SMPTE STANDARD

Free Scale Gamut and Free Scale Log Characteristics of Camera Signals

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Foreword

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SMPTE Engineering Documents are drafted in accordance with the rules given in its Standards Operations Manual. This SMPTE Engineering Document was prepared by Technology Committee 10E.

Intellectual Property

At the time of publication no notice had been received by SMPTE claiming patent rights essential to the implementation of this Engineering Document. However, attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. SMPTE shall not be held responsible for identifying any or all such patent rights.

Introduction

This section is entirely informative and does not form an integral part of this Engineering Document.

FS-Gamut and the FS-Log curve, as well as an associated Color VANC packet carrying camera parameters, are specified in SMPTE ST 2048-1, which is an image format standard for digital cinematography production. FS-Gamut and FS-Log are also useful as sets describing camera parameters used in broadcast production.

Using the definitions in SMPTE ST 2048-1, this standard specifies the more general application of FS-Gamut and FS-Log and provides definitions of parameter sets commonly used in cameras for broadcast production.

1   Scope

This standard specifies the Free Scale Gamut (FS-Gamut) and the Free Scale logarithmic transfer characteristics (FS-Log) for camera signals. The FS-Gamut consists of chromaticity coordinates of red, green, and blue primaries and a white point. The FS-Gamut and FS-Log are specified in accordance with SMPTE ST 2048-1, in which these are originally specified for digital cinematography production.

This standard also specifies names for specific sets of parameter values for FS-Gamut and FS-Log, and associated transfer characteristics for professional cameras that make use of FS-Gamut and FS-Log.

2   Conformance Notation

Normative text is text that describes elements of the design that are indispensable or contains the conformance language keywords: "shall", "should", or "may". Informative text is text that is potentially helpful to the user, but not indispensable, and can be removed, changed, or added editorially without affecting interoperability. Informative text does not contain any conformance keywords.

All text in this document is, by default, normative, except: the Introduction, any section explicitly labeled as "Informative" or individual paragraphs that start with "Note:"

The keywords "shall" and "shall not" indicate requirements strictly to be followed in order to conform to the document and from which no deviation is permitted.

The keywords, "should" and "should not" indicate that, among several possibilities, one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required; or that (in the negative form) a certain possibility or course of action is deprecated but not prohibited.

The keywords "may" and "need not" indicate courses of action permissible within the limits of the document.

The keyword "reserved" indicates a provision that is not defined at this time, shall not be used, and may be defined in the future. The keyword "forbidden" indicates "reserved" and in addition indicates that the provision will never be defined in the future.

A conformant implementation according to this document is one that includes all mandatory provisions ("shall") and, if implemented, all recommended provisions ("should") as described. A conformant implementation need not implement optional provisions ("may") and need not implement them as described.

Unless otherwise specified, the order of precedence of the types of normative information in this document shall be as follows: Normative prose shall be the authoritative definition; Tables shall be next; then formal languages; then figures; and then any other language forms.

3   Normative References

The following standards contain provisions which, through reference in this text, constitute provisions of this engineering document. At the time of publication, the editions indicated were valid. All standards are subject

to revision, and parties to agreements based on this engineering document are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below.

ISO 11664-3:2012 (CIE S014-3/E:2011), Colorimetry – Part 3: CIE tristimulus values

SMPTE ST 2048-1:2011, 2048 x 1080 and 4096 x 2160 Digital Cinematography Production Image Formats FS/709

4   Terms and Definitions

For the purposes of this document, the following terms and definitions apply.

4.1   chromaticity coordinates

chromaticity coordinates (x, y) as defined in ISO 11664-3:2012

4.2   Free Scale Gamut
FS-Gamut

color gamut identified by a parameter set consisting of chromaticity coordinates of red, green, and blue primaries and a white point

4.3   Free Scale Log
FS-Log

logarithmic transfer characteristic identified by a parameter set consisting of the parameters shown in Table 1

5   FS Colorimetry

This section specifies Free Scale Gamut and Free Scale Log.

5.1   Free Scale Gamut (FS-Gamut)

FS-Gamut shall be as defined in SMPTE ST 2048-1:2011 section 6.1.1.

The default values of primaries and reference white of FS-Gamut shall be as defined in SMPTE ST 2048-1:2011 Table 3.

5.2   Free Scale Log (FS-Log)

FS-Log shall be as defined in SMPTE ST 2048-1:2011 section 6.1.2.

A set of parameters representing FS-Log is defined in Table 4 "Definition of FS-Log" of SMPTE ST 2048-1:2011, repeated as Table 1 for convenience.