



### **MXF – SMPTE Material eXchange Format**

MXF is the Material eXchange Format, a standard file format defined by SMPTE ([www.smpte.org](http://www.smpte.org)), the reference organization when it comes to standardization in the Television and the Motion Picture industries. SMPTE standards are at the foundation of several technical developments in the Military field as well.

The MXF file format enables the carriage of both the audiovisual material and its related information. This ranges from structural information of the material such as compression settings, to geo-localization information, to general descriptive information including transcripts of the content. This is why it represents more than a file format. It is a technology that enables the gathering of crucial information as the audiovisual material travels through the workflow. It is therefore the foundation technology driving the adoption of Information Technology in the professional media market.

MXF is now widely used in the Television industry. In fact, users now record in MXF format right at the camera with systems such as SONY XDCAM<sup>®</sup>, Panasonic P2<sup>®</sup>, Thomson Grass Valley Infinity<sup>®</sup> and Ikegami EditCam<sup>®</sup>. The fact that MXF is used right from the camera is leading manufacturers of other systems downstream in post-production, archive and even distribution to adopt this same format.

The fact that MXF proved itself so quickly in the TV industry caught the eye of major players in other application areas. One example is the Motion Picture industry. The seven major Hollywood studios published in 2005 the DCI specification which elects MXF as the format for their Digital Cinema distribution model. MXF enabled projection systems are being deployed in theaters worldwide, cutting distribution costs and enhancing the distribution security model with novel MXF related functionalities, such as data encryption, digital signing, integrity checking and key management.

MXF is also making its way into the Military application area. In fact, MXF technology is heavily based on the KLV coding technology, which is also a SMPTE standard and has been widely deployed in military applications. Therefore, MXF is the obvious next step and its military application is currently being studied by NATO as reported in their AEDP-8 (available at [http://www.nato.int/docu/stanag/4609/4609\\_home.htm](http://www.nato.int/docu/stanag/4609/4609_home.htm)).

## **MOG Solutions**

MOG Solutions is a recognized leader in the development of MXF technology. Their engineering team, former researchers at Portuguese R&D institute INESC Porto, actively participated in the development of the MXF standard itself.

While still at INESC Porto, and already with several years of experience in both IT and Broadcast technology under their belts, this team started in 2000 the development of a reference MXF software implementation that accompanied the development of the first drafts of the MXF standard, 4 years before the standard was published.

In 2002, the same team now fully integrated at MOG Solutions, applied the gathered and matured know-how to develop the first commercially available MXF software product, the award winning MXF::SDK (developed in collaboration with IRT – [www.irt.de](http://www.irt.de)).

MOG Solutions' products include MXF development tools which allow several customers around the world such as Thomson Grass Valley, Apple Computer, Toshiba, Harris Corporation, DAVID Gmbh and Telestream, among several others, to add advanced MXF support to their products.

MOG Solutions' training, consulting and custom development services continues to help manufacturers, system integrators and users to enhance their workflows by integrating MXF technology. The NBC Olympics MXF proxy encoder project is a great example of this. In this project, MOG Solutions developed core MXF based technology that allowed NBC to take full advantage of the metadata and HD coverage of the 2006 Olympic Winter Games.

MOG Solutions continues to research and develop state-of-the-art technology to keep their customers in the forefront of the migration towards Information Technology. The company regards this as an activity for which collaboration with the major players in this area is paramount. For this reason, MOG Solutions is deeply involved in SMPTE standardization and currently chairs the MXF Implementers Group ([www.smpte-mxf.org](http://www.smpte-mxf.org)).

MOG Solutions is also currently involved in European Union R&D projects Worldscreen ([www.worldscreen.org](http://www.worldscreen.org)) and EDCine ([www.edcine.org](http://www.edcine.org)), exploring future directions for the Digital Cinema.

MOG Solutions is also seeking opportunities of collaboration in the Military application area. Major players in this area already recognize the value of MXF technology and the MOG Solutions brand, as confirmed by contacts established in recent trade shows. MOG Solutions also participated in NATO Air Group meetings in 2006, contributing technical information that will help establishing the direction of future NATO technical specifications.

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