



**BROADWAY 1602**



**RAINFOREST.**

**DAVID TUDOR**

**COMPOSERS INSIDE ELECTRONICS**



# BROADWAY 1602

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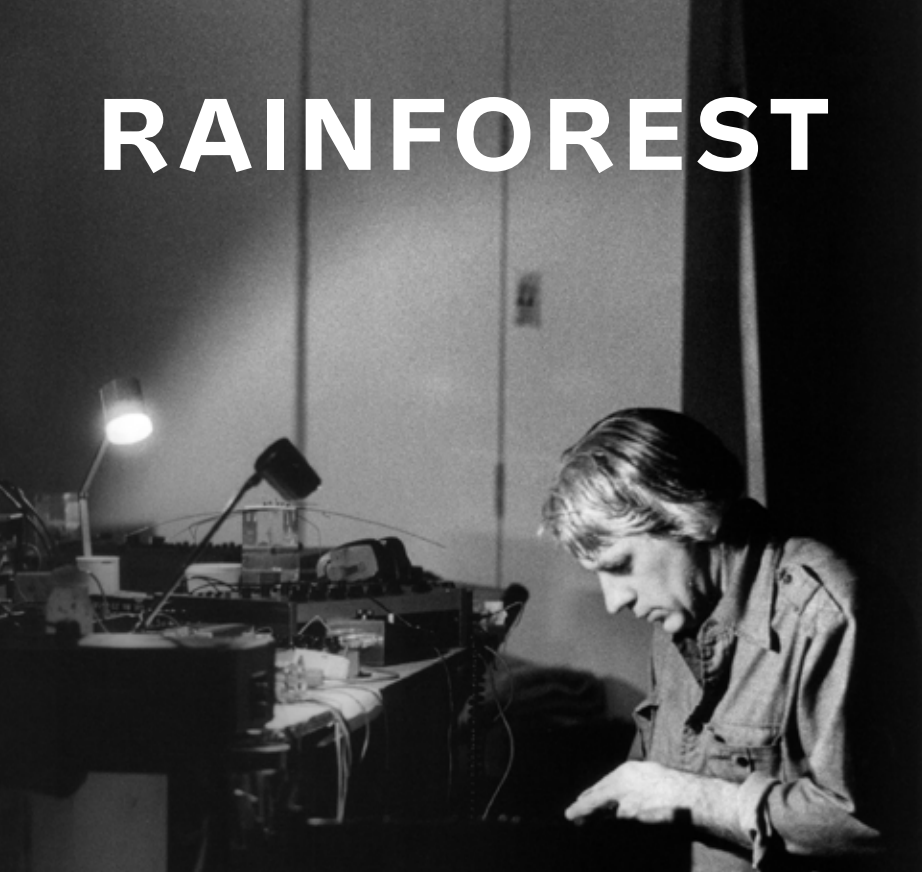
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DAVID TUDOR

COMPOSERS INSIDE ELECTRONICS

# RAINFOREST



## DAVID TUDOR FROM INTERPRETER TO COMPOSER



Above:

*David Tudor, The Kitchen New York City, 1978*

Photo by Stan Ries

David Tudor was a world-renowned avant-garde pianist and prolific interpreter of contemporary music for piano in the 1950's and 1960's. He was best known for his performances of John Cage's "4'33'" and "Cartridge Music" along with other pioneering works. When he received an indeterminate score for a work, he would set about a meticulous process of calculations to create his own performance score, often much more elaborate and detailed than the original. He was highly sought out, not only for his virtuosity at piano, but also for his dedication to creating authoritative interpretations. In some cases these extensive interpretations bordered on creating new compositions.

*"David Tudor was an enigmatic performer and composer. Tudor had two overlapping careers – one as a world renowned pianist interpreting the works of Cage, Brown, Busotti, Boulez, Feldman, Stockhausen, Wolff and others and a second one as a ground-breaking composer of live electronic music. Using unique configurations of custom-built electronics he pioneered the exploration of acoustical and electronic feedback, resonance, and highly non-linear musical systems. Tudor approached electronics and composing with equal fervor and was delighted when he was able to "tease" his instruments into highly unstable states sometimes with very raucous results.*

*He was dedicated to the idea that Rainforest was "self-teaching". He believed the only way to fully grasp the work was through personal investigation and hands-on experimentation. Little instruction was offered. Ralph Jones, a founding member of 'Composers Inside Electronics' (CIE) once said: "David never led the group, unless it was to a particularly good restaurant"."*

*- John Driscoll, New York 2015*

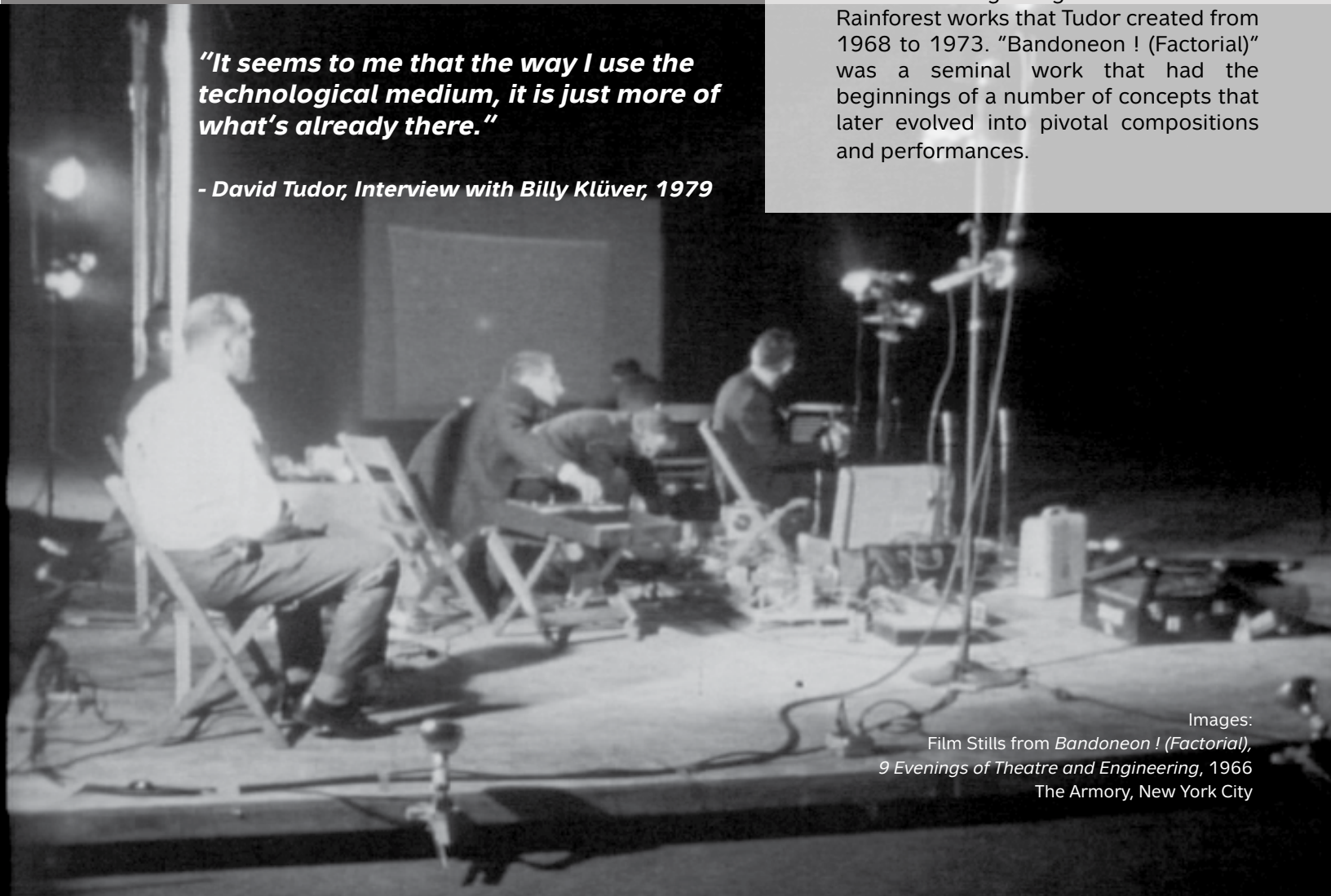


Tudor changed directions after some 20 years as a performer and created his first composition "Fluorescent Sound" in 1964, a collaboration with Robert Rauschenberg. His second composition "Bandoneon ! (Factorial)" in 1966 was a technical tour de force as part of the *Experiments in Art and Technology's* now legendary "9 Evenings of Theatre and Engineering". David Tudor was one of the core artists who collaborated with the non-profit organization Experiments in Art and Technology (E.A.T.), founded in 1966 by engineers Billy Klüver and Fred Waldhauer, and artists Robert Rauschenberg and Robert Whitman to provide artists with access to new technology.

"Bandoneon ! (Factorial)" included an impressive array of custom electronic instruments along with visuals triggered by the music. On robotic radio-controlled carts were a group of unusual speakers. These resonant speakers used special sound drivers to vibrate the sculptural objects and create sound emanating directly from the object. These speakers were the beginning of a series of Rainforest works that Tudor created from 1968 to 1973. "Bandoneon ! (Factorial)" was a seminal work that had the beginnings of a number of concepts that later evolved into pivotal compositions and performances.

***"It seems to me that the way I use the technological medium, it is just more of what's already there."***

***- David Tudor, Interview with Billy Klüver, 1979***



Images:  
Film Stills from *Bandoneon ! (Factorial)*,  
*9 Evenings of Theatre and Engineering*, 1966  
The Armory, New York City

# PROJECTS OUTSIDE ART

Experiments in Art and Technology announces an exhibition of realizable projects in the environment, to be held at Automation House, 43 East 68th Street, New York City, opening October 22, 1970.

PROJECTS OUTSIDE ART will consist of five teams, each composed of artists, scientists, engineers and other professionals working in collaboration. The projects will deal with such areas as education, health, housing, environmental control, transportation, communication, food production and distribution, leisure activities and entertainment. Presentation will be in the form of films, tapes, models, movies or any other suitable materials.

The five teams will be assembled on the basis of submitted ideas and material. Individuals who wish to participate in a project should submit their ideas in the form of written short descriptions, illustrated sketches or granted patents. We do not have who submit these preliminary ideas keep in mind, as much as possible, the following requirements which will characterize the final project's utilization of available technology and existing scientific knowledge: recognition of the scale required to make the project effective under existing social and environmental conditions, ecological effects and organizational methods necessary for execution of the project. Projects may be planned for anywhere.

The written description of ideas must be no longer than 1000 words (drawings may be included). Copies of published articles or granted patents may also be used for submission. On the basis of the material received, E.A.T. staff, in consultation with professionals in proper fields, will choose five broad project areas and assign selected individuals to the five collaborative teams. The teams will begin work by June 15 and the members of the teams will collaborate to develop the final projects and determine their presentation. All submitted ideas are to be published with a reference list of articles and granted patents. This publication will be available when the exhibition opens.

Preliminary lists for projects should be submitted to E.A.T., 235 Park Avenue South, New York, New York 10003 by May 1, 1970.

Left:

*Experiments in Art and Technology  
Poster for Projects Outside Art, 1970*

Opposite:

*Merce Cunningham & Meg Harper,  
"RainForest", 1968*

Photo by James Klosty

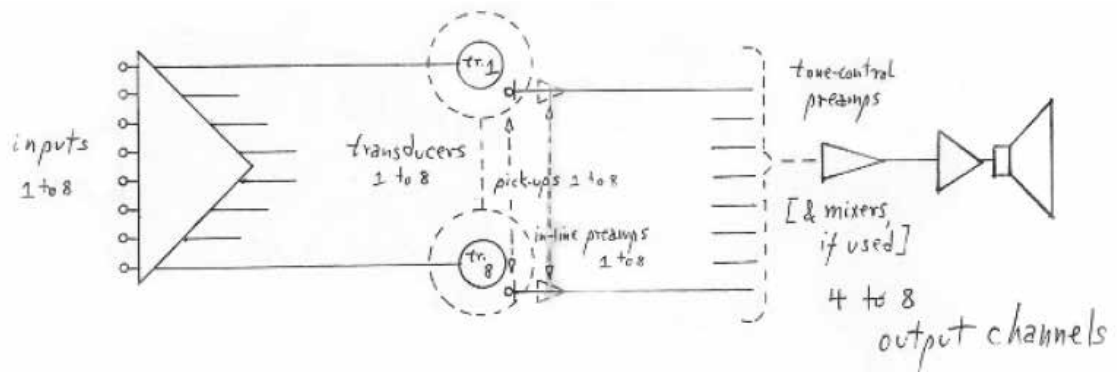
Courtesy of the Merce Cunningham Trust

***"Billy Klüver (co-founder of 'Experiments in Art and Technology') has spoken about the importance of the metaphor of the rainforest for himself and the others at this time. He wrote an article entitled "Rainforest" (1970) explaining the philosophy of E.A.T. in terms of a rainforest ecosystem:***

***The rainforest is made up of thousands of feedback loops of continual activity. Thousands of animals, plants and trees live in the rainforest. Its roots are few and shallow as opposed to the oak tree's deep roots in the ground. The oak tree takes energy out of the ground and shades the area so that no small bush or flower can grow near it. The main purpose of 'Experiments in Art and Technology' is to develop, through experimentation and experience, fluid organizational forms whose model is that of the rainforest rather than the oak tree."***

***- Matthew R. Rogalsky, IDEA AND COMMUNITY: THE GROWTH OF DAVID TUDOR'S RAINFOREST, 1965-2006, City University London, Music Department***





Rainforest 1968  
 block diagram  
 d. tudor

In 1968 Tudor received a commission to create music for a dance by Merce Cunningham titled "RainForest". Tudor's work was titled the same. This first version of "Rainforest" used eight tabletop-sized objects through which sound was driven and then re-amplified into the performance sound system using phono cartridges as vibration microphones. It received over 140 performances as part of the Merce Cunningham Dance Company Repertory and has also continued to be presented as a concert work.

Above:  
 Rainforest I Block Diagram sketched by  
 David Tudor, 1968  
 Courtesy of the Getty Research Institute





The first version of "Rainforest" used tone oscillators as the sound sources that were fed into the objects. A second version now referred to as "Rainforest II" was created in 1972 and received limited performances. It was a simultaneous performance of "Rainforest" along with John Cage performing his "Mestostics". In this case, Tudor used John Cage's voice as the source for the resonant speakers.

*"(...) the use of objects as complex filters— I perceive as Tudor's intention to work a kind of sonic alchemy—(...). Pigeonholing the piece is made complicated by the fact that it is actually a 'performed installation' combining aspects of sound, sculpture, exhibition, live concert, performance and audience interaction.*

*"Rainforest IV" in its earliest years was described by Tudor as an "environmental piece" and later was frequently subtitled "An Electronic Ecology" in programs accompanying installations." (56)*

*- Matthew R. Rogalsky, IDEA AND COMMUNITY: THE GROWTH OF DAVID TUDOR'S RAINFOREST, 1965-2006*

Top Left and Right  
Rainforest, Cunningham Dance Co. electronic  
sound configuration, 1971  
Photos by Gordon Mumma

**RAINFOREST IV - FROM COMPOSER TO COLLABORATOR**

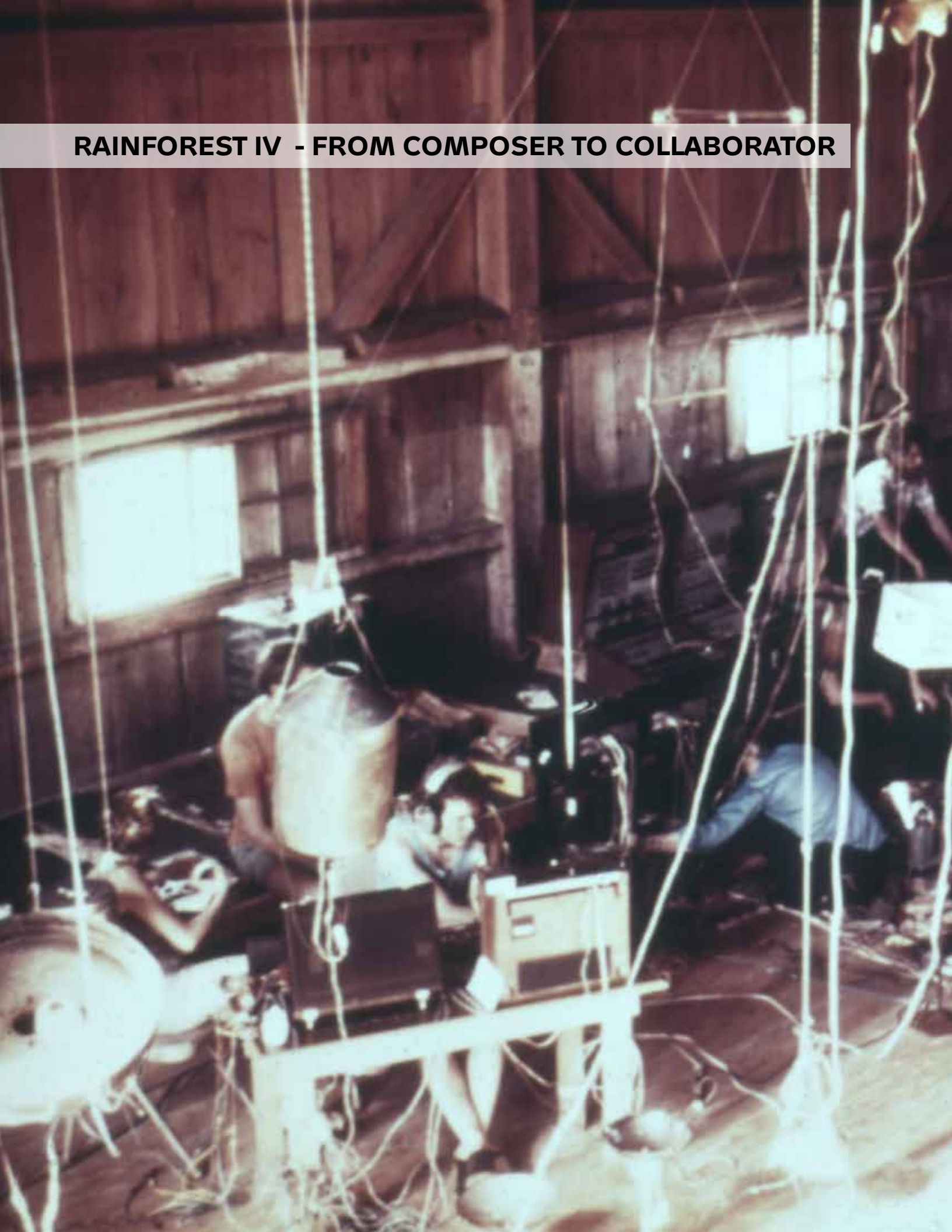
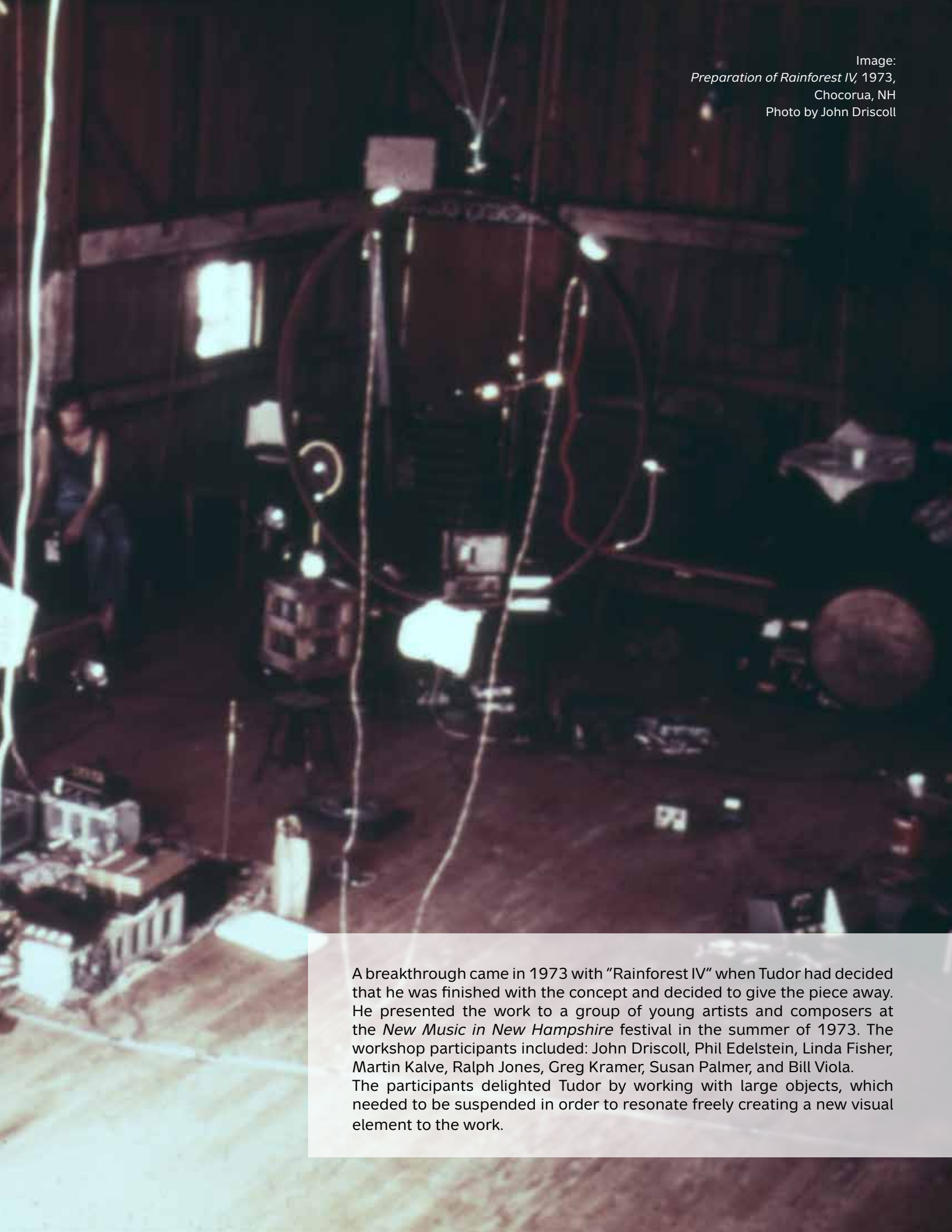


Image:  
*Preparation of Rainforest IV, 1973,*  
Chocorua, NH  
Photo by John Driscoll



A breakthrough came in 1973 with "Rainforest IV" when Tudor had decided that he was finished with the concept and decided to give the piece away. He presented the work to a group of young artists and composers at the *New Music in New Hampshire* festival in the summer of 1973. The workshop participants included: John Driscoll, Phil Edelstein, Linda Fisher, Martin Kalve, Ralph Jones, Greg Kramer, Susan Palmer, and Bill Viola. The participants delighted Tudor by working with large objects, which needed to be suspended in order to resonate freely creating a new visual element to the work.

# "We just do music, music which we feel is necessary to do now"

The incongruity of it all is, nevertheless, quite comfortable and, on consideration, appropriate. Ten young musicians are sitting on a stylistic cacophony of chairs — lawn chairs, ottomans, kitchen uncomfartables — set in a large circle. The circle is in a good 20-cow-capacity barn with a floor almost as clean as a kitchen floor after a TV soap commercial.

Microphones are cocked on metal stands inside the circle, while outside the ring sit any number of kettle drums, pianos and non-percussion instruments. One of the seated musicians walks over to the melange and returns her Viola to her chair. Everyone is ready to hum.

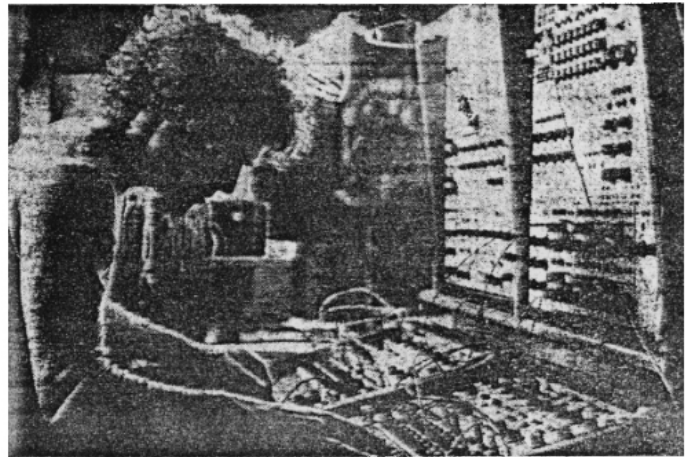
"Try not to say ummmm, because you don't get any resonance. Try oh . . . or . . . ahhh." Julius Eastman, faculty member at the State University of New York at Buffalo, is guiding the group in a music composition workshop. Its aims concern "structuring sounds and space, using the voice, instruments, and body discipline."

This is what is written on the application form for "New Music in New Hampshire" at Concordia, and it is here that Eastman and five other musicians and composers are collaborating with 30 other musicians, about half of them traditional instrumental musicians, and half electronic music creators.

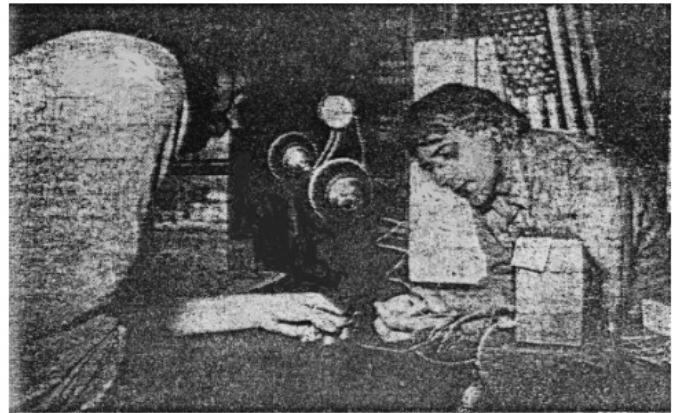
Julius Eastman continues, "Today we'll just amplify. Later we will be remodulated. . . . With the microphone, your voice has more resonance. Maybe tomorrow we'll have a reverberation — give it all a commercial sheen." He laughs, and a few others chorle.

He has moved from the grand piano and has given each of the musicians a note to hum. When he's through assigning notes, he points out that two notes are missing. "Psharp," says one young man, who soon adds, "E-flat." Others are close or right, too — and to the musical buffs who made it as far as Humoresque on the piano a few decades ago, such keen responses veritably mingle with verubosity.

The Concordia program began last Thursday at Stafford's in-the-Fields on Rte. 113. The 30 attending musicians, who came from as far as California

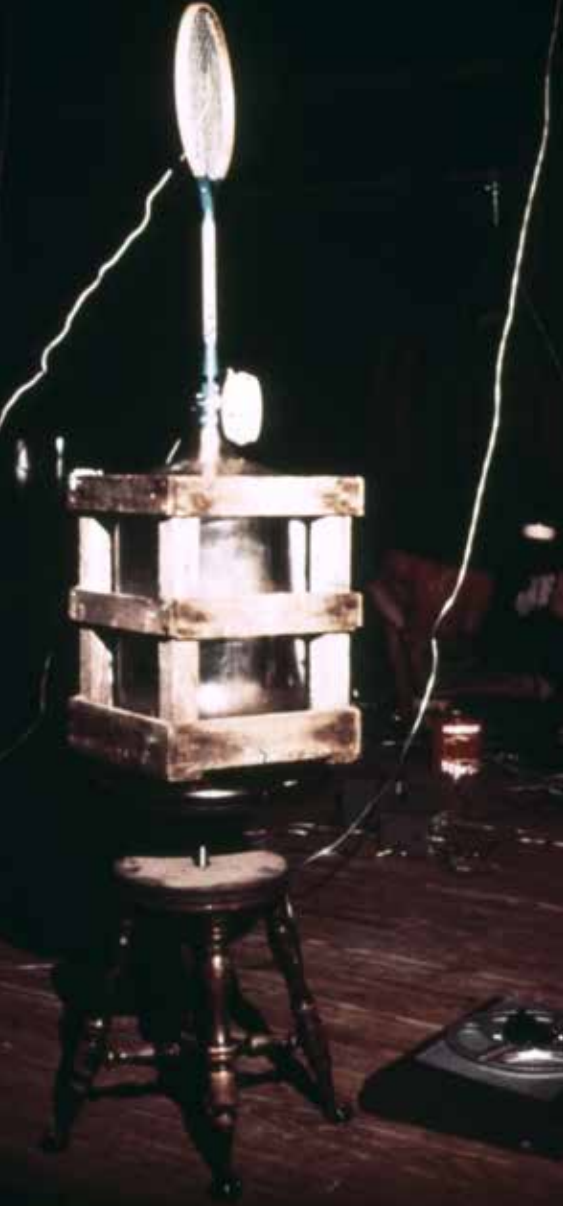


SITTING AT A MOOG SYNTHESIZER



Photos by Bruce Bedford

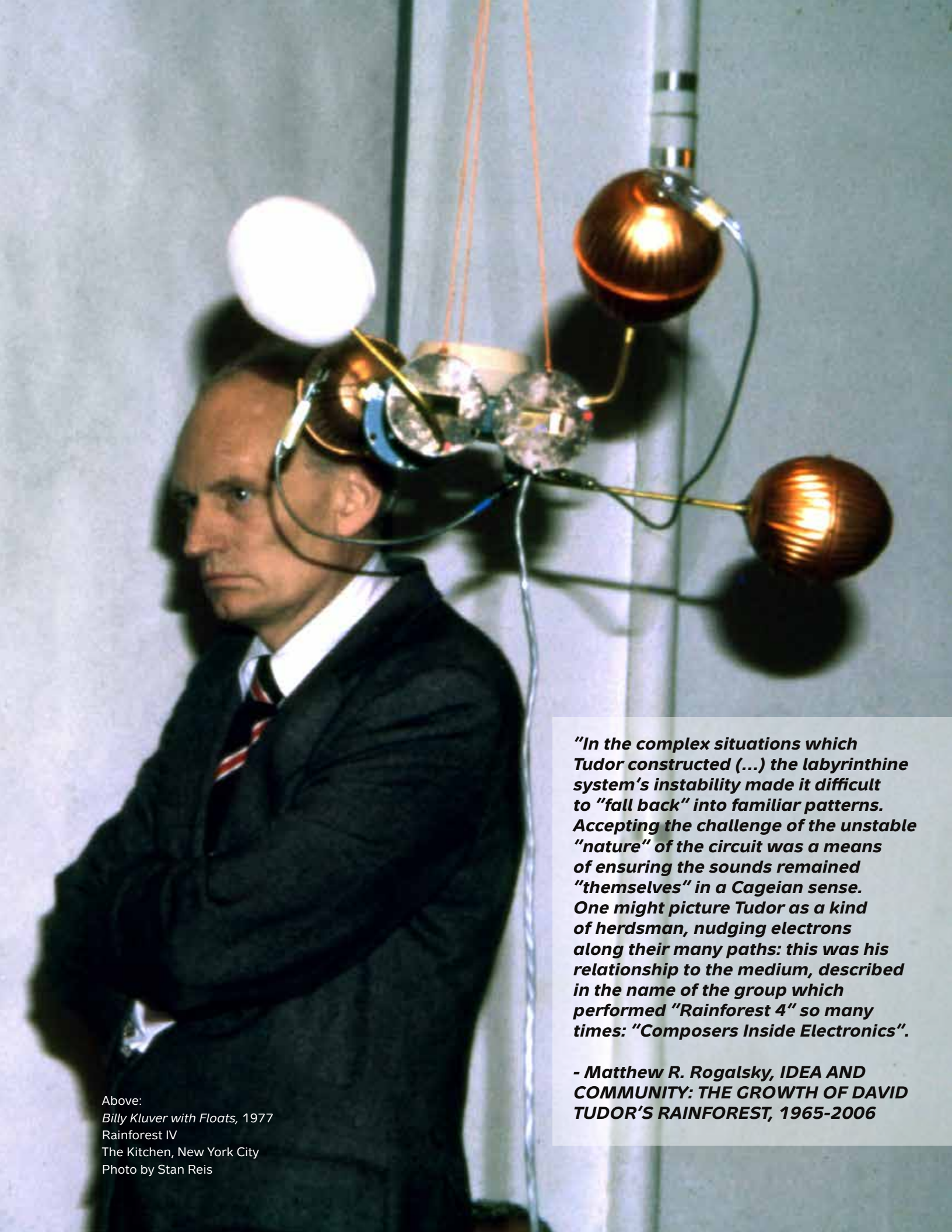
John Driscoll and David Tudor discuss frequency transmitters, a pair of new one of the most unique of the Rainforest and gleaming toilet ball floats.



All of a sudden a new version emerged that was both a *sound* and *sculptural environment* that the audience was free to wander around in and listen directly to the objects. This was the beginning of what later was to become "Rainforest IV". The group wanted to continue to perform the work, and Tudor agreed to the group performing the work.

Top Left:  
Bottle and Badminton Racket, 1973  
Rainforest IV Object  
Photo by John Driscoll

Bottom Left:  
Small Ring and Sprinkler, 1973  
Rainforest IV Object,  
Photo by John Driscoll



Above:  
*Billy Klüver with Floats, 1977*  
Rainforest IV  
The Kitchen, New York City  
Photo by Stan Reis

*"In the complex situations which Tudor constructed (...) the labyrinthine system's instability made it difficult to "fall back" into familiar patterns. Accepting the challenge of the unstable "nature" of the circuit was a means of ensuring the sounds remained "themselves" in a Cageian sense. One might picture Tudor as a kind of herdsman, nudging electrons along their many paths: this was his relationship to the medium, described in the name of the group which performed "Rainforest 4" so many times: "Composers Inside Electronics".*

**- Matthew R. Rogalsky, *IDEA AND COMMUNITY: THE GROWTH OF DAVID TUDOR'S RAINFOREST, 1965-2006***



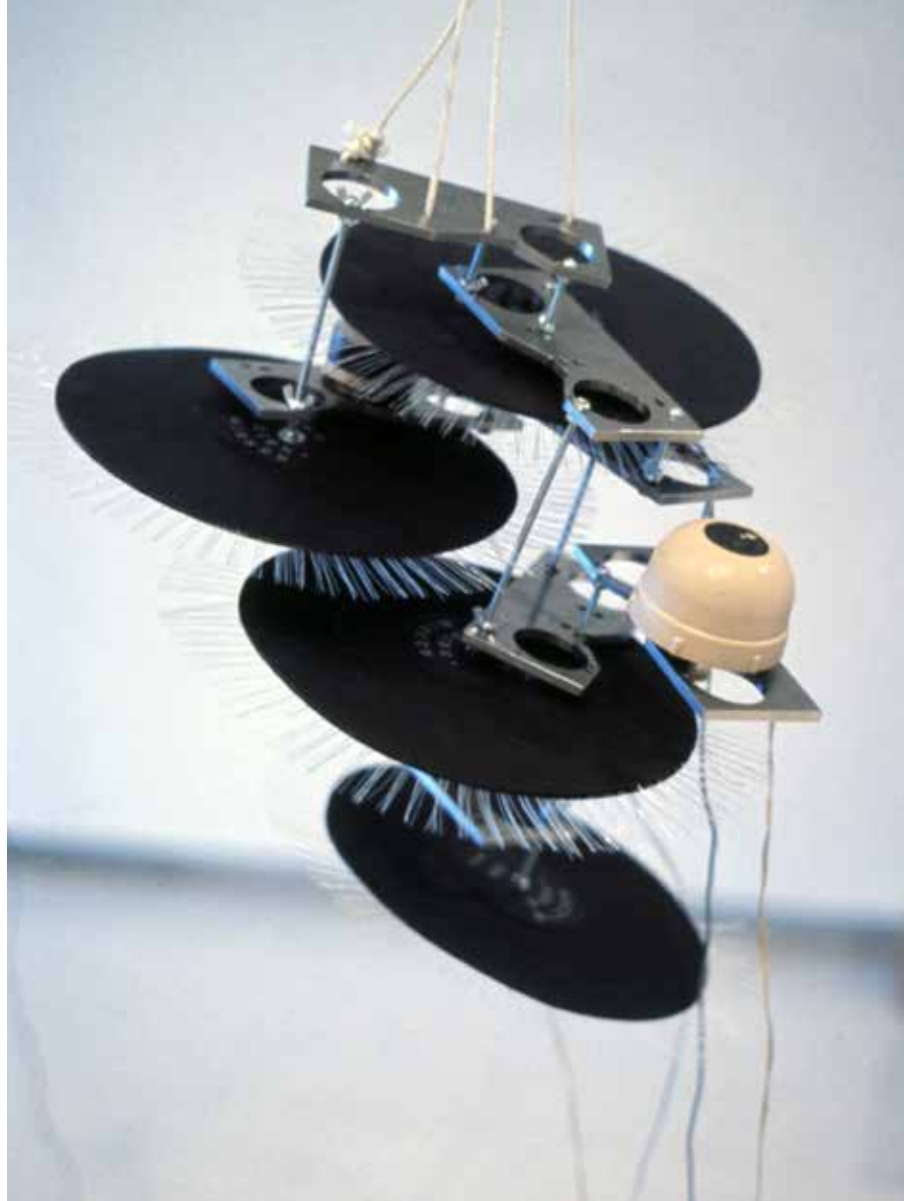
*In 1973 I made "Rainforest IV" where the objects that the sounds are sent through are very large so that they have their own presence in space. I mean, they actually sound locally in the space where they are hanging as well as being supplemented by a loudspeaker system. The idea is that if you send sound through materials, the resonant nodes of the materials are released and those can be picked up by contact microphones or phono cartridges and those have a different kind of sound than the object does when you listen to it very close where it's hanging. It becomes like a reflection and it makes, I thought, quite a harmonious and beautiful atmosphere, because wherever you move in the room, you have reminiscences of something you have heard at some other point in the space. It's (can be) a large group piece actually, any number of people can participate in it. It's important that each person makes their own sculpture, decides how to program it, and performs it themselves. Very little instruction is necessary for the piece. I've found it to be almost self-teaching because you discover how to program the devices by seeing what they like to accept. Its been a very rewarding type of activity for me. It's been done by as large a group as 14 people. So that was how our Rainforest was done."*

*- David Tudor, from An Interview with David Tudor by Teddy Hultberg in Dusseldorf, Germany, May 17-18, 1988.*

Right:  
*Whisker Disker*, 1976  
Rainforest IV Object  
Walker Art Center, Minneapolis, MN  
Photo by John Driscoll

Bottom:  
*Slinkys*, 1975,  
Rainforest IV Object  
Ft. Worth Art Museum, Ft. Worth, TX

Left:  
*Organ Pipe*, 1976  
Rainforest IV Object  
Walker Art Center, Minneapolis, MN  
Photo by John Driscoll



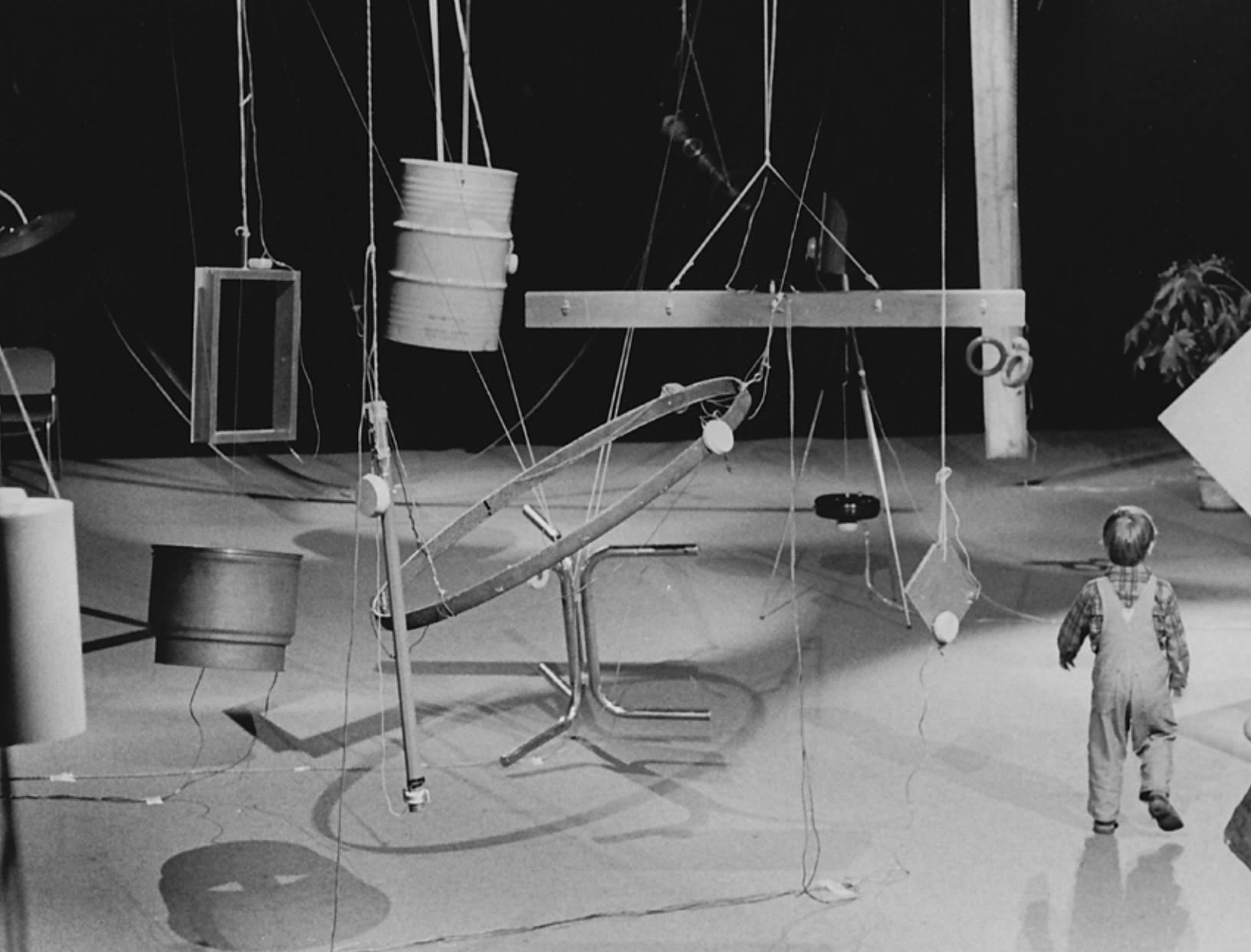


Image:  
Rainforest IV Performance, 1976,  
Pierre Cardin Studio, Paris, France  
Photo by Ralph Jones

After a number of performances of the work, Tudor was invited in 1976 to produce a series of works for the Paris Automne Festival. In order to present not only his works, but also works of the group, a name for the group became necessary. Tudor and John Driscoll settled on Composers Inside Electronics (CIE) in order to emphasize the concept of starting with the electronics and letting the music evolve from their potential. The group for the Automne Festival now consisted of: John Driscoll, Paul DeMarinis, Phil Edelstein, Linda Fisher, Martin Kalve, Ralph Jones, and Bill Viola. This became the core of CIE to continue performances both with and without Tudor until the early 1990's.





Above:

*Composers Inside Electronics*, 1980

From left to right, Ralph Jones, David Tudor, Phil Edelstein, Bill Viola, John Driscoll, Martin Kalve  
Akademie der Künste, Berlin, Germany

Bottom Right:

*Barrel*, 1976,

Rainforest IV Object

Pierre Cardin Studio, Paris, France

Photo by Ralph Jones

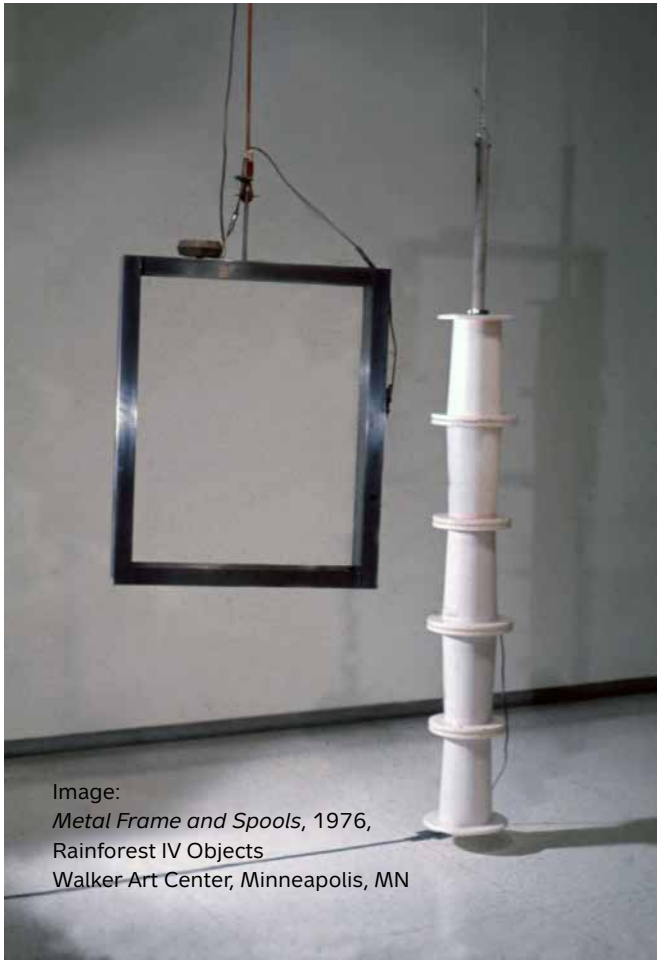
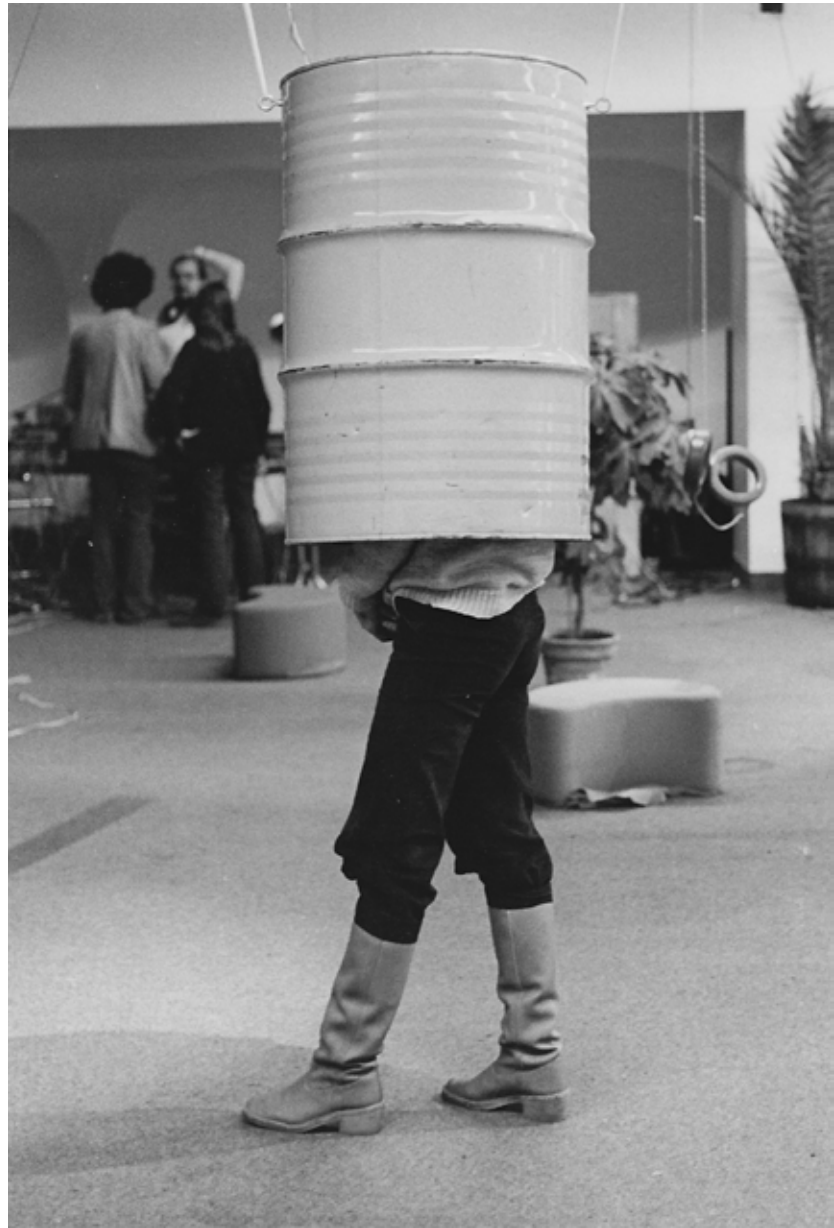


Image:

*Metal Frame and Spools*, 1976,

Rainforest IV Objects

Walker Art Center, Minneapolis, MN



“Rainforest IV” was a unique work and revolutionized the idea of sound art, performance art, and sound installations. In the early 70’s there was really no work quite like it. It was performed by typically four to ten performers each responsible for creating their own sound materials and objects for generally a continuous six-hour period. There was no formal score for the work as it was highly improvisational by its nature, and it was now referred to as an electro-acoustic environment where the audience was free to come and go and interact with the resonant speakers. In some cases the audience even took to biting the objects while plugging their ears – allowing the vibrations to directly resonate their head.

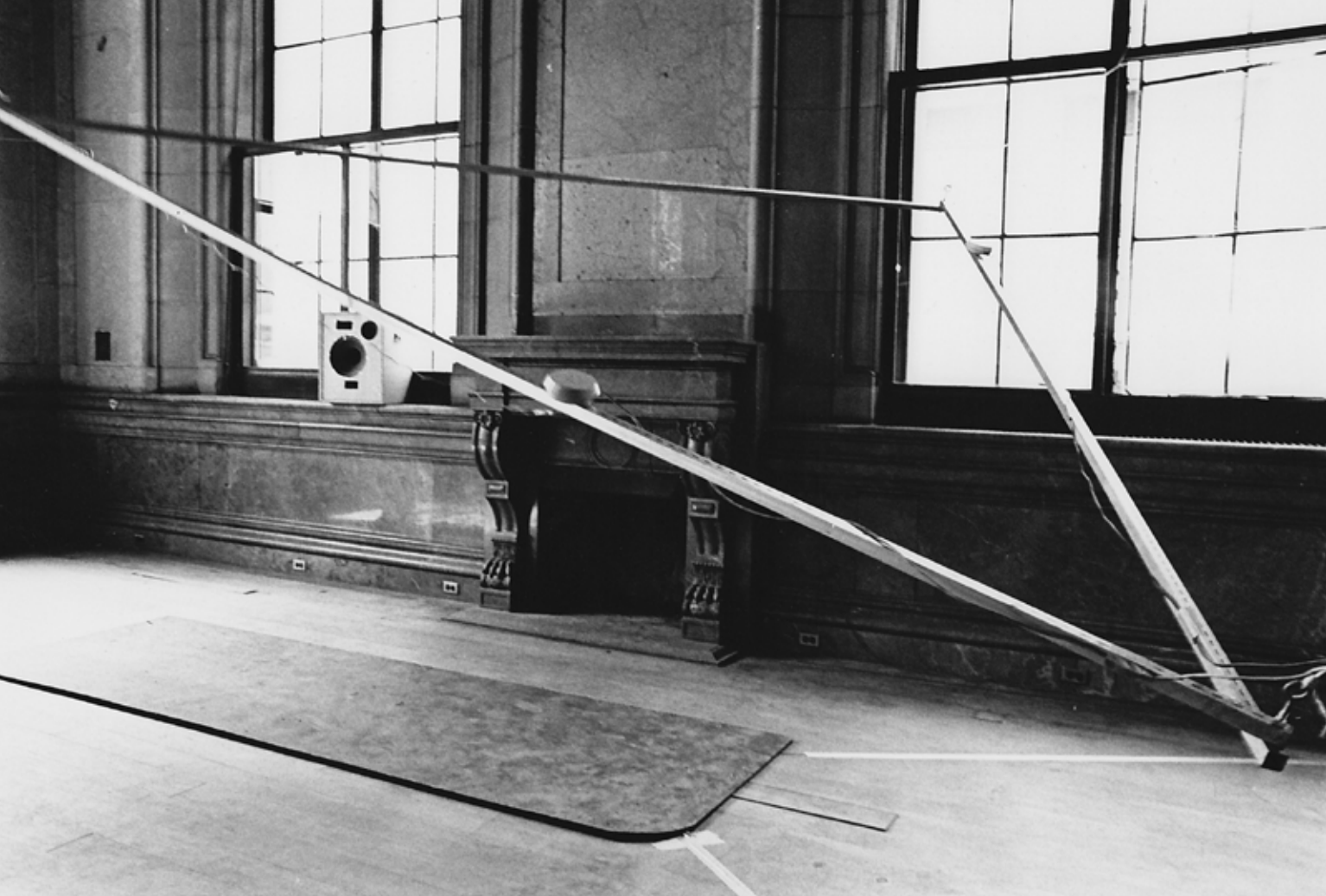
Images:  
*Rainforest IV Performance*, 1979  
Institute of Contemporary Art, Philadelphia, PA  
Photo by Kira Perov



*“Tudor conjured from the electronics the means and spirit for essential transcendent human expression rooted in the fundamentals of engineering and science. These fundamentals used as platform for expressive excursions. There’s mastery in these structures of a simple idea of feedback and modulation that gives rise to monumental structure – the crafting of howls into symphonies. The act of folding input to output gives rise to expansive new worlds. The works he created and discovered, charted and populated new territories for Composers Inside Electronics. The mechanics of resonance was fundamental to his aural expression. His devotion to the collaborative process was one of his greatest gifts to the group.”*

*- Phil Edelstein, New York 2014*

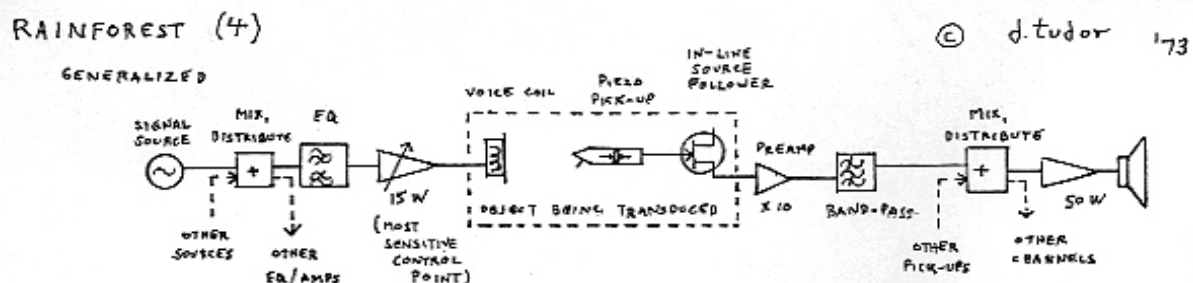




"Rainforest IV" was recorded for an LP in 1980 at the Akademie der Künste in Berlin for release on Edition Block. It was also at this time that a block diagram for the work appeared from Tudor for use on the album cover. Up until this time there was no diagram of the work, as it was passed along by Tudor personally doing the work with interested performers.



Image:  
Rainforest IV Performance, 1981  
Installation View  
Neuberger Museum, Purchase, NY  
Photo by Phil Edelstein



Top Left:  
*Triangle*, 1979  
Rainforest IV Object  
Institute of Contemporary Art, Philadelphia, PA  
Photo by Kira Perov

Bottom Left:  
*Sonotube*, 1976  
Rainforest IV Object  
Walker Art Center, Minneapolis, MN  
Photo by John Driscoll

Above:  
*Rainforest IV Generalized Diagram*  
sketched by David Tudor, 1973  
Courtesy of the Getty Research Institute

## RAINFOREST V – FROM PERFORMANCE TO INSTALLATION

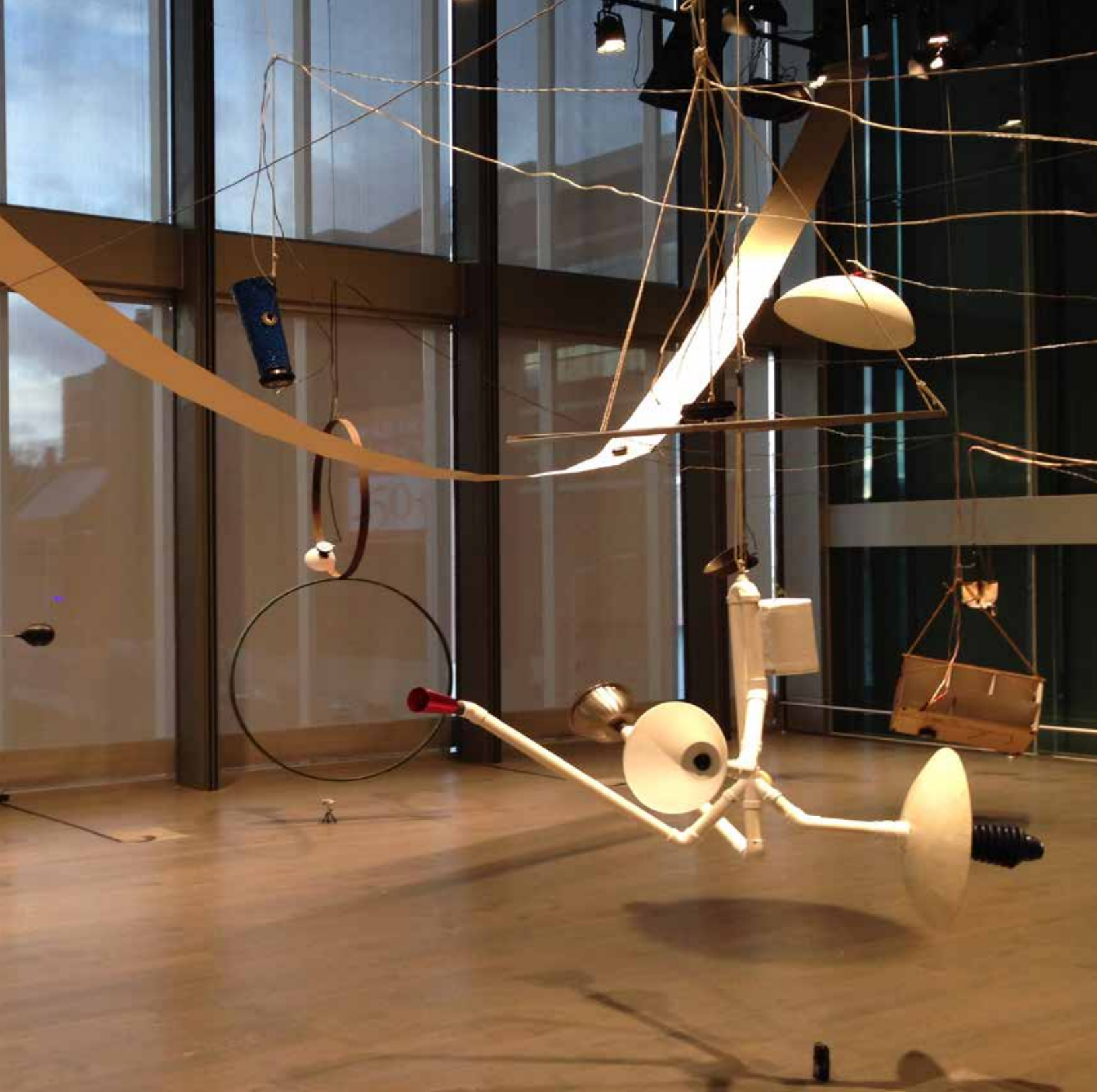
The work has received numerous performances in museums, universities, fashion studios, TV studios, and other venues with over 150 performances to date in over 45 cities worldwide. With Tudor's passing in 1996, CIE decided to continue performing the work.

In 2009, John Driscoll, Phil Edelstein, and Matt Rogalsky created a self-running installation version of the work for Arte Alameda in Mexico City now titled "Rainforest V" to distinguish it from the performance version "Rainforest IV".

John Driscoll and Phil Edelstein are currently working on the restaging of Tudor's compositions for E.A.T.'s legendary synergetic project of the Pepsi Pavilion at that was originally constructed in Expo'70 in Osaka Japan.



Image:  
Rainforest IV Performance, 2014  
Brown University, Providence, RI  
Photo by John Driscoll



**The installation version "Rainforest V" is on show in its site-specific nature at BROADWAY 1602 in January – February 2015.**

**It is realized in our space by John Driscoll and Phil Edelstein, who remain active members of Composers Inside Electronics and since 1973 have not only updated the piece technically, but continued and extended the legacy and aesthetic concept of "Rainforest" and other David Tudor pieces. Additional sound files were created by Matt Rogalsky.**

# RAINFOREST TIMELINE

## 1965-66

Tudor works on resonant loudspeakers as part of *Bandoneon ! (factorial)* which is performed at "9 Evenings of Theatre and Engineering" in 1966.

## 1968 - RAINFOREST

Tudor is commissioned to create a new work for the Merce Cunningham Dance Company titled "Rainforest". This work is premiered in Buffalo in March 1968 with Tudor and Gordon Mumma performing the music using 3 to 8 table-top sized amplified objects. This is often referred to as the original "Rainforest" or "Rainforest I".

The work was part of the Cunningham repertory with a number of revivals until 2011, and was very popular due to its use of helium-filled mylar pillows designed by Andy Warhol as set pieces, costumes by Jasper Johns and evocative music.

## 1969-70 – RAINFOREST II

Tudor creates another version of the work using resonant objects with voice input. He is quoted: "In the second version, I wanted to use a vocal input to the system, the natural resonance of the object and its subsequent amplification. It's a kind of mechanical filter." (David Tudor Interview with Teddy Hultberg – 1988)

Note: there is currently no record of this version being performed or recorded.

## 1972 – RAINFOREST III

Tudor created a third version in 1972 that was performed on a European tour with John Cage.

He is quoted: "The third version had to deal with the ability to have any input go to any transducer. I made the system for a simultaneous performance with John Cage's *Mureau*. It was one of those pieces that changes all the time so I needed to have a sort of continuous things, so I used tape sources, but having the ability to mix them or separate them into different output channels." (David Tudor Interview with Teddy Hultberg – 1988)

## 1973 – RAINFOREST IV

Created as part of a Tudor workshop at *New Music in New Hampshire* in the summer of 1973. Workshop participants were: John Driscoll, Phil Edelstein, Linda Fisher, Greg Kramer, Martin Kalve, Ralph Jones, Susan Palmer, Bill Viola and David Tudor.

In this collaborative version, each of the performers design and construct their own objects and develop appropriate sound sources along with providing the necessary equipment. Performed by Composers Inside Electronics since 1973 with over 150 performances in 45 venues world-wide. It uses between 12-40 resonant objects.

Note: Rainforest IV was titled "Rainforest" until 1981. Then it was titled "Rainforest IV".

## 2009 - RAINFOREST V

This version was created by *Composers Inside Electronics* (John Driscoll, Phil Edelstein, and Matt Rogalsky) as a self-running installation version. It was premiered at Laboratorio Arte Alameda in Mexico City, Mexico, in 2009, and has also been installed at Governors Island, New York, in 2011.

Note: "Rainforest V" can be installed as a temporary or permanent installation with between 12 to 60 objects.





*Composers Inside Electronics: David Tudor Memorial, 1996*  
From Left: Paul DeMarinis, John D.S. Adams, John Driscoll, Phil Edelstein, Bill Viola, Russell Frehling, D'Arcy Philip Gray, Linda Fisher  
Judson Church, New York City

# ***RAINFOREST IV/V***

## **PERFORMANCES CHRONOLOGY**

- 1973 New Music in New Hampshire, Chocorua, NH
- 1974 Everson Museum, Syracuse, NY
- 1975 Fort Worth Art Museum , Ft. Worth, TX  
De Saisset Art Gallery, Santa Clara, CA  
Los Angeles County Museum, Los Angeles, CA
- 1976 Contemporary Art Museum, Houston, TX  
Walker Art Museum, Minneapolis, MN  
Musee Galliera, Paris, France  
L'Espace Pierre Cardin, Paris, France
- 1979 Institute of Contemporary Art, Philadelphia, PA
- 1980 Moderna Museet, Stockholm, Sweden  
Akademie Der Künste, Berlin, Germany
- 1981 Neuberger Museum, SUNY, Purchase, NY
- 1982 Stedelijk Museum, Amsterdam, The Netherlands
- 1996 Judson Church, David Tudor Memorial, New York, NY
- 1998 Lincoln Center, New York, NY
- 2001 California Institute of the Arts, Valencia, CA
- 2009 Alte Feuerwache, Cologne, Germany  
Laboratorio Arte Alameda, Mexico City, Mexico\*  
Ft. Jay - Governors Island, New York, NY\*
- 2014 Serralves Museum , Porto, Portugal  
Caramoor Center for Music and the Arts, Katonah, NY  
Brown University, Providence, RI

\*Installation version

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Cover:

Top Image:

*David Tudor, John Driscoll, 1979*  
Rainforest IV Performance,  
Institute of Contemporary Art, Philadelphia, PA  
Photo by Kira Perov

Bottom Image:

*Installation View of Rainforest IV Performance, 1981*  
Neuberger Museum, Purchase, NY,  
Photo Phil Edelstein