

**Digital modes for 630 mtrs**  
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**Corrections, additions, etc. will be welcomed.**

Please note that this compilation was developed to focus on 630m, and emphasizes weak signal performance. The few actual on the air comparisons were made on 630m daytime groundwave over a 100km path and should not be taken to apply to other conditions, such as HF skywave.

Info from:

<http://www.qsl.net/zl1bpu/MFSK/WSQweb.htm> (5)

[http://ac4m.us/digi\\_mode\\_info.html](http://ac4m.us/digi_mode_info.html) (4)

<http://www.w1hkj.com/FLdigiHelp-3.21/Modes/> (3)

[http://www.w1tag.com/600M\\_Modes.htm](http://www.w1tag.com/600M_Modes.htm)

[http://f1ult.free.fr/DIGIMODES/MULTIPSK/digimodesF6CTE\\_en.htm](http://f1ult.free.fr/DIGIMODES/MULTIPSK/digimodesF6CTE_en.htm) (2)

<http://www.qsl.net/zl1bpu/MFSK/>

<http://www.qsl.net/zl1bpu/MFSK/FSQweb.htm> (1)

Additional info on WSQ2, CMSK and FSQ by email from ZL1BPU, Murray Greenman, who, with ZL2AFP, created these modes (also DominoEX). CMSK is only available in software from his website, FSQ is available in FLDigi, but an enhanced version is available from his website.

GMSK (Gaussian filtered MSK) is similar to CMSK but w/o FEC. I estimate it as having twice the speed but 3dB less min. S/N of the corresponding CMSK mode. It is only available in the MMVARI software. <http://hamsoft.ca/pages/mmvari.php>

Here are the actual times it took FLDigi, MultiPSK if mode was not available in FLDigi, or other software to transmit "CQ DE VE7VV K". (13 characters, aprox 3 five-ltr words). WPM is calculated based on 3 words in the observed transmission time. N.B. some modes are faster in lower case. (For FSQ, time is for "VE7VV: CQ CQ K".)

Mode	Tones	BW/T	Seconds UC/lc	min S/N	Linear?	WPM UC/lc	BW Hz	
WSPR2	4	1.50	120	-30		1.5	6	Beacon mode, not for QSO's
<b>JT9</b>	<b>9</b>	<b>1.77</b>	<b>60</b>	<b>-27</b>		<b>3</b>	<b>16</b>	
JT65	65	2.72	60	-25		3	177	
<b>WSQ2</b>	<b>33</b>	<b>1.94</b>	<b>33</b>	<b>-25</b>		<b>5</b>	<b>64</b>	<b>5 wpm claimed, lower case is faster</b>
<b>WSQCall 0.5</b>	<b>33</b>	<b>1.52</b>	<b>33</b>	<b>-25 (5)</b>		<b>5</b>	<b>50</b>	<b>5 wpm claimed, lower case is faster</b>
<b>WSQCall 1.0</b>	<b>33</b>	<b>3.03</b>		<b>-22</b>		<b>10</b>	<b>100</b>	<b>10 wpm claimed, lower case is faster</b>
CMSK8				-21			12.5	Claims 3.75 wpm but 24 sec T/R delay, not useful
DominoEX4FEC			27	-21(1)		6.7	173	Only available in MultiPSK
<b>FT8</b>	<b>8</b>	<b>5.88</b>	<b>15</b>	<b>-20</b>		<b>12</b>	<b>47</b>	<b>WSJtx v1.8</b>
PSKam10			37	-19.0	linear	4.9	50	Only available in MultiPSK
ThrobX1			23	-18.5	linear	7.8	94	Claims 10 WPM, only upper case
MFSK4				-18.5 (4)		18	154	Claims 18 wpm, lower case faster, uses FEC, may be difficult to tune, sensitive to doppler, resync time loses characters
Thor Micro			59/54	-18.0		3	36	Thor modes are Domino with FEC, half as fast as Domino but claims 3 dB btr s/n and error free Domino and Thor are less sensitive to mis-tuning

and btr s/n than MFSK (see ZL1BPU ref).  
 Thor Micro has 34 sec delay tx to 1<sup>st</sup> rx acc WG2XSV.

DominoEX4			19/19	-18 (1), -16.5 (2)		9.5	173	
FSQ2	33	NA	15/10.5	-17.5?		17-20	290	Claims 20 wpm <b>No better copy than FSQ4.5 with VE7CNF</b>
FSQ3	33	NA		-16		30	290	Claims 30 wpm
PSK10			16	-17.5	linear	11	40	Upper case only, only available in MultiPSK <b>100% copy at 1W with VE7CNF 630m</b>
ThrobX2			12	-17.5	linear	15	94	Upper case only, claims 20 WPM <b>90% copy at 1W with VE7CNF 630m</b>
Thor4			38/35	-17.5?		4.7	173	I could not find s/n data, I estimated as 3dB btr than DominoEX4. Thor4 has 27 sec delay tx to 1 <sup>st</sup> rx.
PSK31FEC			12	-15.5	linear	15	80	Upper case only
MFSK8				-15.5 (4)			26	316
DominoEX Micro			27/26	-15.0 (3)		6.7	36	
<b>GMSK15</b>			<b>10/9</b>	<b>-15</b>		<b>18/20</b>	<b>25</b>	<b>Full character set, including Japanese 100% copy at 1W with VE7CNF 630m</b>
<b>FSQ4.5</b>	<b>33</b>	<b>NA</b>	<b>8/7</b>	<b>-14.5</b>		<b>25-40</b>	<b>290</b>	<b>Claims 40 wpm 30% copy at 1W with VE7CNF 630m Weak signal performance not as good as ThrobX2, PSK10, GMSK15, and wide bandwidth, but very fast, great w/ strong signals.</b>
CMSK31			22	-15		8-15	50	Non-linear option to PSK31FEC, uses FEC, 6 sec T/R delay, claims 15 wpm, might be hard to tune.
FSQ6	33	8.8	5 5	-13		36-60	290	60 wpm claimed, but more prone to static crashes than slower modes
GMSK31				-12		30	50?	
CMSK63			1/11	-12		30	100	Non-linear option to PSK63F, uses FEC, 6 sec T/R delay, claims 30 wpm
PSK63F				-12	linear		140	Claims 42 wpm text
PSK31			6/6	-11.5	linear	30	80	Claims 37 wpm upper, 51 wpm lower case letters
CMSK125				-9		60	200	Non-linear option to PSK63, uses FEC, 3 sec T/R delay, claims 60 wpm
PSK63			3	-7	linear	60	160	Claims 74 wpm upper, 102 wpm lower case letters

CW (FLDigi @20WPM)

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