MISB MOTION IMAGERY STANDARDS BOARD	MISB EG 1108
Engineering Guideline **EG 1108 Video Interpretability and Quality Keys**	**1 November 2011**

1 Scope

This document describes the normative information to define metadata keys necessary to express motion imagery interpretability and quality (IQ) in the transport stream. (*Section 5*)

2 References

[1] MISB RP 0901 Recommended Practice: Video-NIIRS, 15 October 2009

[2] Joint Interoperability Test Command Motion Imagery Tool, online reference: http://jitc.fhu.disa.mil/cgi/mislab/loaddoclisting.aspx?q=jmit

[3] Objective perceptual assessment of video quality: Full reference television, online reference http://www.itu.int/ITU-T/studygroups/com09/docs/tutorial_opavc.pdf

[4] Subjective video quality assessment methods for recognition tasks, online reference, ITU-T P.912 Telecommunication Standardization Sector of ITU Series P: Terminal and Subjective and Objective Assessment Methods, (08/2008)

3 Definitions

DMOS: Difference Mean Opinion Scores, difference mean opinion score between a mean opinion score for a source video data and a mean opinion score for the processed video data.

Interpretability: Refers to the ability of the video to satisfy task-based criteria specified in the Video-NIIRS.

MISB: Motion Imagery Standards Board (URL is http://www.gwg.nga.mil/misb)

NIIRS: National Imagery Interpretability Rating Scale

Quality: General perception of video quality measured on a scale of 0-100.

4 Introduction

Video-NIIRS is a subjective task criteria scale similar to the well-known NIIRS used for still image quality measurement [1]. Each task in the Video-NIIRS includes a dynamic component that requires video of sufficient spatial and temporal resolution.

Reasons to include the IQ keys with the motion imagery:

- Monitoring proper operation of video collection and dissemination systems
- Discovery of motion imagery
- Automatic exploitation assistance

Quality is the perception of the overall appearance of the video. ITU distinguishes between methods to gauge video quality for tasks versus for general viewing in [4]. Video-NIIRS is a task based scale.

The interpretability and quality (IQ) set is described in *Section 5*.

5 Normative Interpretability and Quality (IQ) Set

Six keys are in the IQ set:

1. Time Stamp of most recent frame in rating interval (uint64, microseconds since 1970)
2. Video Interpretability (uint8, 0-14)
3. Quality (uint8, 0-100)
4. Interpretability and Quality method ID (uint8, 0-255)
5. Rating duration in frames (uint16)
6. Creation Time Stamp of the IQ Metadata (uint64, microseconds since 1970)

5.1 Most recent frame time

06.0E.2B.34.01.01.01.01.0E.01.01.03.3B.00.00.00

The most recent frame time is the time stamp of the most recent frame in the rating interval. The most recent frame is the frame with the largest time stamp value.

5.2 Estimated Interpretability (Video-NIIRS 0-9)

06.0E.2B.34.01.01.01.01.0E.01.01.03.39.00.00.00

The estimated interpretability is for an interval of video, nominally at least 10-seconds, played at the sample frame rate speed.

The estimated interpretability can be either manual or automatic as indicated by the Interpretability-Quality (IQ) Method ID.

5.3 Estimated Quality

06.0E.2B.34.01.01.01.01.0E.01.01.03.3A.00.00.00

The estimated quality is expressed using a score in the range of 0-100 where the following adjectives describe the rating: Excellent 100-80; Good 79-60; Fair 59-40; Poor 39-20; and Bad 19-0.

The estimated quality can be either manual or automatic as indicated by the IQ Method ID.

5.4 IQ Method ID

06.0E.2B.34.01.01.01.01.0E.01.02.03.4A.00.00.00

Manual ratings are indicated by a zero. Non-zero entries indicate the version number of the method used.

Technical reference material (TRM) is being prepared to describe how to compute, validate, and verify IQ metrics. The TRM will give additional guidance on version number for automated methods.

5.5 Rating Duration

06.0E.2B.34.01.01.01.01.0E.01.02.03.4B.00.00.00

The rating duration is expressed in frames. The maximum value is 65535.

5.6 IQ Pack Creation Time

06.0E.2B.34.01.01.01.01.0E.01.01.03.3C.00.00.00

The IQ Pack Creation time is the current time when the IQ key value(s) are inserted into the stream.

TABLE I IQ PACK

NAME		**SYMBOL**	**KEY**			
Interpretability and Quality Pack		**IQ**	**06.0E.2B.34.02.03.01.01.0E.01.03.03.1C.00.00.00**			
	Constituent Keys					
Name	TAG	**Symbol**	**Key**	**Units /Range**	**Format**	**Bytes**
POSIX Microseconds Most Recent Time	1	This Key Defined in SMPTE RP210.11	**06.0E.2B.34.01.01.01.01.0E.01.01.03.3B.00.00.00**	micro-secs	UINT64	8
Video Interpretability	2	video_interpretability	**06.0E.2B.34.01.01.01.01.0E.01.01.03.39.00.00.00**	0-14	UINT8	1
Video Quality	3	video_quality	**06.0E.2B.34.01.01.01.01.0E.01.01.03.3A.00.00.00**	0-100	UINT8	1
Interpretability and Quality Method	4	video_IQ_method	**06.0E.2B.34.01.01.01.01.0E.01.02.03.4A.00.00.00**	0-255	UINT8	1
Rating Duration	5	IQ_rating_duration	**06.0E.2B.34.01.01.01.01.0E.01.02.03.4B.00.00.00**	0-65536 frames	UINT16	2
POSIX Microseconds IQ Pack Creation	6	This Key Defined in SMPTE RP210.11	**06.0E.2B.34.01.01.01.01.0E.01.01.03.3C.00.00.00**	micro-secs	UINT64	8