



**AudioSoft**

## White Paper

# Solutions to digital courtroom recording

Ten benefits of upgrading to a digital system

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## Executive Summary

Over the last fifteen years there has been a gradual move to digital recording solutions to reduce costs and improve functionality.

DART (Digital Audio Recording and Transcription) allows for:

- ▶ Central storage for simple access
- ▶ Powerful search for quick retrieval
- ▶ Reduced maintenance and media costs
- ▶ No loss of quality and easy distribution
- ▶ Centralised management of recorders
- ▶ Single system for synchronised audio and video
- ▶ Live monitoring from outside the room
- ▶ Replay whilst still recording
- ▶ Quicker transcription time
- ▶ Secure integrated workflow management

There is now an urgent need to move away from analogue tape recording due to the unavailability of the tapes themselves and spare parts for the recorders.

Digital recording is now a mature technology for court recording with respect to:

- ▶ Audio recording
- ▶ Lip-synchronised video recording
- ▶ Integrated courtroom workflow management

This white paper explains the benefits of upgrading to a digital solution for courtroom recording, the costs savings that it can bring and the important factors you should consider.

## Audience

This white paper is relevant to:

- ▶ Those responsible for the operation of the courtroom recording system (and any associated network)
- ▶ Those responsible for budgeting for the recording system
- ▶ Those responsible for setting the requirements for logistic management
- ▶ Transcriptionists
- ▶ Those responsible for transcriptions

## Section 1: Understand your requirements

Requirements for courtrooms vary from country to country but there are many common factors. Listed below are the key considerations when upgrading to digital:

1. **Choose a provider that can offer a complete solution** - incorporating recording software, audio mixers, input devices, transcription software and integrated workflow management, as well as to provide an assured upgrade path for future technology requirements. It may be that you require a full hardware and software solution or just software to run on existing PCs with support for both legacy and new equipment. Either way it is essential to choose a provider that can offer integration expertise.
2. **An intuitive court service interface** is required to allow the Clerk of the Court to make notes in real time that can be associated with the recordings. It is important to the users of the system that this fits in with your court's customs, language and culture. For example, in the United Kingdom one might refer to the "crown prosecutor", whereas in the United States this might be the "court attorney"; this can be achieved by having configurable database fields. A tailored solution allows the case history to be bookmarked conveniently and intuitively at key moments (either during recording or replay) whilst the capability to allow role-specific recording allows users to search by person. For easy annotation the package should be integrated with Microsoft Word ®.
3. **Define the number of channels (video & audio)** required per courtroom as per current legislation in your country. A typical set-up is as follows:

8 inputs recorded in 4 pairs through a mixer so the recordings require less disk space and the other reason because the pairings should never talk at the same time:

- ▶ Judge & Clerk
- ▶ Witness (defence or prosecution)
- ▶ Examination (defence or prosecution)
- ▶ 2 x A/V inputs (1 Pair); this can be used for a vulnerable witness or to playback the Audio from a CD or DVD.

The ability to change the pairs (and edit the pair labels) and also expand the system to more audio and video channels if required is a must and this may also include expansion to lip synchronised video whilst still using standard PCs.

4. **Define storage requirements** and examine the options available. There are benefits in flexible archiving options including SAN/NAS, removable hard drives and DVD media and the solution should be configured for each courtroom. In particular, it is important to have large enough local storage at each recorder so that if there are network problems then the recordings can all be stored locally until the issue is resolved. AudioSoft can advise on both

local and central storage options. Please ask for our white paper, “Network and Mass Storage for Evidential Requirements”.

5. **Consider and specify support requirements** including first and second line. Reliability is fundamental to the courtroom and a heartbeat health monitoring system means no more concerns about someone kicking the power cable and stopping recording. Such a heartbeat-based health monitoring program may allow alarms to be monitored centrally or e-mailed to the relevant engineer instantaneously.
  
6. **The installation needs to be achieved without disruption** to the courts’ business and the solution integrated with the Courts’ existing audio infrastructure. A seamless install will ensure that the recording process is switched over to digital without problems and ensure buy-in from key stakeholders such as the clerks of the court, the judges and network administrators.
  
7. **Insist on high-quality training.** Users such as court officials, transcriptionists and administrators need to quickly becoming competent and confident in the digital recording system through an intuitive Windows-based front-end and comprehensive SCORM-compliant computer-based training.

## Section 2: Advantages of a digital courtroom solution

There are many advantages to upgrading to a digital courtroom recording solution:

### Advantage 1: Central storage for simple access

All recordings can be archived to a central location for easy access of all recordings without having to find, load and rewind the tape. Recordings can be stored efficiently using high-quality codecs and distributed easily over IP networks or e-mailed over the internet in common formats such as '.wav'. Recordings can be stored locally or centrally (or both) without the need for archive media. This can all be managed securely so that only people with the appropriate access rights can listen to the recordings.

### Advantage 2: Powerful search for quick retrieval

Bookmarks are points of interest within the recording. Whilst recording is in progress, the clerk of the court is able to create bookmarks, which can then be searched on either later on in the proceedings or after the case. The Court Clerk's life, and also the transcriptionist's is made easier by instantly locating audio or their notes using a powerful database search facility such as SQL, meaning that the relevant part of the recording can be found within seconds.

### Advantage 3: Reduced maintenance and media costs

Digital recorders can benefit from Commercial Off-The-Shelf (COTS) PC technology and the low maintenance costs that this brings. Digital recorders can be configured to have no moving parts so lower probability of failure, which also contributes to the low maintenance costs. With tape parts (and the tapes themselves) becoming harder and harder to source, the reduced maintenance costs of a digital solution mean a quick return-on-investment. Furthermore the voice storage per DVD is more than two hours and blu-ray significantly more, which allows for efficient movement of data, e.g. to a transcription house.

### Advantage 4: No loss of quality and easy distribution

Each time a tape is replayed the quality worsens, until eventually the tape will be degraded beyond use. This is of particular importance to transcribers, when a recording may need to be listened to many times to achieve an accurate transcription.

As well as taking longer to copy, any tapes that are made from the original will be of lower quality than the original as the sound is not transmitted perfectly from one tape to another. A copy of a copy is even worse and the speech may be unrecognisable causing significant problems for transcriptionists.

Replay and copying of a digital recording is perfect every time (since there are no physical parts to scratch or damage) meaning that transcription times and costs can be reduced and the accuracy can be increased.

### Advantage 5: Centralised management of recorders

Advanced digital recorders can be managed from a web-based interface anywhere, anytime with functionality such as:

- ▶ Centralised management
- ▶ Reduced installation time through self discovery
- ▶ Time synchronisation to ensure evidential trail
- ▶ Alarming for quicker reporting of problems
- ▶ Easier maintenance scheduling

This allows managers and administrators peace of mind and reduced workload when looking after the recorders; one person can look after many recorders. Both the recorders and the recordings can be managed efficiently with timely maintenance and prompt alerts (e.g. through e-mail or SMS) to any potential issues.

### Advantage 6: Single system for synchronised audio and video

Video recording is appropriate in some courtroom recording scenarios, depending on the country. It is essential to choose a recording system that is capable of both audio and video recording should legislation or policy change. When video recording, it is of high importance that the video is lip-synchronised with the audio.

### Advantage 7: Live monitoring from outside the room

Recordings can be live monitored either at the recorder or across the network without affecting the recording. There are situations in which audio and video monitoring may be required, such as when a vulnerable witness or a bereaved family is in a separate room apart from the courtroom and still needs to hear the court proceedings.

### Advantage 8: Replay whilst still recording

In the same way that recordings can be live monitored whilst the recorder is still recording, digital recorders allow replay of the hearing whilst the case is still in progress without affecting the recording. For example, if testimony differs from one part of the trial to another, the first part can be replayed without having to stop recording of the live courtroom audio.

### Advantage 9: Quicker transcription time

There are modern tools that allow for quicker and easier transcription, reducing transcription costs and the time for the return of transcriptions. Digital recordings can

be manipulated with a foot pedal and integrated with a word processing toolbar such as Microsoft Word™, allowing the transcriber to manipulate the recording easily, insert time and case information, loop and bookmark, etc.

Automated speech-to-text transcription tools can also be used to reduce the cost of human transcription. Audio analytics can be used to search on key words or phrases to quickly find vital information in lengthy cases.

### Advantage 10: Secure integrated workflow management

The transcription workflow can be run most efficiently through web management to save time and money. The recordings can be integrated with note taking during the case to allow efficient bookmarking of crucial events. Both human transcriptionists and automated processes can be allocated by managers, allowing easy monitoring and control of both in-house and external systems. Case numbers and version numbers can be handled carefully to ensure that this system works efficiently for your court service's requirements, reducing costs and improving turnaround time.

Automatic built in testing and security restrictions (such as only allowing the case officers access to their own recordings) can ensure both reliability and security of recordings.

## Section 3: Example Return on Investment

To assess the return on investment that could be made from changing from analogues tapes, most organisations calculate how much they currently spend on tapes, the maintenance of tape systems and other direct costs that are affected. Below is an example from where upgrading to a digital recording solutions has offered significant financial savings.

### **ROI example – Organisation X**

#### **Background**

Organisation X had 50 courtrooms and had for a long time accepted using tapes as the only option available for recording but had become aware of the benefits of moving to a digital courtroom recording system.

#### **Business Objectives**

Organisation X needed to satisfy two key business objectives through the introduction of a digital recording system:

- ▶ Ease of movement of recordings
- ▶ Protection against obsolescence of tapes

These business objectives needed to be achieved along with a quick return on investment.

#### **Assumptions**

As in any example, in order to calculate a useful measure of ROI, a number of assumptions must be made:

- ▶ Of the 50 courtrooms, 46 were audio only and 4 were audio and video
- ▶ 4 channels of audio needed recording per courtroom
- ▶ In the 4 rooms that needed video recording, this was one channel of video in a picture-in-picture format
- ▶ £0.99 per 2 hour audio tape
- ▶ £0.99 per 2 hour VHS cassette
- ▶ Each courtroom is in use for 4 hours per day, 200 days per year; this equates to a total of 292,000 audio hours per annum and 11,680 video
- ▶ 25 cases a week needed transcribing for which it is assumed that in some instances a copy of the recording would need to be couriered to a typing pool, then on to transcription company, then back to the typing pool, then back to a central location – four movements at £20 each. All these costs can be eliminated by secure digital transfer. This equates to a potential saving of 100,000 per annum.
- ▶ The cost for some DVDs has been allowed for the occasions when removable media are required.

## ROI example – Organisation X (continued)

### Cost Analysis – Investment

Organisation X chose to move to a digital solution which archives to a SAN storage solution:

Item	Price	Quantity	Total
Audio only recorder	£4,000	46	£184,000
Audio and video recorder	£8,000	4	£32,000
Installation, training & commissioning	£1,000	50	£50,000
SAN devices	£20,000	-	£20,000
Initial investment:			<b>£286,000</b>

### Total cost savings

Before	(p.a.)	After upgrading	
Audio cassette tapes	£79,200	DVDs	£4,000
VHS cassettes	£3,168	-	-
Manpower in handling tapes	Unknown	No tape handling	-
Tape carousels	£10,000	No tape carousels	-
Courier costs	£100,000	Less courier costs	-
Paper-based workflow management	Unknown	Integrated workflow management	Vastly reduced
Logistic costs, management costs, copying costs	Unknown	Integrated workflow management	Vastly reduced
Annual savings:			<b>£192,368</b>

### Benefits

- ▶ Return on investment in 18 months; then £192,368 saving per annum plus additional indirect cost benefits
- ▶ All recordings could be transferred across the WAN when required, both by an automated archiving process for storage and by operators (with the appropriate access) using a web-based interface from any of the 50 sites for replay
- ▶ Reduced storage costs – fixed storage is significantly cheaper than removable storage
- ▶ Archiving software performed a Cyclic Redundancy Check (CRC) to ensure the integrity of the archived recordings
- ▶ All the recordings are stored centrally so search time reduced to a few seconds
- ▶ Reduced couriating of data and so reduced risk of data loss
- ▶ Audio and video could be synchronised and exported to a common format (such as .avi or .mpeg) along with associated notes
- ▶ Automatic SNR check ensures high quality of speech is recorded

When all of this information had been taken into account, it became apparent to the organisation that, in fact the direct cost savings and indirect manpower benefits were sufficient in the first 18 months alone to justify the investment in digital recorders. Moreover the organisation enjoyed many other business benefits from the change in recorders, including quicker and easier transcription and clearer playback of files.

Integrated courtroom workflow management was later implemented so that:

- ▶ Case numbers and bookmarks could be attached to the recordings
- ▶ Recordings could be assigned to a particular transcriptionist
- ▶ The progress of work and users could be easily monitored and managed anywhere, anytime
- ▶ Version and change control could be managed effectively
- ▶ There was no worries about tasks being forgotten or important pieces of paper being mislaid
- ▶ Tasks would alert to users immediately with priority and the associated recording rather than having to rely on the postal system with potential delays and loss of data

## Section 4: Summary

Over the last fifteen years there has been a gradual move to digital recording solutions to reduce costs and improve functionality.

There is now an urgent need to move away from analogue tape recording due to the unavailability to the tapes themselves and spare parts for the recorders.

Digital recording is a mature technology for courtroom recording.

DART (Digital Audio Recording and Transcription) allows for:

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The key points to consider are:

- ▶ Complete recording workflow solution to ensure all issues are addressed
- ▶ An intuitive court service interface that can be tailored for your courtroom
- ▶ Easy annotation through integration with Microsoft Word ®.
- ▶ Defining the number of audio and video channels with room to expand
- ▶ Careful consideration of local and networked storage requirements
- ▶ Specifying support requirements including first and second line.
- ▶ Heartbeat-based health monitoring program for peace-of-mind
- ▶ The installation needs to be achieved without disruption to the courts' business Comprehensive SCORM-compliant computer-based training.

Speak to your recording system provider about how you can best upgrade to a digital solution.