

# Briefing paper for Proposed Field-Sequential 3D Video Standard

Andrew J. Woods  
Centre for Marine Science & Technology, Curtin University of Technology,  
GPO Box U1987, Perth, 6845, AUSTRALIA

## ABSTRACT

This document discusses the reasons, pros and cons of defining a standard for field-sequential 3D Video. The document also discusses how the standard can be ratified and discusses which standards body could ratify the standard.

## 1. INTRODUCTION

The NTSC, PAL and SECAM video standards can all be used for the recording and playback of stereoscopic 3D video by storing the left and right views in alternate fields of the video signal. This is commonly known as “field-sequential 3D video” or occasionally “alternate-field 3D video”. The use of field-sequential 3D video is quite widespread (as compared to other 3D methods), it is relatively easy to work with and there is a wide range of equipment available which supports it. Unfortunately the choice of which image (left or right) to store in which field (even or odd) is currently somewhat arbitrary.

The proposed standard seeks to:

- define what is meant by field-sequential 3D Video,
- formalise a labelling technique to signify the 3D image/field polarity of field-sequential 3D video, and
- move towards the selection by the stereoscopic imaging community of a recommended 3D image/field polarity.

This standardisation move is being facilitated by participants in the Stereoscopic Displays and Applications conference which is hosted by the SPIE (International Society for Optical Engineering). The SPIE does not have any standards setting activities so the standard will be ratified by a separate body.

## 2. WHY SET A STANDARD?

The reasons for defining a labelling standard and nominating a preferred 3D polarity are:

- Avoid the guesswork of selecting the correct 3D display polarity when a new 3D video is played,
- Reduce the possibility of non-experienced viewers viewing 3D video in the incorrect polarity,
- Ease the compilation of 3D videos combined from multiple sources,
- Avoid the need to invert the 3D polarity of footage that isn't in the 3D polarity that you need to use (and hence possibly incur another generation loss),
- Increase the profile of 3D Video – the definition of a standard will show that we're serious about this format and it's not a gimmick.

I'm sure there are other benefits.

## 3. BUT HAS THE HORSE ALREADY BOLTED?

Is it already too late to define a standard? Does the proliferation of both 3D polarities amongst the stereoscopic imaging community mean that we can't now select a preferred polarity?

It is true that defining a preferred 3D polarity now will necessitate some people/companies changing the 3D polarity they are currently using. In the short term this internal change will cause some difficulty coping with footage in the two different polarities, however, surely this is no worse than the current situation whereby a third party 3D video could be in the opposite polarity to which you normally use. In the long term, if the standard is accepted by the stereoscopic imaging community, these difficulties will fade into the past. I contend that the cumulative difficulty caused by setting a standard now will be much less than if we stay the way we are and live with the current difficulties forever.

#### **4. HOW DO WE SET THE STANDARD AND WHO RATIFIES IT?**

There are many bodies involved in the definition of standards:

- IEEE (Institute of Electrical and Electronic Engineers) – define a wide range of standards related to electronic engineering.
- SMPTE (Society for Motion Picture and Television Engineers) – define a wide range of standards relating to film and video. SMPTE host the NTSC video standard.
- VESA (Video Electronics Standards Association) – define a wide range of video and computer related standards. Holder of the 3 pin VESA connector standard for stereoscopic display hardware.
- and many others...

We are currently negotiating with SMPTE on the standard being ratified through them. SMPTE have a well organised committee structure and balloting procedure for the voting on and ratification of standards. The work for this standard would be done under I23 – the Television Image Technology Committee.

It is my intention to involve all those that are interested in participating and who actively work with stereoscopic 3D video in the process of ratifying the standard and choosing the preferred 3D polarity. It is also not my intention to force a ballot amongst a small group of participants to merely obtain a result. If this standard is to be successful, those in the stereoscopic imaging community must feel as though they have been part of the decision process and that a logical decision has been reached. To that end I think the first step would be to collate a survey of what polarities of stereoscopic video are currently be used in the stereoscopic imaging community – both in terms of software (video tapes, etc) and hardware.

#### **5. OTHER MATTERS**

The standard will make reference to the alignment of the left and right images in the video frame but the amount of detail in this regard will be limited. The standard could also make reference to the temporal difference, temporal synchronism or even spatial filtering of the left and right image streams however it is suggested that this is beyond the scope of this document.

The current draft standard provides an annex that describes methods for determining the 3D polarity of an arbitrary 3D video sequence. One of the methods proposed is the use of “calibrated equipment” – a register of which is maintained at the <http://www.stereoscopic.org> website.

#### **6. CONCLUSION**

The latest draft of the field-sequential 3D video standard will be available from the Stereoscopic Displays and Applications conference website <<http://www.stereoscopic.org/standard>>. If you generate, develop or use stereoscopic video footage or equipment, please make the time to review the standard and determine what your current usage is.

Let’s work together on the ratification of this standard which I hope will reduce one of the current difficulties of working with stereoscopic 3D video.

#### **7. REFERENCES**

PROPOSED STANDARD: “For Field-Sequential 3D Video - A method for the Recording and Playback of Stereoscopic 3D Images and Video Sequences with the NTSC, PAL and SECAM Video Standards.”, Version 0.4, January 2001.