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**CODING OF MOVING PICTURES AND ASSOCIATED AUDIO**

**ISO/IEC JTC1/SC29/WG11 N0389**

**MPEG93/**

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**Summary**

This week in Sydney, at a meeting hosted by Standards Australia, the Moving Picture Experts Group (MPEG) achieved its milestone of defining the MPEG-2 Video Main Profile. In its work toward developing a multichannel Audio coding Standard, MPEG made important progress by merging several previous proposals into a single unified proposal. In its work on the MPEG-2 Systems Standard, MPEG created an initial specification for multiplexing multiple audio, video, and data streams into a single stream for the transmission, storage, and access requirements of many applications.

These achievements signal the convergence of such diverse industries as broadcast (including cable, satellite, and terrestrial), telecommunications, entertainment, and computing to a single, world-wide, digital video coding Standard for a wide range of resolutions, including TV and HDTV. MPEG confirmed that it is on schedule to produce, by November 1993, Committee Drafts of all three parts of its MPEG-2 Standard - Video, Audio, and Systems - for balloting by its member countries.

To ensure that a harmonized solution to the widest range of applications is achieved, MPEG is working jointly with the CCITT Study Group XV "Experts Group on Video Coding for ATM Networks," as well as representatives from other parts of CCITT, and from EBU, CCIR, and SMPTE.

**MPEG-2 Video**

MPEG-2 Video is a developing International Standard which will specify the coded bit stream for high-quality digital video. MPEG-2 Video builds on the success of the completed MPEG-1 Video Standard (ISO/IEC IS 11172-2) by additionally supporting interlaced video formats, increased image quality, and a number of other advanced features, including features to support HDTV. MPEG also confirmed this week that the MPEG-2 Main Profile will be a compatible extension of MPEG-1, meaning that an MPEG-2 Video decoder will decode MPEG-1 bit streams. Also, like MPEG-1, MPEG-2 will support interoperability with the CCITT H.261 video telephony standard.

As a generic International Standard, MPEG-2 Video is being defined in terms of extensible Profiles, each of which will support the features needed by an important class of applications. Among the applications supported by the Main Profile will be digital video transmission in the range of about 2 to 15 Mbit/s over cable, satellite, and other broadcast channels, enabling exciting new consumer video services. Because the MPEG-2 Video Main Profile can be implemented at reasonable cost using today's technology, it will be possible to introduce these services by early 1994. With the Main Profile now defined, manufacturers can complete their initial MPEG-2 Video encoder and decoder designs. Some manufacturers expect prototypes to be operational by mid-1993. Another feature of the Main Profile is support for several picture aspect ratios, including 4:3, 16:9, and others.

The development of further profiles is already well underway. The collaboration between MPEG and the CCIR is bearing fruit with the definition of an hierarchical Profile, which extends the features of the Main Profile. This Profile is well suited to applications such as terrestrial broadcasting, which may require multi-level coding. For example, this system could give the consumer the option of using either a small portable receiver to decode standard definition TV, or a larger fixed receiver to decode HDTV from the same broadcast signal.

**MPEG-2 Audio**

MPEG is developing the MPEG-2 Audio Standard for multichannel audio coding, which will be compatible with the existing MPEG-1 Audio Standard (ISO/IEC IS 11172-3). MPEG-2 Audio coding will supply up to five full bandwidth channels (left, right, center, and two surround channels), plus an additional low frequency enhancement channel, and/or up to seven commentary/multilingual channels. This week in Sydney, MPEG merged several proposals from the November 1992 London MPEG meeting into a unified specification. In its audio work, MPEG is collaborating with the CCIR to conduct subjective tests of the proposed multichannel system.

The MPEG-2 Audio Standard will also provide improved quality coding of mono and conventional stereo signals for bit-rates at or below 64 kbits/s, per channel.

**MPEG-2 Systems**

The MPEG-2 Systems Standard will specify how to combine multiple audio, video, and private-data streams into a single multiplexed stream, allowing for the transmission, storage, access, and retrieval of the original streams, while maintaining accurate synchronization. MPEG-2 Systems will be targeted at a wider range of applications than the MPEG-1 Systems standard (ISO/IEC IS 11172-1). As a generic standard, MPEG-2 Systems will support a wide range of broadcast, telecommunications, computing, and storage applications.

To provide support for these features, the MPEG-2 Systems standard will define two kinds of streams. The Program Stream provides for the creation of an audio-visual program, which could have multiple views and multichannel audio. It is similar to the Systems Stream of MPEG-1, with extensions for encoding program-specific information such as multiple-language audio channels. The Transport Stream is new to MPEG-2. It multiplexes a number of programs, comprised of video, audio, and private data, for transmission and storage using a wide variety of media. The Transport Stream supports multi-program broadcast, storage of single programs on digital video tape, robust performance against channel errors, conditional access to programs, and the maintenance of synchronization over complex networks and through editing operations.

**Collaboration**

MPEG's acceptance into the industry continues to grow. Two hundred thirty experts representing over one hundred organisations came together from eighteen countries to attend MPEG in Sydney this week. Also represented were other standards setting organisations, with interest from bodies including EBU, ETSI, CCIR, CCITT, and SMPTE. The spirit of international collaboration and cooperation was evident by progress achieved this week. Current and potential users of MPEG vary from individuals to major transnational corporations.