.2	458	CQ VE6BYE DN39	203530	-10	0.1	1976	K9PVE WOML DM78
205930	-1	-1.2	677	KDOYVA KT3S EL98	203600	-12	0.1	1976	K9PVE WOML DM78
205930	-1	-1.2	894	SQ3ZRM KP4QVQ RR73	203630	-13	0.1	1976	K9PVE WOML DM78
205930	-2	-1.2	2714	JW9DSA KE9CK EN60	203700	-13	0.1	1976	K9PVE WOML DM78
205930	1	-1.2	1639	R8CCC KD7YOX DM41	203730	-15	0.1	1977	K9PVE WOML DM78
205930	-7	-1.2	1428	EALCYK W0JAY RR73	203800	-13	0.1	1976	K9PVE WOML DM78
205930	-5	-1.3	1351	<...> WP4JLU FR68	204345	0	0.1	1978	SP1MGM N4DM EM60
205930	-6	-1.5	953	CQ KD9ZQN EM69	204600	-14	0.1	1975	CQ KD4JG EL98
205930	7	-1.1	1051	YO2LPI KA9FOX EN43	204630	-13	0.1	1975	VE3SHO KD4JG EL98
205930	0	-1.2	2120	KV2X KA4BVG EM65	204700	-9	0.1	1975	KC6QHP KD4JG EL98
205930	10	-1.2	765	CQ NZ2X EM83	204715	-2	0.1	1978	SP1MGM N4DM EM60
205930	-8	-1.2	2315	EA5QA KD4RH EM94	204730	-9	0.0	1975	KC6QHP KD4JG EL98
205930	10	-1.2	1942	JW9DSA W3PV -24	204745	-3	0.1	1978	SP1MGM N4DM EM60
205930	1	-1.2	1123	CQ KH4UOM FM18	204800	-13	0.1	1975	KC6QHP KD4JG EL98
205930	-12	-1.1	1488	OH6B K1JAK -12	204830	-13	0.0	1975	KC6QHP KD4JG EL98
205930	-13	-1.2	1255	W4XEN KD2WRM FN21	204900	-10	0.1	1975	KC6QHP KD4JG EL98
205930	-10	-1.1	2598	K7CAH K2IU RRR	204930	-8	0.1	1975	KC6QHP KD4JG EL98
205930	-11	-1.3	851	CQ WB2BWU FN30	205230	-13	0.1	1975	KC5SM KD4JG EL98
205930	-14	-1.1	2405	CQ W2RLW FN20	205300	-14	0.1	1975	KC5SM KD4JG EL98
205930	-1	-1.1	734	JW9DSA W7STS DM33	205915	-13	0.2	677	CQ KDOYVA DM67
205930	-2	-1.6	1105	CQ NZ2PGJ FN01	205930	Tx	677		KDOYVA KISOMW EL18
					205930	-1	-1.2	677	KDOYVA KT3S EL98

WSJT-X Details



Tx controls are here

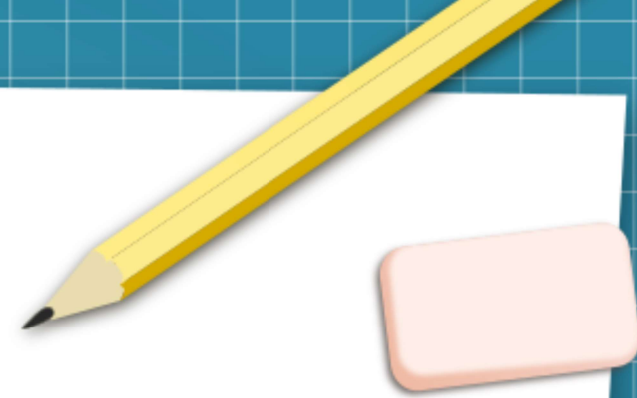
Audio input strength in dB. Adjust with RF gain on the radio.

Red and green bracket locations controlled here

Audio output power. Adjust here to not overdrive the radio audio input (see radio manual for ALC meter or similar)

Elapsed time of the current 15 second Tx period

Log Confirmation



WSJT-X v2.6.1 by K1JT et al. - Log QSO

Click OK to confirm the following QSO:

Call	Start	End
KV4T	5/3/2024 21:21:30	5/3/2024 21:22:30

Mode	Band	Rpt Sent	Rpt Rcvd	Grid	Name
FT8	20m	+11	+03	EM66	

Tx power Retain

Comments Retain

Operator

Exch sent Rcvd

Prop Mode Retain

OK Cancel



License to Learn

That's the basics! Now go run some digital modes!

Links

TigerTronics Signalink: <https://tigertronics.com/slusbmain.htm>

WSJT-X Guide: <https://wsjt.sourceforge.io/wsjt-doc/wsjt-main-2.6.1.html#INTRO>

WSJT-X Download: <https://wsjt.sourceforge.io/wsjt.html>

NetTime Download: www.timesynctool.com

JTAlert Download: <https://hamapps.com/JTAlert/>

GridTracker Download: <https://gridtracker.org/>

