

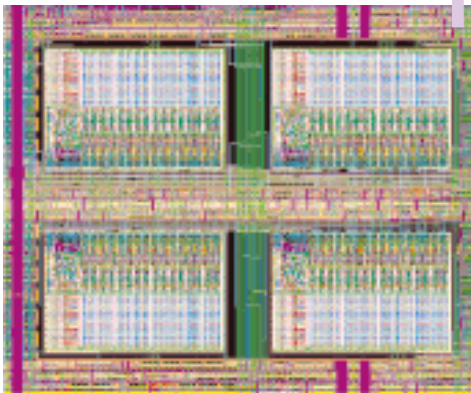


**Left:**  
A frame of video after MPEG-2 coding at 4.3 Mbit/s and decoding eight times without ATLANTIC Mole.

**Right:**  
A frame of video after MPEG-2 coding at 4.3 Mbit/s and decoding eight times with ATLANTIC Mole assistance.



The diagnostic display from an ATLANTIC video recorder showing the validity of the Mole signal at the output of a video mixer.



Part of the IMAGE VLSI chip layout, showing four areas containing memory.

IMAGE was developed by partners CSELT and EPFL to perform motion estimation, vector refinement and mode selection within video coding equipment.

# Mole

# image



# atlantic



# atlantic

The ATLANTIC project, which has just reached its conclusion, involved a consortium of eight organisations, led by the BBC working within the framework of the European ACTS programme. Techniques and equipment were developed within the project for television programme production and distribution, based on MPEG compression of digital video and audio.

Digital compression is the key to using economically-priced IT equipment in broadcasting in place of expensive, purpose-built digital video and audio apparatus. However, with the introduction of compression techniques into more and more areas, it

is becoming difficult to avoid situations in which signals coded at a low bit rate are decoded to uncompressed form (i.e. PCM) and then re-coded. This normally results in a progressive deterioration in signal quality with each decoding and re-coding operation.

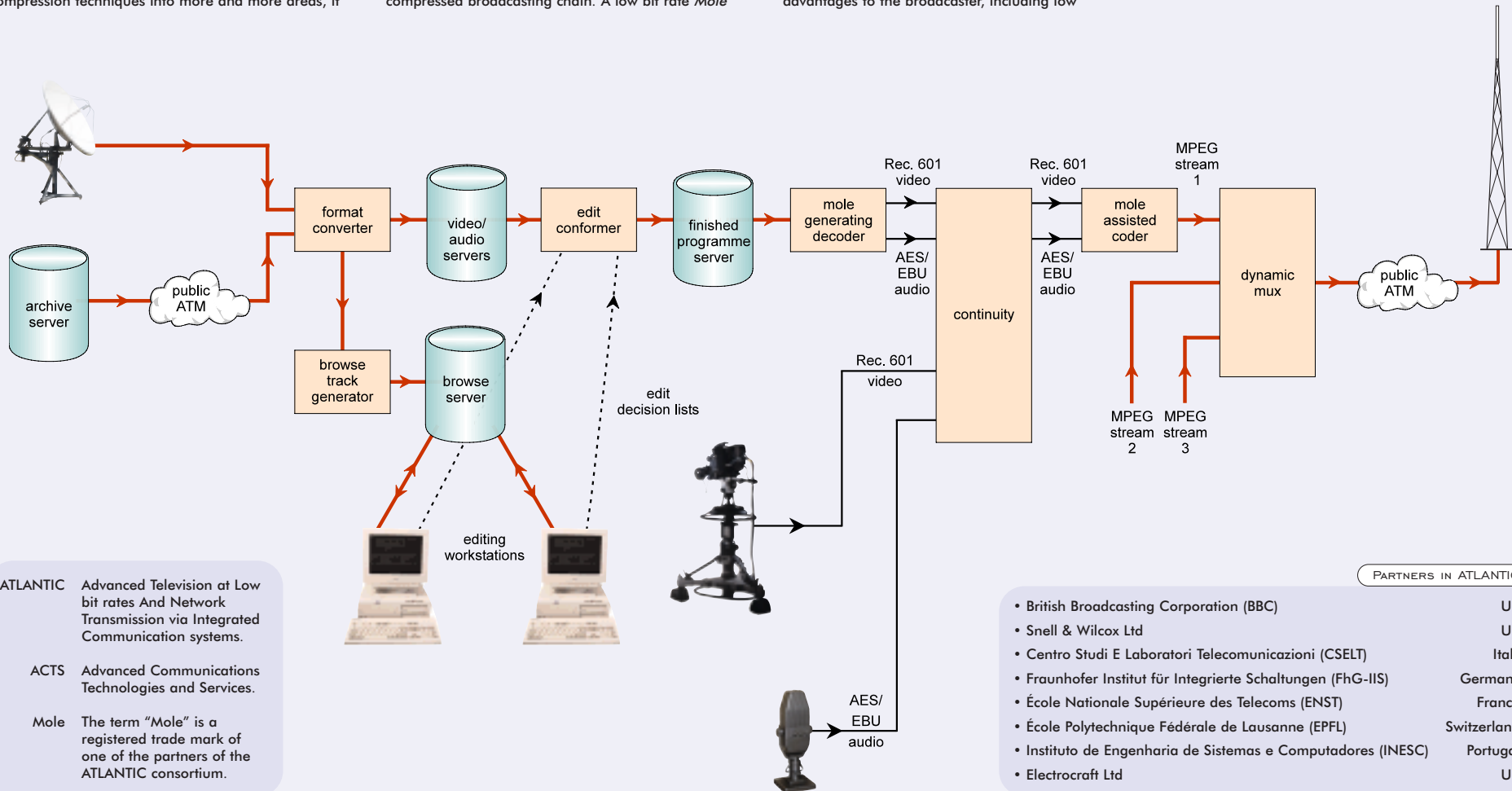
The figure shows a simplified block diagram of an MPEG-based digital television broadcasting chain, with MPEG-coded and uncompressed (i.e. PCM) video and audio.

ATLANTIC provides the means to maintain quality throughout a mixed uncompressed and MPEG compressed broadcasting chain. A low bit rate *Mole*

signal is added to the digital video or audio after decoding, to retain the previous MPEG coding decisions for use in subsequent re-coding. The addition of the Mole does not affect compatibility with existing standards for uncompressed digital video (ITU-R Recommendation BT.601) and audio (AES/EBU, or ITU-R Recommendation BS.647). ATLANTIC also provides the means for transcoding MPEG2-coded video to lower bit rates at a quality indistinguishable from that of video coded directly at the lower bit rate, and for frame-accurate switching and editing.

The use of IT networking technology offers many advantages to the broadcaster, including low

interconnection costs, ease of reconfiguration and expansion, simultaneous multiple access to programme material and use of desktop PCs for browsing current and archive material. ATLANTIC has developed methods for streaming MPEG-based content, using control mechanisms based on CORBA, an open standard for distributed object-oriented computing. It is envisaged that with the standardisation of these mechanisms, the studio of the future will be based around a network with low-cost IT-based equipment offering standard services, e.g. browsing, editing and bit-rate changing.



**ATLANTIC** Advanced Television at Low bit rates And Network Transmission via Integrated Communication systems.

**ACTS** Advanced Communications Technologies and Services.

**Mole** The term "Mole" is a registered trade mark of one of the partners of the ATLANTIC consortium.

#### PARTNERS IN ATLANTIC

- British Broadcasting Corporation (BBC) UK
- Snell & Wilcox Ltd UK
- Centro Studi E Laboratori Telecomunicazioni (CSELT) Italy
- Fraunhofer Institut für Integrierte Schaltungen (FhG-IIS) Germany
- École Nationale Supérieure des Telecoms (ENST) France
- École Polytechnique Fédérale de Lausanne (EPFL) Switzerland
- Instituto de Engenharia de Sistemas e Computadores (INESC) Portugal
- Electrocraft Ltd UK