Circuit Merit Signal Reporting (de Jim Aspinwall, NO1PC)

Introduction

This paper is intended to provide reference to the "circuit merit" method of expressing received signal quality, as well as illustrate the technical factors relative to received signal strength. "Circuit merit" provides an easily perceived plain-language description of reception from another station – be the mode AM, FM, SSB or CW.

Circuit Merit Descriptions

Circuit Merit #	Explanation	Note
CM5	**"Loud and *clear*".** Completely clear, broadcast quality. Each word is fully understood, ***without any interference or noise***; on FM, full quieting. Always breaks squelch (FM.)	This designator is not always earned on FM, and ***seldom on SSB***; as conditions must be superb. (*** >20 dB/>5 S-unit difference between noise and received signal.)
CM4	**"Good readable."** Clear with a slight amount of noise and/or interference. ***Each word is understood***. Always breaks squelch (FM.)	***A common report for solid SSB voice under very good conditions***; the FM equivalent is a slight amount of "white noise". (*** 12-20 dB/3-4 S-unit difference between noise level and received signal.)
CM3	**"Fair readable."** Some noise, static and/or interference may be present. ***Bulk of transmissions are understood without having to be repeated.*** Usually breaks squelch (FM.)	CM3 is generally considered to be at the margin of acceptable voice Communications, particularly when using squelched FM. (*** ~ 10 dB/2 S-units difference between noise and signal level.)
CM2	**"Weak but readable."** The noise level very close to signal level. Static and / or interference very prevalent; words are missed, ***retransmissions are necessary***. Will not open squelch reliably (FM.)	CM2 is not considered not acceptable or reliable.
CM1	**"Unreadable."** A signal is barely evident and words are unintelligible. You can tell that someone is "there" (SSB) but will not break squelch(FM.)	CM1 is deemed unusable for voice communications.
CM0	**"Nothing heard."** Absolutely no signal is detectable.	

[*** dB/S-unit values explained in the following technical pages]

Rule of Thumb

Keep it simple – qualitative not quantitative. Circuit Merit is provides accepted descriptions/perceptions of signal quality are shared among many sources/users.

There are no fractional qualifiers necessary or meaningful in circuit merit designations – the received signal is either CM5, CM4, CM3, CM2, CM1 or CM0. A "strong Circuit Merit 4" is just Circuit Merit 4. Circuit Merit 4 is a VERY good, impressive, reliable signal for SSB. Circuit Merit 5 is rare in a majority of the SSB operations. That is to say – no one should routinely issue a Circuit Merit 5 rating for SSB.