The *Memory Machine*: sound and memory at the British Museum

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The *Memory Machine* is a context-, people- and site-specific interactive sound installation. It has been developed as a collaboration between two composers, Cathy Lane and Nye Parry, who share an interest in sound, oral history, and memory. The *Memory Machine* is an ongoing project which, most recently, was part of the British Museum's 250th anniversary exhibition entitled *The Museum of the Mind; Art and Memory in World Cultures*.

This paper discusses the background and ideas behind the *Memory Machine* within the context of the composers' work. The development of the project in collaboration with the British Museum is described and an evaluation of some of the issues around the public exhibition of the piece is given as well as a full technical description of the different elements of the installation.

1. INTRODUCTION

The *Memory Machine* is an interactive sound installation to which museum visitors contribute their own personal reminiscences. These are subjected to various processes and transformations and played back in a spatialised mix in the gallery space. The installation has been created as a collaboration between two composers, Cathy Lane and Nye Parry, and has developed out of their previous work on sound history and memory and their particular interest in oral history as a material in sound composition. The *Memory Machine* extends their previous experiences of composing with oral history archives, by collecting the material it uses from the listeners themselves.

The *Memory Machine* concept is flexible and context specific. So far the work has been exhibited twice, firstly at the *Cybersonica* festival in 2002, and the following year at the British Museum's 250th anniversary exhibition entitled *The Museum of the Mind; Art and Memory in World Cultures*. In each case the machine was tailored to the specific requirements of the exhibition.

This paper discusses the background and ideas behind the *Memory Machine* within the context of the composers' work, and the development and realisation of the project at the British Museum in collaboration with museum staff.

2. THE EXHIBITION

The Museum of the Mind; Art and Memory in World Cultures opened to the public in April 2003 and closed in early September 2003. The exhibition was curated by Prof. John Mack and was a major part of the museum's 250th Anniversary celebrations. Consequently the objects on display were drawn from all of the museum's collections, from many times and many places. They were chosen because of the way they embody memories: cultural, personal, institutional. They are 'designed to help the different parts of mankind to remember: Arms against oblivion' (MacGregor in Mack 2003: 9).

In addition to the role the objects play within their original contexts, the exhibition celebrated the role the objects play within the context of the museum itself:

> . . . the Museum has been in existence for longer than most nation states. It has therefore acquired its own cargo of memories and persists in the memory of its vast numbers of annual visitors, for many of whom it is a place of pilgrimage. (MacGregor in Mack 2003: 9)

The exhibition was free and was housed in the Joseph Hotung Great Court Gallery, an exhibition space above the historic Reading Room within the new Queen Elizabeth II Great Court, designed by Norman Foster and opened in 2000. It was divided into five sections that explored how the creation of objects and images help to shape and sustain memory. The sections were: *The Museum as a Theatre of Memory*, dealing largely with the history of the British Museum; *In the Mind's Eye – aides mémoire* exploring how objects are created to awaken memories and contain narratives at many levels; *Living Memory* which illustrates some of the many ways in which memory has been kept alive by the creation and manipulation of the human image; *Commemoration Memorial and Ritual Art* and *Holy Relics and Memorabilia*.

3. MEMORY THEATRES AND THE STRUCTURE OF MEMORY

The cross-disciplinary study of memory has come up with a variety of models and metaphors for the workings of memory and as aids to memory and

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Figure 1. The *Memory Machine*.

remembering. While most of these are outside the scope of this paper, the concept of memory as a schematic or architectural space as expressed in the Renaissance Memory Theatre has been extremely influential on both our work and the structure of the exhibition as a whole.

The concepts and ideas behind the memory palaces and memory theatres of the past have been investigated in Frances Yates' book, *The Art of Memory* (Yates 1992). Generally, the memory palaces and memory theatres documented here were sophisticated spatial mnemonic systems built in the mind of the person who wished to remember, though they were occasionally presented in physical form, as in the famous Memory Theatre of Guilo Camillo, which in turn had a profound effect on the development of the modern museum.

The Memory Palace was a place in which you would locate certain objects. These in turn were associated with ideas you wanted to remember. As you walked through your palace you would visit each object and recall the concept or a chunk of text associated with it. The objects had to be chosen very carefully:

> The images chosen to decorate the various memory theatres of the sixteenth century were neither simple nor arbitrary. They were carefully constructed visual images. Thus, they were not mere 'reminders' constructed as a convenient means to retrieve semantic knowledge stored in the memory; instead they were designed to embody and depict the knowledge they represented. They were 'maps' – things designed to represent other things. (Fentress and Wickham 1992: 12–13)

If one of the purposes of producing work relating to sound, history and memory is to try and stimulate recollection or remembering in the listener, then this kind of embodiment and depiction of knowledge through symbolic means is something that the composer seeks in both the sonic material and its organisation. The spatial or architectural metaphor of the Memory Palace finds a close ally in musical structure:

> Our ability to recall and fantasize in spatial and acoustic images . . . shows that sensory memory of space and sound is no less conceptual than our abstract memory of meanings. Space and sound characterise the world as we represent it to ourselves in our imagination in a way that smells, tastes, and feelings do not. (Fentress and Wickham 1992: 31)

As composers we emphasise the spatial qualities in our work to produce sonic memory theatres for others to wander thorough, either literally or metaphorically. The musical work can be seen as a journey through a sound space. Personal memories and associations are triggered in the minds of the listeners, both in response to the material and to the structural arrangement of that material. The *Memory Machine* in this context becomes a sonic analogue of the museum itself: 'a place where the products and processes of history meet' (Kavanagh 2000: 148).

4. THE MEMORY MACHINE AT THE BRITISH MUSEUM

The *Memory Machine* was heard at the exhibition's entrance and exit. The visitor heard a constantly changing mix of layers of spoken word material, some recorded in advance of the exhibition, from people who work at the British Museum and people in some way associated with some of the objects on display, and others recorded over the duration of the exhibition by visitors themselves. Visitors used a 1950s-style telephone in the exhibition area to contribute their own memories to the mix.

The memory mix was constantly changing. The density of voices, the spatialisation of each individual memory excerpt over the three loudspeakers in each listening space, the choice of voices and the mix of visitor memories with staff memories, the degree of intelligibility of any given voice and the degree of fragmentation or decomposition of the recording, all these were in a constant state of flux and the playback was never the same from one moment to the next. This

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created a collision of words and ideas around the subject of memory and the museum, and provided an aural metaphor for the complex web of interrelationships of human memory itself. Unlike many interactive exhibits which re-order a given set of materials according to some form of user input, it is the actual content of the *Memory Machine* that is the subject of the interaction. In this way the visitors shared their experience and memories through the installation and the voices and stories that are heard are those of the general public.

5. PREVIOUS WORKS INVOLVING ORAL HISTORY

Prior to the development of the *Memory Machine*, both Cathy Lane and Nye Parry had completed a number of projects using archive material in various forms.

Nye Parry's *Boomtown* (1998) uses material from the North West Sound Archive, consisting of interviews with residents of Oldham and its surroundings. In it the listener experiences a poignant identification with the events occurring around the Peterloo massacre according to the information given in the form of personal testimonies. The piece is framed with the obsolete sounds of the textile mills and their associated machinery. It offers at once an insight into the distant past and a requiem for the more recently disappeared industry of the North of England.

Cathy Lane's *The House of Memory* is a multichannel sound piece inspired by aspects of growing up in Hackney, East London in both the past and the present. The piece mixes sound material from the oral history collections of the Hackney Archives and the Hackney Museum with present-day recordings made with, and of, Hackney children – particularly of playground games and chants. The sonic imagery and music in the piece are designed to create a mental link to each listener's own childhood memories and feelings about growing up.

In our experience, the disadvantages of working with this sort of material can be that while it covers a very small period of time or specific areas of interest, there may actually be hours of material, which may not be very well catalogued. It can be of extremely poor sound quality, and it may not contain material that you had originally hoped to access. In some cases material cannot be accessed as it is deemed sensitive. (This was the case with an existing archive of interviews with British Museum staff.) In other cases you may be sure that the required material exists, but it proves very difficult to track down. The advantages, however, are of access to a great wealth of material from the past with the concomitant language, patterns of speech and access to memories from other places and periods of time.

Sometimes new 'archive' material will need to be created for a particular project. In *The House of Memory*, for example, the available oral history material did not initially provide the range of content that the composer had hoped for and once she had decided on the basic theme – children's games – it became necessary to record new material. Sounds of contemporary children playing and speaking were included both to avoid a sentimental sonic portrait of a lost past, and to produce more variation of voices, so as to reflect more accurately the ethnographic make-up of East London.

In the *Memory Machine*, this issue is addressed both through the targeted interviewing of museum staff during development and the ongoing creation of an archive by the installation itself. In this way, the *Memory Machine* develops the idea of composing with oral history by, itself, collecting the material it uses.

6. THE MEMORY MACHINE AND THE STIMULATION OF MEMORY

One of our aims in producing work relating to sound, history and memory is to try and stimulate recollection or remembering in the listener. Listeners are stimulated to remember by listening to the mix of other people's reminiscences and are then invited to contribute their own memories. The *Memory Machine* relies upon the listener feeding their own memories into the ongoing sound piece. These contributions are given in response to the heard material and become part of that material, in turn triggering memories in others. A kind of feedback loop is thus created, in which the contributor/listeners feed off each other's memories.

An earlier version of the *Memory Machine* used specially selected archive materials to stimulate memory. This first manifestation of the *Memory Machine* was developed for a sound art exhibition as part of the *Cybersonica* festival in 2002. It was situated in a central London Gallery space and open to a general audience and a more specific sound art audience who were attending the associated conference. In this version of the *Memory Machine*, archival material was released into the sound mix when the user answered an on-screen question about the year they were born and picked a theme from a choice of four categories. These were: Friends and Family, Technology, Arts and Entertainment, and World Events.

A questionnaire had revealed that the sort of things people remembered most clearly were specific songs, TV programmes and theme tunes, extracts from speeches or newsworthy events of the times. The questionnaire was designed to identify the significant occurrences of the century for different age groups, and the soundmarks associated with them. These formed the basis of the archive material included in the first *Memory Machine.*

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On hearing material that we hoped reflected the collective memories of the audience, based on their age and chosen subject area, listeners were then invited to leave a memory of their own. So the first *Memory Machine* was using specific archive material reflecting collective cultural memory to trigger personal memory.

7. THE MUSEUM CONTEXT AND THE STIMULATION OF MEMORY

Unlike this first *Memory Machine*, the *Memory Machine* at the British Museum had a very particular context. A specific question was asked of the participants. They were asked to contribute their own memories of the British Museum and its collections. All the reminiscences dealt in some way with this topic. The role of archive material in triggering memories and associations was therefore replaced to a large extent by the memories already present in the mix when listeners enter the exhibition space.

However, the visitors' memories were not only provoked by the memories of the other participants, but also, importantly, by the exhibition itself, which drew on all the collections of the museum and included archival material about the history of the museum in one of its sections.

The absence of the musical archive and sound effects of the first *Memory Machine* produced a speech-driven aesthetic in which the content of the visitors' contributions is emphasised. The musicality of the experience was engendered by the texture of the voices, the accents, the hesitations, the turns of phrase, as well as by the processing which was applied to the fragments by the computer.

8. MEMORY AND MUSICAL STRUCTURE

This musicality plays an important part in the way the *Memory Machine* represents processes of human memory. Rather than taking a narrative approach, as is the norm in many museum sound exhibits, the *Memory Machine* applies musical processes to the material it gathers. Sounds are fragmented and echoed, repeated and varied, juxtaposed with both similar and unrelated fragments. This way of looking at structure offers a useful analogy to the processes of memory, in which networks of meaning interact and complex connections between ideas link seemingly disparate elements. A possible development of this idea might involve the program remembering (re-recording) some of the juxtapositions and transformations it has generated, treating them as musical motifs that are subject to development and variation. Some form of word recognition software might extend this to allow fragments with semantic connections to be selected for re-use or development.

9. THE DEVELOPMENT OF THE MEMORY MACHINE AT THE BRITISH MUSEUM

Having created the first version of the *Memory Machine* for *Cybersonica*, we were keen to take the idea further by finding a specific exhibition or gallery to collaborate with, tailoring the installation to a specific site and occasion. We were fortunate to find in Prof. Mack a curator who understood our ideas and was already keen to develop a sonic element to the exhibition. A number of decisions about the nature of the installation were taken during the course of numerous meetings with curators, managers and designers at the museum.

9.1. The pre-loaded material

The decision to focus entirely on visitor memories and interviews was made during the development of the piece. Other archive material was initially considered. The sort of material that we had wanted to trace included items such as BBC news reports of major treasure hordes, such as the early seventh century treasures from the Anglo-Saxon ship burial site at Sutton Hoo discovered in 1939, or the tremendous and unexpected success of the treasures of the Tutankhamun exhibition which 1,669,117 visitors saw and 'queuing for Tutankhamun became the fashion' (Caygill 2002: 64).

Whilst the museum itself owns a good deal of photographic material, oral history material proved much more difficult to locate. Other material was sourced or recorded during the development period, for example sounds from inside the museum and musical extracts related to the cultures represented in the exhibition, as well as examples of memorial sounds and lost sounds, but these were not included in the final version.

Instead, we worked with the museum to create a special archive for the installation consisting of interviews with a variety of people suggested by John Mack and his staff. These interviews included curators from different departments at the British Museum, focusing on the objects on loan from their department to *The Museum of the Mind*, and providing a contextual or anecdotal background to the item which may include details of its inclusion or acquisition. Other interviewees included an archivist, a conservator, someone from Visitor Services and the Head of Education, as well as other employees of the museum, such as the Head of Security and members of his team.

Further material was provided by interviews with people who have special relationships with objects in the exhibition: a representative of the Kuba kingdom from the Congo whose *ndop* sculpture is a sophisticated mnemonic linking the Kuba to their past, and Osi Audu, a Nigerian artist, who contextualised and explained the background to his work, *Juju*, which

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was included in the exhibition. Some of this pre-programmed material was present in the sound memory mix at all times and was heard as sonic fragments documenting a deep fascination and engagement with both the museum and the objects in it.

9.2. The question

In the light of this material there was debate about the nature of the question that the visitors would be asked to elicit their memory. This came down to one of two choices. At first we favoured a question about objects owned by the visitors which had particular memories associated with them, as we felt it would elicit very personal responses and emphasise the link between objects and memory. In the end it was decided to focus on memories of the museum itself and its collections. This was felt to reflect the connection between the museum and memory and forged a closer link between the institutional interviews and the visitor contributions.

Responses to the invitation: 'We would like you to tell us your memories of the British Museum and its collections' ranged from memories of elicit liaisons: 'I meet my lover at the British Museum', to childhood visits and deep engagement with particular items.

9.3. File censorship

The issue of censorship is a difficult one in the context of the *Memory Machine*. The museum insisted on retaining the possibility of blocking certain contributions in case of obscenities or libellous statements. While these problems are relatively rare, many users left messages that were not relevant to the question being asked. It is notable that a number of visitors interpreted the telephone simply as a 'visitor feedback' device, and left general comments about the exhibition (e.g. 'I like the exhibition very much') rather than leaving their own personal memory of the museum. Others simply expressed incomprehension, some attempting to dial a number or saying things like 'what do I do now?'. In terms of the clarity of meaning in the sound installation, it proved very useful to be able to filter these statements out and to focus on genuine reminiscences which did constitute the majority of the contributions.

In addition to the explicit censorship of contents, the *Memory Machine* automatically rejected contributions of under three seconds long. (The signal from the phone was delayed by three seconds and the recording was only initiated when this amount of time had elapsed.) This filtered out the many instances when a visitor listened to the instructions but then decided to hang up without saying anything. It is suspected that many people did this in order to hear the instructions before reflecting on their contributions, and many may well have gone on to successfully leave a memory. Automating this part of the censorship process prevented curators having to actively reject a lot of false starts. It is worth pointing out that files rejected by the curators were not deleted from the hard disk. The computer merely compiled a list of accepted files and marked rejected files as unsuitable. This provides researchers with the opportunity of investigating patterns of use and misuse by the public and may provide useful information to future exhibition designers.

There is of course a major down side to the censorship stage in the progress from leaving a memory to having it appear in the mix. It would be preferable in many ways to be able to reward users by letting them hear their own contribution as they leave the gallery. This would no doubt increase their satisfaction and understanding of the *Memory Machine*.

10. TECHNICAL DESCRIPTION

The *Memory Machine* was implemented as a Max/MSP patch. All aspects of the *Memory Machine* were implemented in a single master patch with various sub-patches to look after the three basic functions: recording new contributions, auditioning and censoring material, and generating the constantly evolving sound mix.

These three functions correspond to three separate locations in the gallery, two of which were directly experienced by the public. The third was used by museum curators to audition the material gathered. The visitors heard the memory mix in the corridors leading in and out of the exhibition room and left their own contributions in the exhibition space itself. The users' experience was therefore one of hearing first, contributing their own memory and then listening again on the way out. The following description, by contrast, follows the progress of the soundfile contribution from the user interface to the curator's control room and out into the sound installation in the corridors.

10.1. The user interface

The user interface was located in the main exhibition area and consisted of a 1950s telephone. Users were prompted to leave a contribution by written instructions and by a voice on the telephone when they lifted the receiver. Memories were left in the familiar manner of an answerphone message after a beep, and visitors were asked to hang up when they had finished. The telephone had been adapted to contain a good quality microphone in the mouthpiece so that the recordings were of a high standard. In addition, the phone sent a simple switch signal to the computer to indicate when it had been picked up and hung up. The computer

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interpreted these as key presses via a Don Johnston switch interface, designed for special needs use. These triggered the instruction message and initiated and terminated the recording.

10.2. The control room

All recorded memories were kept as CD-quality soundfiles on the computer's hard disk. Curators had the opportunity of auditioning the files in the small control room where the computer was stored. A simple graphical front end and a pair of headphones were provided for this purpose. Files were indexed by date so that the curator could audition the files received on a particular day. A play button played the file and an accept and a reject button controlled which files would be allowed to enter the *Memory Machine* mix in the corridors. Curators auditioned the files regularly and could accept or reject a file while it was playing back, making the auditioning process quick and easy. The control room also housed an eight-channel audio interface, the amplifiers, and a microphone pre-amp. An overall volume control and a hardware mute switch were also provided.

10.3. The audio installation

Accepted files were accessed by the playback functions of the program along with the pre-recorded interviews with museum staff. Playback was identical in the two corridors which each contained three loudspeakers suspended from the ceiling. Individual files were positioned in a three-channel mix to enhance comprehension and to allow various spatial effects. Different voices were presented at different stages of 'decomposition'. It was important to try and present highly comprehensible material alongside more fragmented sound as the majority of visitors passed through the area very quickly, so a more gradual process of decomposition would not be appreciated. It was also considered desirable to mix visitor memories with staff memories of the museum in about equal measure, reflecting both institutional and private experiences. The composition of the sound mix was controlled by the file selection and playback.

10.4. The playback routines

The playback patch consisted of seven 'channels' which each had a different way of treating the soundfiles they handled (figure 1). The channels were invoked one at a time in sequence 1–7 and back to 1. This was controlled by a central clock. Every twelve seconds a channel came into play. A channel remained active for about forty seconds so there were always three or four channels active at any one time. The channels had the following characteristics:

- Channel 1 – played back a 39 s chunk of a single file (or the whole file if shorter)
- Channel 2 – played back 4 s fragments of a single file through a delay effect
- Channel 3 – played 8 s chunks from various files through a comb filter effect
- Channel 4 – played a 39 s chunk from a single file through a custom effect
- Channel 5 – played 8 s fragments from a single file through a comb filter effect
- Channel 6 – played 12 s chunks from a single file through a custom effect
- Channel 7 – played 5 s fragments from various files through a delay effect

This set of options ensured that:

(1) a long section of relatively easily comprehensible text was always in the mix (channels 1 and 4),
(2) a good balance existed between different effects (comb, delay), and
(3) a good balance existed between long and short file fragments.

When fragments were taken from a single file, the file was cut into sections and these were re-ordered. There was a random delay between each fragment and each fragment was different.

10.6. File selection

All but two of the channels dealt with a single memory file. The selection of this file was handled by a routine which decided whether the file should be a pre-recorded interview or a visitor memory, and decided whether the file should be a new one or a recording already present in another channel. The pattern was as follows: V I V r I V I r, where V is a visitor memory, I is pre-recorded interview material and r is a repetition of the previous file. As five of the playback channels called the file selector which had an eight-step pattern, the file selector was out of phase with the channels, thus ensuring that different effects and treatments were applied to each file type, e.g. interviews did not always get delay effects. The purpose of the repetition in the cycle was to allow two versions of the same file to coexist in the mix at the same time. It was felt that the listeners who were only in the listening area for a brief time would get a clearer idea of the process of fragmentation process if, for example, delayed fragments of a file (channel 2) coexisted with a longer section played straight (channel 1).

10.7. Effects

The effects used were quite simple:

(1) *Delay*. The delay produced discrete echoes. A feedback loop produced the characteristic dying

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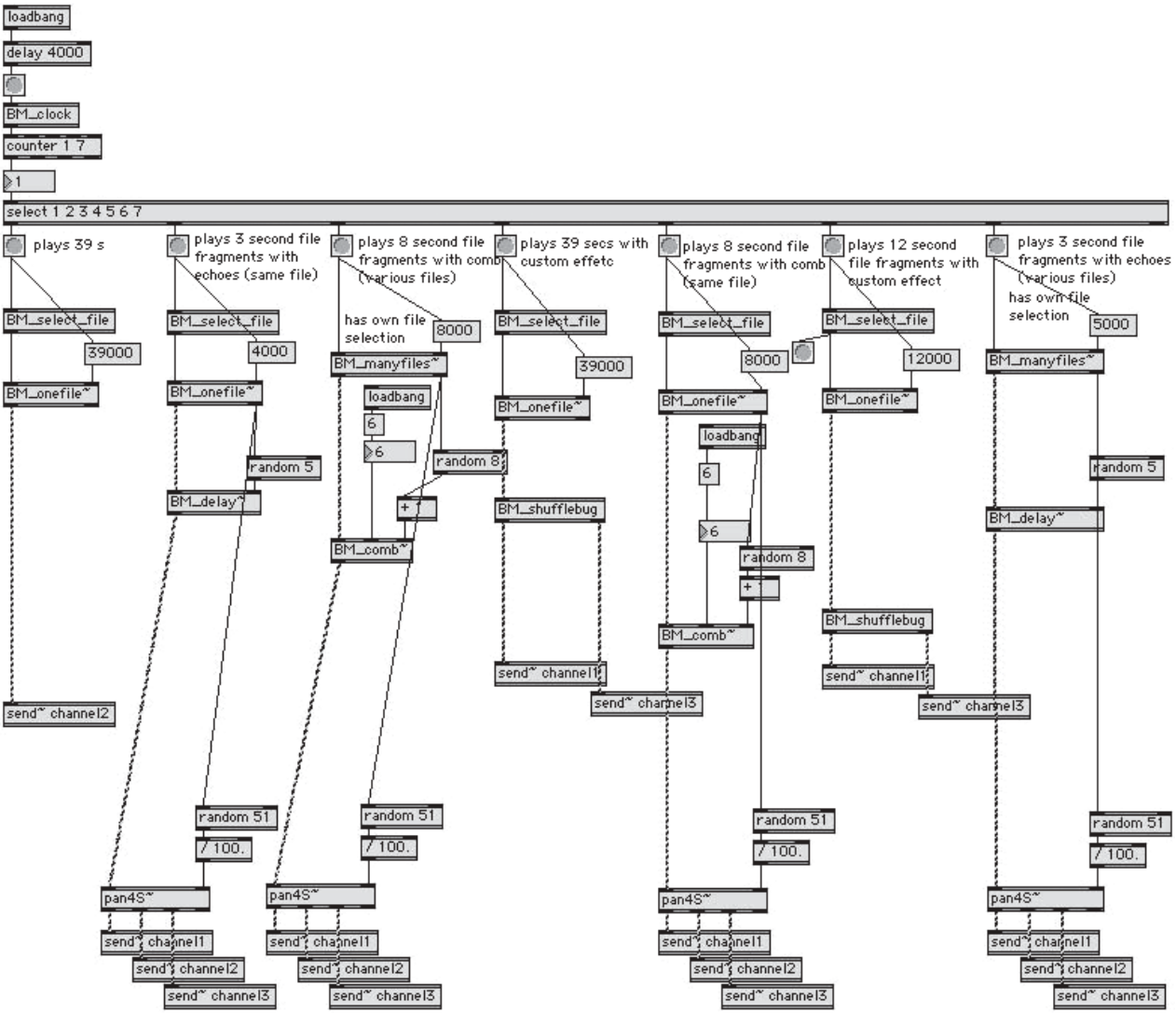


Figure 2. Max/MSP patch showing the seven playback channels.

away of the effect. The amount of this effect was varied randomly.

(2) *Comb filter*. The comb filter produced a pitched quality by resonating at certain pitches when excited by the speech input. Various tuned chords were pr-ogrammed and were selected randomly. The third-party Tap.Tools comb filter was used (by Timothy Place) as it incorporates a low-pass filter in the signal path.

(3) *Custom effect*. The third effect used a quirk in the Max/MSP program to produce a simple fragmentation. The effect caused a spatial illusion in which normal playback of the file in the centre of a stereo image was interrupted by occasional echoes and pre-echoes on the left and right.

10.8. Sound diffusion

After going through the various effects, the files were allocated a position in the spatial mix somewhere on the line between the three speakers above the listeners' heads. (The custom effect was routed directly to the outside pair to allow the stereo illusion to work.) The three- channel panning was achieved using a quadraphonic pan effect and restricting the output to 240 degrees of a notional circle.

11. EVALUATION

The experience of installing the *Memory Machine* at the British Museum was generally very positive. The installation was used by over 8,000 visitors and many interesting contributions were left. As an experience it was invaluable to us and a number of lessons have been learnt.

11.1. User satisfaction

While the responses left were generally encouraging, there was a feeling that many visitors were not

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associating the act of leaving a memory in the gallery with the sound heard in the corridors. This may be due to the physical distance between the user interface and the sound (the advantage of which was to stop the machine recording the playback), but was also a result of the very brief period of time most visitors spent in the sounding part of the installation. As this was in a pair of short and narrow corridors, there was a sense that visitors were discouraged from lingering and many were observed passing through, apparently oblivious to the sound above their heads.

The immediate feedback of the first *Memory Machine* would certainly have helped in this regard, allowing visitors to hear their own contribution as they left the exhibition. In a less sensitive venue one might envisage a compromise where a new memory would temporarily enter the mix before being filed away for consideration.

11.2. Reliability

There were inevitably some issues with reliability. These were initially down to bugs in the program. In retrospect it may seem somewhat ambitious to develop such a large-scale project in Max/MSP. Certainly, the difficulty of controlling the exact flow of information and the lack of sophisticated error handling and debugging may have made our lives harder than need be; however, most of the software issues were sorted out quite quickly. Some system crashes seem also to have been down to the hardware interface between the telephone and the computer, which occasionally hung. As the main reliability issues concerned the telephone interface, the sound installation itself was largely unaffected.

11.3. Sound quality and aural aesthetics

As composers, we were not entirely happy with the quality of the loudspeakers and the height at which they were hung. This, along with the acoustics of the corridors, contributed to a slightly boxy sound. The recordings from the telephone also had a slight coloration from the resonance of the handset, despite the microphone being of reasonable quality and some attempt to damp down the housing with cotton wool.

Aesthetically, we found some of the effects a bit basic in practice, and more time to fine tune the sound itself would have been welcome. The reality of making a program that could be used relatively unsupervised for six months in a major public space tended to skew our priorities toward more mundane programming tasks.

12. FUTURE DEVELOPMENTS

The *Memory Machine* is part of an ongoing collaborative practice based research project into sound, history and memory. Part of that project is the composition of sound works which use as many of the available elements, sources and techniques identified above as possible. These may include historic reconstructions based on researched evidence, archived sounds, soundscapes and testimonies, reconstructed and musically structured with attention to metaphorical and actual space. A recent series of workshops in Bangalore, India led to a site- specific work in collaboration with Srishti college of Art and Design. Further work is taking place at the London College of Communication on oral history archiving, in particular at defining useful taxonomies for artists wishing to use such materials in their work. A future edition of *Organised Sound* will be devoted to Sound History and Memory.

The *Memory Machine* combines the gathering of oral history material with its presentation in a unique context. Developing the *Memory Machine* in conjunction with the staff at the British Museum was a fascinating and enjoyable experience and we are keen to continue this kind of partnership with organisations or institutions providing new contexts for the work and new arenas for the exploration of sound and memory.

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