How to Set Up "Cloud Music"
(the 1970’s installation by Bob Watts, David Behrman and Bob Diamond)

from David Behrman to David Muller. May 4, 1992

There are 3 units: (1) video analyzer (VA) -- tall unit with metal base and lexan top containing circuit cards; (2) music synthesizer (MS) -- lower aluminum unit with circuit card cage in front and wired matrix boards in back; (3) Teac audio mixer with 6 inputs and 4 outputs.

--------------- Setting Up --------------------------

Position the 3 units on a table with video analyzer to the left, music synth in the center and audio mixer to the right. Facing you should be the front of the video analyzer (with many black pots) and the circuit card cage side of the music synth.

Connect video camera output to the female phono jack cable coming from the rear of the video analyzer. Connect video monitor(s) to the other phono cable coming from rear of same.

Connect the six cables (phone to mini-phone) from VA to the 6 inputs on the left side of MS (see accompanying diagram).

Connect six audio cables (phono plug to phono plug) from 6 outputs on the right side of MS marked 1 2 3 4 5 6 to the six line inputs of the audio mixer (see diagram). Disregard the other jacks on right side.

Connect the 4 outputs of the audio mixer to the inputs of a 4-channel sound system.

--------------- Turning On --------------------------

Before powering up the MS, make sure the 14 circuit boards are all fully pushed into their sockets! Also be careful not to let any wires get accidentally jammed between plug-in boards and their sockets.

Turn on MS. Power switch is on back of power supply box on right rear of unit. Power supply pilot lamp should light up. The 6 LED digital readout displays on circuit board #14 (numbered from left) should light up.

Turn on VA. Power toggle switch is on rear. With camera on & connected, a video image should appear on the monitor. There should be six black crosshairs positioned somewhere on the image. Their X Y positions on the image can be adjusted using the 2 leftmost columns of pots on the front of the VA.

Raise gains on audio mixer. Sound should be heard (steady triangle waves slowly rising & falling in gain). If sound is broken up or
Music Synth instructions:
Notice controls on left side of unit... input selector switches A and B should both be on "input" when operating the piece, i.e. when MS is controlled by VA. (Positions 1 thru 6 of these switches are for internal checkout. See debugging instructions).

------------------------- Adjusting ----------------------------

The VA puts 6 crosshairs on the video image. Each puts out a varying voltage according to grey level. The voltage goes (via the cables) to the MS. To adjust MS's response to VA's voltages:

--- set red toggle switch on the left side of MS to "manual low" position.

--- Adjust voltage and offset knobs on VA (3rd row down, corresponding physically to the voltage output jacks on VA's rear so that, when corresponding crosshair goes from blackest to whitest area on the image, the MS LED display (on board #12) goes from 0 to 4.

--- do this with all six channels. Then return MS red toggle switch to "auto shift" position.

--- The switch marked Events Counter (select count) on left side of MS controls a long-term harmony-changing function.... Whenever a video input voltage changes enough to cause one of the harmonies to switch, a count is entered into an internal "events counter". After 8, 16, 24, 32 or 40 counts, the harmonies (as readable on the LED displays) are shifted between their 0-4 range and their 3-7 range. When the 3-7 range is selected the decimal point on the upper rightmost LED display is lit up. The red toggle switch must be in the "auto switch" position for this to happen.

--- adjust panning (there are variable pan controls on mixer) and bass & treble controls on sound system to get a nice full sound in the space. Volume should be moderate.

--- adjust video camera's view of the sky and position of crosshairs in a pleasing arrangement.

--- I'm sending this together with 1 page with a drawing. MS debugging instructions to follow (or hopefully they won't be needed).

--- if something is wrong in the MS, call me, David B, at 212-966-2943. Or FAX 212-966-1606.

--- if something is haywire on the VA, call Bob Diamond at 408-365-0305 or 408-224-1678 or FAX 408-629-1251.

Hope this is easy! Good luck & thanks!
POWER SUPPLY

[Diagram of a power supply circuit]

Current drawn at main output (red banana— all boards except display) = 240 mA

Current (avg) drawn by display board = 100 mA
2 May 1992

The Vasulkas, Inc.
Route 6, Box 100
Santa Fe, NM 87501

Dear Woody, Dear MaLin,

Enclosed are various materials for Ars Electronica. I've included photos, diagrams, statements etc (numbered 1-24 with captions) as well as a history and bios for all artists. If you need any further information on these materials please contact me immediately. David is separately sending tech info to David Muller by Fax.

Please credit at all times as follows:
The correct title of Piece is CLOUD MUSIC, 1974-79 by Robert Watts, David Behrman and Bob Diamond.
It is lent courtesy of The Robert Watts Studio Archive, Sara Seagull and Larry Miller in collaboration with David Behrman and Bob Diamond.

Woody and MaLin – PLEASE SEND US THE OFFICIAL LOAN FORMS A.S.A.P. In all of our dealings with institutions this has been a detail that has always been tended to. I know that Ars Electronica is being slow with you, but please be aware that this is a standard that protects artists and their works.

As you know, we are happy to be included in Ars Electronica. We would very much like to receive copies of all catalog materials, schedules, program notes etc. We'll be available for your tech people if problems arise in set-up. So, please keep us informed of your progress and of course, good luck with all.

Best,
Sara
CLOUD MUSIC
Robert Watts, David Behrman and Bob Diamond

Cloud Music was an installation developed collaboratively by the three artists during the years 1974 to 1979. It consists of a video camera (black & White 1974-78, color thereafter), which scans the sky; a video analyzer, which senses the changes in light produced by passing clouds; and a home-made electronic sound synthesizer, which responds musically to the passage of clouds overhead.

Technical Description

The signal from the color video camera is passed into the video analyzer. The video analyzer generates six crosshairs (graphic elements) which can be manually positioned anywhere on the color video screen.

At each cross hair center point, the video analyzer reads the instantaneous grey scale produced by the sky as seen by the video camera. The analyzer translates the grey scale value into an analog voltage. This analog voltage is fed to the music synthesizer. There are six of these analog voltages, one for each crosshair center point.

The music synthesizer uses the six control voltages to produce harmonic chord changes in a set of 18 digital oscillators. The music synthesizer also reacts to the overall rate of change from moment to moment; a stormy, fast-moving cloud-scape will produce a musical environment distinguishable from that produced by a calm sky with few clouds.

Exhibition History

1977 The Annual, San Francisco Art Institute at Fort Mason, California
1981 New Music America '81 Festival, San Francisco, California.
CLOUD MUSIC / Bob Watts, David Behrman, Bob Diamond

FACT SHEET FOR ARS ELECTRONICA 1992

COMPONENTS OF THE INSTALLATION

EQUIPMENT TO BE SENT

VIDEO ANALYZER
MUSIC SYNTHESIZER
AUDIO MIXER
VIDEO CAMERA *
VIDEO CAMERA SUPPLY
CABLES AND ADAPTORS

* Quality of camera to be reviewed in Iowa City. Alternate camera could be needed.

INSTALLATION REQUIREMENTS

4-CHANNEL SOUND SYSTEM (2-stereo amps plus 4 speakers)
1 to 3 VIDEO MONITORS @ 19" - 23" Size (B&W T&E)
WINDOW ACCESS OR SKYLIGHT WITHIN 100 FEET, to provide unobstructed view of sky
CAMERA MOUNT FOR SKY VIEW (Tripod or other, depends on architecture)

SHIPPING COMPONENTS:

<table>
<thead>
<tr>
<th>CASE</th>
<th>Dimensions (inches)</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASE 1. Music synthesizer</td>
<td>23x11x19</td>
<td>22</td>
</tr>
<tr>
<td>CASE 2. Video analyzer</td>
<td>21x15x19</td>
<td>35</td>
</tr>
<tr>
<td>CASE 3. Audio mixer, cables, video camera</td>
<td>30x18x10</td>
<td>+/-33</td>
</tr>
</tbody>
</table>

[ total wt. +/- 90 lbs ]

INSURANCE VALUE: FOR INTERNATIONAL SHIPMENT (IOWA +/- VIENNA) ....... $ 35,000
Dear Woody,

Thank you for your call this morning. As a result, David and I have quickly compiled these factsheets for you, and we hope they will simplify our next steps together.

I've enclosed installation fact sheet and history / summary of the piece.

Also, I can arrange the shipping with art movers that I've used previously. They need a 15 day billing procedure for their charges, but they are the best price I've found after 5 phone calls. Since that would be an expense that the festival should cover can MaLin oversee that with me?

Please call us as soon as you can have time to review all.

Best,

Sara

P.S. Can you please also put/send info on the phantoms & other program section you mentioned this AM?
CLOUD MUSIC / Bob Watts, David Behrman, Bob Diamond

FACT SHEET FOR ARS ELECTRONICA 1992

COMPONENTS OF THE INSTALLATION

EQUIPMENT TO BE SENT
- VIDEO ANALYZER
- MUSIC SYNTHESIZER
- AUDIO MIXER
- VIDEO CAMERA *
- VIDEO CAMERA SUPPLY
- CABLES AND ADAPTORS

* Quality of camera to be reviewed in Iowa City. Alternate camera could be needed.

INSTALLATION REQUIREMENTS
- 4-CHANNEL SOUND SYSTEM (2-stereo amps plus 4 speakers)
- 1 to 3 VIDEO MONITORS @ 19" - 23" Size (B&WTE)
- WINDOW ACCESS OR SKYLIGHT WITHIN 100 FEET, to provide unobstructed view of sky
- CAMERA MOUNT FOR SKY VIEW (Tripod or other, depends on architecture)

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</tr>
</tbody>
</table>

**New Case needed, see below

[ total wt. +/- 90 lbs ]

INSURANCE VALUE:
- FOR DOMESTIC SHIPPING (NYC +/- IOWA) $20,000
- FOR INTERNATIONAL SHIPMENT (IOWA +/- VIENNA) $35,000

ESTIMATED EXPENSES:
- Restoration, reconstruction, payable to David Behrman $300.00
- New Parts, reconstruction expenses, reimbursable to David Behrman 120.00
- Administrative, office, photolab (payable to Robert Watts Studio Archive) $750.00
- Consultations (payable to Bob Diamond) 100.00

[ Expenses subtotal $935.00 ]

ESTIMATED SHIPPING COSTS - NYC +/- IOWA CITY (ARS ELECTRONICA/ASULKA COVERS INSURANCE)
- Art Movers Quotes: 3 days / air @ $230
- 10 days / truck @ $175

No. American Van Lines (high value product rates) Minimum is $530 for 500 lbs.
Cloud Music was an installation developed collaboratively by the three artists during the years 1974 to 1979. It consists of a video camera (black & White 1974-78, color thereafter), which scans the sky; a video analyzer, which senses the changes in light produced by passing clouds; and a home-made electronic sound synthesizer, which responds musically to the passage of clouds overhead.

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Exhibition History


1977 The Annual, San Francisco Art Institute at Fort Mason, California


1981 New Music America '81 Festival, San Francisco, California.
Hi Woody & Malin,

About video camera & audio mixer & your fax to Sara April 15 —

The video camera is ordinary so we can forego sending it & entrust ourselves to your Camera Pile.

The audio mixer is ordinary too, except that 4-channel-output mixers with pannable inputs are hard to find these days in the small & inexpensive realm.

It is a Teac Model 2 circa early '80s.

Cloud Music requires exactly that, when it is well-installed with a 4 loudspeakers sound system, it needs its 6 outputs panned around the 4 channels, & tuned to the space.

Of course the Austhons could supply such a mixer, but will they?

If answer is yes, we can forego sending Case # 3. (See our [Sara's] Fact Sheet).

Also ... when is the latest possible date you need to receive the piece in Iowa?

All the best, David

CC Sara Seagull
Tuesday  212 - 966 - 1606

Dear Woody,

Funny, Bob Diamond was always easy to reach, but haven’t tried lately....
here’s what I have:

  home  408 - 224 - 1678
  work   629 - 1251  FAX
  alt. work  365 - 0305  best for reaching.

  address is  7109 Via Carmela
                   San Jose CA  95139

his company is called.... Imagine That.
  That's good. Imagine that. His nice wife’s called Pat.

Alas, it was too brief, your & Steina’s visit to NYC
(but better than nothing!) Happy retroactive Birthday to
Steina! Yes, let’s meet in India. Let me
know if you have problems with [lightning].

--- I just got a (used) Mac II ci with color
monitor & lots of music software..... Fun in late middle
age!  XXX  David B

Those spherical shapes were bewitching
Hi Woody & Malin,

Have you resolved all matters for the CLOUD PIECE? As of your fax on Friday (4.10) you listed it in Phantom list, but wrote that we should proceed with shipping by truck.

If we are to send by truck then we have to arrange all a.s.a.p. because David is leaving town again soon, let's resolve.

I'll be in and out today, but fax back or leave message. Thanks, Sara
Dear Sara and David,

Thank you for all of your communiques. We apologize that we have been unable to give you more assurances. Please realize that Linz has provided a very limited and fixed budget. We are pleased that you have had so much interest in the "Pioneers" exhibition and thought that you shared our desire to dust off the CLOUD MUSIC for the installation. We confirm a $300 administrative budget for the archives of Bob Watts. Woody has also committed other funds directly to David Behrman for the restoration. However, we have exhausted our funds for shipping and need a firm estimate from you to see if we can squeeze the money out of this turnip to ship the components to Iowa City. We would also like to know if there is a need for Bob Diamond's participation. So, please give us a complete estimate of the costs and we will try very seriously to pull it off. From the point of view of ARS ELECTRONICA they have already committed money for the museum designers of the installation, the shipping and insurance to Europe and the catalogue. We hope that CLOUD MUSIC can be included in the exhibition, but if the shipping is too high it may be impossible.

Please talk to Woody if you have questions.

Malin Wilson
April 7

Dear Woody,

Thanks for your phone message yesterday.

Before we get into details about "Cloud Music" documentation, Sara & I need to know whether the piece itself is going to line or whether just the concept (photos, videotape etc.) is going instead....

If the piece is to go, we have to know what the festival can offer in terms of shipping, insurance & fee .... Sara has sent you several faxes & made several phone calls ... could you communicate with her?

"Cloud Music" is not just my own piece, it's a 3-way partnership and Sara & I have agreed to split up the work needed to prepare it for possible showings. That includes getting it into shape techwise (which I'm attempting to do) and handling needed arrangements with the outside world (which she's doing).

Please don't misunderstand - we're all thrilled & excited that you and Steina are interested in bringing the piece to Linc and we hope it can happen. If only a videotape and photos + drawings can go we'd be happy about that too. X X X David ---
Dear Woody and MaLin,

I spoke with David immediately after our phone conversation today, and we both are trying to figure out what to do about the Cloud Music. It seems to us that even the $300. that you mention for shipping couldn't cover shipping and the new travelling case needed.

We offer two alternate solutions, since we of course feel that Cloud Music does belong in your exhibition:

Is it possible for me to fax or write to the organizers of Ars Electronica with a description of the piece, its history and its necessary resurrection steps - time/labor/testing/new parts situation? Perhaps they can re-budget some other area of their funding for a small support payment to us and enough money to cover shipping properly? (By the way, we hear everywhere stories of no support money, so it's not that we are naive or unaware of the recessionills)

Otherwise, we have an idea that a video tape from previous exhibits could be sent and installed in a simple monitor set-up. We could additionally send exhibition-size photos of its historical installation, brief artists' statement and black and white photostats of the early schematics. This would be easier/cheaper to ship.

What do you think??? Please advise.

Best,

Sara
Dear MaLin,

I am preparing to send you the packing list today, and also the insurance values that we have arrived at. (U.S. and international) This should all follow a.s.a.p.

I am first responding to your letter of 24 March because we are hoping to also confirm all loan and agreement forms with you before any shipments. As far as we have already gotten, I'd like to reiterate that we are extremely happy to participate in Ars Electronica.

Based upon my very first conversation with Woody, it was my understanding that there would be approximately $1000 to cover fees to David Behrman, Bob Diamond and the Robert Watts Estate, as well as probably $700 for restoration and packing expenses. Initially, Woody told me that the funds were limited, but that he understood that our expenses and a certain minimal time and office expenses would be involved.

However, you must understand that we have no means of supporting our efforts to be ready and to coordinate the equipment and materials. I'm sure you understand the logistics of storage, resurrection, testing time and the purchasing of parts-needed that David and I are already embarked upon. I wonder if you can confirm that either Vasulka, Inc. or Ars Electronica Festival will be able to support us with payments as above.

Let's please discuss this a.s.a.p. by phone. Can you call me or fax back?

Best,

Sara
Dear Sara,

4/1/92

Thank you for your fax. We would love to give you the funds you seek, and feel that you deserve that much and more. Please be assured however, that for the Vasulkas this exhibition is a labor of love with - no profit going to them. Woody’s aim is to recognize significant contributions to the origins of the electronic image. We wish that it were otherwise. The only figure Woody ever gave me was $300, the amount I mentioned in my letter of March 24. In addition we offered our technician’s services, and the personal shipping attention by Woody’ nephew, and inclusion in the exhibition. We would anticipate that the attention brought to CLOUD MUSIC and its restoration would give you the potential to receive reasonable fees under more normal conditions. We regret that we are in a position to beg from the participants, but we are.

Regards,

[Signature]
Thurs -- 212-966-1606

Hi Woody!

Thanks for the fax.

Here's the story for today. "Cloud Music" is set up & working...

But I am in the midst of repair of a broken LED-readout on the music box.

This has required the heating up of the old soldering iron.... and 2 trips to the old electronics store on Canal St....

I have to sort of "inspect" the thing carefully, channel by channel, but so far it seems to be ok & happening. Also I'll check the packing situation...

Probably the video unit can go to Iowa right away * (that's the biggest of 3 cases). If I can do this little repair on the music box, then it too can go immediately, but if I feel things up then I should keep it & send it to Iowa separately. I'll have to talk to you about how secure they should be...

So more follows in a day or 2!...

Love, David (Thursday Eve),

P.S. also it is dirty.

* because David Muller & Bob Diamond can surely give it the go-over better than I can...

Hi Steina!

P.P.S. I had a nice talk with Bob Diamond, who appears to be enthusiastic about this happening.
Dear Sara, David, & Bob,

We want to thank you for considering our request to lend the CLOUD MUSIC Installation to the exhibition that we are curating for the ARS ELECTRONICA Festival in Linz, Austria. As per Sara’s request I am sending a copy of a letter that confirms the Austrian’s intention to return the instruments to the owners after the exhibition. As I have indicated to Sara we are still waiting for loan papers from them.

As to Sara’s other concerns: restoration and packing. Regarding the restoration, we have a technician dedicated to this project—David Muller, of both the Physics and Music Departments at the University of Iowa. He will be preparing all of the equipment for the exhibition and be on site in Germany for the installation and during the exhibition, as will the Vasulkas. The Vasulkas and David Muller will oversee all handling of the equipment. Although we cannot offer you a fee for the installation we can offer David’s expertise and services, as well as inclusion in this international festival, with a full color catalogue.

In addition to highly skilled technical restoration, we are offering very personal shipping attention. As I mentioned, Woody’s nephew, Pavel Skryja, will be driving a rental van, leaving Santa Fe on Wednesday, March 25th, with a possible pick-up in Manhattan on Saturday, March 28th. If you are interested, we are hoping that this will not be too inconvenient for you.

If you are unable to pass the machine onto Pavel/Woody has only a small budget of $300 available for restoration and packing the machine.

However, in addition to confirming the loan, I also need basic information for our insurance—approximate size, weight and an insurance value. For your convenience, I have enclosed a packing sheet for you to return or fax to us with this preliminary information. As I have indicated above, ARS ELECTRONICA has promised to return the CLOUD MUSIC to you soon after the end of the exhibition.
Please note that I need two different Insurance Replacement Values. For shipment within the U.S., and for the shipment to Austria after David Muller has completely reviewed the instrument, and restored it. As certified appraiser with the American Society of Appraiser, in Fine Arts, it is my opinion that for shipment to Austria CLOUD MUSIC should be valued at a higher rate based upon following characteristics - full restoration, inclusion in a highly regarded international festival, and documentation in the museum exhibition catalogue.

Please be assured that from March 28, 1992 until May 4, 1992 CLOUD MUSIC will be insured on the Vasulkas, Inc. policy, Charter Insurance when we receive an apposite amount from you.

ARS ELECTRONICA is shipping the bulk of the exhibition, May 4th from David Muller's workshop in Iowa City. I am assuming that you will want CLOUD MUSIC returned to Sara Seagull.

I will send the information for the loan to ARS ELECTRONICA this week and they should be sending you loan forms.

Also enclosed is a more narrative description of the exhibition that we completed last week.

I realize that there is very little time for you to make decisions, and I am faxing this to Sara and Bob today, with original si sent by mail. We, too, have been in the same position with ARS ELECTRONICA, and are doing the best possible under the circumstances. We look forward to hearing from you.

Regards,

MaLin Wilson
Coordinator

Faxed cc: Sara Seagull & David Behrman c/o Sara Seagull
Bob Diamond
Dear Sara,

April 15, 1992

You did not hear from me as promised because Woody has been delayed in San Francisco. I wanted to be thorough in my response. I also wanted to send you a check on Monday but Woody has the check book! I do have a question about the Case 3 contents. We have many cameras in Iowa that have been refurbished and are in excellent working condition. Attached is our insurance photo of the heap of cameras! Is the audio mixer a custom piece of equipment? If the audio mixer is standard the Austrians should be able to provide it. Woody should be here tomorrow and we can write you and David Behrman checks. By all means proceed with the shipping arrangements. Thank you for the history and description.

Regeards,

[Signature]
Dear Sara,

April 22, 1992

David Muller is the name of the engineer who is receiving the ARS ELECTRONICA instruments works in Iowa City. I would suggest that the air freight company call him to arrange delivery, as both he and his wife work full time.

David Muller
Department of Physics
University of Iowa
Tel: 319/337-4962
Fax: 319/335-1753
Home: 319/335-2076

I continue to beg ARS ELECTRONICA for loan forms. I am faxing the letter that confirms their intention to insure and ship your equipment. As I stated in my letter of March 24, the Vasulkas Inc. will insure CLOUD MUSIC portal to portal, i.e. from New York to Iowa City, through their policy with Charter Insurance of Albuquerque for the amount of $20,000 and ARS ELECTRONICA will insure it for $35,000. Please inform us of the shipping dates so that we can activate the insurance coverage. All equipment will be packed for international air shipment under the supervision of Woody Vasulka in Iowa City. The shipment will be air freight to Austria and it can take up to two weeks to clear customs. ARS ELECTRONICA is handling this. Woody Vasulka and David Muller will meet the shipment at the LANDESMUSEUM - MUSEUM FRANCISCO CAROLINUM in Linz. The exhibition opens June 21, and continues through July 5. On July 8 & 9 Woody Vasulka
and David Muller will repack CLOUD MUSIC. It will be returned directly to you in New York. I am assuming that the shipping company is registering the equipment with U.S. customs for the return. I am currently working with the shipping company. The Vasulkas, Inc. will inform both ARS ELECTRONICA & the shipping company of the value and the return address.

As to the package of documentation please send us any good photos. They will be returned so you can send photos. Xerox is OK for drawings if they are strong and clear. I'm also faxing stuff from the Experimental Television Center about "CLOUDMETRICS." What title do you want to use?

Hope this is what you need.

Regards,

MaLin