

David Tudor's *Rainforest*: An Evolving Exploration of Resonance

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MATT ROGALSKY: RAINFORESTS I, II AND III

The key word in the title of this article is “evolving.” As we survey David Tudor’s electronic music career, it is important to bear in mind that the specific instances that we call his “pieces” or “works” could just as well, and perhaps more correctly, be viewed as points in a continuum. Certainly this is the case for the works in his *Rainforest* series, which stretches for a decade over four “versions” and in which I include, as an experimental prelude, his 1966 *Bandoneon!*, and as a kind of postlude, *Forest Speech* (1976–1979).

The most convincing arguments for approaching Tudor’s work from this perspective are the recurring comments I have heard in interviews and discussions with his colleagues: that his performance practice was based on experimentation and constant change; that it was a rarity for a piece to be assembled in exactly the same way twice; and that Tudor’s score diagrams, while giving some idea of the principles at work in his compositions, are definitely not to be mistaken for blueprints that might define an “authentic” performance setup.

Observing the stream of the works’ development as particles rather than as waves, we can clearly hear that the compositions that Tudor named—these points along a continuum—do have quite specific sonic identities. Moreover,

the existence of *Rainforest IV* implies that there must be *Rainforests I, II* and *III*. But identifying these versions has not been a clear-cut process and has brought me to a more holistic perspective. As Tudor said in a 1988 interview, “My preference is to use modular materials which can change from piece to piece. And also it enables me to expand a piece by adding components to it which were not in the original formation” [1].

In my half of this article, I wish to look at the development of the small-scale versions of *Rainforest* between 1966 and 1972, prior to the 1973 workshop in New Hampshire that led to the creation of the large-scale group version, *Rainforest IV*. “Small-scale” refers to the scale of the loudspeaker objects; for versions I–III, this meant of a size that permitted packing in a suitcase for ease in touring.

The first version of *Rainforest* was commissioned by the Merce Cunningham Dance Company (MCDC) in 1968 for an initial fee of \$500 plus \$25 per performance [2]. The piece has its origins, however, in *Bandoneon!*, the work Tudor created for the show *9 Evenings of Theatre and Engineering* in October 1966. We could look even further back than this: Tudor’s interest in the resonance of physical objects probably has its origins in the experience of performing such works as John Cage’s *Cartridge Music* (1960), which depends on the basic idea of revealing the sonic characteristics of everyday objects. The work that Tudor identifies as his own first composition, *Fluorescent Sound* (1964), is a creative extension of the *Cartridge Music* principle: the amplification of small sounds.

ABSTRACT

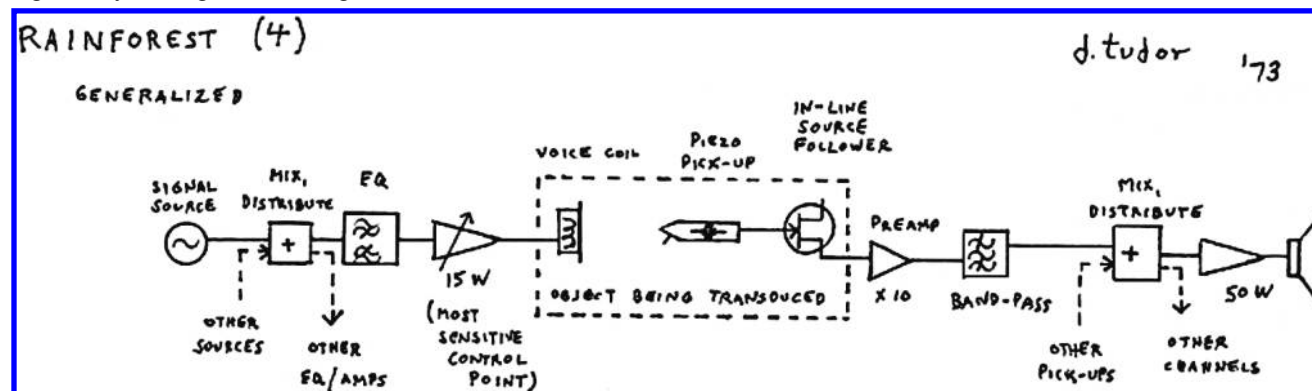
Of the works of David Tudor, none would seem to be better known than *Rainforest IV*, his large-scale performed installation of the 1970s. Although it has received widespread and well-documented public performance, *Rainforest*’s germination in the mid-1960s in elements of *Bandoneon!* (1966) and its evolution over a period of 10 years, from versions I (1968), II (1968–1969), III (1972) and IV (1973) through *Forest Speech* (1976), have not yet been adequately assessed. This paper follows *Rainforest*’s trajectory chronologically: Matt Rogalsky focuses on the early versions of the work, and John Driscoll describes the collaborative development of *Rainforest IV*.

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Fig. 1. *Rainforest IV*, generalized diagram, 1973. (© Estate of David Tudor)



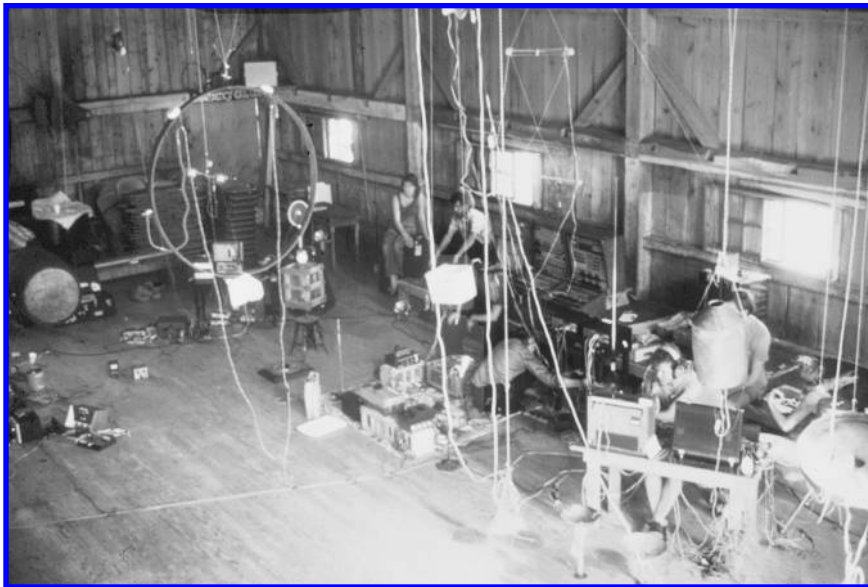


Fig. 2. *Sliding Pitches in the Rainforest in the Field*, installation view, Chocorua, New Hampshire, 1973. (Photo © John Driscoll)

According to interviews, Tudor's interest, dating back to 1965, lay in finding a means of making objects reveal their own resonant characteristics rather than using them as instruments to be played manually. He put it this way: "One didn't have to think of the generation of electronic music from signal source to the reproducing output, but one, instead, might just as well start from the other end and go back and arrive at a signal source." Tudor described this revelation as an instantaneous "dream-vision of an orchestra of loudspeakers, each speaker being as unique as any musical instrument" [3].

The type of audio transducer that Tudor found to cause physical objects to resonate in the way that he imagined was basically a speaker without a cone, which could be attached to a wall or a door and so become part of a home hi-fi system. The year 1966 was apparently one of enthusiasm for the idea of such a device: Among Tudor's papers we find a *Popular Mechanics* article from June 1966, describing to the home hobbyist how to "Build a FANTASTIC CONELESS LOUDSPEAKER! Here are the complete plans that you asked for after reading about this amazing speaker in our December issue" [4]. Also found in the Tudor collection is a copy of the same article from a September 1966 Portuguese edition of the magazine [5].

In 1966, audio transducers were not available only to hobbyists willing to spend hours painstakingly constructing them; they were commercially available as well. The commercial models were ap-

parently descended from a design developed for underwater use by the U.S. Navy. Tudor obtained a number of the commercial transducers, and they were integrated into his contribution to the 9 Evenings, *Bandoneon!*, as "instrumental loudspeakers" mounted on four radio-controlled carts [6] that roamed the space during his performance. Sound was directed to 12 conventional loudspeakers in addition to the roving carts, which were used for "spatial variation" [7].

The four instrumental loudspeakers were, according to Tudor's notes:

1. aluminum sheets (suspended ca. 15 ft)
2. steel tray with vibrating appendages
3. two 14-inch wooden planks mounted at 90°
4. plate glass (push-pull driven) [8]

Other notes describe materials considered:

- sheet rock
- glass
- wood:
 - masonite
 - barrel
- metal: bronze thundersheet
- furniture
- try:
 - metal pipe const.
 - fibreglass
 - jointed metal const.
 - Piano [9]

Here we get a sense of Tudor going through the learning process that all subsequent *Rainforest* participants have experienced. Not all materials make good resonators; it requires a process of trial and error to come up with a handful of

good ones out of a wide range of apparent possibilities. Tudor described *Rainforest* as a piece that "teaches itself" [10], and here we catch a glimpse of him as its first student.

Following 9 Evenings, the loudspeaker-object idea was laid aside for a number of months, until Merce Cunningham commissioned a piece from Tudor for his new dance *Rainforest*. In Tudor's words,

Merce Cunningham asked me for a piece. Well, I have those things lying around, so I might as well put them to use. So, the first thing I did was to work on an amplifier to run them. I made an eight channel amplifier with small capacity. And I made objects which I could travel with. And they were so small they didn't have any sounding presence in the space, so I then amplified the outputs with the use of contact microphones [11].

The use of contact microphones on the transduced speaker-objects in this first version of *Rainforest* harkens back to *Cartridge Music* and *Fluorescent Sound*. It also raises the question of exactly where the sonic identity of a *Rainforest* object is to be found; the (in)fidelity of *Rainforest* objects depends not only on the objects themselves but also and as much on the frequency response of the object in each stage of transduction. The transducers do not transmit bass frequencies efficiently; the piezoelectric phonograph cartridges originally used for pickups have good bass response but roll off quickly in higher frequencies. All these limitations contribute to the overall sonic presence of a *Rainforest* object, which of course is ultimately dependent on the choice of sound materials to be transduced through it.

Gordon Mumma recalls that while Tudor was developing the piece, he did not have a name for it, and when he heard that the dance was to be called *Rainforest*, he said, "Now there's a title" [12]. So any connection between the title of the piece and its sonic content is apparently coincidental. However, in a later description of the piece, Tudor wrote, "The composition was implemented thru the construction of special insts. [instruments], which can be manipulated to produce sounds resembling those of nature"; and in an interview in the 1980s, Tudor described *Rainforest I's* sound sources as "oscillators that made animal-like and bird-like sounds" [13]. Thus connections to an (imaginary) natural soundscape do exist, even in this strictly electronic version of *Rainforest*.

An anecdote from Jean Rigg in March 1970 illuminates these connections—or their boundaries—further. Tudor was not touring with the Cunningham Com-

pany; he was in Japan at the time, working on the Experiments in Art and Technology (EAT) Pepsi Pavilion at Expo 70 in Osaka. Rigg wrote to him:

we got to the aviary in Pittsburgh, Gordon [Mumma] w/ tape recorder, and John [Cage]. . . . and I got in to an amusingly heated battle over whether or not Gordon's aviary recordings belonged in that night's performance of *Rainforest*. Well, I don't know what was amusing about it except maybe to find myself in heated battle with John in the first place. Anyway, it was finally agreed that the recordings were, to use David Behrman's tactful description, "too literal" [14].

The piece was intended for performance by a duo, "piano-four-hands" style, in Mumma's words, with each player taking responsibility for four objects and sharing access to a single mixer. (The performer would send signals to the transducers attached to those objects.) Mumma says of the style of interaction that

I was surprised to see how often David just sat aside, not doing anything except perhaps a level adjustment. He would listen carefully, sometimes taking notes (when there was enough light), and then reenter so that we were working together, or I might "step aside," in particular when David got lots of sound going [15].

Mumma recalls that from 1970 Tudor began making source tapes of electronically generated sounds to replace the hardware oscillators in order to facilitate performance by others (specifically Cage) without deep technical knowledge of his setup. The piece was also occasionally performed as a solo when MCDC was especially short of musicians, in which case "the sounding materials of *Rainforest* were somewhat simpler, but not dramatically so, because when we performed together we always left room for what the other was doing" [16].

Tudor's description of *Rainforest* dated 1968 (but written in 1972, I believe) [17] cites these four possible realizations:

1. Use only signal generators, any kind, as inputs. At least eight will be required. Vary the waveforms. (Note that simpler waveforms generally produce more complex results).
2. One (speaking) voice only as input; the instruments acting as filters. The outputs can be mixed down to two for this version.
3. As (2.) but with up to eight voices, singing or speaking. Four to eight output channels.
4. Various taped materials used as input. Limit these to two at any given time, distributed among the eight channels [18].

Option 1 is the *Rainforest* used for MCDC. We have already seen that it was subject to several variations in realization.

The next two options are intriguing because they seem together to constitute *Rainforest II*, and yet there does not appear to be any specific record of their performance as compositions in their own right. Tudor later stated, "In the second version I wanted to use a vocal input to the system" [19]. Mumma recalls that as part of Cunningham's *Events*—dance performances made up of scenes from numerous other Cunningham dances, collaged seamlessly together, with "free" musical accompaniment—Tudor experimented with processing Cage's vocalizations. These experiments were overlaid with contributions from the other company musicians. There are no specific musical credits given for *Events*, so it is impossible from Cunningham Dance Foundation records to establish what the musicians were doing for any given performance. However, I have found no record of options 2 and 3 above receiving performances as concert works, so if they were performed at all—and I assume they were, because the list of options is so specific—it seems likely that they were realized by Cage and Tudor as *Event* contributions.

If the versions with vocal input are *Rainforest II*, then the version identified as "option 4" in the above list is *Rainforest III*. Certainly option 4 describes the technical characteristics of the version that was developed as a double performance with Cage and toured throughout Europe in the summer of 1972. Several documents in Tudor's papers support the identification of this version as *Rainforest III* [20].

The "various taped materials" of option 4 were drawn from an extensive

sound library that Tudor, Ritty Burchfield and geographer Peter Poole gathered together in 1969 and 1970 for use in EAT's Pepsi Pavilion at Expo 70. Poole brought recordings of deer and birdsong from the U.K.; recordings of satellite data communications were gathered at the Jet Propulsion Laboratory; a U.S. Navy lab in California provided recordings of neural activity. Some of the first recordings of whale song were also included. Some sounds were recorded by the team themselves, including a vivid one of mosquitoes in a jar. The tapes had to be "rescued" when PepsiCo decided they would take over control of their pavilion from EAT. Peter Poole recalls a 3 A.M. phone call from artist Robert Whitman, who warned "Gotta get the tapes out!"; Poole and Whitman were then accosted by a policeman as they threw tapes over the pavilion perimeter [21]. Burchfield remembers smuggling other tapes out a few at a time in the pavilion cleaners' carts [22].

Tudor made four significant sound pieces for the Pepsi Pavilion, and the library of tapes continued to be an important resource throughout the rest of his career, appearing in various compositions and used as source material for *Events* performances with Merce Cunningham.

According to Tudor's diagrams for the 1972 version of *Rainforest*, designed for simultaneous performance with Cage reading his text *Mureau*, only four loudspeaker-objects were employed, with input from two stereo-cassette decks for four separate tracks of audio source material. Pickups on the objects amplified

Fig. 3. David Tudor and John Driscoll at their performers' tables, ICA, Philadelphia, Pennsylvania, 1979. (Photo © Kira Perov)





Fig. 4. Installation view, L'espace Pierre Cardin, Paris, 1976. (Photo © Ralph Jones)

their resonances into a four- or eight-channel conventional sound system (Cage did not share Tudor's system but had his own four-channel loudspeaker setup solely for his live and prerecorded vocalizations). A preparatory list of sound sources per object identifies a selection of laboratory brainwave recordings, water sounds, "vibes" (earth vibrations), and a favorite nightjar recording [23]. A recording of the premiere performance of this version at Radio Bremen has been released on New World Records [24], and in the mix we can aurally identify other Pepsi sounds as well: a beetle walking, a wasp chewing, the mosquitoes buzzing in their jar.

Unfortunately, the New World release of this excellent recording, documenting one of the major (and most pointedly egalitarian) collaborations between Tudor and Cage, has muddied the waters where identification of the various versions of *Rainforest* is concerned. Tudor's contribution is (mis-)identified as *Rainforest II*, and the CD liner notes give a mistaken description of the piece, stating that Cage's vocalizations were used as the primary input to Tudor's loudspeaker-objects. As far as I have been able to ascertain from Tudor's notes and diagrams and from available recorded evidence, that was never the case on this 1972 European tour. The CD notes read, "Warbling sine-wave oscillators are used for *Rainforest I* . . . but, by contrast, *Rainforest II* is designed for vocal input." I agree with this general description, but unfortunately *Rainforest II* is not the piece documented on the CD.

To be too obsessive about getting the version numbers right is to risk losing sight of the broader picture: that of a musical practice based on constant modification and innovation. Tudor found it useful to retrospectively organize the *Rainforest* series in this way, which suggests that each version represents a significant stage in the development of an idea. But Tudor was himself at times apparently indecisive about how to number the series [25], and this does much to suggest how *Rainforest* may resist such pigeonholing.

JOHN DRISCOLL: *RAINFOREST IV*

As Matt Rogalsky mentions above, the titles of the different versions of *Rainforest* were not as evident as one might assume. The title *Rainforest IV* only appeared in print during negotiations with René Block over the *Rainforest* LP that he produced on Edition Block in 1981 [26]. The first use of the *Rainforest IV* title was for the installation at the Holland Festival in 1982. A description of *Rainforest*, which I authored with David Tudor, follows:

Rainforest IV is an electro-acoustic environment conceived by David Tudor and realized by the group Composers Inside Electronics. Each composer has designed and constructed a set of sculptures that function as instrumental loudspeakers under their control, and each independently produces sound material to display their sculptures' resonant characteristics. The appreciation of *Rainforest IV* depends upon individual exploration, the audience is invited to move freely among the sculptures [27].

General Description

The work is improvisational by nature and typically performed by a minimum of four performers continuously for 3–6 hours at a time. Between 16 and 40 sculptural speakers are suspended in the space. The work has been installed in approximately 36 different locations (museums, universities, performance centers and theaters), with over 125 individual performances to date.

The character of a *Rainforest IV* performance is that of an informal social environment in which visitors are encouraged to wander and physically interact with the work (e.g. placing one's ear against the sculptures; feeling the vibrations in one's hand or against one's head; and even biting an object, allowing the sound to travel through the bones in one's head). Performers are also free to move about during the performance to monitor the sculptural speakers and engage in discussions with the audience. Chairs are placed at the performers' tables to encourage this interaction. David requested that two particular audiences be invited when possible—the blind and children.

Origins of *Rainforest IV*

Rainforest IV was technologically a direct outgrowth of the earlier *Rainforest* versions, using low-powered amplifiers, electronic and tape source signals and sound transducers fastened to objects (Fig. 1). However, the characteristics distinguishing *Rainforest IV* from other versions are:

- The creation of a visual and sonic environment with 16–40 suspended sculptural speakers
- The size of the sculptural speakers (some as large as 12 × 12 ft)
- The duration of the performance (typically 3–6 hours)
- The projection of a strong acoustical presence in the space by each sculpture
- The use of a vibration pickup to amplify the resonant frequencies present in the sculpture through the speakers, creating a reflection of what the audience hears directly in the object but with additional harmonic content
- The collaboration of 4–10 performers (i.e. Composers Inside Electronics, discussed below) in the creation of the sculptural speakers, sound materials and the visual environment.

Rainforest IV evolved out of a workshop that David presented at the New Music in New Hampshire Festival at Chocorua, New Hampshire, in the summer of 1973. The first performance, entitled *Sliding Pitches in the Rainforest in the Field*, took

place in a large barn and lasted for approximately 5 hours. The “Sliding Pitches” part of the title came from a joint circuit-building workshop by Gordon Mumma and David Behrman, and “in the Field” came from the name of the inn at which the festival was held (Stafford’s in the Field). The many sculptures included a metal bedspring, a huge wine barrel, toilet floats, cast-iron wagon wheel rims, a stainless-steel milk container lid, lawn sprinklers, a copper still, a Styrofoam box and a large metal cable (Fig. 2). The performers included John Driscoll, Phil Edelstein, Linda Fisher, Martin Kalve, Greg Kramer, Susan Palmer, David Tudor and Bill Viola.

This first realization of the work was probably as much a revelation to David as it was to the other performers, for a unique visual and sonic environment was created. This performance set the stage for the evolution of the work over the next 31 years. David stated that his intention at Chocorua was to “give away” the *Rainforest IV* work [28]. This desire lay at the heart of the long collaboration that grew into an extended family of associates eventually known as Composers Inside Electronics (CIE).

Composers Inside Electronics

Following the Chocorua performance, more *Rainforest IV* installations involving the core group took place: in 1974 at the Everson Museum, SUNY Buffalo; and in 1975 at York University, Mills College, The Kitchen, Fort Worth Art Museum, DeSaisset Art Gallery and the Los Angeles County Museum. The 1975 performances at York University and the Fort Worth Art Museum involved both David and me giving workshops with students and then performing with the students. This led to installations in 1976 at the Houston Contemporary Art Museum and the Walker Art Museum, followed by many other venues.

David formed the performance group that became CIE in order to present a series of 13 performances and four installations for the Festival D’Automne at the Musée Galliera in Paris (1976). The group name evolved from discussions between David and me, and reflected David’s fascination with how electronic components take on their own personalities and suggest musical directions derived from intense experimentation with them—thus, Composers Inside Electronics.

This newly formed group (Paul DeMarinis, John Driscoll, Phil Edelstein, Linda Fisher, Ralph Jones, Martin Kalve and Bill Viola) became the collaborative nucleus for *Rainforest IV* and has per-

formed the work for well over 500 hours in total. Over the years a number of other composers/artists performed including David Behrman, Cynthia Black, Nic Collins, Russel Frehling, Takehisa Kosugi, Ben Manley, Virginia Quesada, Prent Rodgers, Ann Sandifur, Richard Teitelbaum and Andrej Zrajic.

Origins of the Sound Sources

Each *Rainforest IV* performer is responsible for producing the sound materials for the particular sculptural speakers he or she constructs. These sound materials have covered the gamut from electronically produced to highly amplified natural sounds (e.g. a fly walking on paper). The only restriction David ever mentioned is that there should not be any prerecorded musical material used.

The choice of source material is motivated by the unique set of resonant characteristics that each sculptural speaker presents. After investigation, the composer creates material that will tease the speaker’s resonant nodes into strong vibration, creating responses that are highly nonlinear. It is the equivalent of tickling someone—a little input at just the right spot creates great output. The resonance nodes of the sculptural speaker contribute to what is heard as much as do the original sounds and in some cases influences the result even more. It is possible to input a sound that is unrecognizable coming out of the sculpture. For example, David occasionally used two out-of-phase transducers to create results that did not exist in the source material.

There are no coordinated starting points and ending points to the work other than the scheduled durations of the performances. The work relies upon the performers listening to each other and responding accordingly. Given the duration of the work, it is possible to create large shifting sound characters that

evolve over extended periods interspersed with short-duration local sound events unique to one object.

Because numerous performers are involved and the work is performed for up to 5 continuous hours, it is never musically the same from performance to performance. It is an improvisational coordination of the sound materials, but one that has become extremely familiar and ingrained in the performers. Since there is no single listening point, the work is never heard in the same way by any two audience members or performers, who are arranged in the periphery of the space (Fig. 3). This is why performers occasionally walk about testing the sonic balance and density in other parts of the space.

Evolution of Sculptural Loudspeakers

The creation, design and construction of the sculptural speakers is left to each individual composer. The use of specific sculptures varies greatly from installation to installation based upon:

- Weight and shipping cost
- Number of performers (each composer maintains a personal collection of objects)
- Scale and nature of the performance space
- Balance of the sonic properties of various materials (metal, plastic, glass, etc.).

Because of the varying backgrounds of each composer, some sculptural speakers may be found objects, while others may be more elaborately fabricated sculptures. The simplicity or elaborateness of the sculptural speakers was never specified.

The repertory of available sculptures increases exponentially as more installations of the work take place. Many were unique to a particular installation and are retired because of difficulty in trans-



Fig. 5. Children biting sculpture, ICA, Philadelphia, 1979. (Photo © Kira Perov)

porting them due to their size or weight. A number have persisted and become almost “classic” sculptures that appear and reappear, some of which grow larger and mutate with time.

Installations at the Los Angeles County Museum of Art and the Walker Art Center lent themselves to the creation of new sculptures given the easy access to Disney’s surplus materials in Los Angeles and Honeywell/3M’s surplus in Minneapolis.

Creating the Visual Environment

A critical aspect of the collaboration is the arrangement of the objects in the performance space so as to create both a visual and a sonic environment. Once a sponsor indicates interest in the work, a site visit is usually necessary to verify that the space can accommodate the requirements of the work. Some sites have presented unique challenges: at the DeSaisset Art Gallery, some 20 suspension points had to be individually drilled into the concrete ceiling; a suspended grid was custom-constructed at the Musée Galliera in Paris. Other sites allow easy installation, such as the Clark Theater at Lincoln Center, with its pipe grid for suspending both the sculptures and the theatrical lighting.

The numerous issues that are considered in the installation of the work include:

- Staggering the sculptures to create pathways through the environment (Fig. 4)
- The use of strong anchor points for suspending heavy objects and audience safety
- Higher overhead suspension for objects having a “loud” acoustical presence
- Hanging fragile objects, such as Tudor’s sculpture with four Slinkies, out of reach
- Creating sculptures that many people can access at once—numerous objects have worked well this way; the toilet ball floats and the 55-gallon drum often had couples or individuals inside while others listened on the outside; a gourd with fishing poles often had multiple visitors biting on them (Fig. 5); a long copper strip suspended high above and arcing down to floor level accommodated many people at once
- A good dynamic balance in the placement of the objects according to size, shape and sonic properties
- Use of theatrical lighting—due to their duration, performances often

evolved as daylight gave way to artificial light (the most striking use of light was that by the lighting designer Beverly Emmons at the Lincoln Center installation in 1998)

- Assembly/disassembly—installation required 1 to 3 days and disassembly approximately 1 day.

Because of my sculptural background, the task of organizing the space often fell to me; sometimes it was done in collaboration with Phil Edelstein, with input from all the performers.

CONCLUSION

The various versions of *Rainforest* present a rich and stimulating vision of David’s exploration of resonance. In a testament to the scope of this vision, *Rainforest IV* still is being actively performed 31 years after its inception, and a new group of performers have emerged to carry the work forward, including John D.S. Adams, D’Arcy Philip Gray, Ron Kuivila and Matt Rogalsky. Planning is currently under way to explore the creation of a permanent installation of *Rainforest IV*.

In the fall of 1995, a student version of *Rainforest IV* was presented at Bard College. David was in attendance, though at the time he was blinded by a stroke and in a wheelchair. While I was wheeling David around, we stopped at one particular sculpture that tickled his interest, and he turned to me and said, “See, this was the reason we did this.”

References and Notes

1. Interview with David Tudor, Radio 100, Germany 14 June 1988. David Tudor Papers, Getty Research Institute (GRI) (980039), audio CD C157A.
2. Contract between David Tudor and Merce Cunningham Dance Company for commission of *Rainforest*, 12 June 1968. David Tudor Papers, GRI (980039), Box 16, Folder 10.
3. Interview with David Tudor by John David Fullemann, Stockholm, 31 May 1984. Published electronically at <<http://www.emf.org/tudor>>.
4. *Popular Mechanics* (June 1966).
5. David Tudor Papers, GRI (980039), Box 37, Folder 6.
6. The carts had been developed for choreographer Deborah Hay’s 9 Evenings performance piece, and Tudor’s borrowing of them apparently caused some friction; according to Robert Kieronski, one of the Bell Labs engineers working with Tudor, Tudor saw the gadgetry assembled for the series as a communal pool of resources to be drawn upon by all—a view not shared by some of the other artists. Of the disharmony resulting when Tudor began borrowing things, Kieronski states, “Billy, of slightly socialist leanings . . . did not adjudicate the fray. . . . Cage was happy with the chaos. Nobody bothered Rauschenberg.” Robert Kieronski, e-mail correspondence, 3 December 2000. “Billy” is Billy Klüver, spearhead of Experiments in Art and Technology (EAT), which produced the 9 Evenings; Robert Rauschenberg was also an EAT founding member; both he and John Cage contributed performance pieces to the series.
7. Tudor-Fullemann interview [3].
8. David Tudor, working note for *Bandoneon!*, David Tudor Papers, GRI (980039), Box 3, Folder 2.
9. Tudor [8].
10. David Tudor, interview with Matt Rogalsky, 28 March 1995, Tomkins Cove, NY. Published electronically at <<http://www.emf.org/tudor>>.
11. Tudor-Fullemann interview [3].
12. Gordon Mumma, e-mail correspondence, April 2001.
13. Tudor-Fullemann interview [3].
14. Letter from Jean Rigg to David Tudor, 11 March 1970. David Tudor Papers, GRI (980039), Box 58, Folder 11.
15. Gordon Mumma, e-mail correspondence, April 2001.
16. Gordon Mumma, e-mail correspondence, April 2001.
17. If the description (which includes four “options” for performing *Rainforest*) had been written in 1968, it would likely not have included any but the version for dance (option 1). Because the list includes an option that fits the version performed in 1972 on tour with John Cage in Europe, but does not include an option that fits the version developed in 1973 (the large group version known as *Rainforest IV*), I infer that the list was written in 1972 and back-dated to 1968, when the first version was premiered.
18. David Tudor, *Rainforest* description dated 1968. David Tudor Papers, GRI (980039), Box 3, Folder 2.
19. Tudor-Fullemann interview [3].
20. These include score diagrams and notes that reference the 1972 version as “Rainforest 3”; David Tudor Papers, GRI (980039), Box 3, Folder 28.
21. Peter Poole, telephone conversation, March 2001.
22. Ritty Burchfield, conversation, New York City, March 2001.
23. David Tudor, notes for *Rainforest*, 1972. David Tudor Papers, GRI (980039), Box 44, Folder 8.
24. New World Records 80540-2, released 2000, documents Tudor and Cage’s premiere performance of *Rainforest/Mureau* at Radio Bremen, 5 May 1972.
25. For instance, in one note from 1974 Tudor refers to the 1973 large group version of *Rainforest* as “RF III.” David Tudor Papers, GRI (980039), Box 109, Folder 18; John Driscoll says that this version was not identified as *Rainforest IV* until the 1980s (e-mail correspondence, April 2001).
26. *Rainforest IV* (Berlin Version) Edition Block/Grammvision LP GR-EB1 (1980).
27. Publicity document by John Driscoll and David Tudor, 1979.
28. Tudor-Fullemann interview [3].

Matt Rogalsky’s work as a media artist often focuses on exploration of abject, invisible/in-audible or ignored streams of information. Recent projects include a series of performance and installation works exploring radio silences, a commission from the Berliner Festspiele for a new version of John Cage’s Fontana Mix, the sound installation Auricle in Norwich Cathedral (U.K.), and Perfect Imperfect, a collaborative series of exhibitions with U.K. artist Chloe Steele. He is currently studying in the Music Department of City University, London, researching the history of David Tudor’s Rainforest series.

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1. John Driscoll. 2012. Resonance: From the Architectural to the Microscopic. *Leonardo Music Journal* -:22, 25-33. [[Abstract](#)] [[PDF](#)] [[PDF Plus](#)]