AIRLINE PASSENGER EXPERIENCE ASSOCIATION

APEX RECOMMENDED PRACTICE 0210
"VISIBLE WATERMARKING BEST PRACTICES"
VERSION .9
July 26, 2010

Created by the Watermarking Ad Hoc Working Group

Proposed for Adoption by the Airline Passenger Experience Association

Technology Committee

© 2010 Airline Passenger Experience Association. All Rights Reserved.

The Airline Passenger Experience Association (APEX) is the author and creator of this recommended practice for the purpose of copyright and other laws in all countries throughout the world. The APEX copyright notice must be included in all reproductions, whether in whole or in part, and may not be deleted or attributed to others. The APEX hereby grants to its members and their suppliers a limited license to reproduce this recommended practice for their own use, provided it is not sold. Others should obtain permission to reproduce this specification from the Airline Passenger Association, Attn: Executive Director, 355 Lexington Avenue, 15th Floor, New York, NY 10017 USA; Phone: (212) 297-2177; Fax: (212) 370-9047; email: info@apex.aero.

IMPORTANT NOTICES

This document is a recommended best practice developed and adopted by the Airline Passenger Experience Association (APEX). This document may be revised by APEX. It is intended solely as a guide for companies interested in developing products that can be compatible with other products developed using this document. APEX makes no representation or warranty regarding this document, and any company using this document shall do so at its sole risk, including specifically the risks that a product developed will not be compatible with any other product or that any particular performance will not be achieved. APEX shall not be liable for any exemplary, incidental, proximate or consequential damages or expenses arising from the use of this document. This document defines only one approach to compatibility, and other approaches may be available to the in-flight industry.

This document is an authorized and approved publication of APEX. Only APEX has the right and authority to revise or change the material contained in this document, and any revisions by any party other than APEX are unauthorized and prohibited.

Compliance with this document may require use of one or more features covered by proprietary rights (such as features which are the subject of a patent, patent application, copyright, mask work right or trade secret right). By publication of this document, no position is taken by APEX with respect to the validity or infringement of any patent or other proprietary right. APEX hereby expressly disclaims any liability for infringement of intellectual property rights of others by virtue of the use of this document. APEX has not and does not investigate any notices or allegations of infringement prompted by publication of any APEX document, nor does APEX undertake a duty to advise users or potential users of APEX documents of such notices or allegations. APEX hereby expressly advises all users or potential users of this document to investigate and analyze any potential infringement situation, seek the advice of intellectual property counsel, and, if indicated, obtain a license under any applicable intellectual property right or take the necessary steps to avoid infringement of any intellectual property right. APEX expressly disclaims any intent to promote infringement of any intellectual property right by virtue of the evolution, adoption, or publication of this document.

TABLE OF CONTENTS

FOREWORD **4**
1 INTRODUCTION **5**
2 RECOMMENDED HARDWARE AND SOFTWARE **5**
2.1 DIGITAL RAPIDS STREAMZ (OR HIGHER GENERATION) ENCODING SYSTEM 5
2.2 STREAM 3.0 OR GREATER ENCODING SOFTWARE 5
2.3 ADOBE PHOTOSHOP CS1 (OR BETTER RELEASE) GRAPHIC EDITING PROGRAM 5
3 ASSET PREPARATION **5**
3.1 HIGH QUALITY MEZZANINE MASTER FILE 5
3.2 VIDEO TAPE MASTER 5
3.3 WATERMARK GRAPHIC 5
4 WATERMARKING INSERTION **6**
5 INFORMATIVE ANNEX: ACRONYMS, ABBREVIATIONS AND GLOSSARY **8**
6 INFORMATIVE ANNEX: LIST OF PARTICIPANTS: **8**

FOREWORD

The Watermarking Ad Hoc Working Group is a working group established by the Airline Passenger Experience Association (APEX) [formerly the World Airline Entertainment Association (WAEA)] Technology Committee to develop and publish recommended practices for the visible watermarking of digital content for use on in-flight entertainment systems (IFES). The WAWG membership includes representatives of post-production facilities and content service providers.

The work of the WAWG was for the purpose of the development of this recommended practice in 2010 under authority of APEX (formerly WAEA). A call for contributions from content providers, post-production facilities, and content service providers was widely distributed in June 2010. There were regular WAWG meetings and discussions on the resulting contributions, leading to the development of this recommended practice.

The key concerns, purposes and objectives of the WAWG in establishing this recommended practice are:

- The development and publication of an open, voluntary technical recommended practice that permits, at Content Provider discretion, the insertion of a visible watermark in in-flight entertainment content that is airline-specific and suitable for the purpose of identifying the source of content which may have been illegally copied or illegally used outside the scope of the license agreement under which it was provided.
- The development and publication of a methodology that inhibits the erroneous insertion of a watermark bearing the identification of one airline in the exhibition of the content on another airline.

The scope of work for this recommended practice includes Best Practices recommendations for hardware and software, asset preparation, and watermark insertion methodology.

1 INTRODUCTION

The WAWG recognizes that Content Providers may require, at their individual discretion, the use of visible watermarks to identify the airline under whose license agreement content assets may have been delivered. The purpose of such visible watermarking includes:

1.1 The ability to accurately determine the broad source of content materials that may have been the source of illegal copying of such materials, and

1.2 Establishment of an open, voluntary technical methodology to help to ensure that content materials licensed for use on one airline are not exhibited, intentionally or erroneously, on another airline and to minimize errors in the application of such visible watermarks such that their efficacy in the realization of these objectives is maximized.

2 RECOMMENDED HARDWARE AND SOFTWARE

The hardware and software cited below are suitable under the Best Practices of this document:

2.1 Digital Rapids StreamZ (or higher generation) Encoding System

2.2 Stream 3.0 (or better release) encoding software

2.3 Adobe Photoshop CS1 (or better release) graphic editing program released by Adobe Systems, Incorporated. “CS” refers to “Creative Suite” and the numeral to the release sequence.

3 ASSET PREPARATION

This Best Practices of this document address the use of three specific assets:

3.1 High quality mezzanine master file:

The Digital Rapids encoder does not perform a simple key of the watermark but instead performs a full transcode of the source file over which the watermark graphic will be placed. Using a deliverable format such as MPEG-1 can result in a less than satisfactory image.

3.2 Video Tape Master:

Any professional broadcast format is acceptable as outlined in WAEA 0395 or APEX 0403 specifications.

3.3 Watermark Graphic:

Watermark text graphics should be created and saved as vector objects. Converting layers to smart objects in Photoshop (see 2.3) is advised. The font should be Ariel regular at 36 points. Characters should be stroke black on the outside at three pixels.

4 WATERMARKING INSERTION

4.1 The Best Practices in the insertion of the visible watermark involve the following steps:

4.1.1 Select the prepared graphic as an overly image and enter at an in-point of 30 frames from the beginning of the program.

4.1.2 Select 30 frame fade-up, 300 frames duration, and 30 frame fade-down.

4.1.3 The image level should be set just above the threshold of visibility using a calibrated monitor.

4.2 At a second in-point keyframe, using the same prepared graphic from the program head should be placed at a random point in the program.

4.2.1 The location should be unique from encode to encode.

4.2.2 Evenly placed in-points, e.g., 1:00:00:00, 02:00:00:00, 1:30:00:00:00, should be avoided.

4.3 Opacity for the second watermark shall be set at 50 percent.

4.4 Positioning of the watermark shall be at the discretion of Content Providers and airlines, examples of which are as follows:

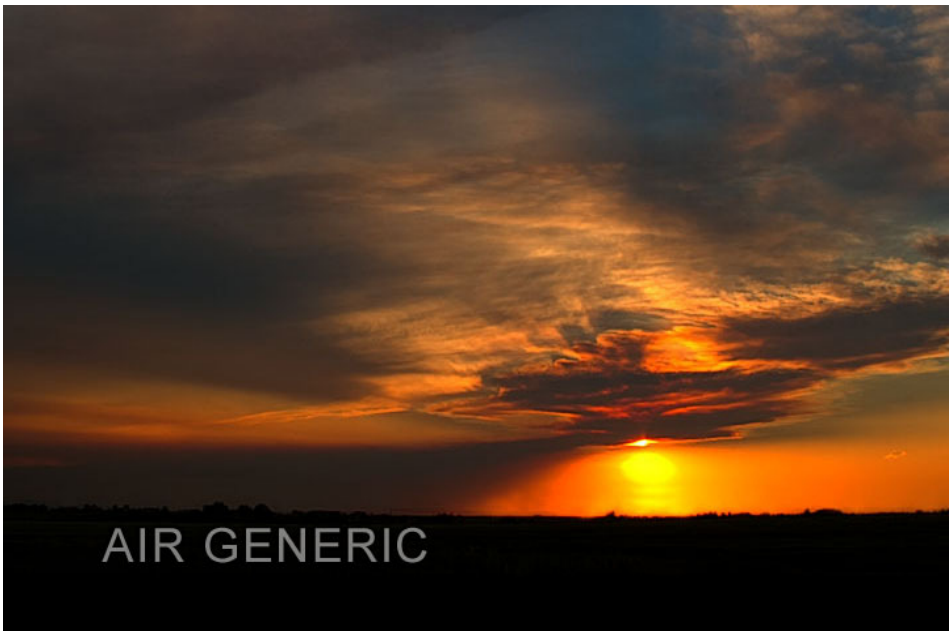

Figure 1: The airline identifier in lower left of frame

Figure 2: The airline identifier in lower left of frame

Figure 3: The airline identifier in upper center of frame

Figure 4: The airline identifier in upper center of frame

5 INFORMATIVE ANNEX: ACRONYMS, ABBREVIATIONS AND GLOSSARY

APEX	Airline Passenger Experience Association *fna* World Airline Entertainment Association [WAEA]
MPEG	Refers to "Moving Pictures Experts Group"
MPEG-1	Refers to a standard for compression of audio and video codified as ISO/IEC 11172
StreamZ	Refers to the standard definition audio video encoder from Digital Rapids which is also available in a high definition version.
WAEA	World Airline Entertainment Association [now the Airline Passenger Experience Association]
WAWG	Watermarking Ad Hoc Working Group

6 INFORMATIVE ANNEX: LIST OF PARTICIPANTS:

This recommended practice could not have been produced without the dedicated involvement of many individuals and companies. The following persons participated in the creation of this document by attendance at one or more meetings of the APEX WAWG or other significant contributions. Their company affiliation at the time of their participation is also given:

Andy Beer	Inflight Productions
Leigh Mantle	Inflight Productions (Chair)
John O'Conner	Cinemagnetics
Bryan Rusenko	Crest Digital