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SUBJECT	RSQ and MOS signal quality reporting on HF and VHF		
Society	NRRL	Country:	Norway
Committee:	C5	Paper number:	CT08_C5_34
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Background for the proposal

Two proposals regarding reporting scales for digital modes and for digitized speech were submitted to the 2005 IARU Region 1 Conference in Davos, by OeVSV (DV05_C4_28) and NRRL (DV05_C4_35), respectively.

These submissions were accepted by the 2005 IARU Region 1 Davos Conference, resulting in the recommendations DV05_C4_Rec_10 and DV05_C4_Rec_18. The proposals had, however, not been discussed in C5, and were therefore limited to use below 30 MHz in the Final Plenary. The present submission from NRRL will let also C5 discuss and hopefully recommend the use of these reporting scales also above 30 MHz.

The use of the traditional RST system for signal reporting is almost meaningless for *digital modes*. Following the idea of the team VK3BGH, K6MBY, GM4KLN and W8NUE (CQ magazine Feb. 2005) ÖVSV recommended the introduction of the **RSQ**-digital signal reporting system.

For *digitized speech*, the **MOS (Mean Opinion Score)** reporting scale is used professionally, and should be recommended for amateur radio use. NRRL proposed that the MOS reporting scale should be included in the HF Manager's Handbook as a supplement to the RS(T) reporting scale for digitized speech.

The MOS reporting scale (shown above) was excerpted from the paper "Digital Voice: The Next New Mode?" by Doug Smith, KF6DX, published in QST Magazine, January 2002, page 29.

Further literature:

Segalstad, Tom V. (LA4LN), 2005: Digitalisert tale på kortbølge [Digitized speech on shortwave]. *Amatørradio [NRRL]*, Vol. 70, No. 2, pages 10-15.

and

<http://folk.uio.no/tomvs/la4ln/digtalhf.htm>

Proposal, to replace DV05_C4_Rec_10 and DV05_C4_Rec_18 by:

1. It is recommended that RSQ (Readability Strength Quality) reporting be used for digital modes, and that MOS (Mean Opinion Score) reporting be used for digitized speech, as a supplement or substitute to the RST (Readability Strength Tone) reporting scale.
2. The recommendation and the RSQ and MOS reporting scales with notes should be included in the HF- and the VHF Managers Handbook.

The RSQ (Readability Strength Quality) reporting scale for digital modes:

Readability (% of text)

R5	95%+	Perfectly readable
R4	80%	Practically no difficulty, occasional missed characters
R3	40%	Considerable difficulty, many missed characters
R2	20%	Occasional words distinguishable
R1	0%	Undecipherable

Strength

S9	Very strong trace
S7	Strong trace
S5	Moderate trace
S3	Weak trace
S1	Barely perceptible trace

Quality

Q9	Clean signal, no visible sidebar pairs
Q7	One barely visible pair
Q5	One easily visible pair
Q3	Multiple visible pairs
Q1	Splatter over much of the spectrum

The MOS (Mean Opinion Score) reporting scale for digitized speech:

MOS	Quality	Impairment
5	Excellent	Imperceptible
4	Good	Perceptible, but not annoying
3	Fair	Slightly annoying
2	Poor	Annoying
1	Bad	Very annoying
0	Unusable	Total

Notes:

Non-integer MOS scores like 3.5 are possible. An MOS of 3.0 is generally referred to as toll quality, meaning good enough to pay for. Digital voice users may tolerate MOS levels less than three if they get additional benefits, such as simultaneous voice and data services.

While evaluation of voice systems may be made based on test-bench measurements, they must ultimately relate to the perception of the listener. A large body of voice-system evaluations exists based on MOS. Comparisons among systems are therefore readily made. MOS relates well to the readability figures commonly used in Amateur Radio signal reports.