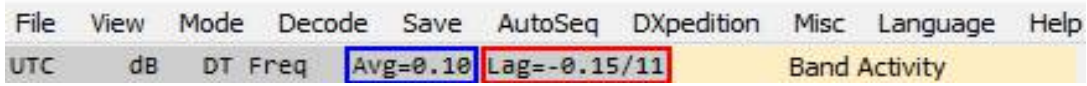
The optimal decoding settings for JTDX v2.1.0-rc150 and later

by DB6LL, with friendly help from ES1JA

Starting with version v2.1.0-rc150, three new pieces of information are displayed below the menu line:
1) The standard deviation (Avg) of the own time from the times of the decoded signals (framed in **blue**)
2) The deviation of the decoding time from the time window, what is available for decoding and
3) The number of decoded signals (framed in **red**)



'**Lag**' can be negative, then the CPU had enough time, or positive, then decoding took longer than the available decoding time (2.3 sec.)
If you have a lag of < +0.4 sec at full band (more than 30 stations), your settings are optimal.

FT8 threads ▸

- ● Auto
- 1
- 2
- ...
- 12

With the selection of '**FT8 threads**', the decoding of the recorded audio spectrum is divided among the existing Hyperthreading cores. This means that the entire waterfall is distributed with its bandwidth to the selected number of threads (with a certain overlap) and then decoded in parallel.
'**Auto**' is usually the correct setting. You should never manually set the number of threads higher than physically threads available. The number of threads in use has no linear relationship to the decoding time over the whole period. For example, I manually use 3 threads from my 4 threads in the Intel i5-4570, so the whole system looks a bit more alive when I do something on the side. Ask google how many Hyperthreading cores your processor has, or leave the setting at ' **Auto**'.

	recommended	CPU Load
FT8 decoding ▸ **wideband decoding** ▸		
	fast	↘
●	medium	→
	deep	↗

The overall decoding quality and performance depends on **wideband decoding**, '**deep**' is simply the best, but also the slowest and requires a lot of processing power. During each decoding pass the whole AF spectrum is searched for information. First the signals that are easy to decode, then those that require deeper analysis. The sensitivity of the decoding algorithm can be adjusted in three steps.
For '**deep**' at least a i7 of the latest generation is required, otherwise the ' **lag**' value is too high, decoding takes too long.

narrow Filter ▸		
	fast	↘
	medium	→
●	deep	↗

Here only the audio spectrum around the receiving frequency (the green marker) is searched (approx. 150 Hz). The software routines are the same as for 'wideband decoding'. Here '**deep**' should be set.
The frequency range to be processed is narrow, the search is accordingly fast, even with not so fast CPUs.

decoding cycles ▸		
●	1	→
	2	↗
	3	↗

Up to 3 cycles are possible. Here we are completely lost with older CPUs (i5 and older), only few new CPUs can handle more than 1 cycle smoothly. Each cycle has three decoding passes. One cycle is standard, two or three additional cycles can be activated independently for operation and SWL modes.
The number of decode passes has a massive impact on processor load and decode time.

Guideline: The higher the value, the better the decoding performance, the longer it takes and the faster CPUs are required.
CPU < i7 = "**1**", CPU >= i7 "**2**" or maybe even "**3**".

SWL decoding cycles ▸		
	1	→
●	2	↗
	3	↗

See above, the SWL decoding cycles are longer. The more cycles, the longer it takes and the higher the processor load.

QSO RX freq sensitivity ▸		
	low	↘
●	medium	↘
	high	↘

This setting is not performance-based. It is important for the number of wrong decodings, which depends on the QRM situation at your QTH.
'**high**' can be used in places where no QRM is available, which is not found in industrial areas...
If you choose a higher setting with less QRM, the number of decodings will increase a bit, but at the same time the number of wrong decodings can also increase.

decoder sensitivity ▸		
	minimum	↘
●	use low thresholds	→
	use subpass	↗

The setting '**decoder sesitivity**' is the second important setting after ' **wideband decoding**'.
'minimum' = the lowest decoding sensitivity, JTDX decodes almost without AP decoding[1], lowest processor load
'use low...' = lower thresholds are used, the number of false decodings can increase
'use subpass' = the audio spectrum is searched a second time, takes longer, requires more processing power (>i7 and >3 GHz)

[1] = AP decoding --> AP from 'a priori', perhaps best translated as 'predicted by calculation'

wideband DX Call search ▸		
●	on	↘
	off	↘

'**wideband DX Call search**' slightly increases the decoding sensitivity when searching for a callsign if this callsign is entered in the 'DXCall' window. The decoder then searches the audio spectrum for the callsign's signature first.
This setting does not put much load on the processor and can always be left on.

status: June 18, 2020