

RECOMMENDATION ITU-R BT.1205^{*,**}**User requirements for the quality of baseband SDTV and HDTV signals when transmitted by digital Satellite News Gathering (SNG)**

(1995)

The ITU Radiocommunication Assembly,

considering

- a) that Recommendations ITU-R BT.601 and ITU-R BT.709 define the parameters of Y , C_B , C_R based digital standard definition digital television (SDTV) and high-definition television (HDTV) signals;
- b) that the use of Satellite News Gathering (SNG) and the technical and operational standards for SNG are defined in Recommendations ITU-R SNG.770, ITU-R SNG.771 and ITU-R SNG.1007;
- c) that SNG is essential for broadcast operations and provides a valuable method of transmission for the rapid acquisition and broadcasting of news events;
- d) that SNG is temporary and occasional and its activation often cannot be determined long in advance;
- e) that for the successful operation of SNG priority is given to the mobility and the capability to cover unexpected events;
- f) that the technical means for SNG will allow a very quick set-up;
- g) that the SNG equipment should be capable of uplinking the video programme with its associated sound or sound programme and data signals and capable of providing two-way communication channels for operation and control;
- h) that coding algorithms using bit-rate reduction techniques for both SDTV and HDTV signals should be established to enable SNG transmission with the aim of maximizing satellite resources;
- j) that the baseband signals should be transmitted with a minimum of impairment;

* This Recommendation should be brought to the attention of Telecommunication Standardization Study Group 9.

** Radiocommunication Study Group 6 made editorial amendments to this Recommendation in 2003 in accordance with Resolution ITU-R 44.

- k) that some restrictions to the downstream post-transmission capabilities may be accepted;
- l) that general advice on methods of assessment is contained within ITU-R texts, and that subjective evaluation methods are defined in Recommendations ITU-R BT.500 and ITU-R BT.710;
- m) that both the design of codecs and their assessment will need to take account of user requirements;
- n) that in order to be complete, the user requirements should specify the test procedures and test material that should be used to check that the user requirements are being met,

recommends

that the following user requirements should govern the specification design and testing of systems for the transmission of SNG-type SDTV and HDTV signals through the satellite up and down link as part of the broadcasting chain:

1 Definition of SNG

Temporary and occasional transmission with short notice of television and/or sound for broadcasting purposes, using highly portable or transportable uplink earth stations operating in the framework of the fixed-satellite service.

The SNG equipment should be capable of uplinking the video programme with its associated sound and sound programme signals, and capable of providing two-way communication circuits for operation and control. The equipment may provide for data transmission and should be capable of being set up and operated by a crew of no more than two people within a reasonable time (for example, one hour).

2 Modes of operation

The failure characteristic of digital transmission systems is generally abrupt. It is therefore desirable in SNG applications, and in case of conditions likely to endanger normal reception, to provide a means of switching the form of the transmitted signal to a more rugged one. There would therefore be two operation modes. Optimum methods of doing this need to be investigated. It is anticipated, however, that some reduction of vision signal quality will be incurred when the switch is made; the figure given here indicates what would probably be a reasonable compromise.

3 Performance requirements

TABLE 1

Basic picture quality	Good transmission conditions: Quality difference $\leq 12\%$ of the DSCQS using at least four sequences taken from Recommendations ITU-R BT.710, ITU-R BT.802, ITU-R BT.1128 and ITU-R BT.1210, at least half of which must be high activity sequences. The given quality grade must be met using at least 75% of the sequences chosen; the rest must achieve $\leq 20\%$
	Poor transmission conditions: Quality difference $\leq 36\%$ of the DSCQS using at least four sequences taken from Recommendations ITU-R BT.710, ITU-R BT.802, ITU-R BT.1128 and ITU-R BT.1210. The given quality grade must be met using at least 75% of the sequences chosen; the rest must achieve $\leq 50\%$
Vision failure characteristics/ error performance	Good transmission conditions: BER: $\leq 1 \times 10^{-4}$ including error bursts ≤ 30 bits (as measured at the demodulator output). Impairment less than one grade with DSIS method using at least two appropriate sequences taken from Recommendations ITU-R BT.710, ITU-R BT.802, ITU-R BT.1128 and ITU-R BT.1210
	Poor transmission conditions: BER: $\leq 1 \times 10^{-3}$ including error bursts ≤ 30 bits (as measured at the demodulator output). Impairment less than two grades with DSIS method using at least two appropriate sequences taken from Recommendations ITU-R BT.710, ITU-R BT.802, ITU-R BT.1128 and ITU-R BT.1210
Basic audio quality	To be specified
Audio failure characteristics/ error performance	To be specified
Recovery time ⁽¹⁾	< 1 s after a break of 50 ms
Maximum relative sound/vision delay	± 2 ms per codec

DSCQS: double stimulus continuous quality scale.

DSIS: double stimulus impairment scale.

⁽¹⁾ The recovery time can be measured as the number of fields of delay that is required between the connection of signal to the receiving terminal, and switching the picture monitor input from a grey level signal (or suitably delayed non-processed signal) to the receiving terminal output signal such that no picture disturbance can be observed.

4 Operational requirements

TABLE 2

Input signal formats	SDTV: 4:2:2 of Recommendation ITU-R BT.601 (Part A) or composite HDTV: Recommendation ITU-R BT.709
Bit rate	SDTV: to be specified HDTV: to be specified
Codecs in cascade	Two codecs in tandem using digital interconnections (good transmission conditions): Quality difference $\leq 18\%$ of the DSCQS as in first part of Table 1
Change of overall delay after major disturbance	Less than 20 μ s

DSCQS: double stimulus continuous quality scale.