Signal-to-noise ratio amateur radio modes

This is a list of amateur radio modes with corresponding minimal signal-to-noise ratio. A lower S/N ratio means you are more likely to make a QSO as conditions worsen. So lower minium S/N is better. The higher the minimum signal-to-noise radio the more likely you will need a better antenna and more power to make a contact.

Or in other words any signal you receive with +10dB can be read without problems. Whereas a signal received with -20dB can only be read if it is FT8, JT65, JT9 or WSPR.

Mode	Minimum S/N	Comment
SSB/SSTV	+10dB	here SSB means voice
RTTY	-5dB	
FELD HELL	-6dB	
PSK31	-10dB	
FSKHELL105	-12dB	
THROB4	-12dB	note 1
OLIVIA	-14dB	
CW	-15dB	
FT2	-14.5dB	
FT4	-17.5dB	
FT8	-21dB	
FT2 Fast Track 2	-23dB	non-linux, experimental
JT65	-25dB	
JT9	-27dB	
WSPR	-31dB	beacon only mode

note 1: personally find this mode hard to decode even with much better S/N.

Further reading

- https://www.pa3fwm.nl/technotes/tn09b.html
- https://www.qsl.net/zl1bpu/HELL/PSK.htm
- https://en.wikipedia.org/wiki/Olivia_MFSK
- http://ac4m.us/throb.html
- https://www.ft2.it/#sensitivity