

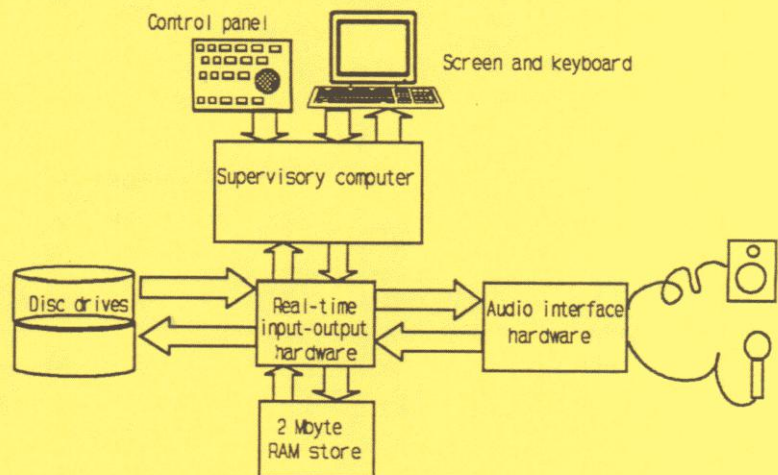
DIGITAL AUDIO EDITING

Whilst digital audio recorders of various designs have been available for several years, difficulties in using such equipment have restricted their widespread introduction in broadcasting. Perhaps the most limiting of these is the difficulty in editing the material once recorded in digital form. Although some digital recording formats can be edited by cutting and splicing recording tape, they still have a number of disadvantages compared to analogue methods. The relatively recent availability of high capacity magnetic disc drives, each capable of storing about 30 minutes of stereo audio, has promoted the development of alternative editing systems based on these devices.

Early work at Research Department identified various techniques for implementing such a system and this led to the development of prototype equipment to demonstrate the potential of this approach. With successful completion of this it was decided to develop a fully operational disc based editing system for use in service. This would allow operational techniques to be explored and give a better understanding of the advantages and disadvantages of this approach.

The Digital Audio Editing System that resulted from this work was installed in Broadcasting House in September 1987.

Recordings can be made straight onto the disc from a number of signal sources: an analogue input, a digital AES/EBU input or from a PCM F1 input allowing digital transfer of recordings.



Once the recordings are on the disc the final programme is compiled by a non-destructive editing process. By means of the user-interface (in this case, the control panel, screen and keyboard and the software that controls them all) the operator indicates which sections of the recordings are to be included in the programme, and any sections which should be cut out. The operator can define the way in which the sections are to be joined: the length of cross fade from one section to the next and a limited amount of gain change can be specified.

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That the editing process is non-destructive means the original recordings are not changed in any way. The editing is done by compiling a list of the sections needed to make up the programme. An edit may be rehearsed and then modified over and over. This can be very difficult and time-consuming when working with tape.

A second editing system was built for further evaluation and demonstration. This had been used for a number of purposes including further audio signal processing experiments at Research Department. It was also shown at the International Broadcasting Convention in 1988. With slight modifications to the hardware and different software the Digital Audio Editing System was converted to a delay device for use by World Service during President Bush's inaugural address.

The inauguration of President Bush presented a problem for the World Service. An audio delay was needed because President Bush was to start his address a few minutes before the programme covering the ceremony. The length of time for which the address had to be delayed was not known beforehand to any great accuracy. What was required was a device that could start recording when President Bush started to speak and start playing back from the beginning whilst still recording the remainder of the incoming speech. In the event the modified Editing System performed faultlessly. The listener could not have known that President Bush's 20 minute speech was replayed after a 5 minute rest on the disc drive of the Digital Audio Editing System.

The first prototype is now in service in Egton House, near Broadcasting House where it is used heavily in Radio 1 programmes. The second machine was converted back to an editing system and was put into service at the Oxford Road studios in Manchester.