MISB MOTION IMAGERY STANDARDS BOARD	MISB RP 9721
Recommended Practice	**16 Jan 1997**
Motion Imagery Tape Formats	

1 Scope

This Recommended Practice (RP) documents the Motion Imagery System Practices and MISM (Motion Imagery Systems Matrix) for DoD/IC/NSG motion imagery tape formats.

2 References

2.1 Normative References

[1] MISB RP 9720, *Motion Imagery Systems Matrix*, MSIP

[2] SMPTE 342M-2004, *HD-D5 Compressed Video 1080i and 720p Systems - Encoding process and Data Format*

[3] MISB RP 9902, *Authorized Limited Applications of DV Format Video*, Jan 1999

3 Acronyms

AES3	Audio Engineering Society 3
D-VITC	Digital Vertical Interval Time Code
D-VHS	Digital VHS
HD	High Definition
LTC	Longitudinal Time Code
SMPTE	Society of Motion Picture and Television Engineers

4 Introduction

In reference to Recommended Practice 9720[1], "Motion Imagery Systems Matrix," the Motion Imagery System Practices for DoD/IC/NSG motion imagery tape formats shall be as follows:

Tape MISM L11-L8

There are no specific recommendations for uncompressed MISM- L11 or MISM-L8 motion imagery tape implementations as of this version of the Motion Imagery Standards Profile. However, any digital tape format converted into a "bit-bucket" mode with sufficient data bandwidth to store MISM-L11or MISM-L8 signals may be used provided they also:

1) Transparently transport a minimum of two stereo AES3 audio channels;
2) Transparently transport Digital Vertical Interval Time Code (D-VITC) (Longitudinal Time Code (LTC) internal processing/storage is authorized provided D-VITC input and output is maintained);
3) For MISM-L8, transparently transport a minimum of an additional 6 Mb/s of ancillary data (either as part of the bit-serial interface ancillary data stream or as additional AES3 audio streams).

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Tape MISM L10-L7

Whereas the HD-D5 format has become SMPTE Standard 342 [2], SMPTE 342M (360 Mbps data rate mezzanine compression of authorized DoD/IC/NSG high and enhanced definition formats such as 1280x720x60p and 720x480x60p) is an authorized initial motion imagery tape implementation partially meeting MISM L10-L7 requirements. Other desired MISM-L10 and MISM-L7 attributes include the ability to:

1) Transparently transport a minimum of two stereo AES3 audio channels;
2) Transparently transport D-VITC (LTC internal processing/storage is authorized provided D-VITC input and output is maintained);
3) Transparently transport a minimum of an additional 6 Mb/s of ancillary data (as a portion of the bit-serial interface ancillary data stream or as additional AES3 audio streams).

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Tape MISM L9-L6

The MISB expects that there will be a number of inexpensive tape systems for handling MISM-L9 through MISM-L6 including D-VHS.

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Tape MISM L5

For MISM-L5 implementations authorized motion imagery tape formats may include widely accepted commercial systems that:

1) Use 4:2:2 digital processing
2) No compression or use no more than 2.5:1 compression
3) Use bit-serial interface input/output protocols
4) Transparently transport a minimum of two stereo AES3 audio channels
5) Transparently transport D-VITC (LTC internal processing/storage is authorized provided D-VITC input and output is maintained)
6) Transparently transport a minimum of an additional 6 Mb/s of ancillary data (either as part of the bit-serial interface data stream or as additional AES3 audio streams)

Anticipated MISM-L5 compliant (subject to verification) video-tape formats include:

SMPTE D1
SMPTE D5
Ampex DCT
Sony Digital Betacam

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Tape MISM L4

For MISM-L4 implementations, authorized motion imagery tape formats may include widely accepted commercial systems that:

1) Use 4:2:2 digital processing
2) No more than 5:1 compression
3) Use bit-serial interface input/output protocols,
4) Transparently transport a minimum of two stereo AES3 audio channels
5) Transparently transport D-VITC (LTC internal processing is authorized provided D-VITC input and output is maintained)
6) Transparently transport a minimum of an additional 3 Mb/s of ancillary data (either as part of the bit-serial interface data stream or as additional AES3 audio streams)

Anticipated MISM-L4 compliant (subject to verification) video- tape formats include:

Any MISM L5 format
SMPTE D9 (JVC Digital-S)
Sony Beta-SX
SMPTE D7 (DVC Pro 4:2:2)

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Tape MISM L3-L0

For Motion Imagery System implementations MISM L3-L0, it is anticipated that information technology based storage systems will be used instead of videotape except for archival purposes. If videotape is used, digital tape formats other than MISM-L4 (or higher) may only be used in order to meet specific mission constraints (size, weight, power consumption) that cannot be met with MISM-L4 (or higher) tape formats. In such instances, other such formats may only be used in limited roles such as first generation acquisition, with a requirement to immediately transfer and interface such acquisition formats using SMPTE bit-serial interfaces (with MISM-L4 or higher tape systems) at the first processing interface. See Recommended Practice 9902[3] for further details.

Anticipated “acquisition-only” tape formats, in order of priority of choice are:

1) Any MISM-L5 tape format
2) Any MISM-L4 tape format
3) 4:1:1 Digital tape formats
4) Component Analog formats (Y, R-Y, B-Y), such as Betacam-SP or MII
5) High Resolution Analog formats (Y/C), such as Hi8mm or SVHS

(VWG, 26 March 1997 - approved for study)(VWG, 25 February 1998 - language revised)(VWG, 8 June 1999, language revised)(27 July 2000 - editorially revised)

Other Video Tape Notes:

"Analog - composite - limited resolution - color under" videotape formats (such as VHS or U-Matic) are not authorized for acquisition, processing or new archive implementations. " Analog-composite-limited resolution-color-under" video tape formats may be authorized as the means for video tape mass distribution of finished intelligence products provided no other digital distribution tape format is widely available. In no case are such formats authorized for new permanent motion imagery archive storage. Existing, legacy archive systems based on "analog-composite-limited-resolution-color-under" tape formats should convert to one of the new, approved digital tape formats as soon as practical.

Digital composite formats (such as D2, D3) are generally not authorized for any new DoD/IC/NSG implementations because of their incompatibility with 4:2:2 component processing systems.

No motion imagery tape formats other than MISM-L5 or higher may be used for any new permanent motion imagery tape archives, where MISM-L5 or higher systems should be used for the most demanding applications.

(VWG, 26 March 1997 - approved for study)(VWG, 25 February 1998 - language revised)(27 July 2000 - editorially revised)