EBU Statement D80 - 1996
Compression in Television Programme Production

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At the present time, broadcasters are faced with a choice between incompatible compression algorithms used on different non-linear-editing and acquisition devices. Systems based on the new tape recording formats SX and DVCPRO operate on compression algorithms at 18 and 25 Mbit/s respectively and are intended to be used in the acquisition of sports and news material. New tape recording formats for mainstream television applications have already been announced. One is based on an extension of the DVCPRO compression algorithm to the 4:2:2 signal format and will operate at about 50 Mbit/s. Other formats based on the 4:2:2profile@ML of MPEG may follow.

It is possible to integrate devices using compression systems into existing digital facilities if they are equipped with the standard serial digital component interfaces in accordance with ITU-R Recommendation BT.656. However, the compressed signals must first be decoded into ITU-R Recommendation BT.601 format.

The following consequences also arise:

- any further re-encoding and decoding of the previously compressed signal, such as may be required for further non-linear editing, will further increase the loss of signal quality;
- Even for simple assemble editing, programme segments encoded with different compression algorithms would each need to be decoded into BT.601 format. Subsequently, a decision may have to be made on which format is used for the edited programme material for future storage on a server or in the archive.
- The cost and operational benefits of an integrated tape and disk strategy using a single algorithm would be nullified by the time required to transfer the programme material between different media. This is because there is little possibility of faster than real-time transfer between the acquisition, processing and storage devices using signals in BT.601 form.

The provision of a single interface standard to carry compressed signals would alleviate this situation but the interface signal formats based on existing algorithms would not be compatible with each other or with other MPEG-based standards. Unfortunately, the EBU sees little likelihood of achieving harmonisation at bit-rates in the range 18-25 Mbits.

The situation is different for compression algorithms operating at higher bit-rates, which may possibly be used in use in main-stream television studio operations. No significant amount of equipment is installed in this area of activity and hence the possibility still exists for achieving harmonisation.

The EBU is encouraged by the continued improvements in performance and cost of disk storage and considers that:

- there are real economic benefits to be achieved through the use of a single compression algorithm and file format for programme exchange,
- intermediate storage and long term archival of material in a variety of formats is inefficient and creates problems extending into the future,
- disk-based editing produces time and cost benefits over tape-based systems,
- there are technical and system benefits for programme production through an ability to select equipment from different suppliers as appropriate for different applications,

- that compression algorithms operating in an I-frame only format at about 50 Mbit/s have been demonstrated and they are likely to offer a picture quality and a headroom for post-processing which are appropriate for all but the most-demanding studio operations.

The EBU firmly believes that:

- for high-end programme production, uncompressed signals according to ITU-R Recommendation BT.601 or systems using lossless compression or systems using lossy DCT-based compression with a compression factor not exceeding 2 should be used;
- for mainstream programme production and for programme acquisition using low bit-rate compression formats where the operational advantages of compression are obvious, only a <u>single</u>, <u>open</u> compression algorithm should be applied for storage or file transfer applications. Furthermore, this system should operating at 50Mbit/s and use an I-frame only format.