Configurable Space XIII - Creativity and Communication

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Abstract. *Configurable Space* is a research and communication project directed towards exploring the visual, aural, tactile, and configurable capabilities of digital technologies, examining how the tools developed affect ways that we think, feel, formulate, and develop on intellectual, spiritual, and emotional planes. The central ideas are examined through simulations of future artist's work environments, and are expressed using multimedia presentations/installations. This article moves beyond the concept of art and music as artifact, concentrating on the creative process, on the underlying resource requirements, and on the opportunities that new technological resources provide for self expression.

1.0 About Configurable Space

Configurable Space is a research and communication project directed towards exploring the visual, aural, tactile, and configurable capabilities of digital technologies, examining how the tools developed affect ways that we think, feel, formulate, and develop on intellectual, spiritual, and emotional planes. The central ideas are examined through simulations of future artist's work environments, and are expressed using multimedia presentations/installations. The simulations incorporate representations of interactive computer display tables, walls, and holographic images, within a multi-dimensional sound environment. *Configurable Space* examines the potential of immersive simulation technologies as applied to the creation of powerful and effective art and music studio environments, exploring the relationship between creativity, technology and human expression.

The envisioned technology incorporates large integrated and interactive display tables and walls, with comprehensive and integrated resources supporting transparent, translucent and opaque overlay and mixture of visual elements on any surface. Multi-dimensional and multi-channel sound resources provide the same integrated and configurable capabilities in the aural domain that are available in the visual domain, where one has the ability to dynamically configure all resources following the natural flow of an individual's creative energy. Size, shape, sound, spatial characteristics, and styles of interaction are all elements that coincide directly with creative intent and personal style, in contrast to resources that force one to work within preconceived notions about what art is, or how the human process is supposed to function.

This article moves beyond the concept of art and music as artifact, concentrating on the creative process, on the underlying resource requirements, and on the opportunities that new technological resources provide for self expression. Visual resources of *Configurable Space* will be discussed, with attention to the role that the visual domain performs in representing and communicating activity in the sound and music domain.

1.1 Summary of basic principles

The original *Configurable Space* installation consisted of a light table, a light wall, slide projectors, a chair, a piano bench, and a table with a water jug and candles. Figure 1 is a photograph of a room view that contains the physical objects, in a setting reflecting the character of the space. The design of the space, including the type, size and positioning of objects in the environment, reinforces perception of the environment as a totally immersive experience. For example, the inside corner of the light table was positioned in front of the corner of the light wall and
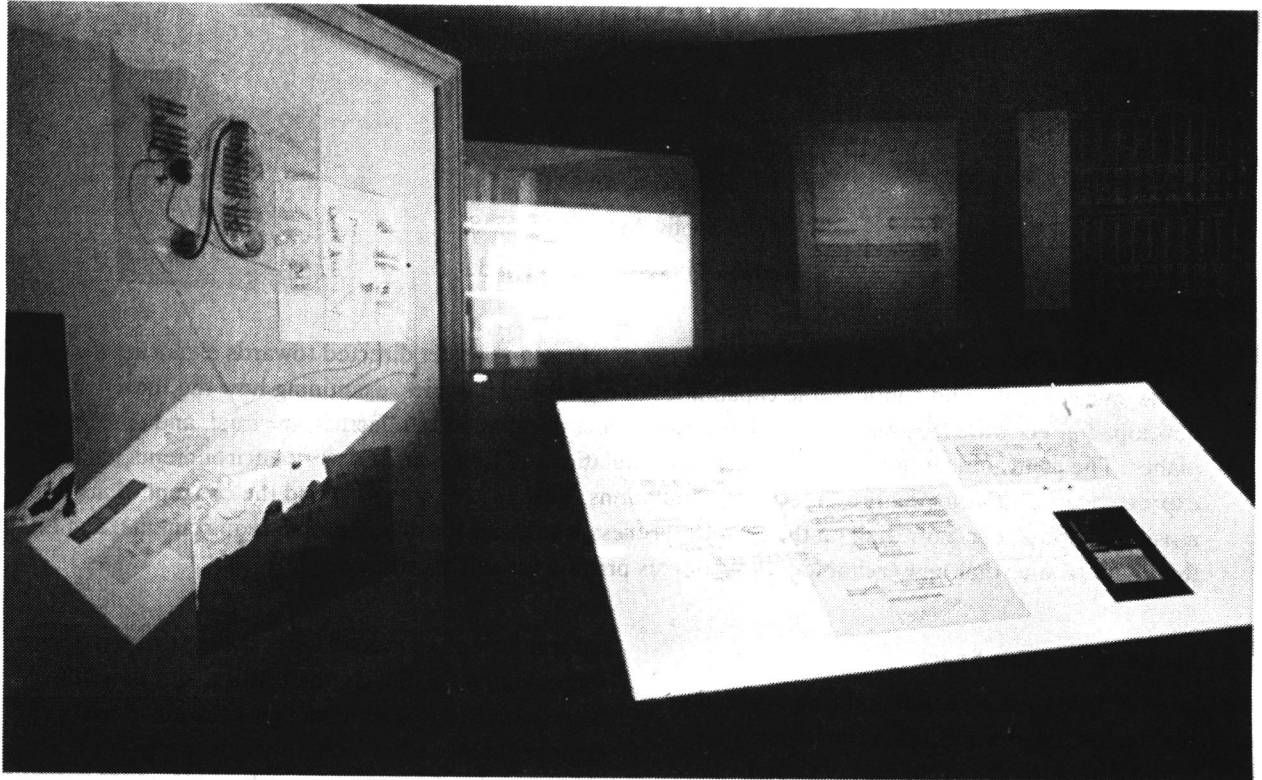
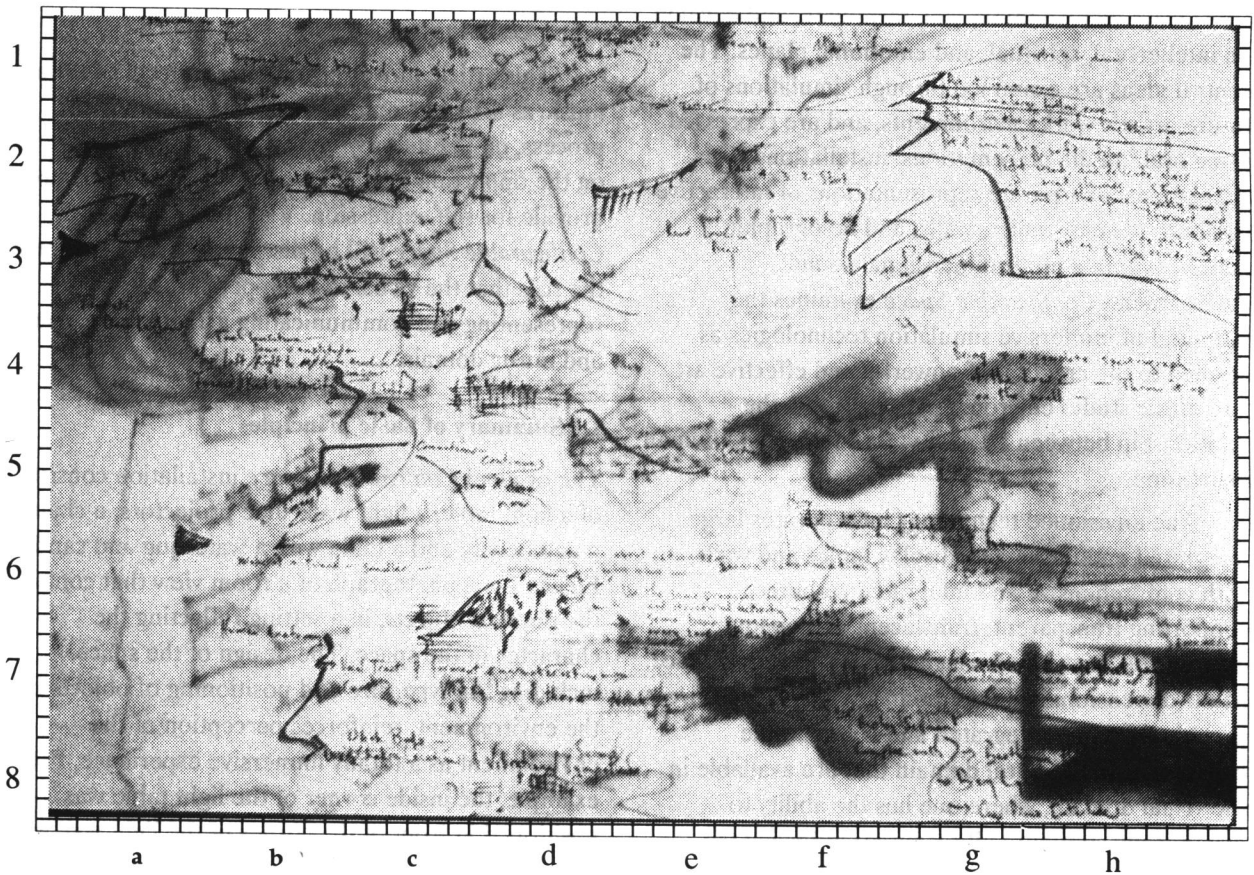Figure 1: *Configurable Space* Room View. Photo by Marion Gray (1989).

Figure 2: Room Talk #358. Photo by Marion Gray (1989).

placed at an angle to create shadows and reflections from several vantage points. The contents present on the light table in this room view can also be seen in reflection on the light wall, where it is then possible to draw connections with the rest of the contents on the wall.

San Francisco-based photographer Marion Gray captured various perspectives of room views and close images in several hundred photographs taken during multiple sessions working in the environment. These images document the sketching and representation process, the evolving environmental characteristics and the resource requirements during the evolution of a music composition.

Sketching on transparencies made it possible to move visual material around in the space. Sketches were copied onto additional transparencies using a variety of size and magnification transformations, becoming icons at one end of the range, and zooming in to examine items in detail at the other end of the range. Colored gels were used to enclose and to relate material on the sketches and room states. Slide projections of rooms and close-up views of sketches photographed during earlier sessions were superimposed onto existing environments to reinforce the impressions of the space at an earlier time, in addition to its contents. Live drawing captured the detail involved in developing a sketch, and also served to create links and annotations among the transforming content in the environment.

A storyboard covering the main topics formed the foundation of a set of scenarios for the initial physical environment. These scenarios explored the sketching and notation process during the evolution of the musical ideas, followed the numerous intersecting threads occurring during the creative process, and highlighted the resources required to facilitate and enhance the activity. The entire physical environment was used to expand the visual and aural scope of the activity, and to explore how the multidimensional perspective could affect perception and creativity.

Successive installations incorporated materials created in previous manifestations, examined additional topics, and created more materials for use in future installations. Materials gathered include sketches, transparencies, photographs, slides, digital soundfiles, audiotapes, journals and videotapes. Manifestations of the project have been created in many forms, including hardcopy book chapters and journal articles, synchronized multimedia presentations, hybrid performance-presentations, multimedia installations, music compositions, and gallery exhibitions with accompanying sound environments. The basic set of scenarios and concepts are presented in hardcopy format in "Artistic Necessity, Context Orientation, Configurable Space" [Harris (1992)], a chapter in a book exploring contemporary musical thought. The structure of this chapter extended traditional linear presentation format by creating a textual thread and an image-based thread, each of which could be read independently, while both may be explored for the connections that link them. A more detailed and formal description of the *Configurable Space* principles and major installations can be found in "Configuring Hospitable Space - Fantasy and Fantastic Media" [Harris (1995)].

2.0 Creativity and Communication in Immersive Environments

The difficulty of conveying the concepts and scope of *Configurable Space* using traditional communication techniques became apparent early in the development of the project. Impressions of the environment exist internally as a complex constellation of sensations, fusing words, images, sound, touch and feeling in an intricate web of evolving connections and intersecting processes. Traditional linear presentation techniques were problematic because of the need to translate multidimensional messages into a single stream of information that has a predominant foundation in a formal language style. Critical information is lost in the translation of this internal multimedia sensation into a linear stream, and in the reformulation into a personalized, multidimensional impression in the receiving side. An impression lasting a few seconds could take several hours to bridge the communication gap. Just as the concepts embodying *Configurable Space* required the building of an actual multidimensional space in order to explore them effectively, expanded resources were necessary for meaningful communication.

Configurable Space reflects these multidimensional aspects of our innate capabilities, employing our diverse perceptual and expressive resources in both exploration and communication.

The importance of impressions, of gesture, and of our ability to comprehend multiple simultaneous layers and threads is incorporated into the basic principles of the project. There is an underlying sensitivity to individual needs and preferences on both the sending and receiving side of the communication loop, and to the importance of context in deciding on system configuration. Attention is directed to the particular requisites for communication with self, with others, and with the environment.

2.1 Visual materials

Visual material in the environment appears in many ways and serves a variety of functions. In addition to textual information, visual material is used to enclose, to separate, to associate, to organize, and to create ambiance. Graphics can represent musical symbols, can be symbolic of gesture, and can operate as icons representing complex concepts in simple forms. Even when an image performs a predominant role in one domain, sensitivity to the ability of an image to affect sensibilities in other dimensions provides a powerful resource. The following categories provide a summary of some key concepts as they apply to *Configurable Space*.

2.1.1 Image as art, environment, signification and articulation

The *image as art* domain includes pictures, photographs, moving images, or any visual content presented in a context that is oriented towards the presentation of art. The context orients the perceiver in an aesthetic mode, requiring a specific kind of attention and participation.

Wall paper, even if it is animated and configurable, affects the character of the environment. In the same way, the furniture, ambient lighting, and directed spot lights all contribute to the nature of the environment, the focus brought to its contents, and therefore the impact of the image for its environmental characteristics.

Image as signification includes textual meaning, such as text that is language, and iconic representation, such as graphic elements that reduce or define objects and concepts. In the case of an image of a piano keyboard, for example, the representation carries a meaning relating to a physical object, a sound realm, a method of interaction, and a

nearly 300-year historical reference spanning multiple cultures and musical styles. In the case of music notation there is an accepted set of symbols that come with meaning, in contrast to symbols that have their meaning defined dynamically or by the application of general principles.

As articulation visual characteristics can be used to frame concepts, to articulate events within the space, and to define connections among collections of things along with defining the nature of their connections. Lighting may change in order to view an art video, articulating a change that serves a transformation that alters one's attitudes about what is about to occur. This consequently affects the experience and the perceptual modes one uses to interact in the specific circumstance. These concepts are operative within a single image, a collection of images, the environment as a whole, a revised perspective of the environment, or an entirely new environment.

3.0 *Room Talk*

The visual and aural layering capabilities of immersive technology assist memory, perception and communication on multiple cognitive planes, creating an environment that projects aspects of the inner self onto the physical world surrounding the participant. *Configurable Space* visual resources suggest thorough and comprehensive transparent, translucent, reflective and opaque functionality, along with their sonic counterparts. These capabilities are important components in creating the multidimensional effect, and in maintaining a close connection with work as one maneuvers in an immersive environment.

The *Room Talk #358* photograph embodies many of the *Configurable Space* principles and underlying themes (Figure 2). A grid surrounding the image has been supplied in order to clearly identify the content for purposes of discussion. Coordinates are supplied in the form RT[number(s)][letter(s)], signifying the appearance of material in the image along the vertical and horizontal axes, respectively. A similar grid is employed to assist in discussing Figure 4, the 3D music notation example (3D[number(s)][letter(s)]).

Room Talk #358 characterizes a complex constellation of internal states, reflecting a broad range of emotions and activities occurring during the

creation of the music composition. The content incorporates traditional and extended music notation, graphic images, and text, existing at varying levels of specificity, employing multiple degrees of clarity and focus. One traverses the web of links and connections within and among eight layers of transparencies using a configurable, touch-sensitive surface, simulated by placing the transparencies on top of each other on the light table. The light table lights through the transparencies, and the room lighting highlights the surfaces. As one presses around the template one manipulates the elements that are visible, the degree of focus and clarity, and the context in relation to other components currently visible on the template. The design is meant to create an expression of self that relates closely to human experience, and to provide a paradigm for developing resources that facilitate creativity and communication.

A complex web of content and processes provides multiple windows into creative activities in the environment. Some content is designated to communicate solely for personal purposes, requiring no directives to the environment, and created with no need or intention to communicate with others. Other content reflects communication with the environment, and, at the other end of the spectrum, is directed to be understood by other people viewing the material. *Room Talk #358* is one of many snapshots that began with a single graphic on a single transparency layer, and evolved into a multidimensional representation.

At first glance the image under consideration seems to be a complex web of individual entities. The connections and intersections come into focus when the image is viewed as a reflection of a single moment in a process that links multiple threads during a series of work sessions. These threads, or layers, are not mutually exclusive, nor is there any single representation that contains all information or acts as the definitive version. The representation is configurable by the viewer, as it was for the creator during its development. The view and the configuration settings constantly evolve according to varying degrees of perception and the intent at a specific moment. Touch sensitive control of the coarseness or subtlety of the mix of multiple simultaneous planes of activity, color-coding and shading of layers as a means of connection and separation, and the ability to transform the view

according to the context are all factors that contribute to the sense of integration between the self and the manifestation.

The utilization of the overlay extends the display beyond a flat representation to add hierarchical dimensions. This makes it possible to dynamically create, transform, link and maneuver among multiple threads of the creative process. This is a facile mechanism for quickly documenting internal states on multiple levels using varying degrees of specificity. The participant can work at the speed and detail that suits the creative requisites of the moment. Complex concepts can be reduced to iconic representations in order to maintain a conceptual connection while exploring detailed realizations of specific ideas. The necessity to quickly capture a link between different ideas or to document a brief gesture rising into consciousness can be accommodated without suppressing the need to keep working on another thread or idea.

3.1 Layers and links

Several categories rise to the surface as soon as one tries to define the activities that occur, and the processes that are activated. Some of the content of the image falls easily within specific categories or activity types, while other content operates on multiple layers. Figure 3 portrays a subset of the layers created during the series of work sessions reflected in *Room Talk #358*.

The documentation of categories by their content distinctions alone does not reveal the underlying processes and the associations that connect content within and among the various layers. A significant aspect of creative activity is the impulse to create associations among content, to follow threads that move in many directions, and to extrapolate general principles from seemingly distinct activities. Connections are made using line, color, shape, layer, content, and structure. The links indicated throughout Figure 3 serve to highlight these relationships, and with the following description help to illustrate the complex network taking place during the creative process.

3.1.1 Vocal thread

One of the fragments that appeared with no obvious connecting source is the statement placed in the

Sketch Pad

I was only trying to -   supposed to be
                            There!   boy/girl/boy/girl

No - no - no.   yes!

but if it were up to me!---what I would do...

Research

Bring up a complete spectrograph of
the low C on a piano.

                                    Human
                                    anatomy

Explain
about
networks -
general   vocal tract & format characteristics
information   - view the head and throat

                            whole body - describe
                            chakra locations, functions
                            & vibrational sympathies

Environment Control

Throw it up on the wall.
                            Stop - replay segment.

Compare   Notate harmonic content using
               International Phonetic Alphabet.   Continue -

                                                            Slow it down now.
               Overlay on top of   Female - make it Louise.
               each other.   "Complex 4 is done."

Sonic Design

Put it in a room.

    Put it in a large hollow cave.

        Put it in the front of a long, thin room

    Put it in a big, soft tube, with a light wind, and
    delicate glass wind chimes. Start about mid-way,
    in the space, quickly move it forward, and just as
    it's about to strike you it just as quickly recedes
    and trails off.

Instrument Design

Template - piano keyboard; touch sensitive

    down is amplitude
    map left/right to vibrato
    forward and back is intensity.

Compositional Structure

Use the same processes for both local and
structural activity.

Transfer harmonic design to new level of sketch.
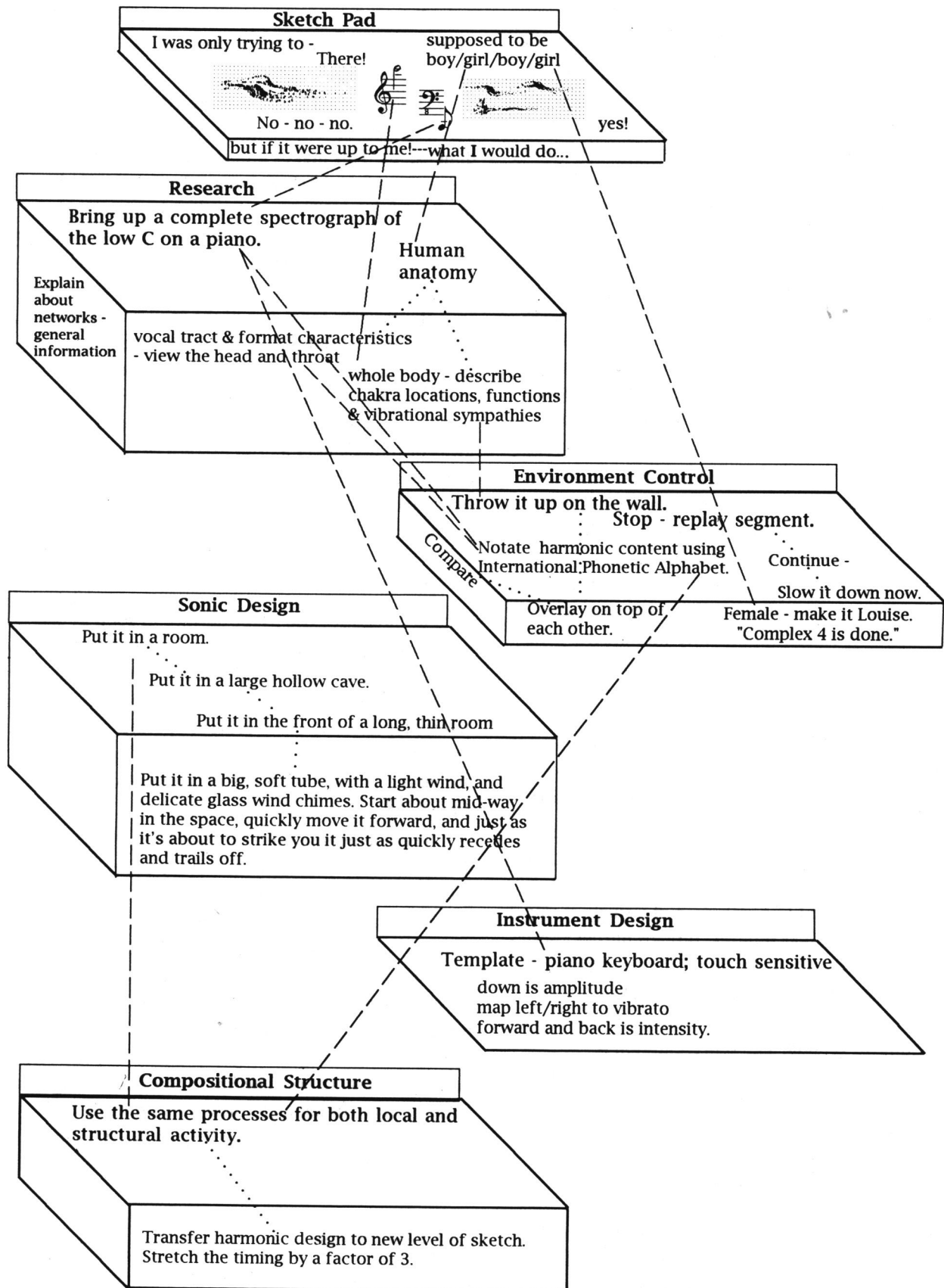Stretch the timing by a factor of 3.

Figure 3: *Room Talk #358* Categories, Layers and Links.

Sketch Pad category in Figure 3, "supposed to be boy/girl/boy/girl", suggesting a dichotomy dividing along gender lines (RT[1][b-c]). The phrase documents the occurrence of a concept rising from the unconscious to the conscious level of perception, placed on the transparency as a means of allowing parts of our conscious world to be actualized in our representation, even with no apparent, immediate function with respect to the specific task at hand. This initial fragment spawns a group of activities developing the idea, and exploring the potential for application in the work.

One thread found in the *Research* category in Figure 3 explores human anatomy generally, and the vocal tract specifically. The environment is instructed to display the results on the wall, notating the harmonic content using the International Phonetic Alphabet as one of the mechanisms for describing the sonic (spectral) characteristics in the composition. This can be seen in the *Environment Control* category of Figure 3.

Another thread, also illustrated in *Environment Control*, assigns male and female voices to be used in some of the communication from the environment, creating a component within the active audio environment that is designed to explore reactions to different voices communicating a variety of types of information during the work session. "Female - make it Louise - 'Complex 4 is done.'" (RT[1][f-h]) refers to assigning a female voice to be used when the environment informs regarding the notification of the state of background jobs that have been running. The use of a specific person's voice attaches a personal connection that brings that person, in both voice and character, into the space, just as the voices and presence of family members, friends, mates, mentors and others appear in various degrees of consciousness.

3.1.2 Graphics thread

The sweeping graphic designs appearing on *Room Talk #358* are suggestive of a gesture that appeared in raw form early in the development of the work, and continued to evolve into something that affected both local and large scale design. The sweep in the upper left region of the image (RT[1-4][a-b]) was the original design. The two additional similar graphic sketches in the lower right region (RT[4-8][e-g]) carry the ideas further, with the suggestion of multiple

pulses or waves in the sound as it progresses, attempting to signify the subtle transformation of the sound spectrum and sound energy dispersion. A specific instance of the application of the graphic gesture into the sonic realm is found in the sequence of instructions to "place the sound" in a grouping of sound environments, each one with increasing specificity with respect to the nature of the environment and the sound that occurs in that environment, as a function of time (RT[1-3][f-h]). Note how the shape of the graphic enclosure of these *place* statements resembles the graphic sweeping gestures.

3.1.3 Piano thread

In another instance, also first appearing in the "*Sketch Pad*" layer in Figure 3, the early seeds of sonic gestures are indicated. Some appear as notes in music notation, while others appear as raw graphic suggestions. This idea is connected to content appearing in the *Research* category, where the environment is directed to display complete spectrographic information of a low C on the piano. This follows the same basic process - idea, followed by a guided analysis and display procedure that was exhibited in the vocal thread example described above. Both of the research threads are then compared with each other.

In the *Instrument Design* category on Figure 3 one finds design instructions for a template of a touch-sensitive piano keyboard to be used to perform the sounds. Note how the rough gesture in quasi-music notation found at RT[7][c-d] resembles the first pulse of the graphic at RT[7][e], and how the two gestures in music notation found at RT[4][c] is suggestive of the pulse sequences in the same RT[7][e] graphic, and in the graphic gesture appearing at RT[4-6][e-g].

3.1.4 Environment control

Throughout the *Room Talk #358* one finds instances of directives to transform the environment on several layers. Some of these operate in a very direct and immediate mode, such as the commands that direct the environment to set a tempo, or to start or stop a procedure:

"Tempo - pace - 4, 3, 2, 1, start." (RT[2][e-f])
"Slow it down now." (RT[5][c-d])
"Stop. Replay segment." (RT[7][f]).

Other directives require such operations as comparisons, or cause alterations in the sound environment that are meant to sustain the presence of an idea in the background:

"Compare with Beethoven..., Berg ..., Cage ..." (RT[8][g])
"Juxtapose guitar concerto with intense conversation - keep it going far away." (RT 2-3, a-b).

The reduced image of the *Configurable Space* full room view appearing in the background in the lower right corner of *Room Talk #358* reinforces the sense of large scale perception while working in a very detail-oriented mode of writing.

4.0 Historical Perspective - Time and Process

These are some of the ongoing threads participating in the creation of the composition and the room environment. All of these issues contribute to decisions regarding what to write, where to write it, how it should be represented, and what resources are configured. The environment is manipulated to record input in a variety of ways, with facile resources to transform the configuration of the space to suit an evolving set of short and long term requisites. These threads within the *Room Talk #358* image represent some of many possible readings, affected as much by the processes that are set in motion as they are by the response to immediate intentions and interests. Much of the functionality implied in *Configurable Space* comes with this ability to create and track multidimensional processes, and to allow for reconfiguration based on new sets of information.

This sense of the time dimension broadens the scope of one's ability to reconnect with the historical perspective that engages our entire self, and embodies the same processes that we enable when we relive an event, or recreate the steps taken to arrive at the current state. The reconstructible nature of history, and the configurability of its presentation offer a means of getting in touch with many aspects of work, even after leaving it for long periods of time. The historical perspective that a configurable, multi-track and multi-layered audit trail can provide, especially with configurable analysis and display resources, facilitates in assimilating and understanding long term projects, and in maneuvering among sets of activities on several planes.

For example, one may wish to follow the compositional process that brought the work to its current state by developing a sequence of room view configurations, compressing a month of work into a blended five-minute multimedia presentation. The visual and sonic presentation reinforces memory of detail, structure, process and character. In another instance, the context may suggest an examination of hypothetical relationships among a group of different projects. The comparison could highlight conceptual and structural similarities and differences, revealing important insights into the projects and into the technological resources devised to solve other challenges.

The film-like nature of presentation facilitates orientation with the multidimensional character of the environments presented. Whether the use of the historical resource is in preparing chronological sequences of room views, random sequential presentation of environments, or simultaneous imposition of multiple perspectives from different times and projects, the history and presentation mechanism is an integral component in connecting the *Configurable Space* resources with the total self.

5.0 Music Notation - the Communication Gap

Music notation derived from the western European tradition provides a useful model illustrating many issues relevant to communication and expressive resources. As a visual representation describing aural processes, graphic music notation exists in stark contrast to the clarity and specificity required in computer languages. Yet the circumstances surrounding the realm of music notation provide for directives that mediate remarkably well among compositional intent, performance practice, and realization. These circumstances are based on a mutual understanding among composers, performers, and listeners regarding the components of the musical language, established through centuries of evolution. The mechanism implemented to inform the practitioners about both process and product is firmly based on this understanding, reinforced by a constellation of intersecting and somewhat redundant systems including visual, aural, verbal, physical, and technologically-enforced conventions.

In the visual domain particular aspects of the sonic information are assigned graphic symbols,

identifying pitch, rhythm, meter, pace, nuance, and even performance technique on a time line. But if the information is restricted to what appears on the page of a traditional music score alone, one would not be able to accurately recreate the resultant music. As suggested earlier, the reference to the piano comes with a dense group of affiliated meanings that affect the interpretation of the symbols that ensue. Some knowledge of these elements is essential to understanding how to interpret the written symbols. Many years of lessons and practice create an organic means of assimilating this knowledge, and includes the passing of years of experience from a master or group of masters, transmitted through demonstration, explanation, and directed study. The years of practice and study train both mind and body in a combination of intellectual and physical systems, all of which are reflected and summarized in the visual language used to communicate the music itself. This points directly to the serious difficulties faced by those who attempt to reduce music notation and performance to a set of computer instructions. The system only works when you remain within the set of accepted common practices, and when the communication loop, with all of its domains and threads, is maintained among composers, performers, and audiences. It breaks down when the human is removed from the practice, and when one explores new territory.

In contemporary, new media-based music this discontinuity is particularly evident. Relationships that have been fundamental to the creation of a fruitful musical environment have been severed, resulting in an application of computers to merely imitate established hard copy practices. Notation and performance by machines tends to be reduced to a mechanical process emulating a complex activity using simple rules; the creative process is forced into the acceptance of musical practices based on paradigms created for a paper-based technology, and new exploration of sounds and processes are relegated to remain in an ill-defined classification of *other*, attached onto the traditional system as an after thought, not as a fundamental principle built into the foundation of the program. We need expand our expressive language in a way that enhances the communication loop, rather than limiting it, including the extensive sonic worlds and processes that are possible using digital means.

By way of illustration, there is currently no meaningful notation system to signify anything but the most traditional musical features, either to indicate the composer's intention, or to describe a performance practice that is transferable among instruments, and among compositions. However, current technological resources make it possible to create and mix discrete sonic environments that can transform in time, and inside of which sonic objects can move. There is no mechanism for speaking about or representing these sonic characteristics in a formal way, a situation that makes it difficult to bring that feature out of the realm of sound color, and into a realm of musical structure and performance practice.

Figure 4 reflects a method of communicating some of what is possible in the realm of notation, signifying a sense of space, proximity, movement and association, using 3-dimensional representation techniques to characterize the general nature of the active spaces, the grouping of elements within a space, the spatial movement as time progresses, and the relationships among constellations of events in the context of multiple environments merged within a single sonic realm.

As the time line on this diagram moves from left to right, 3-dimensional graphic objects are used to group musical events, to characterize the nature of the environments in which they operate, and to reflect the transformations that the sonic events and environments exhibit. This representation mediates between the composer's intentions, the realization by live performers, and the apprehension by an audience.

There is clear evidence of the origins of the creative content seen in *Room Talk #358* in this more-refined 3D music notation sketch . The early reference to the low C on the piano, and the research examined regarding its spectral properties finds several manifestations in Figure 4:

Low C is struck loudly at the beginning of the grouping found in region 3D[2-3][b-e], and is present in the resonance indicated in the graphic shaping that follows the initialization of the tone.

Low C is the predominant tone in the running figures found in the rectangular space in region 3D[6][a-e].

The high C found in the rough sketch in quasi-music notation at RT[4][c] is found in 3D[2][g].
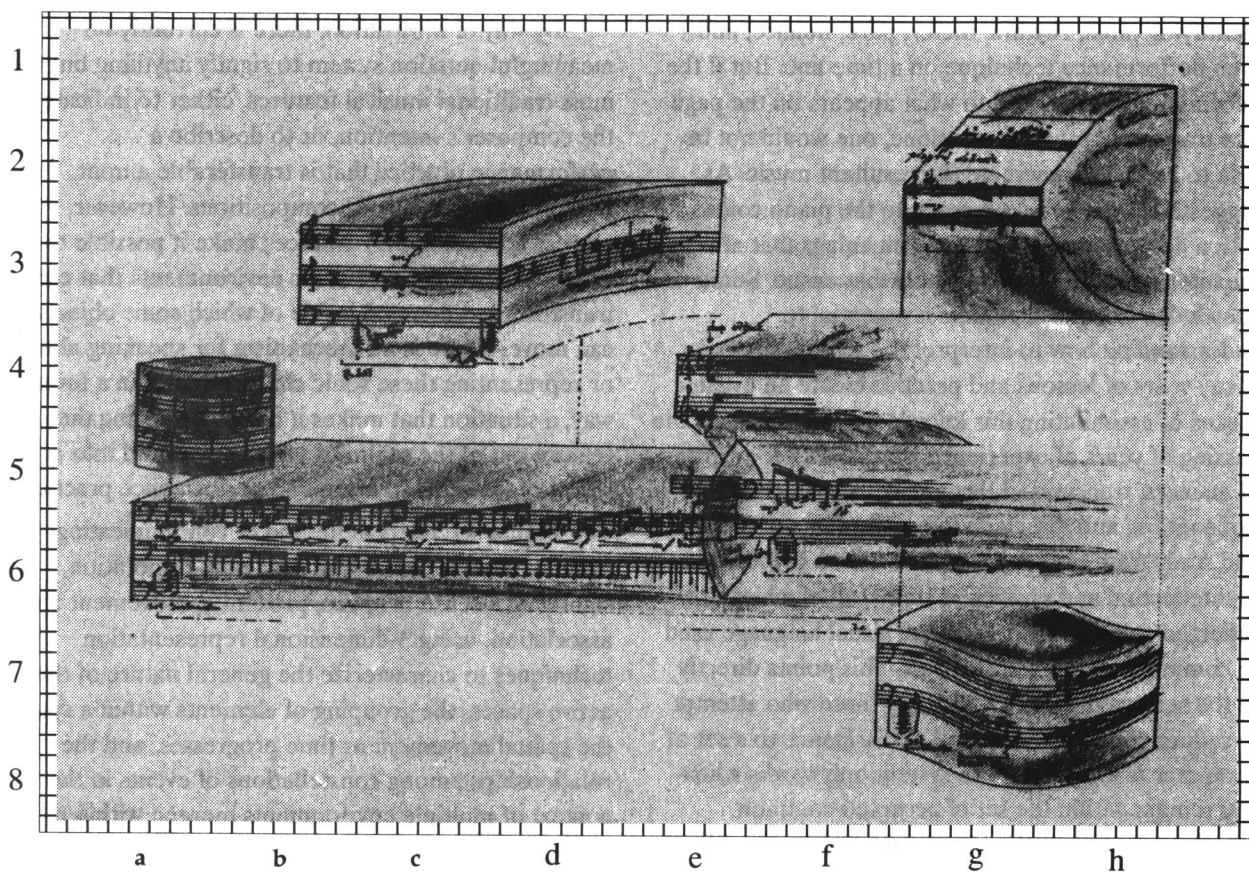
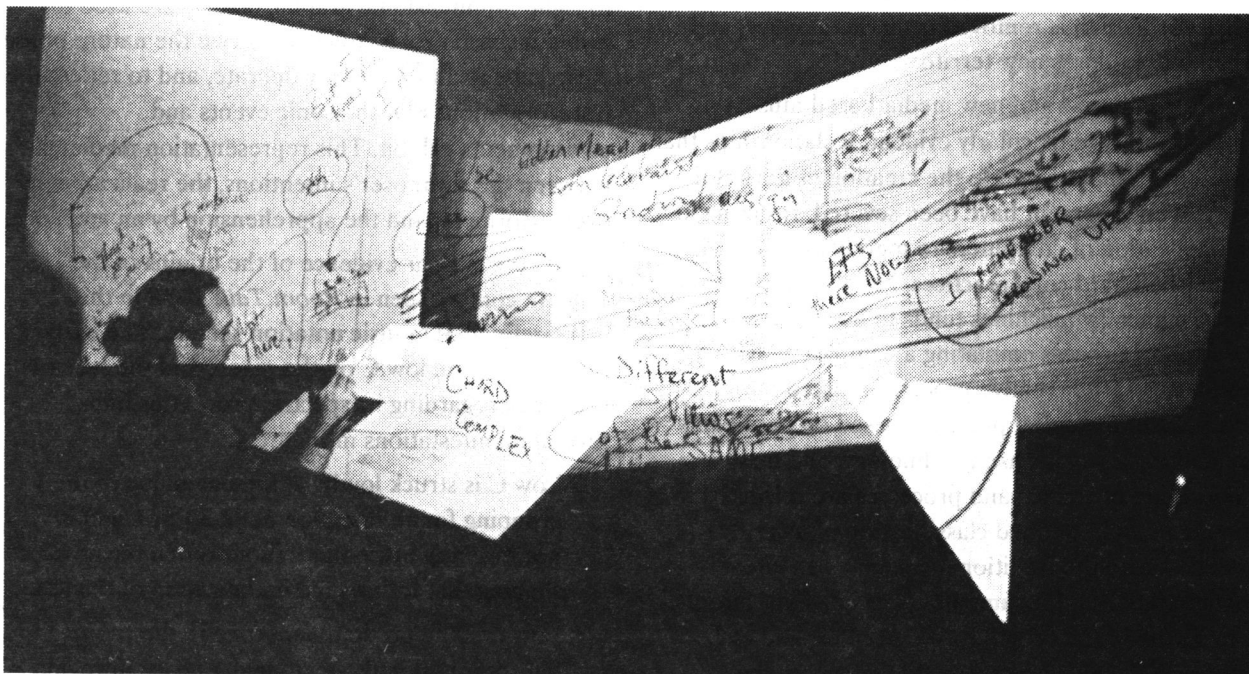Figure 4: 3D Music Notation. Photo by Marion Gray (1989).

Figure 5: *Configurable Space VII*. Photo by Marion Gray (1991).

The concepts implied in the following phrases found in *Room Talk #358*:

> Put it in a room
> Put it in a long hollow cave.
> Put it in the front of a long thin room.
> Put it in a big, soft tube - with a light wind, and delicate glass wind chimes. Start about midway in the space, quickly move forward, and just as it is about to strike you just as quickly recede, and ...

are refined and applied in the 3D sketch, with indications of distinct room environments that transform in size, shape and reverberant characteristics. Distinct events and sequences occur inside of these environments, extrapolating from the graphic sketches found in *Room Talk #358*, to create a representation that signifies spectral characteristics and reflects the sonic characteristics of the sounds performed in the specific environments. The distinct environments are placed in a context that facilitates interpretation of the sonic activity in relation to each other as a function of time and proximity.

6.0 The Communication Gap Extended

The enhanced functionality experienced in expressing sonic behavior on multiple planes in a complex and evolving environment has significant implications when applied to such activities as the creation, performance and participation in interactive multimedia art work, and by extension in collaborative multimedia communication. As an integral component of the environmental design resources, multidimensional representation provides concrete visual distinction while retaining a conceptual and time-based connection with activity on individual planes. In musical contexts the content on each plane of a musical score may provide different perspectives of the same sonic component, could display varying levels of detail and structural design, or may refer to actual sonic movement in a simulated space. Similarly, representation on multiple planes significantly widens the bandwidth of information in multidimensional perception, assimilation and communication by providing an organization of complex data in a manner that is quickly assimilated.

In both the music and visual art domain the concept of mixing multiple signals in a complex, evolving environment has become a standard operational technique. The point is not simply to create a merging of discrete environments, though that is certainly one possibility. There is an element of transformation and juxtaposition; there are concerns about retaining the meaning or integrity of a signal in the path, and still provide a means of linking distinct components in multiple signal paths through both direct and intuitive planes of communication.

Configurable Space VII (Figure 5) represents a full, active space, continuing the exploration into the realm of multimedia communication, collaborative environments, and multi-person performance systems. *Configurable Space VII* was a hybrid performance-presentation sponsored by Yamaha Music Technologies in Marin, California, in 1991. The event space was constructed around a large, white wall. Individually-controlled slide and video projectors displayed still and moving images of room environments and magnified detail shots, creating a sense of visual rooms within rooms, with intersections among content, concepts and processes. The multi-layered sound environment included original music, prerecorded music from different cultures and styles, and prepared soundfiles of sampled and processed sound, all placed in a variety of simulated room environments. Sound from each of two microphones was processed to create a different ambiance, reinforcing different styles of communication. One was used to evoke a large room with a distant dreamy character, used for story-telling and indirect communication. The other evoked a smaller, less-reverberant environment, and was used for declamatory and direct communication.

The work consisted of two movements. Each movement was weighted differently with respect to direct, linear presentation techniques, and indirect, non-linear modes of communication. Each movement consisted of a different balance between specific, timed accompaniment, quasi-random selection from sets of elements, and extemporaneous selection from a wide variety of sonic and visual materials.

Score directions utilizing a 3-dimensional score notation were provided for live presentation assistants to perform the visual and aural components. During the event, I wrote and drew over the surface of the wall, selecting multicolored marking pens of different thicknesses, with attention towards the functional use of color, shapes and multi-dimensional containers.

Writing and drawing on the wall reinforced main points, summarized internal sections within the presentation, followed tangential thoughts, and drew links between graphic and textual material written and projected. The performer of the visual component controlled slide carousel position and light intensity for three slide projectors, and also controlled the video projector. The performer of the audio component incorporated twenty channels of sound, including pre-recorded tapes and CDs, live performed sounds from the computer, live-processing of sound, two microphones, and an antique Victrola. Performers responded to what was seen, heard, and felt. Images changed and modulated in light intensities, blending, highlighting, and contrasting with the drawing on the wall. In this context I track the creative process, examining tasks and the tools designed to address several circumstances. The total environment was considered in relation to its impact on creative activities, and the main expressive systems were illustrated - communication with self, the environment, and others.

Configurable Space VII provided an important opportunity to explore the factors that a human observer/participant derives from a situation, and from an evolving familiarity with the concepts and the material presented. This helped to hypothesize about what would be required by a computer-based environmental presentation assistant. The combination of scripted or scored activity with simultaneous extemporaneous elements necessitates a collection of resources that spans a vast range from direct score-following to creative adaptation. The selection of individual sound and image components, and the careful shaping of the overall environmental character requires a sensitivity to specific content, general principles and even stylistic convention. Flexibility in real time reconfiguration of resources and content improves the ability to respond effectively to new circumstances or specific purposes, whether the situation involves artistic creation or presentation, communication, education or collaboration. The concept of an intelligent, conceptually and contextually-sensitive presentation assistant provides an intriguing model for adding additional depth to the multimedia, multi-functional, multi-person environmental design paradigm. Each participant has the opportunity to communicate using the resources

that most effectively combine their natural inclinations, their history and the current context.

7.0 Conclusion

The concepts embodied in *Configurable Space* take on considerable meaning when art and self expression is viewed as a process, and not merely as artifact. A page of traditional music notation comes laden with assumptions about the nature of the music being presented. If this is used as the paradigm for creating computer-based resources designed to support composition, then only the artifact is being considered. All participants in the expressive loop are forced to adhere to systems that were created to be conveyed using paper, the only visual communication medium available at the time, and to be performed using traditional instruments, a factor that restricts the sonic capabilities to the physical universe of an earlier era. The creative process is absent in this paradigm, as is the potential to rigorously explore the new territory that has only become available as a result of digital technology.

In a similar fashion, the multidimensional aspects of our natural thinking and feeling behavior are being suppressed and distorted if we restrict our expressive resources to a medium that is predominantly language based, delivering information employing a single, linear stream. *Configurable Space* engages these other dimensions inherent in our natural states, and provides a paradigm for developing resources designed to support multidimensional communication and creative expression.

8.0 References

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