

# FT8 & FT4

## Digital Soundcard Modes

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# FT8 & FT4

Digital Soundcard Modes



*[tiny.cc/  
ft8ft4](https://tiny.cc/ft8ft4)*





# Contact Information

- Email- [k8zt@arrrl.net](mailto:k8zt@arrrl.net)
- Website- [www.k8zt.com](http://www.k8zt.com)
- Digital Operating-  
[www.k8zt.com/digital](http://www.k8zt.com/digital)

# K8ZT





# What is FT8/FT4 ?

- I am guessing that most of you reading this have either heard about FT8 from fellow Hams or heard it on air as that strange repetitive buzzing sound between the CW and SSB portions of the bands

FT8

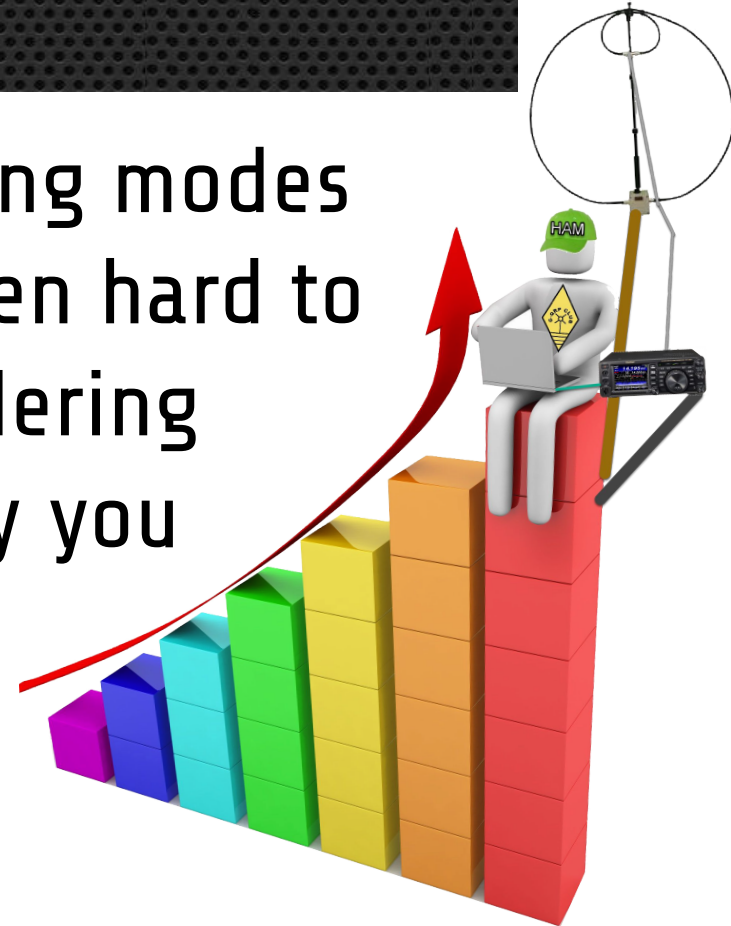


FT4



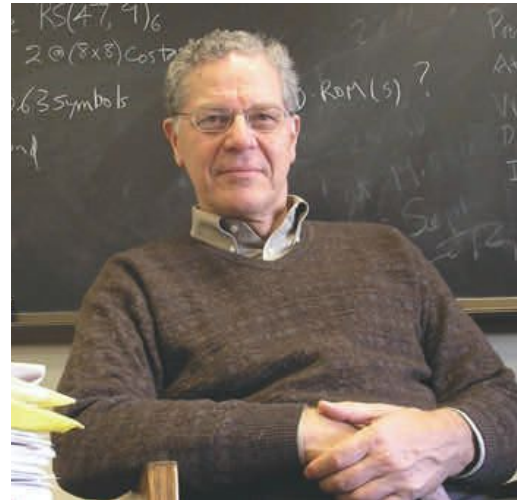
# What is FT8/FT4 ?

- As one of the fastest growing modes of Amateur Radio it has been hard to miss, but you may be wondering how to get started and why you would want to?
- First, who is responsible?



# Who is Responsible for these Modes?

- Joe Taylor, K1JT
  - Nobel Laureate in Physics (1993)
  - Princeton University,  
Distinguished University  
Professor in Physics, retired
  - [Bio Link](#)





# Open Source Project

- Other prominent developers–
  - Steve Franke, K9AN
  - Bill Somerville, G4WJS
- Joe K1JT–“You (or anyone else) are more than welcome to submit patches or larger revisions of our code to implement features you'd like to see.”



# Why I Do FT8/FT4 ?

- My “Multitasking Mode” (while I am reading email, writing with computer, etc.)
- Great with Low Power
- Seems that Bands are Open More Often
- Fill in those missing State/Band Combos

# Why I Do FT8/FT4 ?

- My “Multitasking Mode” (while I am reading email, writing, working with computer, etc.)
- Works great with my QRP (low-power) signal



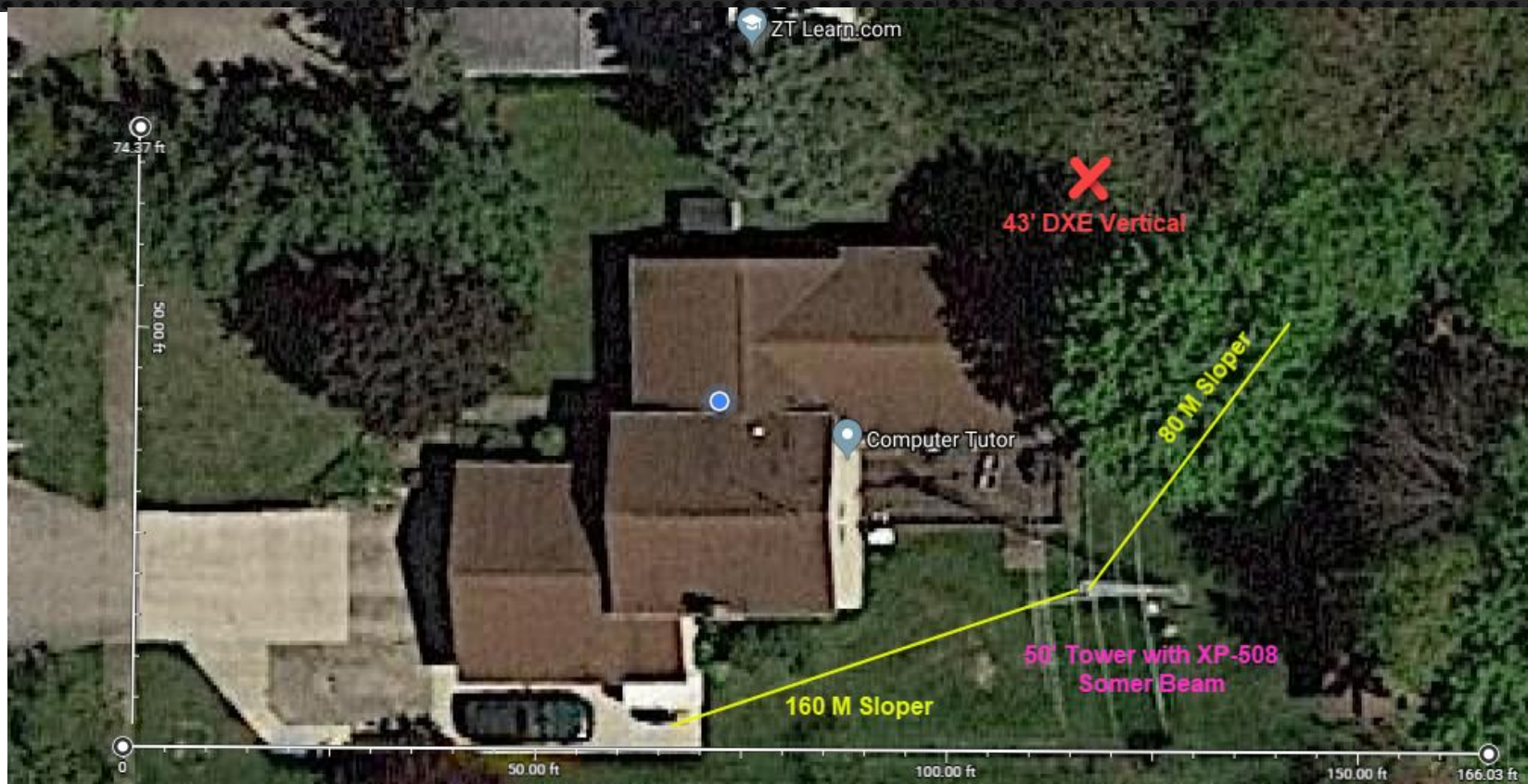


# Why I Do FT8/FT4 ?

- Increase my total DXCC, WAS & total QSOs #s on less used Bands
- Allow me to use bands that often seem dead
- Call CQ, even as a QRP Station, and get pileups of responders!

% QSOs by Mode for 11 Bands at K8ZT				
Band	CW	SSB	RTTY	FT8, FT4 & JT65
6M	11%	51%	0%	38%
10M	29%	66%	2%	3%
12M	43%	14%	5%	38%
15M	61%	28%	4%	7%
17M	24%	8%	2%	66%
20M	56%	20%	3%	22%
30M	37%	0%	2%	61%
40M	68%	14%	3%	15%
60M	1%	1%	0%	98%
80M	54%	21%	5%	20%
160M	76%	8%	0%	17%

# Why I Do FT8/FT4 ?



# Why I Do FT8/FT4 ?

- Allows my QRP signal (5 watts) & marginal antenna (60' sloper) to work all states & new DX on 160 M.
- Best 160 DX so far... ZS (13,000 m), UA0 (8500 m) & E51 (6600 m)

160 Meters DXCC by Mode															
DXCC	CW	FT8	SSB	DXCC	CW	FT8	SSB	DXCC	CW	FT8	SSB	DXCC	CW	FT8	SSB
TOTAL	55	61	10	ONLY	14	22	1	Multi	42	39	9	%	70%	77%	13%
6Y	6		1	EI	3	4	1	KP2	41	2		SV9		1	
8P	1	1	1	F	2	3		KP4	8		2	TG		1	
9A	2	2		FG		3		LA		1		TI	1		
9X		1		FM	2			LY		1		UA	1	3	
9Y		1		FP		1		OE	1			UA0		2	
C6	24	1	3	G	9	4		OL	2	1		UR	2	3	
CE	1			GM	3	3		OM	1	1		V3	6	2	1
CN	3	1		GW	1	2		ON		1		VE	711	90	106
CO	2	2		HA	1	1		OX	1	1		VP2-E			1
CT	3	2		HB		1		OZ		1		VP2-M	2		
CT3		1		HI	3	2		P4	7	1		VP2-V		1	
CU	1	2		HK	3			PA	2			VP5	8	1	1
CY9		1		HP	1	1		PJ2	18	1		VP9	13		
D4		1		I	1	3		PJ2-N	9			XE	10	1	
DL	5	3		J3		1		PJ4	1			XF4	1		
E5-N		1		J6		1		PJ5		1		YU	1	1	
E7	1			J7	2	1		S5	1			YV	3	1	
EA	2	1		K	6823	1372	663	SM	4	3		ZF	19	1	1
EA6		2		KH6	4	1		SP	2			ZS		1	
EA8	1	1		KL7	1	2		SV	1						

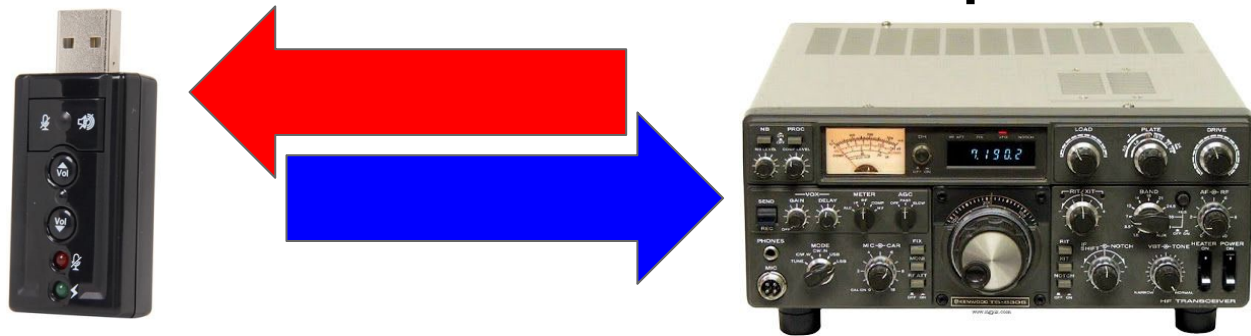


# Amateur Digital Soundcard Modes

- FT8 is one of the many digital modes referred to as soundcard modes (SCM)
- Utilize a computer's sound card to bring in audio from your radio to be processed by software to decode the information embedded in the signal.

# Amateur Digital Soundcard Modes

- Conversely, when you want to transmit, the software encodes your message into audio tones that are sent out via your sound card to your radio's audio or Mic input

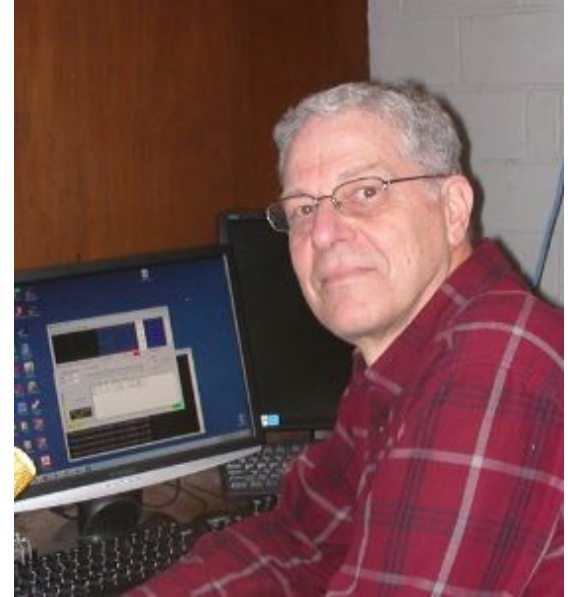


# Amateur Digital Soundcard Modes

- Frequency-Shift Keying- RTTY
- Phase-Shift Keying - PSK31 & PSK63
- Multiple Frequency-Shift Keying (MFSK)
  - MSK144, JT9, JT65, FT8, FT4 & Olivia
- Packet Radio (AX25) & (APRS)
- Lots of Others

# WSJT-X Software – Brief History

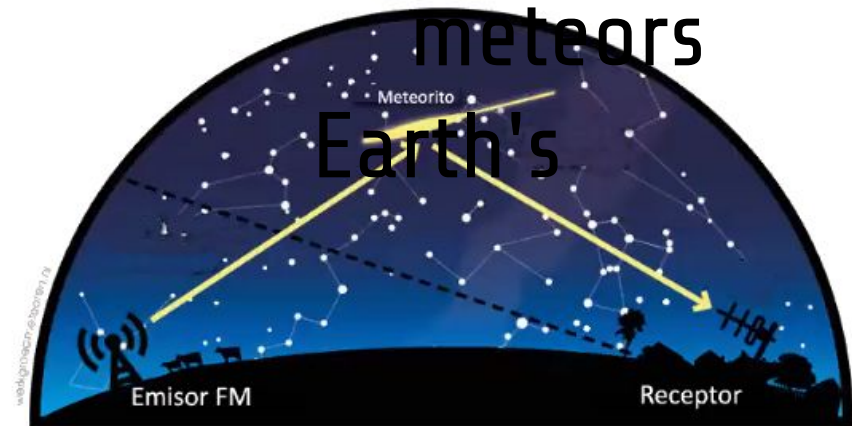
- Originally released in 2001
- Undergone several major revisions
- Modes have been both added & removed





# WSJT-X Software – FSK441

- FSK441, (2001) first mode included with WSJT is designed to support VHF contacts using streaks of radio-reflecting ions created by the trails of meteors entering the atmosphere



# WSJT-X Software – JT65

- JT65 (2003) is intended for extremely weak but slowly varying signals–
  - Troposcatter
  - Earth-Moon-Earth (EME or "moonbounce") paths

# MFSK– WSJT–X Software – JT65

- Operators soon began using the JT65 mode for contacts on the HF bands, often using low transmit power. Ability to decode weak signals was paramount.

# WSJT-X- JT65, FT8 & FT4

- Can decode signals many decibels below the noise floor and can often allow amateurs to successfully exchange contact information without signals being audible to the human ear.



# WSJT-X- JT65, FT8 & FT4

- Add redundancy to the data, such that all of a message may be successfully recovered even if some bits are not received by the receiver.

# WSJT-X- JT65, FT8 & FT4

- Messages are typically either decoded correctly or not decoded at all, with very high probability.
- Requires tight synchronization of time & frequency between TX and RX

# WSJT Software – FT8

- **FT8** (June 29, 2017)
- Stands for "Franke-Taylor design, 8-FSK modulation"
- Created by Joe Taylor, K1JT and Steve Franke, K9AN.

# WSJT-X Software – FT8

- Very similar to JT65 but transmission times 1/4 as long (~15 seconds per cycle). So typical QSO could be completed in less than 2 minutes.
- This was the game changer!



# WSJT Software – FT8

- FT8 although designed primarily for VHF it quickly gained popularity on HF.
- A few dB less sensitive, but allows QSOs four times faster. Bandwidth is greater than JT9, but about 1/4 of JT65

# WSJT Software – FT8

- T/R sequence length: 15 s
- Message length: 75 bits + 12-bit CRC
- FEC code: LDPC(174,87)
- Modulation: 8-FSK, Keying rate
- Tone spacing = 6.25 Hz.

# WSJT-X Software – FT4

- **FT4** (April 2019) very similar to FT8 but transmission times 1/2 as long (~7.5 sec).
- Typical QSO could be completed in less than 1 minutes.
- Designed primarily for contesting.

# WSJT-X- JT65, FT8 & FT4

- Decoding threshold by mode better than:

○ JT65 -24 dB

○ FT8 -20 dB

○ FT4 -18 dB

○ CW -15 dB

○ SSB +10 dB



# WSJT Software – FT8 & FT4

- Multi-decoder: finds & decodes all FT8 or FT4 signals in passband
- FT8 & FT4 not decoded at same time
- Auto-sequencing after manual start of QSO

# WSJT-X

- Quick View of Program's Screen

The screenshot displays the WSJT-X v2.2.0-rc1 interface. The top menu bar includes File, Configurations, View, Mode, Decode, Save, Tools, and Help. The main window is divided into several sections:

- Band Activity:** A list of stations and their frequencies. Callouts include "Stations being Received" pointing to the list and "Stations I am trying to work" pointing to the "Rx Frequency" column.
- Rx Frequency:** A list of received frequencies and messages. Callouts include "Transmit Enabled" pointing to the "Tx" column and "Stop Transmit" pointing to the "R-15" column.
- Change Band/Frequency:** A callout pointing to the "20m" band selection dropdown.
- Current Frequency:** A callout pointing to the "14.080 000" frequency display.
- Current Mode:** A callout pointing to the "FT4" mode selection.

The bottom section contains controls for transmission and reception:

- TX Controls:** Includes "Log QSO", "Stop", "Monitor", "Erase", "Decode", "Enable Tx", "Halt Tx", "Tune", and "Menus".
- TX Settings:** Includes "Tx even/1st", "Tx 423 Hz", "Rx 712 Hz", "Report 15", "Auto Seq", and "Call 1st".
- TX Call and Grid:** Includes "DX Call", "DX Grid", "Az: 46", "4513 mi", "Lookup", and "Add".
- TX Date and Time:** Displays "2020 May 20 15:18:43".
- TX Queue:** A table with columns "Generate Std Msgs", "Next", and "Now". It lists various call signs and modes, such as "OE1EQW K8ZT EN91", "OE1EQW K8ZT R-15", "OE1EQW K8ZT RR73", "OE1EQW K8ZT 73", and "CQ K8ZT EN91".

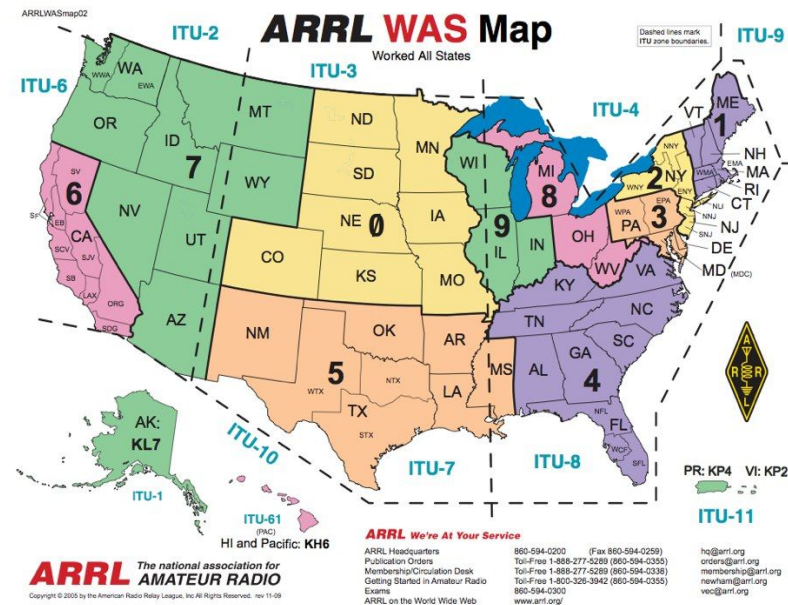
# WSJT-X

- Quick Demo Video



# What Can FT8 & FT4 & 5 Watts Do?

- Worked All States
  - 66 Days to FT8 WAS
  - <2 years to FT8 Eight Band WAS (160-15)
  - 122 Days to FT4 WAS (1 week to 39, 2 wks to 45 with a brand new mode!)



# What Can FT8 & FT4 & 5 Watts Do?

- DXCC
  - 272 days to FT8 DXCC
  - 214 days to FT8 DXCC
  - 219 DXCC
- >19,000 FT8 & FT4 QSOs since July 2017

Band	DXCC Entities
160M	61
80M	57
60M	67
40M	64
30M	84
20M	187
17M	156
15M	108
12M	49
10M	39
6M	22



# What Can FT8 & FT4 & 5 Watts Do?

- In just three years, during sunspot low...
  - DXCC
    - 219 Entities
    - 3 bands
  - 10 Bands WAS
  - Over 19,000 QSOs
  - All QSOs <5 watts

Band	DXCC	WAS	QSOs	%
160M	61	50	1618	10%
80M	57	50	949	6%
60M	67	50	647	4%
40M	64	50	1526	10%
30M	84	50	663	4%
20M	187	50	5757	37%
17M	156	50	1806	12%
15M	108	50	842	5%
12M	49	49	396	3%
10M	39	48	497	3%
6M	22	48	812	5%
Totals	894	545	15513	

# What Can FT8 & FT4 & 5 Watts Do?

1A	SMO Of Malta	9L	Sierra Leone	DL	Germany	G	England	K	USA	PJ2	Curacao	TT	Chad	XT	Burkina Faso
3B8	Mauritius Island	9X	Rwanda	E3	Eritrea	GD	Isle Of Man	KG4	Guantanamo Bay	PJ4	Bonaire	UA	European Russia	YA	Afghanistan
3B9	Rodriguez Island	9Y	Trinidad & Tobago	E4	Palestine	GI	Northern Ireland	KH1	Baker Howland	PJ5	Saba & St Eustatius	UA0	Asiatic Russia	YB	Indonesia
3D2-F	Fiji Is.	A3	Tonga	E5-N	North Cook Is.	GJ	Jersey	KH2	Guam	PJ7	Sint Maarten	UA2	Kaliningrad	YJ	Vanuatu
3X	Guinea	A4	Oman	E5-S	South Cook Is.	GM	Scotland	KH6	Hawaii	PY	Brazil	UJ	Uzbekistan	YL	Latvia
4L	Georgia	A6	UEA	E6	Niue	GU	Guernsey	KH8	American Samoa	PY0F	Fernando De Noronha	UN	Kazakhstan	YN	Nicaragua
4O	Montenegro	A7	Qatar	E7	Bosnia-Herzegovina	GW	Wales	KL7	Alaska	PZ	Suriname	UR	Ukraine	YO	Romania
4X	Israel	A9	Bahrain	EA	Spain	HA	Hungary	KP2	Us Virgin Is.	S0	Western Sahara	V2	Antigua & Barbuda	YS	El Salvador
5B	Cyprus	BY	China	EA6	Balearic Is.	HB	Switzerland	KP4	Puerto Rico	S5	Slovenia	V3	Belize	YU	Serbia
5N	Nigeria	C3	Andorra	EA8	Canary Is.	HB0	Liechtenstein	LA	Norway	S7	Seychelles Is.	V4	Saint Kitts & Nevis	YV	Venezuela
5R	Madagascar	C5	The Gambia	EA9	Ceuta & Melilla	HC	Ecuador	LU	Argentina	S9	Sao Tome & Principe	V5	Namibia	Z3	North Macedonia
5T	Mauritania	C6	Bahamas	EI	Ireland	HC8	Galapagos Is.	LX	Luxembourg	SM	Sweden	VE	Canada	Z6	Kosovo
5V	Togo	C9	Mozambique	EK	Armenia	HH	Haiti	LY	Lithuania	SP	Poland	VK	Australia	Z8	South Sudan
5W	Samoa	CE	Chile	EL	Liberia	HI	Dominican Rep.	LZ	Bulgaria	SV	Greece	VK9N	Norfolk Island	ZA	Albania
5X	Uganda	CE0E	Easter Island	ER	Moldova	HK	Colombia	OA	Peru	SV5	Dodecanese	VP2E	Anguilla	ZB2	Gibraltar
5Z	Kenya	CE0Z	Juan Fernandez Is.	ES	Estonia	HK0-S	San Andres Island	OD	Lebanon	SV9	Crete	VP2M	Montserrat	ZD7	Saint Helena
6W	Senegal	CE9	Antarctica	EU	Belarus	HL	Korea	OE	Austria	T2	Tuvalu	VP2V	British Virgin Is.	ZF	Cayman Is.
6Y	Jamaica	CN	Morocco	F	France	HP	Panama	OH	Finland	T31	Central Kiribati	VP5	Turks & Caicos Is.	ZK3	Tokelau Is.
7P	Lesotho	CO	Cuba	FG	Guadeloupe	HR	Honduras	OH0	Aland Is.	T7	San Marino	VP6	Pitcairn Island	ZL	New Zealand
7Q	Malawi	CP	Bolivia	FJ	Saint Barthelemy	HV	Vatican City	OJ0	Market Reef	T8	Palau	VP6-D	Ducie Island	ZP	Paraguay
7X	Algeria	CT	Portugal	FK	New Caledonia	I	Italy	OK	Czech Republic	TA	Turkey	VP8-F	Falkland Is.	ZS	South Africa
8P	Barbados	CT3	Madeira Is.	FO-F	French Polynesia	IS0	Sardinia	OM	Slovak Republic	TF	Iceland	VP8-H	South Shetland Is.		
8R	Guyana	CU	Azores	FO-M	Marquesas Is.	J3	Grenada	ON	Belgium	TG	Guatemala	VP8-O	South Orkney Is.		
9A	Croatia	CX	Uruguay	FP	Saint Pierre & Miquelon	J6	Saint Lucia	OX	Greenland	TI	Costa Rica	VP9	Bermuda		
9G	Ghana	CY9	Saint Paul Island	FR-R	Reunion Island	J7	Dominica	OZ	Denmark	TK	Corsica	VR	Hong Kong		
9H	Malta	D4	Cape Verde	FS	Saint Martin	JA	Japan	P4	Aruba	TN	Rep. Congo	VU	India		
9K	Kuwait	D6	Comoros	FY	French Guiana	JW	Svalbard	PA	Netherlands	TR	Gabon	XE	Mexico		



- WAS
- FT8
- 5 watts
- Need 2 QSOs for 11 Band WAS


	160M	80M	60M	40M	30M	20M	17M	15M	12M	10M	6M
# St / Band	50	50	50	50	50	50	50	50	50	50	48
AK	2	4	4	1	4	10	6	3	2	2	
AL	21	20	7	23	20	27	8	7	7	12	18
AR	7	8	9	15	17	24	9	5	10	7	17
AZ	7	7	7	7	11	44	57	33	13	4	5
CA	8	27	12	15	19	99	71	67	27	17	5
CO	18	6	5	6	14	67	25	6	6	7	22
CT	34	21	13	9	9	6	3	2	3	5	3
DE	9	7	3	8	3	3	1	2	1	3	3
FL	38	20	35	53	43	139	44	33	40	67	84
GA	53	19	17	45	25	27	9	7	6	12	3
HI	1	3	3	3	1	11	8	1	2	1	
IA	25	11	11	10	12	14	6	3	7	6	10
ID	13	5	5	5	8	10	19	12	8	1	3
IL	102	35	19	53	18	26	5	3	5	5	5
IN	71	26	18	21	7	5	2	2	3	2	11
KS	19	8	10	6	12	23	6	5	11	10	24
KY	48	17	7	21	3	6	4	3	2	3	2
LA	12	10	6	11	10	28	6	8	9	18	14
MA	55	17	8	28	12	33	14	4	2	10	2
MD	58	25	7	23	5	5	2	3	2	3	3
ME	16	7	8	10	17	18	8	5	8	5	5
MI	68	29	9	14	7	6	5	3	2	1	14
MN	37	22	12	19	25	15	11	4	4	10	9
MO	49	27	8	28	24	32	9	4	9	9	12
MS	19	9	7	8	9	19	9	4	5	7	16

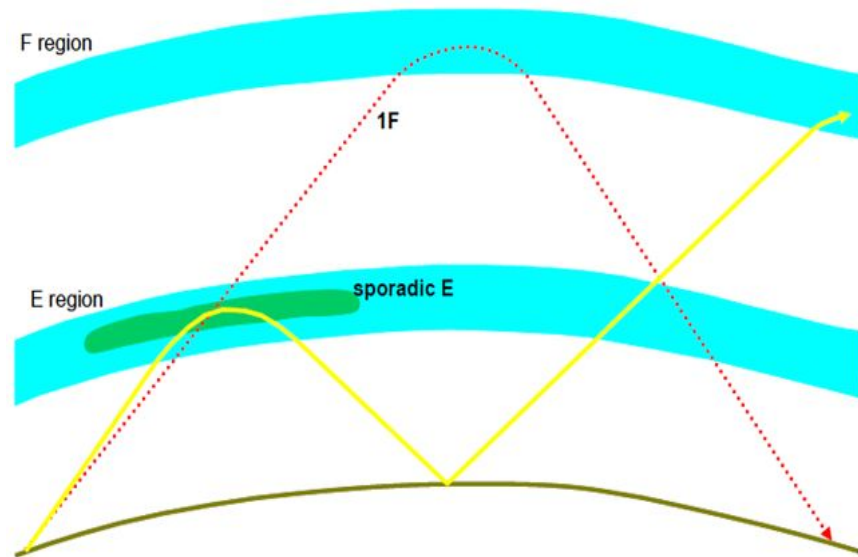
	160M	80M	60M	40M	30M	20M	17M	15M	12M	10M	6M
# St / Band	50	50	50	50	50	50	50	50	50	50	48
MT	4	6	1	2	5	10	11	5	4	1	1
NC	104	27	29	78	21	25	7	8	3	5	1
ND	6	8	6	2	5	8	3	4	4	11	6
NE	10	4	3	5	13	13	4	4	3	12	11
NH	31	18	8	19	14	27	8	4	9	10	5
NJ	62	40	13	37	9	17	4	4	2	6	1
NM	2	2	1	2	8	10	7	2	3	1	6
NV	1	6	2	8	3	19	10	8	6	2	3
NY	102	37	22	45	14	20	4	3	2	7	5
OH	131	56	21	36	10	46	36	29	27	36	220
OK	10	5	4	12	7	25	5	2	7	11	18
OR	5	5	4	4	1	15	18	14	7	2	2
PA	111	56	12	34	7	18	7	7	5	12	23
RI	11	4	6	9	4	5	3	3	5	4	2
SC	28	14	4	28	10	12	6	8	3	4	5
SD	6	6	3	3	3	7	6	2	6	4	12
TN	61	18	8	36	12	28	5	2	4	9	6
TX	22	23	23	37	40	200	47	20	26	43	82
UT	8	4	6	5	6	31	19	11	5	2	2
VA	88	40	21	43	4	12	3	2	2	2	8
VT	25	21	5	15	6	8	6	2	2	3	1
WA	15	14	8	6	12	39	37	30	11	8	2
WI	49	19	9	24	15	5	8	6	2	7	2
WV	33	13	3	7	2	5	2	2	3	3	10
WY	3	1	2	4	4	6	6	4	1	2	5

# What Can FT8 & FT4 & 5 Watts Do?

CQZ	160M	80M	60M	40M	30M	20M	15M	12M	10M	6M	Total		CQZ	160M	80M	60M	40M	30M	20M	15M	12M	10M	6M	Total
Zones	21	18	20	25	26	33	26	18	17	10	34													
1	2	4	12	3	4	31	1	1	2		60		21					1	11					12
2	3			1	1	4	1		2	2	14		22											0
3	58	79	42	97	57	526	152	42	33	33	1119		23											0
4	777	428	248	641	302	1179	137	157	241	586	4696		24											0
5	790	421	237	768	219	845	103	99	163	202	3847		25					71						71
6	2	2	3	2	3	18	6	5		2	43		26											0
7	4	4	3	8	6	26	15	8		1	75		27											0
8	18	21	17	29	31	98	44	19	16	17	310		28											0
9	4	8	8	15	6	62	22	8	5	2	140		29					1						1
10				2	2	13	8	4			29		30				5	6	38					49
11		3		1	2	24	94	31	12		167		31	1	3	3	4	1	21	1				34
12						13	11	4	2		30		32	1	1		7	4	34	13	3	2		65
13		7	2	1	2	21	51	17	12		113		33	3	3	6	4	3	29	4	4	1	4	61
14	36	62	136	70	41	1666	151	19	15	5	2201		34					1						1
15	10	10	39	22	27	836	49	10	3		1006		35	1	4	3	2	2	14	7		1		34
16	7	6	2	3	4	278	7				307		36	1		1	1	1	11	4	1	2		22
17	2					39					41		37			1	1	1	5					8
18						12	1				13		38	1	1	2			21	17	4			46
19						7					7		39				1		5	3				9
20	1		5	6	4	105	12		1		134		40	1		2	1	1	25	5				35

# What Can FT8 & FT4 Do?

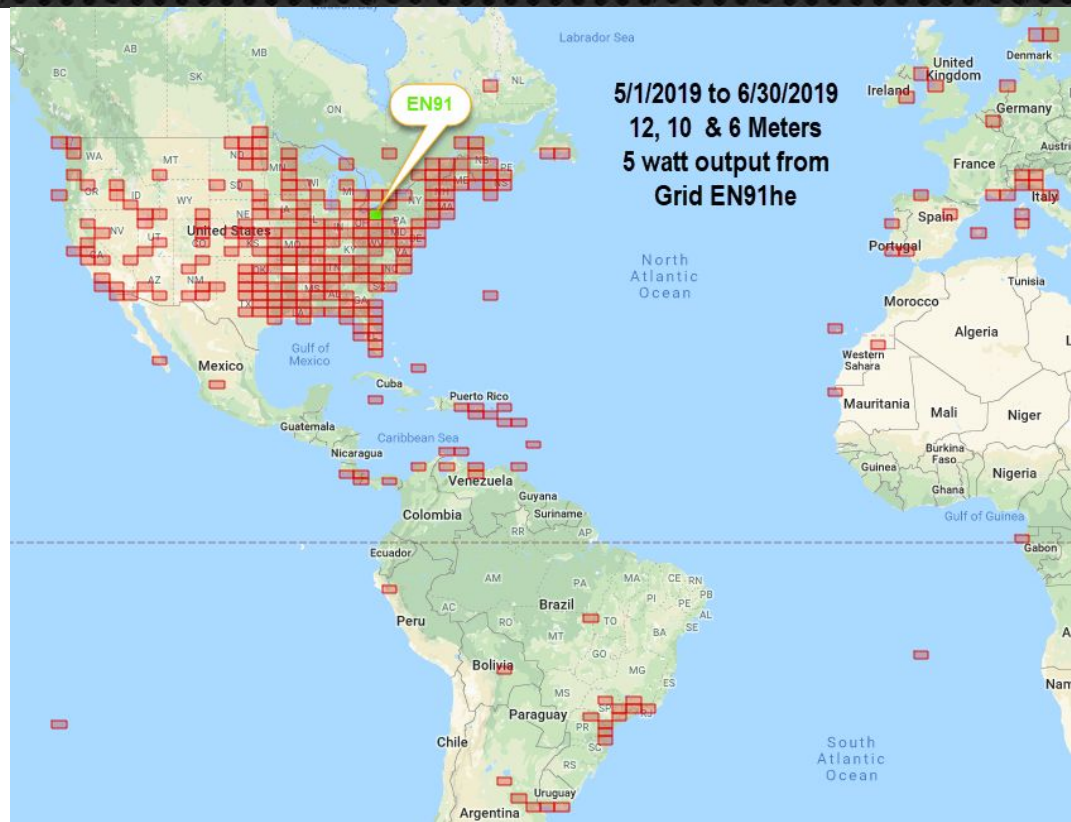
- “Dead” Bands are alive daily (12, 10 & 6)
- Read-  
*“Want to Work 6, 10 or 12 Meters But No Sunspots? Don’t Miss Your Chance with Summer E Skip and FT8”* 





# What Can FT8 & FT4 Do?

- “Dead” Bands?
- 10, 12 & 6 M QSOs
- May 2018 to June 2019
- 5 Watts
- Antena – 3 El Beam at 50'



# What Can FT8 & FT4 Do?

- K8ZT from:
  - May 2018–
  - July 2019
- Power output
  - 5 watts.
- Antenna
  - 3 El Beam at 50 feet.

## DXCC

DXCC	12m	10m	6m	Total
5T		1		1
8P		3		3
9Y			1	1
C6			1	1
CE	3	3		6
CE0E	1			1
CP	1			1
CT		1	1	2
CX	1	3		4
EA	3			3
EA6	1	2		3
EA8	1	2	3	6
EI		2		2
F	3	1		4
FG	1		1	2
FP		1	1	2
G		4		4
GI	1			1
HC		1		1
HI	2	3	1	6
HK	1			1
HP	2			2
I	4	2		6
IS0		1		1
J7	1			1
K	165	279	393	837
KP2	1	4		5
<b>Total</b>	<b>440</b>	<b>226</b>	<b>1044</b>	

DXCC	12m	10m	6m	Total
KP4	1	4	3	8
LU	4	8		12
OA	1			1
ON		1		1
P4	1	4		5
PA		1		1
PJ2		3		3
PJ4	1	5		6
PJ5	1			1
PY	10	12		22
S0	1			1
SM			2	2
TG		1		1
TI	2			2
TK	1			1
TR		1		1
VE	3	10	26	39
VP2-E	1	1		2
VP2-M		1		1
VP6-D	1			1
VP8-F	2	1		3
VP9		1	5	6
XE		3	1	4
YN		1		1
YV	2	4	1	7
ZD7	1	1		2
ZF	1	2		3
<b>Total</b>	<b>440</b>	<b>226</b>	<b>1044</b>	

## WAS

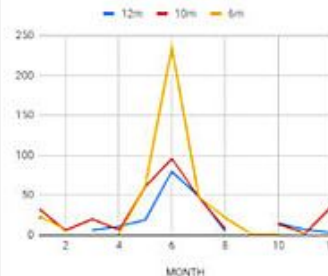
STATE	12m	10m	6m
AL	5	9	11
AR	4	3	11
AZ	3	5	3
CA	2	13	3
CO	5	3	12
CT	1	6	1
DE	1	2	3
FL	17	43	55
GA	2	3	3
IA	6	1	5
ID	2	1	1
IL	4	4	2
IN		2	6
KS	7	7	14
KY	2	3	2
LA	8	9	9
MA	1	7	3
MD	1	3	3
ME	6	5	4
MI	2	2	7
MN	3	8	2
MO	6	4	4
MS	5	5	10
MT			1
<b>Total</b>	<b>226</b>	<b>379</b>	<b>443</b>

STATE	12m	10m	6m
NC	3	4	1
ND	2	10	4
NE	3	5	3
NH	5	7	3
NJ	2	5	1
NM	3	1	3
NV	1	4	3
NY	2	3	1
OH	9	22	110
OK	2	7	14
OR	1	1	1
PA	3	5	5
RI	2	4	
SC	3	4	3
SD	6	4	6
TN	2	3	5
TX	12	26	40
UT	2	2	2
VA	2	2	4
VT	2	2	1
WA	1	5	
WI	2	2	1
WV	2	3	4
WY	1	1	3
<b>Total</b>	<b>226</b>	<b>379</b>	<b>443</b>

## by Month

MONTH	12m	10m	6m	Totals
1	22	33	24	79
2		6	8	14
3	6	20		26
4	11	7	1	19
5	19	61	62	142
6	80	96	235	411
7	49	48	48	145
8	5	8	22	35
9			1	1
10	15	14	1	30
11	7	2		9
12	3	36		39
<b>Year</b>	<b>217</b>	<b>331</b>	<b>402</b>	<b>950</b>

12m, 10m and 6m



# What Can FT8 & FT4 Do?

- Works well with HOA Limited, indoor, temporary, mobile, etc.  
Antenna Options
- Magnetic Loop Antennas are very portable, and the limited bandwidth (without retuning) is not as big a problem on fix frequency modes FT8/FT4 as on other modes





# What Can FT8 & FT4 Do?

- 160 M capability for modest stations
  - Currently (with 5 watts & 60' sloper antenna)
    - >1600 QSOs
    - 61 DXCC
    - 50 WAS
    - 6 WAC
    - Best DX-ZS (13,000 m), UAØ (8500 m) & E51 (6600 m)

# What Can FT8 & FT4 Do?


- ✓ Automatic Logging into ADIF file
- ✓ Easy transfer of electronic log to LOTW, eQSL and your master station logbook
- ✓ Let you know how strong stations you are decoding are in dBs
- ✓ Work with almost any SSB Radio including VHF/UHF

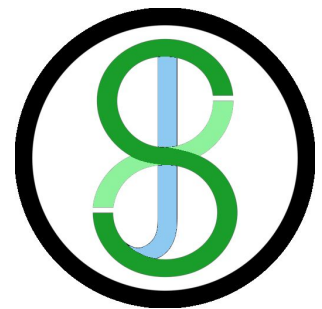




# What FT8 & FT4 CANNOT Do?



- ⊘ Rag Chewing and Long Contacts
  - *JS8CALL*  is option
  - PSK31 is more traditional option
- ⊘ Work without a computing device
- ⊘ Work with a CW only radio
- ⊘ Work a station without an Operator



# FT8/FT4 Myths



FT8 requires Internet to make QSOs



No Operator is required



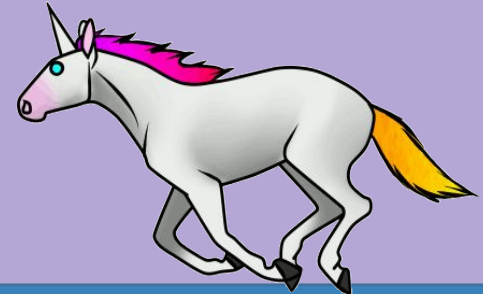
No Operator skill required



There is no home-brew or kits for Digital

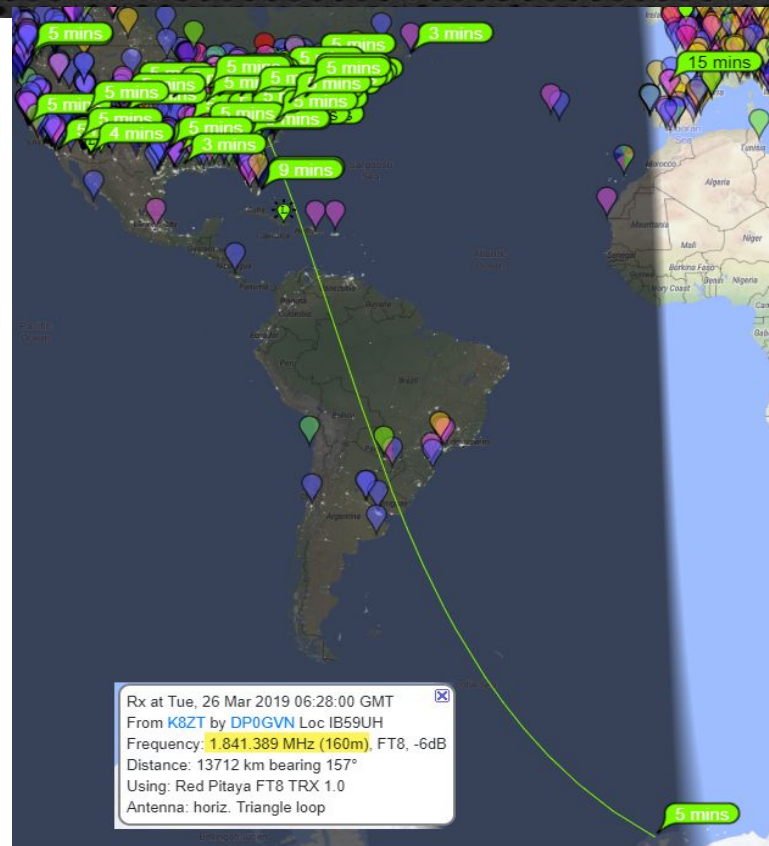


Only new radios can be used



# 160 M the one that got away!

- Antarctica!
- PSK Reporter showed they were receiving me (for over 20 minutes)
- Unfortunately no one seem to be at station to reply to my calls





**Getting Started**

# Getting Started– What You Need

- HF Radio
- Computer
- Soundcard or Soundcard Interface\*
- Software (Free)

\* Some radios have this built into the radio



# Getting Started– What You Need

- Method to generate audio (soundcard either in radio, in interface or independent)
- Way to Key Radio's PTT when transmitting
  - CAT Control
  - Sound Card Interface with built-in keying
  - Radio's VOX
  - Manual PTT Switch

# Getting Started– What You Need

- Radio Hardware
  - HF Radio Capable of SSB Transceive
  - Sound Card Interface (one of these):
    - i. Not needed if radio has it own
    - ii. External Interface such as Signalink
    - iii. Audio cables to computer sound card

# Recent Radios\*–Built in Soundcard?

Radios with Built in Soundcard	Radio that do not have SC	Radio w/o SC but Isolation circuits so you can connect directly to soundcard
ICOM 7300	ICOM 718	<a href="#">Phaser Single Band Kits</a> \$55 <a href="#">QRPGuys DSB Digital Transceiver Kit</a> \$40
ICOM 7100	Yaesu FT-891	
Yaesu FT-991 / 991A	Yaesu FT-1200	
Yaesu FTDX3000	Yaesu FT-450	
Elecraft K3s	Yaesu FT-857	
Kenwood TS 590 S / 590SG	Yaesu FT-818 /817	
FLEX-6400	Kenwood TS-480	
ICOM 705	Alinco DX-SR8T	

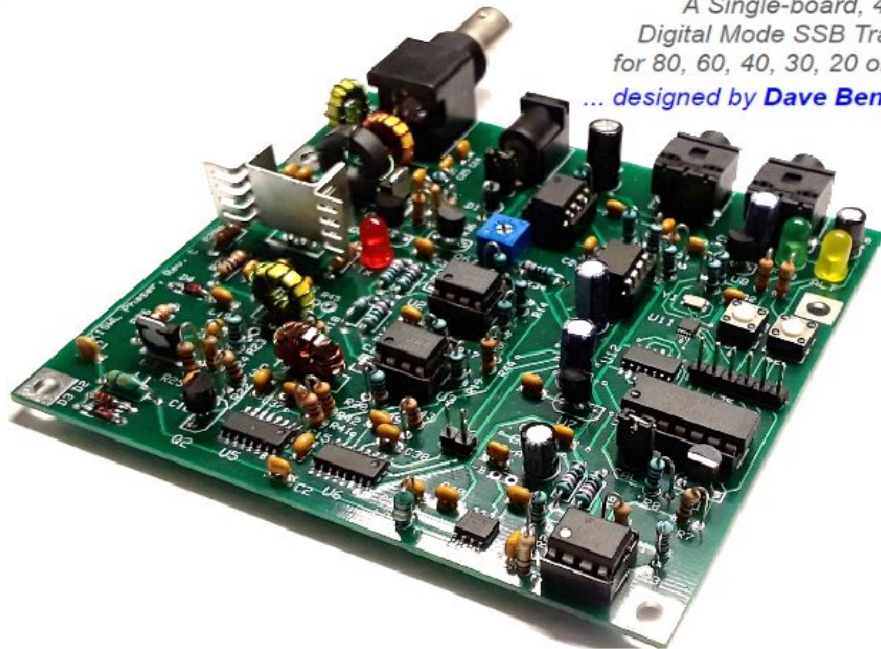
\* Under \$2000

# QRP Single Band FT8/FT4 Kits

Midnight  
Design  
Solutions

## *PHASER* Digital Mode Transceiver

A Single-board, 4-watt  
Digital Mode SSB Transceiver  
for 80, 60, 40, 30, 20 or 17 Meters  
... designed by **Dave Benson, K1SWL**



QRPGuys

QRPGuys – Unique ham radio kits for the budget minded







QRPGuys DSB Digital Transceiver II  
w/ crystal control

# Getting Started– What You Need

- Computer Hardware
  - Computer running Windows (7 or later), Linux, or OS X
    - 1.5 GHz or faster CPU and 200 MB of available memory.
    - Monitor with at least 1024 x 780 resolution
    - Possibly 2nd monitor for more screen space



# Getting Started- What You Need

- Computer Software
  - *WSJT-X*  (Free!) Operating Software
  - Helper Software
    - *JT Alert*  (Free!) for Windows or
    - *AlarmeJT*  for Linux (Free!)
  - Software to maintain highly synchronized time
  - Online Monitoring (spotting) *Pskreporter* 

# Getting Started– What You Need

- Miscellaneous stuff (you might need)
  - USB Cable
  - Audio Cables / Y-Splitters
  - Microphone Cables
  - DIN connector Cables

# WSJT-X Software



**WSJT-X User Guide**

# Putting it All Together– Radio

## 1. Setup Radio

- a. Install manufacturer's driver software
- b. Set Baud Rate of Radio (you may also need to turn on interface)
- c. Connect Interface cable
- d. *Determine Com Port # of Radio* ⚗
- e. Test operation of CAT control with logging or contesting software (*N1MM* ⚗, etc.)



# Sound Card Radio Interfaces

1. Radio with built in Soundcard
2. Interface with built in Soundcard
3. Interface without built in Soundcard
4. Radio without soundcard but capable of direct connection to Soundcard



# Sound Card Radio Interfaces

## 2. Interface with built in Sound Card

- *Tigertronics Signalink*
- *MFJ-1204*
- *ZLP Electronics MiniProSC*
- *Digirig Mobile*



# Sound Card Radio Interfaces

## 2. Interface with built in Sound Card

- *West Mountain RIGblaster*
- *XGGCOMMS*



# Sound Card External

## 3. & 4. External USB Sound Card

- Syba SD-AUD20101 USB (\$10 or less at many places)
- Review of many [USB Audio Interfaces for Digital Modes](#) – Jim Brown K9YC



... we interrupt for extra geekiness



# Soundcard Interfaces

**K7AGE**  
**Basics of**  
**Sound Card**  
**Interfaces**



# Soundcard Interfaces

- *Ham Guide to Interfacing Everything*  -Jim Brown K9YC

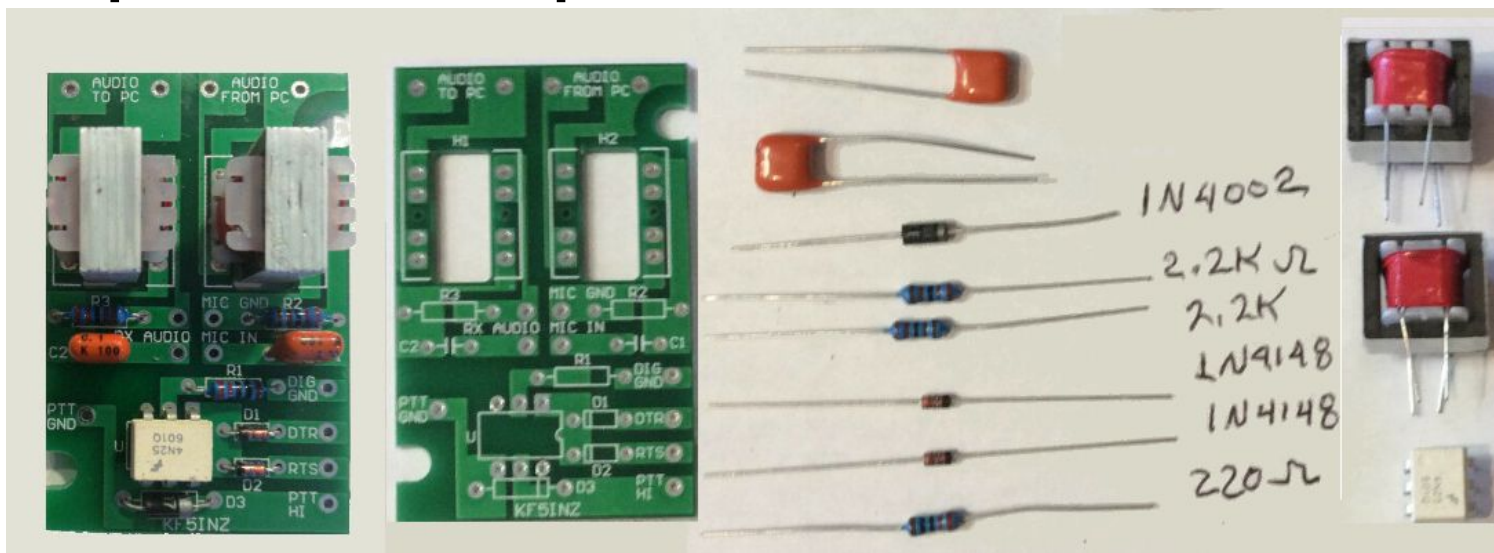


# Homebrew Soundcard Interfaces

- *G4ILO* 
- KD2AVU
  - *Video* 
  - *Circuit Diagram* 
- KB9RLW *DuinoVOX* 

# Kit Interfaces

- EASY DIGI- Kit ~\$9 on eBay. Requires separate computer soundcard



# Kit Interfaces

- EASY DIGI- Built with case ~\$20-30 on eBay.
- Requires computer soundcard





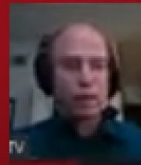
# Dealing with Com Ports!

- Legacy PC Serial Ports
- USB Ports and Devices
- USB-to-Serial Adapters
- Using the Device Manager
- Managing Serial Port Numbers
- Using Serial Ports for CW / FSK / PTT Keying
- Sharing Serial Ports
- USB Sound Cards

Everything You Need to Know  
About USB and Serial  
Interfaces



Presented by N6TV




[n6tv@arrl.net](mailto:n6tv@arrl.net)



A must read even if not  
interested in FT8!



# Serial & USB Port Interfacing

- Read this excellent reference on Serial and USB Ports to avoid/ fix problems with logging software, WSJT-X, etc.– *N6TV – “Everything You Need to Know About USB and Serial Interfaces”*  or watch the [video](#) of presentation at Contest University 2020

# Radio Computer Interfacing



# Sharing Com Ports!

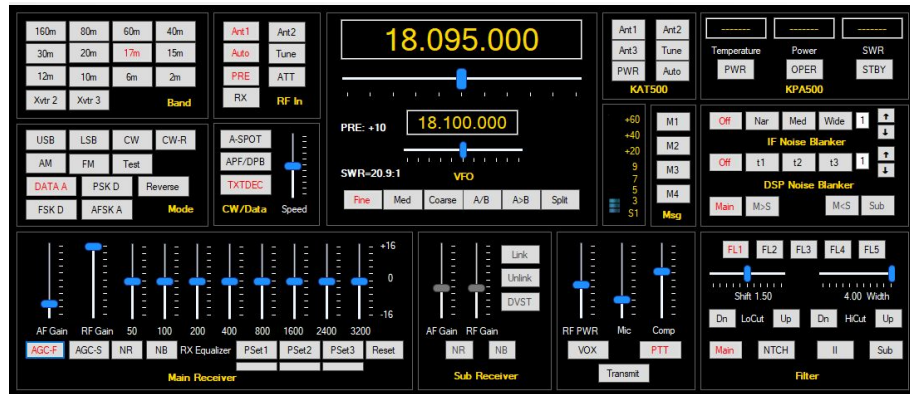
- If you want to use rig control with multiple software programs at same time

- Win4\_\_\_\_ Suite

- *Win4K3Suite* ∞

- *Win4IcomSuite* ∞

- *Win4Yaesu Suite* ∞

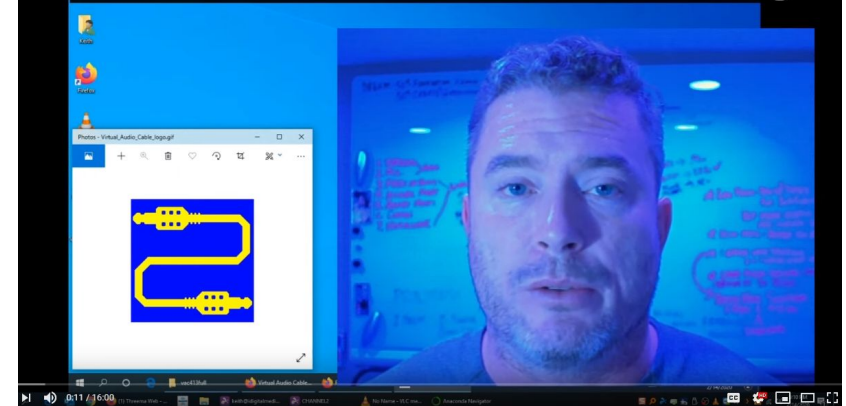


- *Null-modem emulator (com0com)* ∞

# Virtual Audio Connections



## Metascience Foundation and iDigitalMedium Class 1: Virtual Audio and Audio Routing





... now back out regularly scheduled  
presentation





# Resources to Help With Setup

KØPIR- FT8  
with Icom 7300

**FT-991 SETUP FOR  
DIGITAL MODES**

K3S on JT65/JT9-  
Setting Up & Using



 Yaesu FT-991  
WSJT-X Setup

Setup Elecraft Radios  
for Data Modes

W6AWD  
WSJT-X-- IC-7100, 7200, 7300 & 7410

Yaesu FT-891  
WSJT-X



**LAMCO** Kenwood  
**TS590 WSJT-X**

**KB9VBR**  
**Yaesu FT-891**

**KENWOOD TS590**  
Setup for WSJT-X

# Putting it All Together– Audio

## 2. Setup Audio Path

- a. If Radio has built in Soundcard
  - i. Install manufacturer's driver software
  - ii. Check Computer's Sound settings (Control Panel)

# Putting it All Together– Audio

## 2. Setup Audio Path

- b. If Radio does not has built in Soundcard
  - i. Chose Interface Device (Signalink, MFJ-1204, etc.)
  - ii. Follow manufacturer's instructions
  - iii. Connect all cables
  - iv. Check Computer's Sound settings (Control Panel)

# Putting it All Together– Audio

## 2. Setup Audio Path

- c. In all cases make sure your Radio or Interface sound card is **NOT DESIGNATED AS THE DEFAULT SOUND DEVICE** in Sound Control Panel Settings
- d. Set your computer's internal soundcard (the one you are not using for WSJT-X) as default

# Putting it All Together– Software

## 3. Install Software

- a. WSJT-X– [\*Installer Link\*](#)
- b. The built-in Windows facility for time synchronization is usually not adequate. Install *Meinberg NTP* ([\*Network Time Protocol Setup\*](#)) or *Dimension 4* from [\*Thinking Man Software\*](#).
- c. Install JT Alert– [\*Link\*](#)



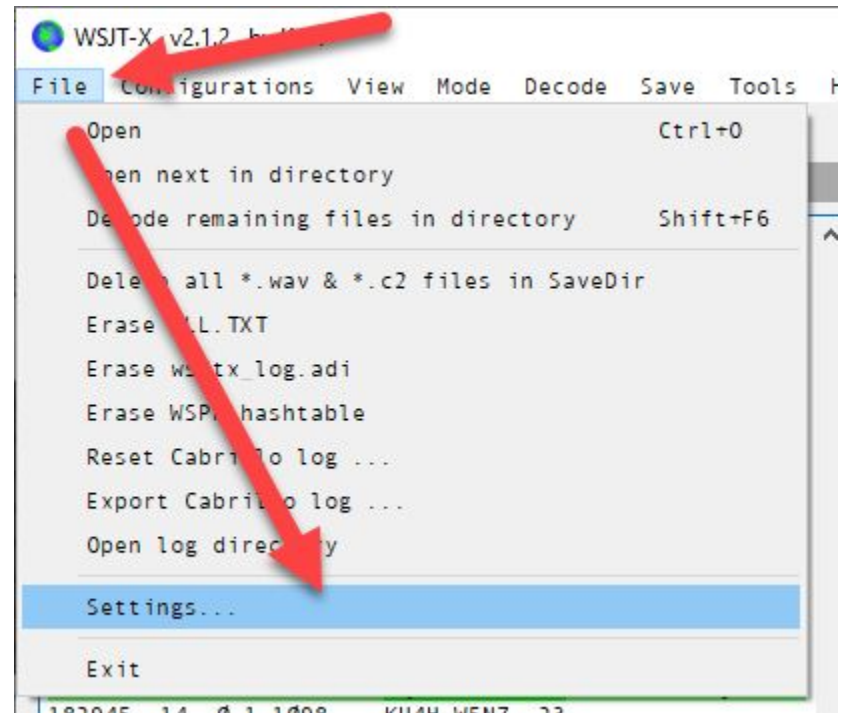


# Putting it All Together– Configure

## 4. Configure Software

### a. WSJT-X–

*Configuration Link*



# Putting it All Together- Configure

Settings ? X

General Radio Audio Tx Macros Reporting Frequencies Colors Advanced

Station Details

My Call:  My Grid:  ☐ AutoGrid IARU Region:

Message generation for type 2 compound callsign holders:

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

Font...  
Decoded Text Font...

Behavior

☐ Monitor off at startup ☐ Enable VHF/UHF/Microwave features

☐ Monitor returns to last used frequency ☐ Allow Tx frequency changes while transmitting

☒ Double click on call sets Tx enable ☐ Single decode

☒ Disable Tx after sending 73 ☐ Decode after EME delay

☐ Calling CQ forces Call 1st

☐ Alternate F1-F6 bindings

☐ CW ID after 73

Tx watchdog:


Periodic CW ID Interval:

OK Cancel

# Putting it All Together- Configure

Settings

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

Rig: Elecraft K3S  Poll Interval: 1 s

CAT Control

Serial Port: COM17

Serial Port Parameters

Baud Rate: 38400

Data Bits

☐ Default ☐ Seven ☒ Eight

Stop Bits

☐ Default ☐ One ☒ Two

Handshake

☐ Default ☒ None ☐ XON/XOFF ☐ Hardware

Force Control Lines

DTR:  RTS:

PTT Method

☐ VOX ☐ DTR ☒ CAT ☐ RTS

Port: COM11

Transmit Audio Source

☐ Rear/Data ☒ Front/Mic

Mode

☐ None ☐ USB ☒ Data/Pkt

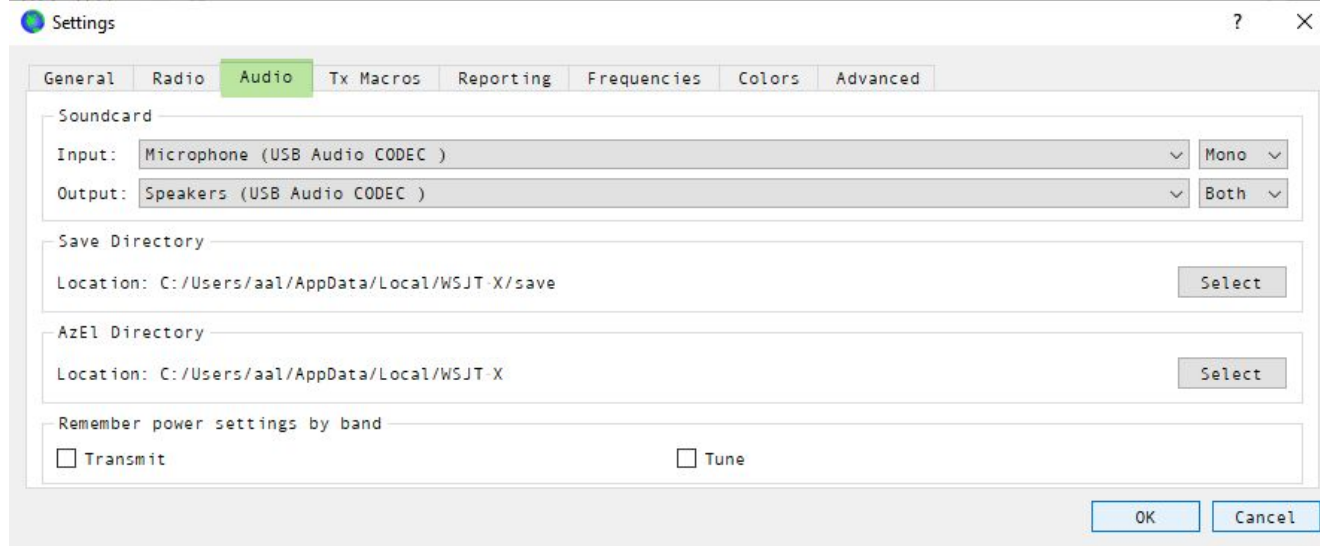
Split Operation

☒ None ☐ Rig ☐ Fake It

Test CAT Test PTT

OK Cancel

# Putting it All Together– Configure



Make sure Soundcard Input and Output are not your computer's internal soundcard

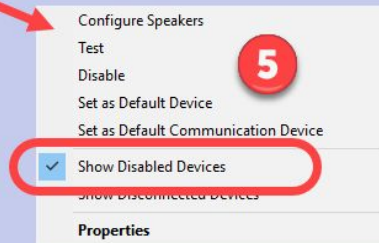
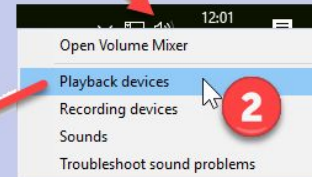
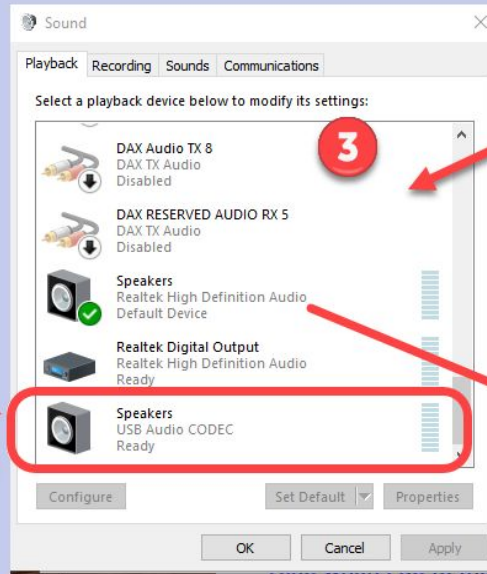
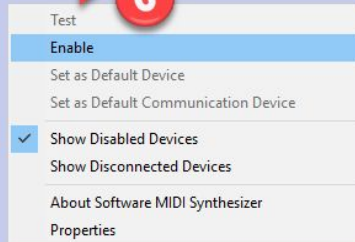
# Putting it All Together– Configure

A. If this not listed, right click on any one of the other speakers and then click "Show Disabled Devices"

B. The "USB Audio CODEC" device should then be visible.

C. After showing disabled devices, you will need to enable that device, by right clicking on it and then choosing "Enable".

D. This should allow you to choose it in WSJT-X configuration.





# Resources to Help With Setup

KØPIR- FT8  
with Icom 7300

**FT-991 SETUP FOR  
DIGITAL MODES**

K3S on JT65/JT9-  
Setting Up & Using



**Yaesu FT-991  
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TS590 WSJT-X**

**Yaesu FT-891  
WSJT-X**



**KB9VBR**  
**Yaesu FT-891**

**KENWOOD TS590**  
Setup for WSJT-X



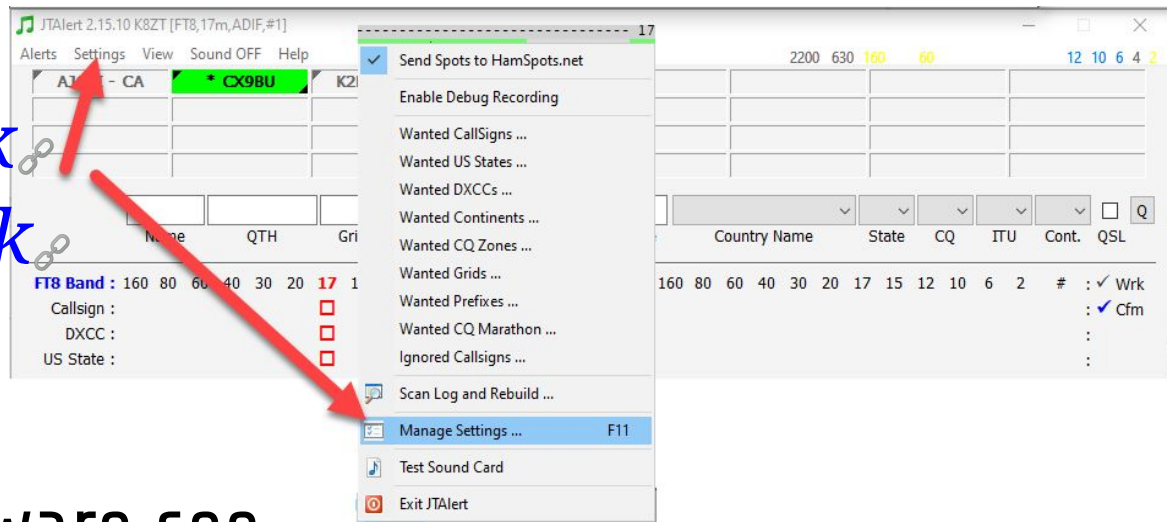
# Putting it All Together– Configure

## 4. Configure Software

### b. JT-Alert

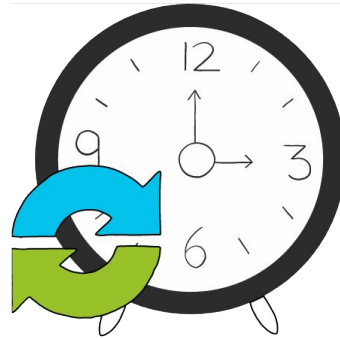
- i. *AE4VJ Link*
- ii. *KC8RP Link*
- iii. *M0MCX*
- iv. Logging

c. Time Sync software see below



# Helper Software –Time Sync

- *Meinberg NTP Time Server Monitor*
- *Thinkman*
- *Mania Software*



VA3MW- List of Time  
Syncing Options



UTC	dB	DT	Freq	Message
144415	-3	0.8	1341 ~	W9GI KM6MRQ 73
144415	-18	1.9	1420 ~	HA7VC IT9BZG JM68
144415	-13	0.8	1478 ~	CQ PD4WB JO21 ~Netherlands
144415	4	0.1	1549 ~	OZ1BQM KCØRF DM79
144415	-11	0.4	1676 ~	CQ CO3JR EL93 ~Cuba
----- 20m				
144445	-7	0.8	1300 ~	K8ZT KM6MRQ DM12 ②
144445	-12	0.8	1478 ~	CQ PD4WB JO21 ~Netherlands
144445	6	0.1	1549 ~	OZ1BQM KCØRF DM79
144445	-12	0.4	1676 ~	CQ CO3JR EL93 ~Cuba
----- 20m				
144515	-5	0.8	1300 ~	K8ZT KM6MRQ R-Ø3 ④
144515	7	0.1	1549 ~	OZ1BQM KCØRF DM79
----- 20m				
144545	3	0.8	1300 ~	K8ZT KM6MRQ 73 ⑥
144545	5	0.1	1549 ~	OZ1BQM KCØRF DM79
144545	-22	0.1	1644 ~	CQ G8BCG IO7Ø ~England ⑦

UTC	dB	DT	Freq	Message
143945	3	0.1	1624 ~	N3PKJ N7AED R-Ø6
144015	2	0.1	1624 ~	N3PKJ N7AED 73
144100	Tx		1300 ~	CQ K8ZT EN91
144130	Tx		1300 ~	CQ K8ZT EN91
144200	Tx		1300 ~	CQ K8ZT EN91
144230	Tx		1300 ~	CQ K8ZT EN91
144300	Tx		1300 ~	CQ K8ZT EN91
144315	-19	0.2	1615 ~	VU2RPS VU2JXL R-Ø7
144330	Tx		1300 ~	CQ K8ZT EN91
144400	Tx		1300 ~	CQ K8ZT EN91
144430	Tx		1300 ~	CQ K8ZT EN91
144445	-7	0.8	1300 ~	K8ZT KM6MRQ DM12
144500	Tx		1300 ~	KM6MRQ K8ZT -Ø7
144515	-5	0.8	1300 ~	K8ZT KM6MRQ R-Ø3
144530	Tx		1300 ~	KM6MRQ K8ZT RRR
144545	3	0.8	1300 ~	K8ZT KM6MRQ 73
144600	Tx		1300 ~	KM6MRQ K8ZT 73

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

20m

14.074 000

☒ Tx even/1st

DX Call

DX Grid

Tx 1300 Hz

Tx - Rx

KM6MRQ

DM12

Rx 1300 Hz

Rx - Tx

Az: 264

2068 mi

☒ Hold Tx Freq

Lookup

Add

Report 3

☒ Auto Seq

☒ Call 1st

☐ NA VHF Contest

2017 Oct 23  
14:46:10

Generate Std Msgs

Next

Now

KM6MRQ K8ZT EN91

☐

Tx 1

KM6MRQ K8ZT +Ø3

☐

Tx 2

KM6MRQ K8ZT R+Ø3

☐

Tx 3

KM6MRQ K8ZT RRR

☐

Tx 4

KM6MRQ K8ZT 73

☐

Tx 5

CQ K8ZT EN91

☒

Tx 6

# Operating Tips

- Before starting WSJT-X software
  - Always make sure all USB cables & devices are attached to computer (USB Sound Cards, Digital Interfaces, Radio Controllers (CAT), etc.)
  - Make sure the Radio is turned on



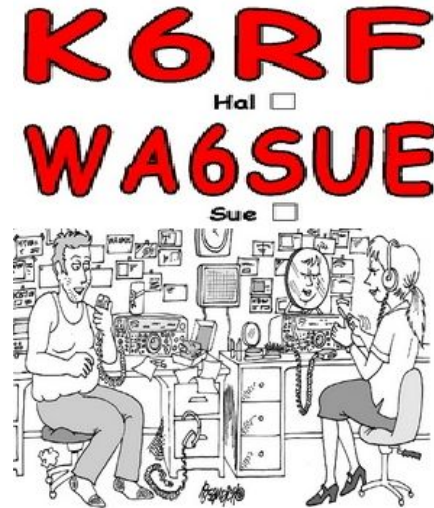


# Operating Tips

- You can create multiple WSJT-X Configurations for different radios/operators
- You can copy your configuration files for installation on new computer
  - Copy following files-WSJT-X.ini, wsjtx\_log.adi and ALL.TXT

# Operating Tips 2nd Operator

- You can create multiple WSJT-X...
  - Configurations for different radios
  - Logs for *Second User on the Same Windows Computer*
- You can copy your configuration files for installation on new computer (WSJT-X.ini, wsjtx\_log.adi and ALL.TXT)



# FT8/FT4 Operating Tips

- If things stop working check:
  - Computer Soundcard settings (especially after Windows updates)
  - Time Synchronization
  - Radio bandwidth filter is set at maximum
  - Is radio in correct mode (USB or Data)?
  - Is WSJT-X in correct mode (FT8 or FT4)?
  - 3 boxes checked? (Hold Tx Freq, Call 1st, Auto Seq)
  - Is “Special Operating Activity” selected?
  - Is radio working on other modes?



# Screen

WSJT-X v2.2.0-rc1 by K1JT, G4WJS, and K9AN

File Configurations View Mode Decode Save Tools Help

Band Activity Rx Frequency

Message Freq Message

**Stations being Recieved**

**Stations I am trying to work**

**Change Band/Frequency**

**Current Frequency**

**Transmit Enabled**

**Stop Transmit**

☐ CQ on        ☒ Menus

20m ☒ 14.080 000 ☐ Tx even/1st

Tx 423 Hz ☒ Hold Tx Freq

Rx 712 Hz

Az: 46 4513 mi Report 15

☒ Auto Seq ☒ Call 1st

**2020 May 20 15:18:43**

**Current Mode**

Next Now

☐ Tx 1

☐ Tx 2

☒ Tx 3

☐ Tx 4

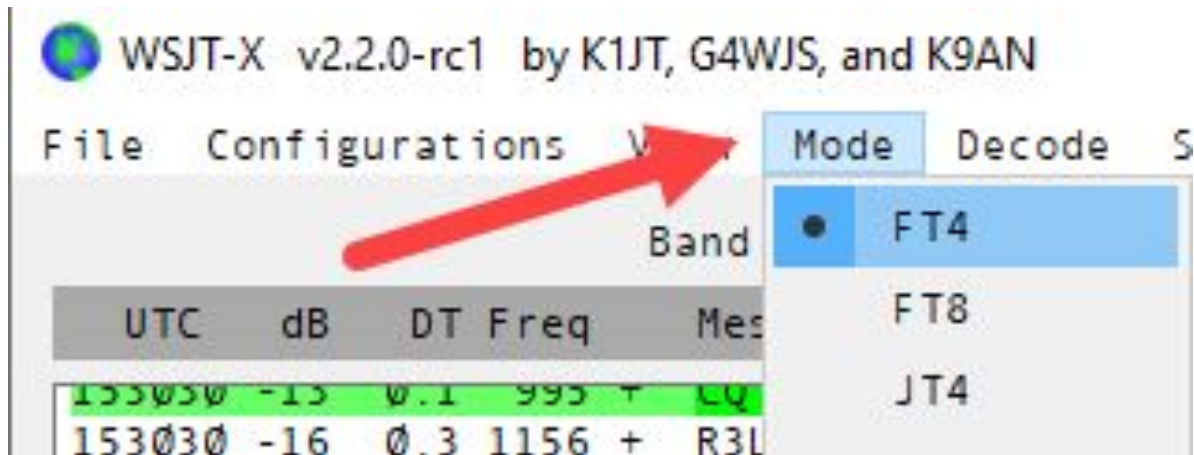
☐ Tx 5

☐ Tx 6

K3S Current FT4 Last Tx: OE1EQW K8ZT R 15 11 5/7.5 WD:7m

# Basic Operation Steps

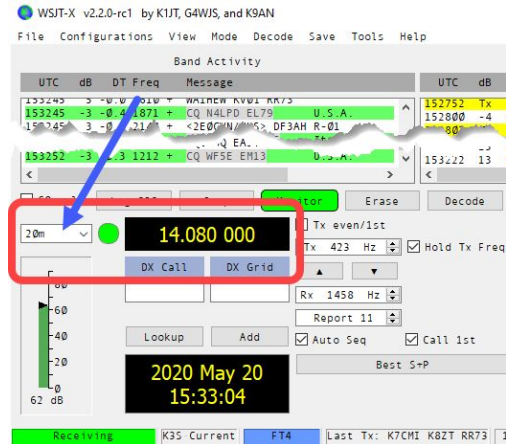
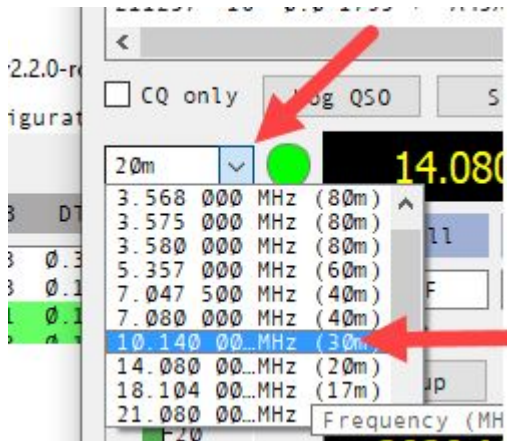
- Start Program
- Choose FT8 or FT4 from “Mode” menu





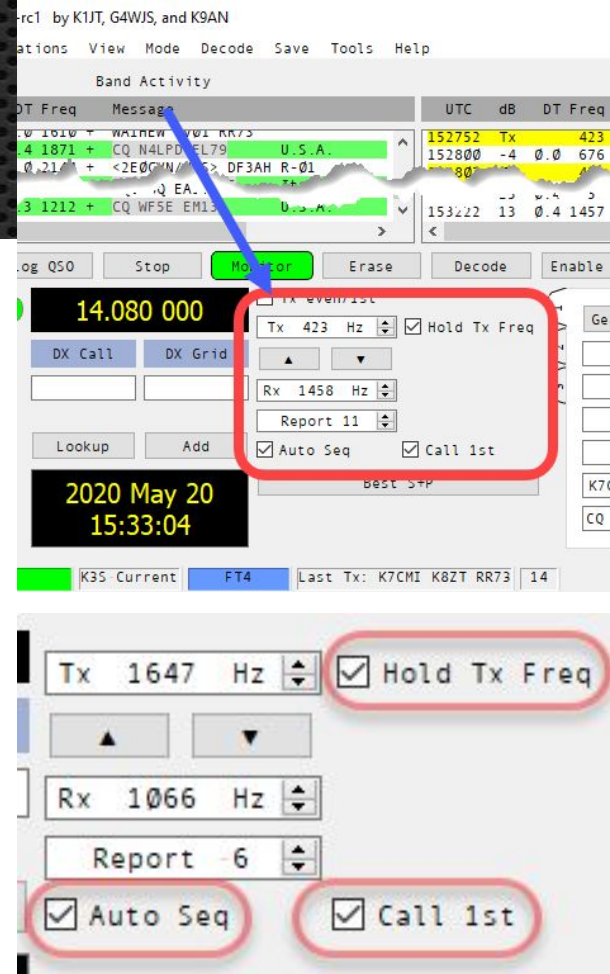
# Basic Operation Steps

- Use Frequency selection box to choose desired band using drop down-menu or by directly typing in freq.



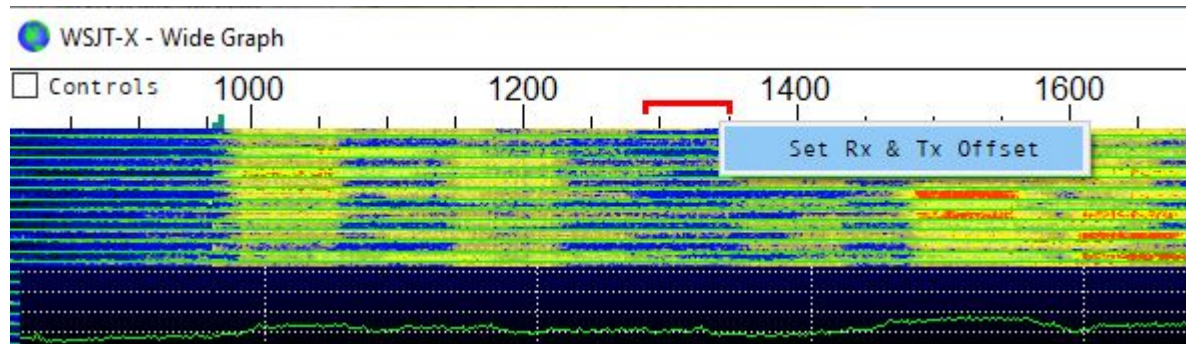
# Basic Operation Steps

- Three boxes that should be checked in normal operation
- "Hold Tx Freq" (avoids changing transmitting frequency when you double click on a station to call them)
- "Auto Seq" (sends proper replies after starting of a contact or response to CQ)
- "Call 1st" (used when CQing to allow auto-answering of responding station)



# Basic Operation Steps

- Choose Transmit Frequency Using Band Map
- Allow a couple cycles of decode
- Find unoccupied space and Right Mouse Click to choose “Set Rx & Tx Offset”



# Basic Operation Steps- Receiving

Shows new round of decodes

Stations calling CQ

Two stations in a QSO. UA3XHZ (station on right, the one we are receiving) is telling F5NAA "73"

Gray color indicates a station we have worked B4 on this band

UTC	dB	DT	Freq	Message
153245	-3	-0.0	1810	WA1NEW KVV01 KK75
153245	-3	-0.4	1871	CQ N4LPD EL79 U.S.A.
153245	3	-0.0	2144	<2E0CVN/NHS> DF3AH R-01
153245	-6	-0.3	728	CQ IK2DUW JN45 Italy
153245	-5	-0.4	908	M0IHT RUI2 KP69
153245	-14	0.1	1374	CQ 2E0VDF IO93 England
153245	-6	0.2	2107	W6SA EW8KT KO42
153245	-20	0.0	918	J51MRA F4HEG R-12
----- 20m -----				
153252	-8	0.3	334	JE1AEX DL8MRE -01
153252	-9	0.1	997	CQ E20WXA OK03 CQ Zone 26
153252	-2	-0.2	1103	CQ HB9CUZ JN47 Switzerland
153252	-2	0.4	1155	W7OK G7FWE -17
153252	-12	-0.0	1377	CQ WD5GRW EM13 U.S.A.
153252	6	0.5	1498	CQ N4ULE EM94 U.S.A.
153252	1	-0.0	1651	KA2DUT WG4P EM73
153252	-4	0.0	1759	CQ W7KKC CN88 U.S.A.
153252	-8	-0.2	1896	SV5DKL DL0VBG R-05
153252	-20	0.1	2221	YC1RKT W6AER CM87
153252	-3	0.1	1047	F5NAA UA3XHZ 73
153252	3	-0.0	1514	JE1AEX M0ARC R-02
153252	3	-0.0	1514	SQ6COQ EA3GM RR73
153252	-3	0.3	1212	CQ WF5E EM13 U.S.A.

Log QSO Stop Monitor Erase

20m 14.080 000

Tx even/1st Tx 423 Hz Rx 1458 Hz Report 11



# Basic Operation Steps– CQing

- Make sure “Call 1st” box is checked
- Choose “CQ” message
- Enable Tx

The screenshot displays a radio software interface with a log window and a message generation panel. The log window shows a series of messages between K8ZT and WB8SIC. The message generation panel has a 'Generate Std Msgs' section with a list of messages and a 'Tx' button for each. The 'Call 1st' checkbox is checked, and the 'CQ K8ZT EN91' message is selected.

**Log Window:**

UTC	dB	DT	Freq	Message
161022	1	-0.2	910	+ PA ADG KJ4GK -15
161337	Tx	1483	+	CQ K8ZT EN91
161352	Tx	1483	+	CQ K8ZT EN91
161445	Tx	1464	~	CQ K8ZT EN91
161515	Tx	1464	~	CQ K8ZT EN91
161530	12	0.1	1464	~ K8ZT W8SIC EN91
161545	Tx	1464	~	W8SIC K8ZT +12
161600	11	0.1	1464	~ K8ZT W8SIC R-10
161615	Tx	1464	~	W8SIC K8ZT RR73

**Message Generation Panel:**

Generate Std Msgs	Next	Now
W8SIC K8ZT EN91	<input type="radio"/>	Tx 1
W8SIC K8ZT +11	<input type="radio"/>	Tx 2
W8SIC K8ZT R+11	<input type="radio"/>	Tx 3
W8SIC K8ZT RR73	<input type="radio"/>	Tx 4
W8SIC K8ZT 73	<input type="radio"/>	Tx 5
CQ K8ZT EN91	<input checked="" type="radio"/>	Tx 6

**Callouts:**

- K8ZT (me) calling CQ
- WB8SIC Answering
- K8ZT responses with signal report of +12
- WB8SIC responses with confirmation of "R" and signal report of -10
- K8ZT sends "RR73" as final confirmation and goodbye



# Basic Op Steps- Answering a CQ

K4IIA calling CQ, I double click with mouse on this. My Enable Tx activated and I send "K4IIA K8ZT EN91"

K4IIA responds with "K8ZT K4IIA" and signal report of "-20"

K4IIA responds with "K8ZT K4IIA" and confirmation of "RR73"

Band Activity				Rx Frequency			
UTC	dB	DT Freq	Message	UTC	dB	DT Freq	Message
164715	-1	0.1 1495	~ K2COP K3LA 73	164015	Tx	1277	~ SV9FBT K8ZT EN91
164745	-2	0.3 1578	~ K3MAW N1UL 73	164030	-1	0.1 1276	~ IK4RQJ N4JRS EM8
164745	6	0.0 1650	~ WB9TFH WE45 EL98	164045	Tx	1277	~ SV9FBT K8ZT EN91
164745	1	0.2 2000	~ WD4CVK N4NDR -14	164100	4	0.1 1276	~ IK4RQJ N4JRS EM8
164745	0	0.1 1495	~ CQ K4IIA EL97	164115	Tx	1277	~ SV9FBT K8ZT EN91
164815	5	0.1 1475	~ K8ZT K4IIA -20	164130	0	0.1 1276	~ IK4RQJ N4JRS EM8
164815	13	0.0 1650	~ WB9TFH WE45 R-12	164145	Tx	1277	~ SV9FBT K8ZT EN91
164815	2	0.5 2000	~ WD4CVK N4NDR -14	164215	Tx	1277	~ SV9FBT K8ZT EN91
164815	2	0.2 988	~ CQ WB5AAA EM40	164245	Tx	1277	~ SV9FBT K8ZT EN91
164815	9	0.2 1578	~ CQ N1UL FL95	164407	-3	0.2 1274	+ KA2DUT TF3IG R+05
164845	6	0.1 1475	~ K8ZT K4IIA RR73	164417	-7	0.2 1274	+ KA2DUT TF3IG 73
164845	11	0.2 1578	~ CQ N1UL EL95	164715	1	0.1 1474	~ CQ K4IIA EL97
164845	5	0.2 2000	~ WD4CVK N4NDR -14	164730	1	1028	~ K4IIA K8ZT EN91
164845	7	0.0 1650	~ WB9TFH WE45 73	164745	2	0.1 1475	~ CQ K4IIA EL97
164845	-8	0.2 988	~ CQ N1UL EL95	164800	Tx	1028	~ K4IIA K8ZT EN91
				164815	1	0.1 1475	~ K8ZT K4IIA -20
				164830	Tx	1028	~ K4IIA K8ZT R+05
				164845	6	0.1 1475	~ K8ZT K4IIA RR73
				164900	Tx	1028	~ K4IIA K8ZT 73

☐ CQ only   Log OSO   Stop   Monitor   Erase   Decode   Enable Tx   Halt T

K8ZT responds with "K4IIA K8ZT" and confirmation and signal report of "R +05"

K8ZT responds with final "K4IIA K8ZT 73"

UTC	dB	DT	Freq	Message
144415	-3	0.8	1341	~ W9GI KM6MRQ 73
144415	-18	1.9	1420	~ HA7VC IT9BZG JM68
144415	-13	0.8	1478	~ CQ PD4WB JO21 ~Netherlands
144415	4	0.1	1549	~ OZ1BQM KCØRF DM79
144415	-11	0.4	1676	~ CQ CO3JR EL93 ~Cuba
----- 20m				
144445	-7	0.8	1300	~ K8ZT KM6MRQ DM12 2
144445	-12	0.8	1478	~ CQ PD4WB JO21 ~Netherlands
144445	6	0.1	1549	~ OZ1BQM KCØRF DM79
144445	-12	0.4	1676	~ CQ CO3JR EL93 ~Cuba
----- 20m				
144515	-5	0.8	1300	~ K8ZT KM6MRQ R-03 4
144515	7	0.1	1549	~ OZ1BQM KCØRF DM79
----- 20m				
144545	3	0.8	1300	~ K8ZT KM6MRQ 73 6
144545	5	0.1	1549	~ OZ1BQM KCØRF DM79
144545	-22	0.1	1644	~ CQ G8BCG IO70 ~England 7

UTC	dB	DT	Freq	Message
143945	3	0.1	1624	~ N3PKJ N7AED R-06
144015	2	0.1	1624	~ N3PKJ N7AED 73
144100	Tx		1300	~ CQ K8ZT EN91
144130	Tx		1300	~ CQ K8ZT EN91
144200	Tx		1300	~ CQ K8ZT EN91
144230	Tx		1300	~ CQ K8ZT EN91
144300	Tx		1300	~ CQ K8ZT EN91
144315	-19	0.2	1615	~ VU2RPS VU2JXL R-07
144330	Tx		1300	~ CQ K8ZT EN91
144400	Tx		1300	~ CQ K8ZT EN91
144430	Tx		1300	~ CQ K8ZT EN91
144445	-7	0.8	1300	~ K8ZT KM6MRQ DM12
144500	Tx		1300	~ KM6MRQ K8ZT -07
144515	-5	0.8	1300	~ K8ZT KM6MRQ R-03
144530	Tx		1300	~ KM6MRQ K8ZT RRR
144545	3	0.8	1300	~ K8ZT KM6MRQ 73
144600	Tx		1300	~ KM6MRQ K8ZT 73

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

20m 14.074 000

☒ Tx even/1st

DX Call

DX Grid

Tx 1300 Hz

Tx - Rx

KM6MRQ

DM12

Rx 1300 Hz

Rx - Tx

Az: 264

2068 mi

☒ Hold Tx Freq

Lookup

Add

Report 3

☒ Auto Seq

☒ Call 1st

☐ NA VHF Contest

2017 Oct 23  
14:46:10

Generate Std Msgs

Next

Now

KM6MRQ K8ZT EN91

☐

Tx 1

KM6MRQ K8ZT +03

☐

Tx 2

KM6MRQ K8ZT R+03

☐

Tx 3

KM6MRQ K8ZT RRR

☐

Tx 4

KM6MRQ K8ZT 73

☐

Tx 5

CQ K8ZT EN91

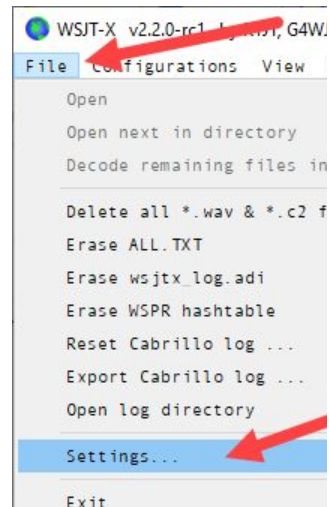
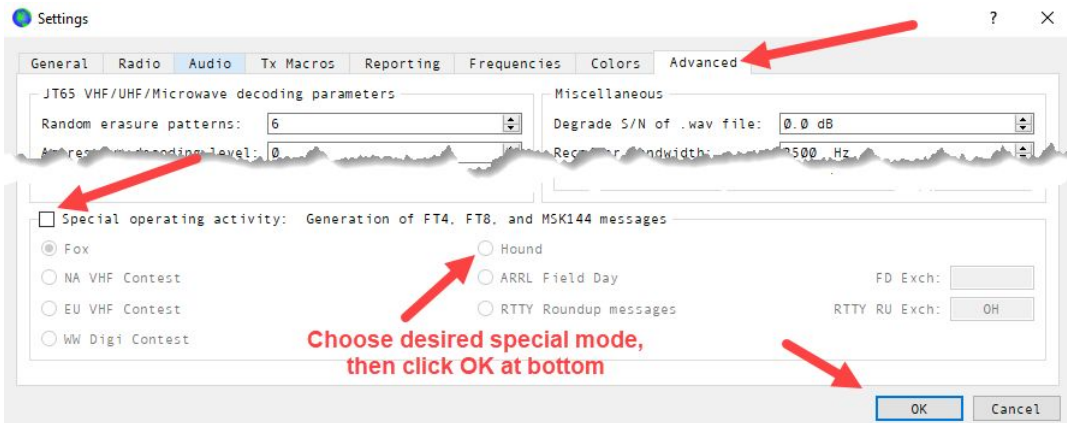
☒

Tx 6



# Special Modes Settings

- There are a few special modes available from “Settings...Advanced” menu
  - Hound Mode for DX stations using F/H
  - FD & other contesting modes



# Special Modes Settings– Field Day

## WSJT-X Settings for Field Day

The image shows the WSJT-X v2.2.0 Settings window with the 'Advanced' tab selected. The window is annotated with red circles and arrows indicating the steps to configure for Field Day.

**1** Click the 'Settings...' option in the File menu.

**2** Click the 'Settings...' option in the File menu.

**3** Click the 'Advanced' tab in the Settings window.

**4** Check the 'Special operating activity:' checkbox.

**5** Select 'ARRL Field Day' from the list of special operating activities.

**6** Enter your FD Exchange & Section in the 'FD Exch:' and 'RTTY RU Exch:' fields.

**7** Click the 'OK' button to save the settings.

The 'Advanced' tab contains the following settings:

- JT65 VHF/UHF/Microwave decoding parameters:**
  - Random erasure patterns: 6
  - Aggressive decoding level: 0
  - ☒ Two pass decoding
- Miscellaneous:**
  - Degrade S/N of .wav file: 0.0 dB
  - Receiver bandwidth: 2500 Hz
  - Tx delay: 0.2 s
  - Tone spacing:
    - ☐ x 2
    - ☐ x 4
  - Waterfall spectra:
    - ☒ Low sidelobes
- Generation of FT4, FT8, and MSK144 messages:**
  - ☒ Special operating activity:
    - ☐ Fox
    - ☐ NA VHF Contest
    - ☐ EU VHF Contest
    - ☐ WW Digi Contest
    - ☒ ARRL Field Day
    - ☐ RTTY Roundup messages
  - ☐ Hound

The 'FD Exch:' field is set to '1B' and the 'RTTY RU Exch:' field is set to '0H'.

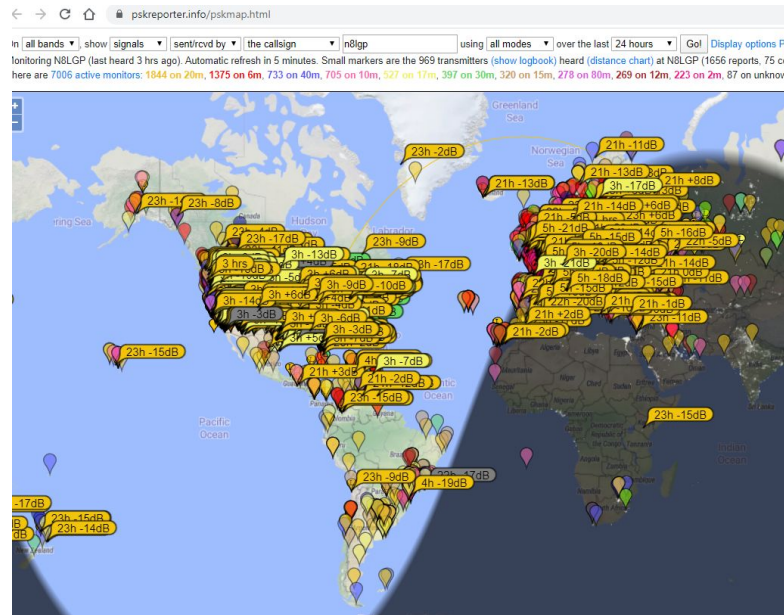
# Operating Tips

- Reduce power output settings on your radio to avoid overheating your transmitter
- Make sure your radio's filtering is set for its maximum bandwidth
- All speech processing, noise blanking, etc. is turned off



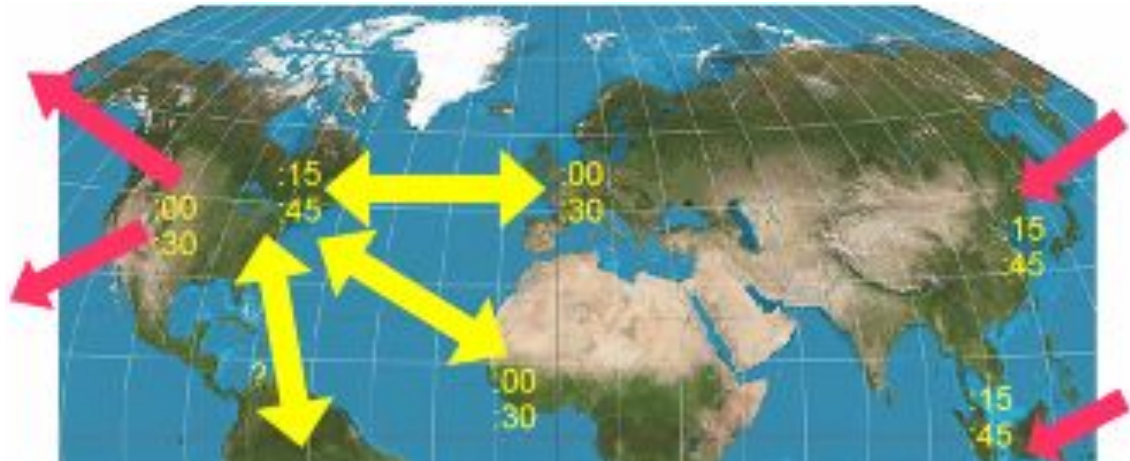
# Operating Tips

- After transmitting a few times you can use *PSKReporter* to check to make sure your signal is getting out and other stations are decoding you



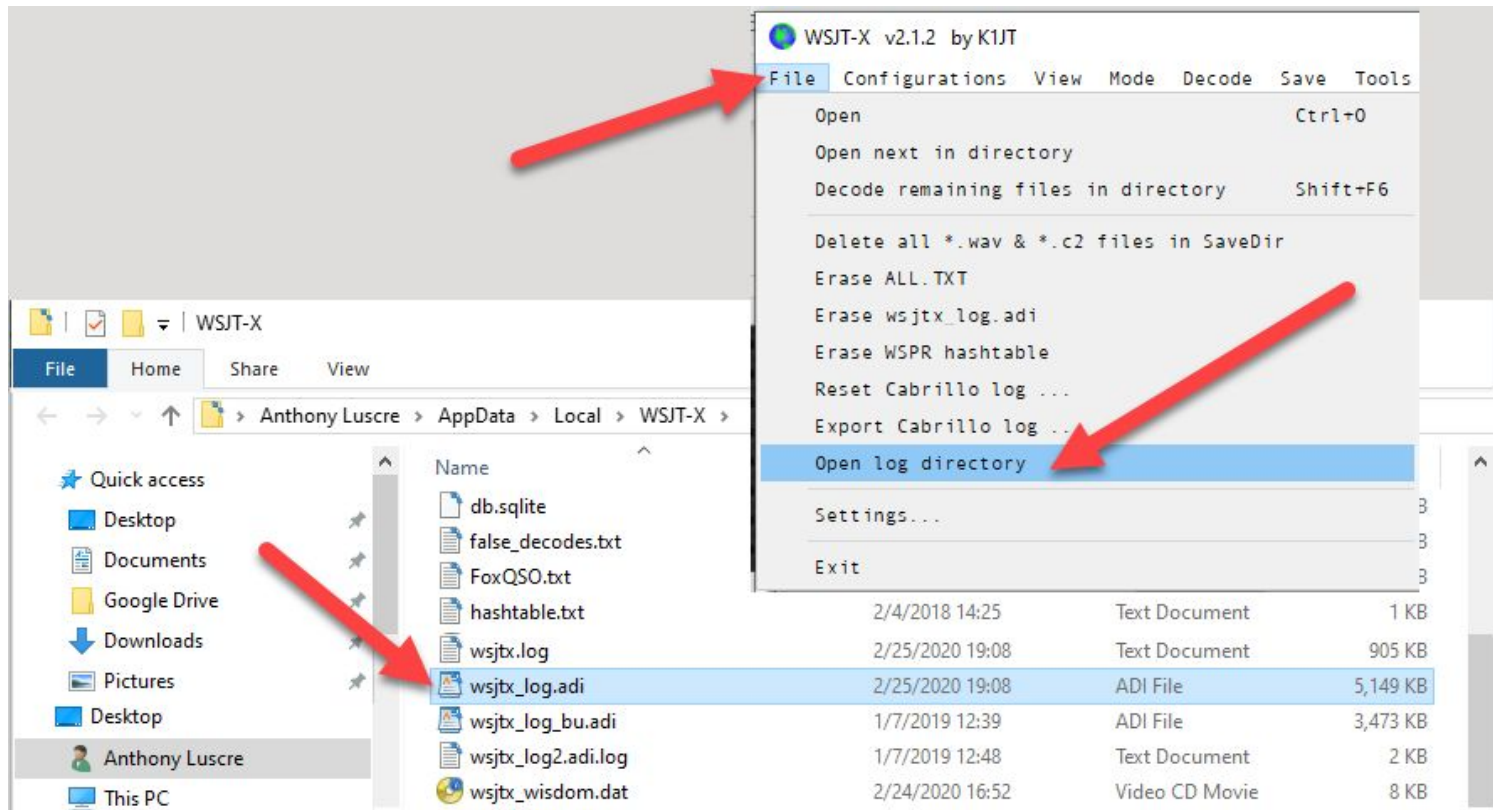
# Operating Tips– 6M DX

- Intercontinental 6M DX
  - Check both 50.313 & 50.323
  - May, June & July Peaks
  - Use timing conventions



# Operating Tips

- Where is my log?



# JT Alert

- A “helper” program to use with WSJT-X
  - Provides several audio and visual alert types based on decoded Callsigns within WSJT-X.
  - Support logging to some external logbook programs
  - Online XML Callsign Database lookup of names & locations of Calls- QRZ.com (paid) & HamQTH (free)
  - Upload QSOs to Online Logbooks- ClubLog & HRDLog



# JT Alert

[illegible]



# JT Alert- Text Message Window

The screenshot displays the JTAlert 2.11 software interface. A red arrow points to the 'View' menu, which is open, showing various options. Another red arrow points to the 'Text Message Window' option in the menu. A third red arrow points to the 'Text Message' window itself, which is titled 'Text Message' and contains a 'Callsign' field with 'K3STL' and a large text area for the message. The window also has 'Send' and 'Close' buttons. To the right of the text message window is a 'Received Messages - Last 10' list, which shows a list of received messages with their timestamps and content. The bottom of the screen shows a grid of call signs, including W6AER - B4, KE8Y - OH, KE8JNU - OH, KB6C - B4, WB4KTF - B4, PV8ABC, CO8RCP - B4, KA7X - OR, 9Y4DG - B4, HK2AQ, PY2TUA, PY3WW, K2UO - NJ, G7JWR/W4, PT2CSM, and NK9N - NC.

**Text Message Window**

Send a short text message.  
Message is sent without confirmation of receipt. The recipient station may not be using JTAlert or may have messages turned off.

ONLINE

Callsign: K3STL

256 Characters Max

Send Close

**Received Messages - Last 10**

Clear

- LA6TMA [2020-01-27 16:03:18 utc]  
tnx 73 tu gl logged
- F5SSQ [2020-01-06 16:05:35 utc]  
BIG QSB  
HNY 2020. 73 !!
- WA7CPA [2019-12-24 17:50:57 utc]  
Merry Christmas!
- K7MOE [2019-12-13 17:27:50 utc]  
Great not that I have ever done that, HA HA
- K7MOE [2019-12-13 17:26:19 utc]  
Tony, DX always TX on 00 and 30 . so you should TX 15 and 45, when in FH.

**JTAlert 2.11**

Alerts Settings View Sound OFF Help

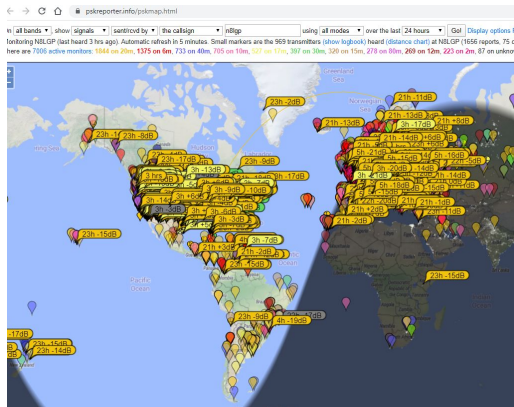
* W6AER - B4	# KE8Y - OH	# KE8JNU - OH	KB6C - B4	WB4KTF - B4	# PV8ABC	* CO8RCP - B4	* KA7X - OR
9Y4DG - B4	HK2AQ	PY2TUA	PY3WW	K2UO - NJ	G7JWR/W4	* PT2CSM	NK9N - NC
PY3OL	AA9DU - IN	* HC1DAZ					

# Propagation & Spotting

- See How Your Signal is Getting Out
- Find Other Activity



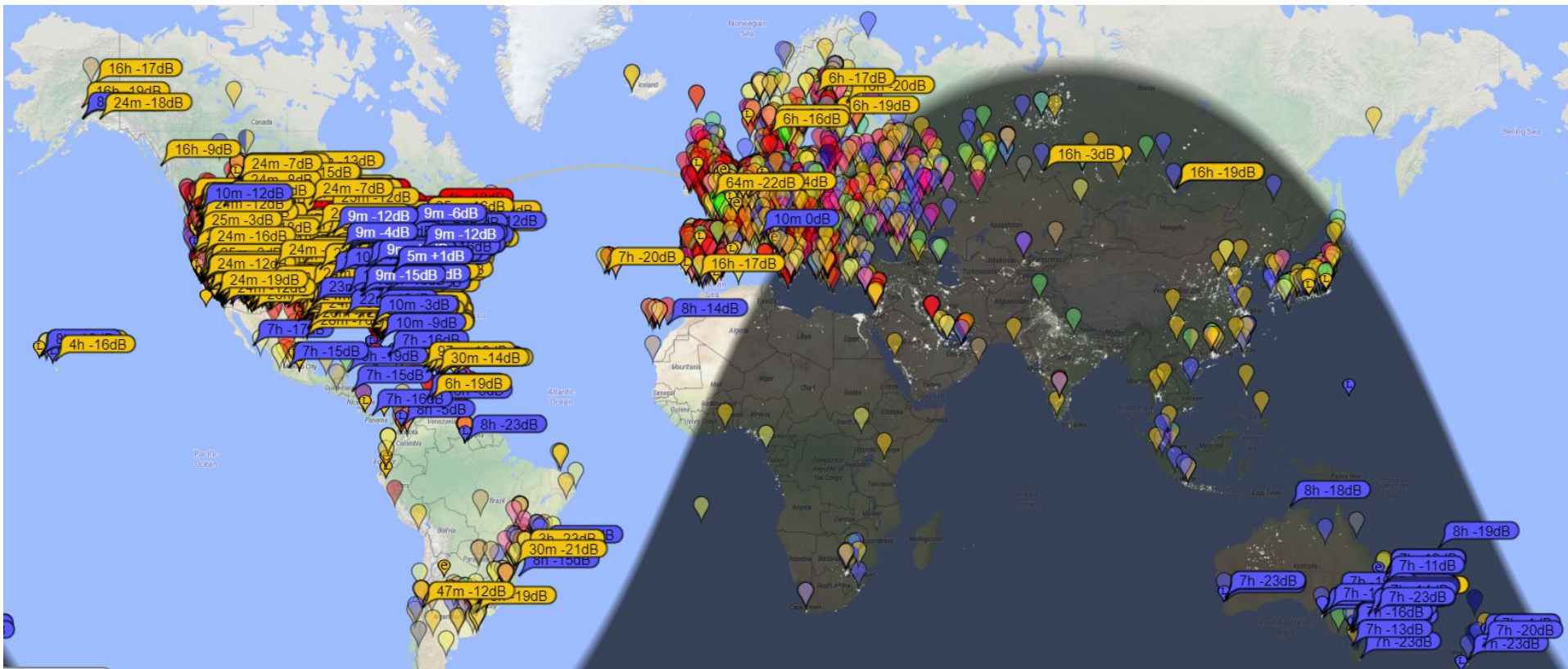
**PSK Reporter**  
David Casler-KEØOG



Cluster Spots			
Age	DX	Freq	Spk Mode
2m	14275.17	10	FT8
3m	14275.17	10	FT8
4m	14275.17	10	FT8
5m	14275.17	10	FT8
6m	14275.17	10	FT8
7m	14275.17	10	FT8
8m	14275.17	10	FT8
9m	14275.17	10	FT8
10m	14275.17	10	FT8
11m	14275.17	10	FT8
12m	14275.17	10	FT8
13m	14275.17	10	FT8
14m	14275.17	10	FT8
15m	14275.17	10	FT8
16m	14275.17	10	FT8
17m	14275.17	10	FT8
18m	14275.17	10	FT8
19m	14275.17	10	FT8
20m	14275.17	10	FT8
21m	14275.17	10	FT8
22m	14275.17	10	FT8
23m	14275.17	10	FT8
24m	14275.17	10	FT8
25m	14275.17	10	FT8
26m	14275.17	10	FT8
27m	14275.17	10	FT8
28m	14275.17	10	FT8
29m	14275.17	10	FT8
30m	14275.17	10	FT8
31m	14275.17	10	FT8
32m	14275.17	10	FT8
33m	14275.17	10	FT8
34m	14275.17	10	FT8
35m	14275.17	10	FT8
36m	14275.17	10	FT8
37m	14275.17	10	FT8
38m	14275.17	10	FT8
39m	14275.17	10	FT8
40m	14275.17	10	FT8
41m	14275.17	10	FT8
42m	14275.17	10	FT8
43m	14275.17	10	FT8
44m	14275.17	10	FT8
45m	14275.17	10	FT8
46m	14275.17	10	FT8
47m	14275.17	10	FT8
48m	14275.17	10	FT8
49m	14275.17	10	FT8
50m	14275.17	10	FT8
51m	14275.17	10	FT8
52m	14275.17	10	FT8
53m	14275.17	10	FT8
54m	14275.17	10	FT8
55m	14275.17	10	FT8
56m	14275.17	10	FT8
57m	14275.17	10	FT8
58m	14275.17	10	FT8
59m	14275.17	10	FT8
60m	14275.17	10	FT8
61m	14275.17	10	FT8
62m	14275.17	10	FT8
63m	14275.17	10	FT8
64m	14275.17	10	FT8
65m	14275.17	10	FT8
66m	14275.17	10	FT8
67m	14275.17	10	FT8
68m	14275.17	10	FT8
69m	14275.17	10	FT8
70m	14275.17	10	FT8
71m	14275.17	10	FT8
72m	14275.17	10	FT8
73m	14275.17	10	FT8
74m	14275.17	10	FT8
75m	14275.17	10	FT8
76m	14275.17	10	FT8
77m	14275.17	10	FT8
78m	14275.17	10	FT8
79m	14275.17	10	FT8
80m	14275.17	10	FT8
81m	14275.17	10	FT8
82m	14275.17	10	FT8
83m	14275.17	10	FT8
84m	14275.17	10	FT8
85m	14275.17	10	FT8
86m	14275.17	10	FT8
87m	14275.17	10	FT8
88m	14275.17	10	FT8
89m	14275.17	10	FT8
90m	14275.17	10	FT8
91m	14275.17	10	FT8
92m	14275.17	10	FT8
93m	14275.17	10	FT8
94m	14275.17	10	FT8
95m	14275.17	10	FT8
96m	14275.17	10	FT8
97m	14275.17	10	FT8
98m	14275.17	10	FT8
99m	14275.17	10	FT8
100m	14275.17	10	FT8



# Spotting



# Spotting

[Information](#)[Settings](#)[Searches](#)[Digital Modes](#)[LOTW & eQSL](#)[BANDS](#)[My Spots](#)[Online?](#)

Call:

 [Search](#)

SFI 77, A 6, K 2

Online : 98:42:42

\*\* FT8 MODE \*\*

501 Online

14:29:12 : UTC

Auto refresh every 60 secs - Next refresh in 56 secs - [Refresh Now](#)

## Local Spots / Chat / Skeds

de **K7DD**

3574.67 kHz

IS THERE EVER ANYONE ON FROM DELAWARE?

FT8

[age +2h] Oct-23 12:03utc

de **W0MU**

LZ2WP could not hear me :(

[age +10h] Oct-23 04:00utc

## Calls You Spotted.

[\[DETAIL\]](#)

Age	DX	Bnd	Mode	Sig
2m	<a href="#">AG9S</a>	40	FT8	+4
2m	<a href="#">K4PO</a>	40	FT8	-05
2m	<a href="#">KE4ZUN</a>	40	FT8	+5
2m	<a href="#">N4TL</a>	40	FT8	-15
2m	<a href="#">W5ADD</a>	40	FT8	-13
2m	<a href="#">W7TRA</a>	40	FT8	-24

## Your Call Spotted.

[\[DETAIL\]](#)

Age	Spotter	Bnd	Mode	Sig
+14h	<a href="#">DF1VB</a>	60	FT8	-14
+14h	<a href="#">K6EID</a>	60	FT8	+5
+14h	<a href="#">N5DG</a>	60	FT8	-03
+14h	<a href="#">WE4X</a>	60	FT8	-07
+14h	<a href="#">DF1VB</a>	60	FT8	-18
+14h	<a href="#">K6EID</a>	60	FT8	+7

[\[Blocked.Calls\]](#)

## Cluster Spots.

[\[POST.SPOT\]](#)☒ 160M ☒ 80M ☒ 60M ☒ 40M ☒ 30M ☒ 20M ☒ 17M ☒ 15M  
☒ 12M ☒ 10M ☒ 6M [Apply Changes](#) [Check All](#) [UnCheck All](#)

S	Age	DX	Freq	Sig	Mode	St	Country	Spotter
P	1m	<a href="#">DC5EG</a>	14075.24	-20	FT8		Germany	OF8TA
P	1m	<a href="#">S51TC</a>	21076.63	-24	FT8		Slovenia	IK6JRJ
P	2m	<a href="#">JR4CTF</a>	3574.33	+01	FT8		Japan	JG8FWH
X	2m	<a href="#">WA0RLC</a>	21076.15	+4	FT8	MO	United States	LU2FCY
X	2m	<a href="#">OZ1PIF</a>	28075.00	-14	FT8		Denmark	ZS5LEE
X	2m	<a href="#">SV2MJY</a>	28075.13	-16	FT8		Greece	ZS5LEE
X	2m	<a href="#">TF5B</a>	10137.39	-15	FT8		Iceland	R8KAH
X	2m	<a href="#">DL4ABN</a>	28075.83	-18	FT8		Germany	ZS5LEE
X	2m	<a href="#">ZS2ZG</a>	21076.15	-05	FT8		South Africa	LU2FCY
X	2m	<a href="#">DJ4BO</a>	10136.84	-16	FT8		Germany	R8KAH
X	2m	<a href="#">F6EAZ</a>	28074.83	-24	FT8		France	PA2BT





# Propagation- GridTracker

- *GridTracker* a companion program listens to WSJT-X Decodes & displays them on a map



# Additional Reading

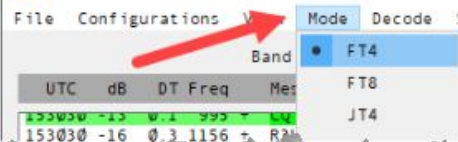
- 7-page "Quick Start FT8/FT4 Operations" 
- Using PSK Reporter as Propagation Tool 



## 2. Changing Modes

- Click on Mode in the top menu
- Choose FT4 or FT8

WSJT-X v2.2.0-rc1 by K1JT, G4WJS, and K9AN



# Additional Reading

WSJT-X User Guide

FT8 OPERATING GUIDE  
ZL2iFB



JS8Call The Basics

- *Ham Radio Deluxe adding WSJT-X FT8* ∞
- *HRD Logbook and WSJT-X Integration* ∞
- *FT4 and FT8 Contesting- operating advice for future contests* ∞
- *An Introduction to JS8CALL- M0SPN* ∞
- *Digital Mode Operating Tips: Worth What You Pay!-NO6E* ∞

# Questions / Comments ?

View/Download this slide show at  
*[tiny.cc/ft8ft4](http://tiny.cc/ft8ft4)*

If you need a PDF copy click [here](#)





# Other Presentations



# Presentations

- If your club is interested in a online presentation I am currently offering seven options
  - *Field Day in Social Distancing*⌘
  - *FT8 & FT4- Digital Soundcard Modes*⌘
  - *QSLing in Online World*⌘
  - *Having Fun with Morse Code*⌘
  - *Youth in Amateur Radio*⌘ - (based on my article in March 2020 CQ Magazine)
  - *Software & Web Resources for Contesting*⌘
  - *Top Secret- Techniques to work DXCC and WAS*⌘
- Email me if interested k8zt@arrrl.net

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