

SMPTE RECOMMENDED PRACTICE

VC-2 Mezzanine Level Compression of 1080P High Definition Video Sources



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Foreword

SMPTE (the Society of Motion Picture and Television Engineers) is an internationally-recognized standards developing organization. Headquartered and incorporated in the United States of America, SMPTE has members in over 80 countries on six continents. SMPTE's Engineering Documents, including Standards, Recommended Practices, and Engineering Guidelines, are prepared by SMPTE's Technology Committees. Participation in these Committees is open to all with a bona fide interest in their work. SMPTE cooperates closely with other standards-developing organizations, including ISO, IEC and ITU.

SMPTE Engineering Documents are drafted in accordance with the rules given in Part XIII of its Administrative Practices.

SMPTE RP 2047-1 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 Recommended Practice. 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 recommended practice defines constraints on the VC-2 specification (SMPTE ST 2042-1) such that source video images of 1920 x 1080 pixels using 4:2:2 sampling at 50, 60 and 60/1.001 frames per second will be compressed by a factor of approximately 2.5 to 1. The bit rate of the resulting VC-2 stream is such that it can be carried over a single-link serial digital interface (SDI) operating at 1.485Gbps (1.485/1.001 in the case of the 60/1.001 frame rate). This documents defines constraints on the coding and syntax, it does not define a mapping to any specific transport layer.

1 Scope

This recommended practice defines constraints on the VC-2 video compression specification to provide a mezzanine level compression coding. It defines coding constraints such that source video of 1920 x 1080 pixels using 4:2:2 sampling at 50, 60 and 60/1.001 frames per second can be compressed by a factor of approximately 2.5 to 1 resulting in a compressed bit-rate that permits carriage over a single-link SDI operating at 1.5 Gb/s.

This document defines a VC-2 bit-stream for video compressed according to this practice. It also defines an application specific level for VC-2 compression.

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; followed by formal languages; then figures; and then any other language forms.

3 Normative Reference

The following standards contain provisions which, through reference in this text, constitute provisions of this recommended practice. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this recommended practice are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below.

SMPTE 274M-2008, Television — 1920 × 1080 Image Sample Structure, Digital Representation and Digital Timing Reference Sequences for Multiple Picture Rates

SMPTE ST 2042-1:2009, VC-2 Video Compression

SMPTE ST 2042-2:2009, VC-2 Level Definitions