

# 4

Notes

starting 10/11/77



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### COMPOSITION BOOK

60 SHEETS - 10 $\frac{1}{4}$ " IN. x 7 $\frac{7}{8}$ " IN.

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09-9142	11 $\frac{1}{32}$ " WIDE RULED - NO MARGIN
09-9144	9 $\frac{3}{32}$ " COLLEGE RULED - 1 $\frac{1}{4}$ " MARGIN
09-9148	QUAD. RULED 5 SQS. TO INCH
09-9146	PLAIN
09-9140	11 $\frac{1}{32}$ " WIDE RULED - 1 $\frac{1}{4}$ " MARGIN

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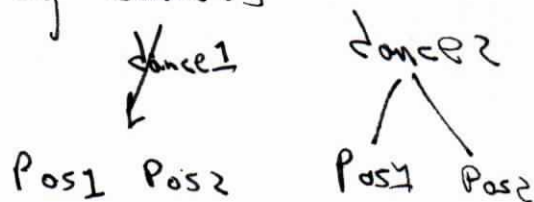
10/11 Dance (of course)

Need to work on the fill prog.  
To do rot based interpolation.

---

Should create a Library maintenance system  
filled with all those wonderful positions

Lib can be structured by dances



Also want ~~an~~ a movement library  
which could synthesize a movement  
it has all by positions and refinements and timings  
structure could also be organized by dances  
and also individual movement (ie walking)

Basically the movements are a convenient way  
of grouping together commonly used positions.

---

Need simultaneous viewpoints and a better  
way of moving viewpoints

Make more help routines  
for refining routine

10/12

Refiner

~~MemIndex~~ Indexes  
Stacker  
Movsphere

Body[1;] R Finder Body[2;]  
Intrefine

~~Vertex~~ R Finder ~~Order~~ In R Finder

A ← ~~Order~~ [1; 2 3 4]

B ← ~~Vertex~~ [1; 2 3 4]

B must be the vertex

---

In Fill

Angre ... ..

RotLineMat [count;] ← ~~Angf~~  
~~LI~~ < 1



Ask for inting. Get # of int

Scan for

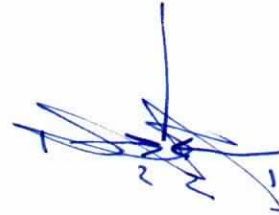
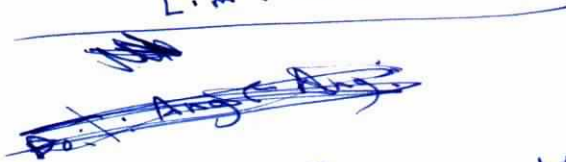
Given RotLineMat and AngVec

Scan down body

First do the move

AngVec ← AngVec + intro

Lim ← intro



Body [Index of ~~Body~~ + 1] ← Body [Index of ~~Body~~ (count + 1)] Rot Ang  
- 1 + 2 \* count

Loop: → (0 ≠ AngVec[count]) / Do it  
→ (1 < count < count + 1) / Do it

Do it Body [count ... ]  
→ (Lim > Lim count + 1) / Body

~~Temp~~  $\leftarrow$  ~~base~~  
~~Lim Counter~~  $\leftarrow$  1  
Angvec  $\leftarrow$  Angvec  $\div$  i  $\leftarrow$  no  
cov

~~Begin~~  
Begin     count  $\leftarrow$  1

Loop:  $\rightarrow$  (~~0~~  $\neq$  Angvec[count]) / Do:it  
 $\rightarrow$  ( $18 \geq$  count  $\leftarrow$  count + 1) / Loop

Do:it: Index  $\leftarrow$  -1 + 2 x count  
Body

vec[count], RotLimMat[count;]

$\Rightarrow$  ( $Intno \geq$  Limcount  $\leftarrow$  Limcount + 1) / Begin

~~Temp~~  
~~Mat~~

~~Temp~~ [Index, (Index + 1);]  $\leftarrow$  ~~Temp~~ [Index, (Index + 1);] Rot Angvec[count] Rot [cont;]

28-29

Does 29 point r. 28 → 30

$$\text{MAT 1}[\text{Index-1}, \text{Index};] \leftarrow \text{MAT 1}[\text{Index-1}, \text{Index};] \text{ Rot}$$

if Ang<sup>vec</sup><sub>vec</sub> is a CA RA<sup>2</sup>  
 0 0 0 0 0 9 0 9 0 9 0 0 0  
 ↑  
 counter is 6

Index is 11

Are Anger indexes  
in right spots

Anger from Morevec



Game for computer

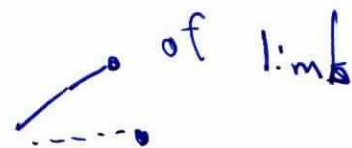
High

// scrabble //

symbols (letters of key Board shown by hovering shadow)

For 3D use real curve This would look better than  
~~rectangle~~ and put data in file pulled out  
in computation puts away

<loth as ~~outline~~ of outlines



for multiple viewpoint of screen make direction input  
directly by maybe picking from ~~listed~~ # as input data.

for graphs at mobile make letters ~~movable~~ movable all  
over screen not "graphics wise" but by LF & spacings

make 3D stat charts

<.loth

ribs of cloth can always stay with motion of  
ends. 13th outdot and a rib. next outdot wouldn't  
have a rib assigned ~~with~~ index is matched with  
vector holding position of ribs on all cloth's edge  
(outdots)

sound around path of dia sphere 27 rings

---

Silver leaf Scus on plastic as base of sculptures  
could spray with enamel D, protect from chipping

---

Mix together synthesizer sounds and Votrax  
for ~~the~~ watts

10/13

~~Angle~~

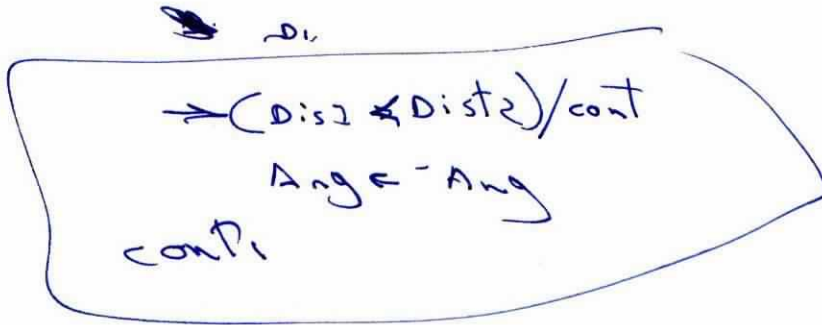
$$\text{Temp} = (\text{Angle} \neq 0) / \rho \text{Angle}$$

$$\text{Angle} \left[ -1 + ((\text{Angle} \neq 0) / \rho \text{Angle}) \right] \leftarrow \text{Angle}$$

~~Temp~~ Angle

$$(\text{Angle} \neq 0) / \text{Angle}$$

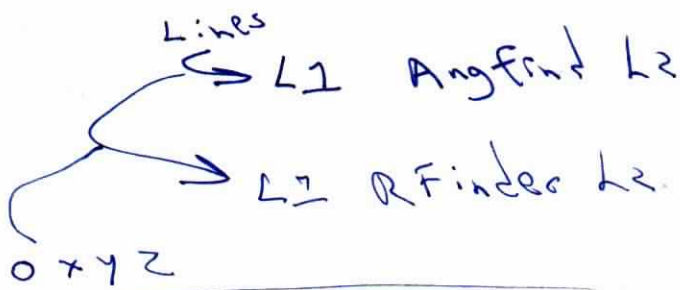
$$\text{Angle} \left[ ((\text{Angle} \neq 0) / \rho \text{Angle}) \right] \leftarrow \text{Angle}$$



??

Dis Line





RL:R  
 483 299 0  
 same 483 294 3066  
 at end as in middle of a full run

Angvec  
 0 0 0 9 0 9 0 9 0 0 0 0

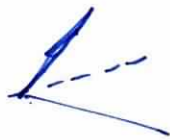
Rotline mat  
 2 4 6 8 10 12 16

problem  
 with  
 Angvec [1 + 18]  
 Hz & RF

~~PT~~ ~~PT~~  $PT \leftarrow Mat1[IndexB, IndexB + j]$

Dis PT  
 Dist2  $\leftarrow Di$

More may be fucken



$PT \leftarrow Mat1[IndexB + j, 234], [1] Mat2[IndexB + j, 131]$   
 Dis PT  
 Dist2  $\leftarrow Di$   
~~PT~~  $PT \leftarrow Rot Angvec[counter], Rotline mat[counter + j]$   
~~PT~~  $PT \leftarrow Mat1[IndexB + j]$

$PT \leftarrow PT [13234]$   
 Dis PT  
 Dist2  $\leftarrow Di$   
 $(Dist2 < Dist1) / con$   
 $\rightarrow Angvec[counter] \leftarrow Angvec[counter + 1]$   
 cont:

(23) Rollment [count?] ← RLine

For group movement

need ~~all~~ <sup>correct</sup> slots (3 for leg or arm)

filled in Angue

Angue get indexed from mover

Mover ← Mover [1 + 2 \* 8]

Mover is not indexing right.

reason Anuec ~~indexing~~ was fucked was cause

Mover should be count + 1

or  
count - 1

Mover should look for endpoint to be moved

ie count count up  
and only even #'s

Do it:

$\rightarrow (1 \text{ if } \text{Flag} \leftarrow \text{Flag} + 1) / \text{cont.}$

Given Angvec

Angvec is

0 0 0 0 0 0 0 0 0 0 0 0 9 0 9 0 9

So you rot the 14 16 & 18th bps

~~(Angvec != 0) / ~~SP~~ Angvec~~

(Angvec != 0) / ~~Ang~~  
SP Angvec

make a stack of 14 16 18th bps

F Stack  $\leftarrow$  ~~(Angvec != 0) / SP Angvec~~

Mat 1 [(Angvec != 0) / SP Angvec], (1 + (Angvec != 0) / SP Angvec)

14 16 18

13 15 17



E Stack  $\leftarrow$  Mat 1 [(Angvec != 0) / SP Angvec];

O Stack  $\leftarrow$  Mat 1 ~~(Angvec != 0) / SP Angvec~~ [-1 + (Angvec != 0) / SP Angvec];



In stacks

when checking for Ang sign must do it for each by position

So for each index position  $\neq 0$  in Angvec  
Do a check by using ptr taken from stacks  
use EStack

Compare distances of EStack To Matr

A code To ~~do~~ check if Angles are correct sign  
if not change sign. Only do this once  
count  $\leftarrow 1$

Loop  $\rightarrow$  (Angvec[count]  $\neq 0$ ) / Does  
 $\rightarrow$  (18  $\geq$  count  $\leftarrow$  count + 1) / Loop

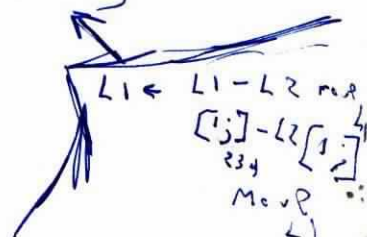
ver))) ]

Does: sindex  $\leftarrow$  sindex + 1

sIndex must be initialized To 0

Line  $\leftarrow$  4 P EStack[sindex;], Matr[count;]  
 Dis Line  
 Dist1  $\leftarrow$  ~~Di~~  $\leftarrow$   $\left\{ \begin{array}{l} L1 \leftarrow \text{EStack[sindex;]} \\ L2 \leftarrow \text{Matr}[1 + \text{count;}] \end{array} \right.$  EStack[sindex;]  
 Line  $\leftarrow$  Line Rot Angvec[count;], Rline  
 Dis Line  
 Dist2  $\leftarrow$  ~~Di~~

over



→ (Dist1 < Dist2) / continue

Angle[Count] ← -Angle[Count]

continue → (4 ≥ Count ← Count + 1) / Rotshit  
~~Continue~~ → Loop

// Now The Angles are ok so we do the rotations now  
This is done Intra of Times

Rotshit:

~~Rotshit~~  
RCount ← 1  
~~RIndex ← 0~~

checkers: → (0 ≠ Angle[RCount]) / Do Rot

→ (18 ≥ RCount ← RCount + 1) /

Do Rot: ~~RIndex ← RIndex + 1~~  
RIndex ← RIndex + 1

Initialize RIndex

LL1 ← ~~2 x RCount~~  
2 x RCount, EStack[RIndex];

LL2 ← 2 x RCount, EStack[RIndex];

LL1 Rot LL2

Mat1[-1 + 2 x RCount, (2 x RCount);] ← Mat1[-1 + 2 x RCount, (2 x RCount);]

Rot Angle[RCount], RLint

Body ← Mat1

Nextrot

Attack

Mat1 ← Body

→ (18 ≥ RCount ← RCount + 1) / checkers

Draw Body

→ (Intro = Limcount ← Limcount+1) / Rotshift

Limcount initialized on top of whole program.

code to check Ang sign won't work  
without code for moving bases together to  
make a vertex // same for Rotshift //

In Doer

$L1 \leftarrow (L1[1; 2; 3; 4] - L2[1; 2; 3; 4])$  Move L1

Do this first thing in Doer  
Then check distances

— May need a move here

14 10/16

];]



$$P \text{ Angvec} \left[ \begin{matrix} \text{Angvec} \\ 10 \\ 2P \text{ Angvec} \end{matrix} \right] \leftarrow$$

14 16 18

$$- \text{Angvec} \left[ \begin{matrix} \text{Angvec} \\ 10 \\ 2P \text{ Angvec} \end{matrix} \right]$$

index  $\leftarrow$

$\begin{matrix} 4 & 8 \\ 4 & 7 \rightarrow 48 \\ 4 & 8 \rightarrow 49 \\ 4 & 9 \rightarrow 66 \end{matrix}$

2282

x2

10/19

~~Need a way of GOT THE V of !!!!!~~

~~Need a way of~~

Need a supplemental way of positioning bb's by rotations ~~at~~ around bp lines ie spine turning and twist of hand.

These rotations may have to be stored in a separate vector and then used to rotate the mapped images

BP ← BP rot, BPLine

Command could be called  
twist  
and you twist  $x^\circ$  either  
in or out

So

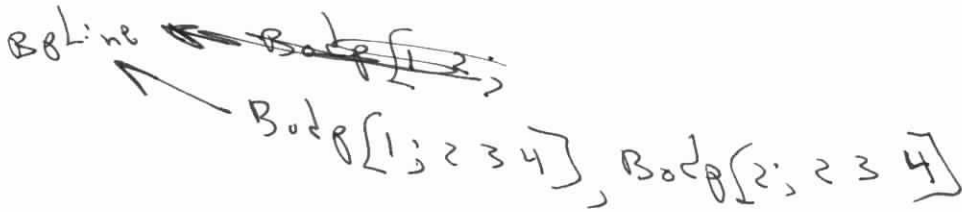
T

LL

45°

out

is an outward rotation  
or Turnout of Leg



↓ Bpnames [pointes [child ; ]], ← Body'

10/21

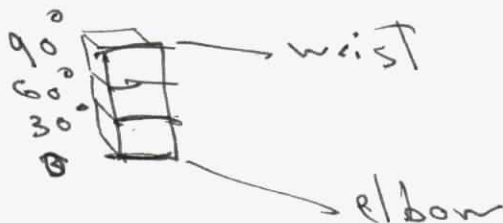
~~Start to work on a 3D man~~  
~~Make a twist command~~

For a realistic twist

keep base fixed and rotate top square  
max amount and then linearly down  
the line.

So if for example forearm made of  
4 squares connected

Then rotate top square wrist



LFA ~~is~~ skeletal line goes through center  
of ~~the~~ unit

~~the~~ rotations affect bp's in both directions  
i.e. wrist affects fa and hand.

For

10/22 control syst design set up of Seairight's (lights) use  
for TV special effect generators

---

10/23 From 10/22 walk

control lights by the tension in the muscles  
of a dancers movements. How do you extract  
the tension? By the position of the dancer and  
using the stuff the computerized Biomechanical Analysis co.  
does. Tension is a fraction of work. Work can be  
obtained by determining the forces the body is  
working against (gravity or another body...)  
Then after you have tension values, assign certain  
parts of body control values for lights, ~~and~~  
the more tension the brighter a light or <sup>louder</sup> sound  
The speed of movements could control rates  
of various pulses of lights or sounds. Ultimately  
this could be done in real time and then you  
would have individualized ~~lighting~~ lighting and music  
for each performance and dancer. The energy of  
the dancer and his/her style is then reflected



in the lighting and music.

---

Create shape on a screen dependent on the movement of the body. Certain positions could mean ~~color~~ colors or shapes in combination. Combinatorial Geometry could be used (synthavision) and certain pos would mean various combinations of a few basic shapes.

---

Use the hand as the ultimate 3D input device. By keeping track of finger positions <sup>\* tension</sup> change shape of objects or create ~~objects~~ objects.

To analyze positions of fingers on hand non-optically without use of fancy pattern-rec. progs. get pos. of fingers by ~~using~~ comparing fingers to a fixed pt on wrist. Hand could go in a glove all wired up. It would naturally be a left handed glove.

Back to reality



Set up a file system for the data prog.  
Just make the same as the openpi x fn and  
when naming a pos in Go open the file and put  
it in (Ask first.)

The fill routine work fine sometimes and  
lousy other times. It seems to be taking some  
inaccurate calculation and then magnifying it more  
and more for each intermediate position.  
Pain in the B's

Twist Routine (Int. rot) chold is from Binput

count ← 1

Lim ← + / pointers [chold;] ≠ 0

Doit: Body ← Bnames [pointers [chold; ~~count~~];]

Bpline ← Body [1; 234], Body [2; 234]

Body ← Body Rot Ang Bpline

Bnames [pointers [chold; count];] ← Body

→ (Lim ≥ count ← count + 1) / Doit

Body [(1 + 2xcount), (2xcount);] ← Body

Convert all pictures to binary and put the decoder  
in Draw

The decoder should check if binary or decimal

10/21 In order to move the ~~maps~~ maps with  
The bp's must determine the angle and  
Rotline to move about

So need to have a memory of where  
The bp came from and where it is

Almost Every Time Body is changed (just before) put  
that value of Body in a variable called Bodymem  
Then in Mapper determine Angles and Rotlines

Maybe able to use Makeover.

then apply Those angles & Rotlines To The Maps

Mapper

Need

will need a RedMap Routine.

~~count  
 BodyMem [count, (count+1)]  
 Body [count, (count+1)]  
 ...~~

A BodyMem for This

Pos1 ← BodyMem

Pos2 ← Body

~~Pos1~~  
Makeavee

? Does makeavee make RLinevee?

Doit

A Man have angles

~~count~~  
 Index count  
 Lmem ← BodyMem [Index count, (Index count+1)]  
 LTo ← Body [Index count, (Index count+1)]  
 LMem Rot LTo

~~Mapnames [count]~~ → Mapnames [count] Rot Angvec [count] RLine

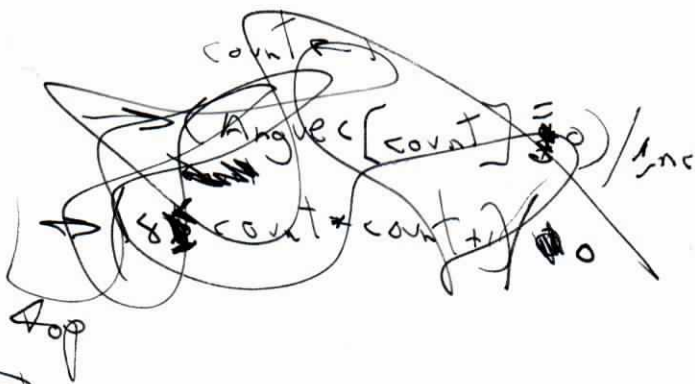
Mapnames [count] ← Mapnames [count] Rot Angvec [count]

→ (if count < count+1) / Doit

Display: Draw Mapnames [count]

→ (if count < count+1) / Display





~~loop~~ checker  $\rightarrow (Angles[count] \neq 0) / \text{Doit}$

$\rightarrow (18 \geq count \leq count + 1) / \text{next checker}$

Doit:  $Index \leftarrow count * 2$

Mapper; count, count, index; rot; Map2.  
 Map2 Pos1  $\leftarrow$  Body mem  
 Map2 Pos2  $\leftarrow$  Body  
 Makeave  
 count = 1

Angles is in the incremental form

checker:  $\rightarrow (Angles[count] \neq 0) / \text{Doit}$

$\rightarrow (18 \geq count \leq count + 1) / \text{checker}$

Doit:  $Index \leftarrow count * 2$

~~$Lmem \leftarrow Body mem [count, count + 1]$~~

~~$LDo \leftarrow Body [count, count + 1]$~~

$Lmem \leftarrow Body mem [I + Index, Index]$

$LDo \leftarrow Body [I + Index, Index]$

$Lmem Rot \leftarrow LDo$

$\neq Map names [count], \leftarrow, Map names [count], Rot Angles [count], \text{Rot}$

$\rightarrow (18 \geq \text{count} \leftarrow \text{count} + 1) / \text{checker}$   
 $\text{count} \leftarrow 1$

Display: Draw  $\Phi \text{Mapnames}[\text{count}_i]$

$\rightarrow (18 \geq \text{count} \leftarrow \text{count}_i + 1) / \text{display}$

$\Phi \text{Mapnames}[\text{count}_i] \leftarrow \text{Mapnames}[\text{count}_i]$

10/25

Housekeeping  
Erased - <sup>Fns</sup> check 26

Vals - A B D Actlim Bopart Bparts Bpoint  
(9)

count count2 counter ctest

DisAB DisAC Dist1 Dist2 Div  
(21)

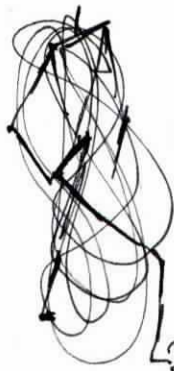
Down ~~E~~ Estack Fand Flag  
(5) (2) (0)

Hinp ID Inc IndexB  
(c) (2) (4) (37)

Intro Lcount  
(10) (2)

10/27

Intro to Nubian Lady 45 secs whole thing



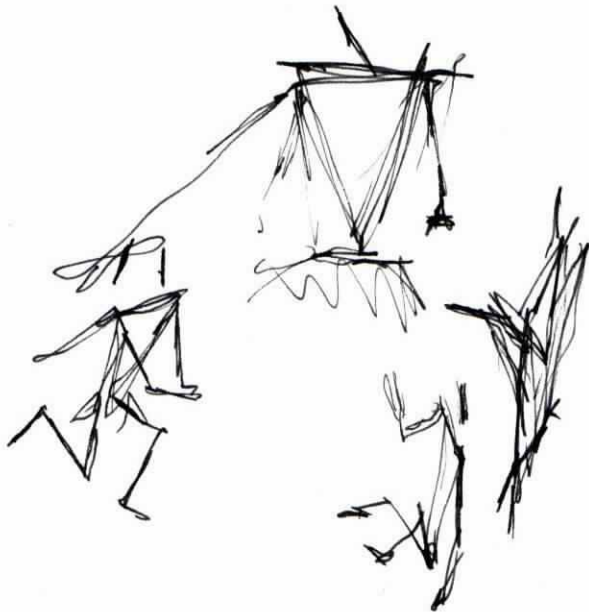
Need to be able to say refine  
right away without doing a pos fist

↳ Refiner

Do a Binput in ~~Binput~~

---

Put classical picture in computer stick figures  
and draw line to show (Teach) composition.





Make The Last Supper

Rape of Sabine Women

Tribute Money

The Discovery & Proving of The True Cross

353

David by Michaelangelo of ~~Bernini~~ Donatello - 302

The Dying Slave and rebellious slave

The Creation of Adam 352

The School of Athens - 303

Tintoretto - The last Supper  
559

Bologna - Rape of Sabine women - confirming without hid-lines  
374

Bernini - David - 410

10/31

45:07.16  
2:43:25

1/2

What can computers do that humans can't in the realm of an art context?

Quantity of information

Return of information (output)

Interactive works

A "painting" which reacts to the viewer's emotions. But not really a painting more like a video or some machine.

see notebook 2

4/10

Use a program ~~as~~ as the input for another program ... ad infinitum

The output is a program, which can either be hooked into (fed in) another program or be used to manipulate pictures when put into usable forms.

Deal with program in two forms  
one is algorithmic the other is executable  
and fully coded.

Give the algorithmic program a menu to  
choose from with classes ~~of~~  
things in the menu.

operator and operatee

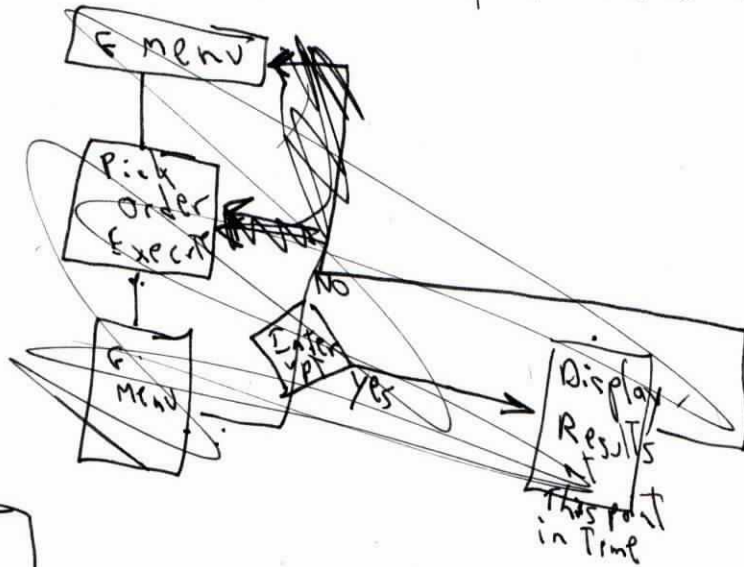


Menu consists of  
operators

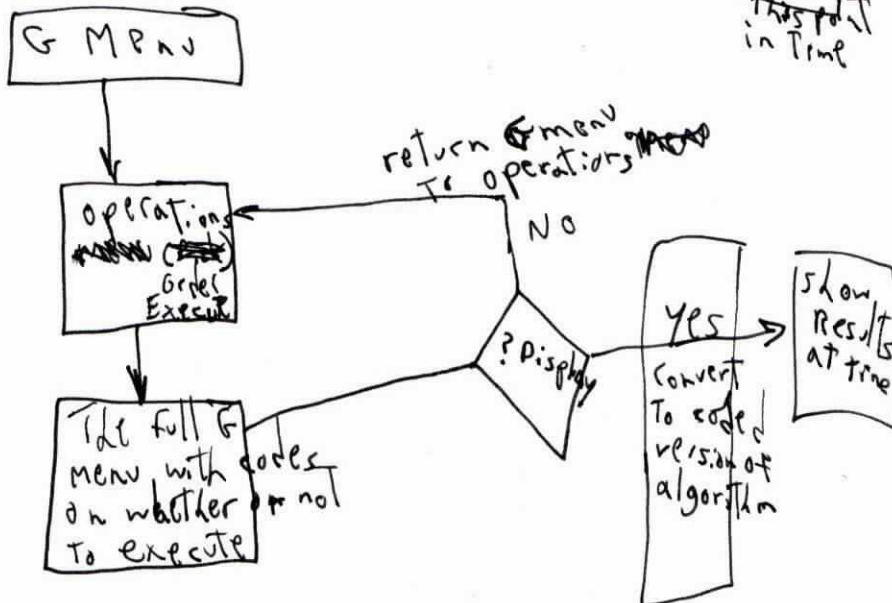


Start by Picking a random number ~~and~~ of operators  
 Then classify operators as mono or dy  
 and then put them in random order  
 Need a Menu of Things To do To The  
 Graphic menu.

~~Order~~  
 Order (Graphic Menu)  
 Execute (based on past state of execution)



Execute means  
 pick.





Print out ~~the~~ algorithmic program every time  
you cycle regardless of whether or  
not you display something

Also add looping to the operations

Plus ~~decisions of whether or not~~

Add a print pix numbers to F menu.

1/4

# Votrax Phonemes

A  
 A1  
 A2  
 AE  
 AE1  
 AH  
 AH1  
 AH2  
 AW  
 AW1+2  
 AY  
 B  
 CH  
 D  
 DT  
 E  
 E1  
 EH  
 EH1+2+3  
 ER  
 F  
 G  
 H  
 I  
 I1 2 3  
 IU  
 J  
 K

L  
 M  
 N  
 NE  
 O  
 O1 2  
 OO  
 OO1  
 P  
 PAO  
 PA1  
 R  
 S  
 SH  
 T  
 TH  
 THV  
 U  
 U1  
 VH  
 VH1  
 -UH2  
 W  
 W'



1/5

~~APhon~~

APhon ← A  
 A1  
 A2  
 AE  
 AE1  
 AH  
 AH2  
 Aw  
 Aw1  
 Aw2  
 Ay

JPhon ← J  
 KPhon ← K  
 LPhon ← L  
 MPhon ← M  
 N  
 NG

OPhon ← O  
 O1  
 O2  
 O01

BPhon ← B

CHPhon ← P  
 PA0  
 PA1

DPhon ← D  
 DT

EPhon ← E  
 E1  
 EH  
 EH1  
 EH2  
 EH3  
 ER

RPhon ← R  
 SPhon ← S  
 Sd  
 TPhon ← T  
 TH  
 THV

FPhon ← F

UPhon ← U  
 U1  
 UH1  
 UH2

HPhon ← H

IPhon ← I

WPhon ← W

I1  
 I2  
 I3  
 IU

check



P

When doing a

Phone [? X]

X is 1PP phone

Lim ← P string      Talk' ~~PAD~~ PAD'

PHT ← 1PTSTR

TSTR ← 1PTSTR

Phone ← 'PHT', 'PHON'

X ← 1PP phone

Say Phon [? X]

→ (Lim ≥ count ← count + 1) / Top

A	B	D	E	F	H	I	J	K	L	M	O	P
R	S	T	U	W								

Available phone

∇ Talk TSTR; X; count; Lim; PHT; Phon

Lim ← PTSTR  
count ← 1

Top: PHT ← 1PTSTR

TSTR ← 1PTSTR

Phone ← 'PHT', 'PHON'

X ← 1PP PHON

Say Phon [? X]

→ (Lim ≥ count ← count + 1) / Top

11/7

Bp's Est Lang

RHip got larger while refining 'Hig'

11/a Conf. as Medium,

what can the computer enable you to do that is not possible in any other medium?

what you are doing is participating in a structured interaction.

The program controls the dialogue of mind defines the interaction. These are ~~an~~ <sup>an</sup> infinity variety of types of interaction and because of this the kinds of artistic possibilities are also infinite. Up to now the interaction has always been undertaken with a specific purpose in mind... an end... such as the creation of a graphic work or musical piece. If one looks at the interaction as art then ~~one must~~ ~~the~~ ~~phenomenon~~ of computer games and game playing becomes much clearer.



It is the interaction which is stimulating. That is why people can sit for hours and play games or create graphics. This interaction must be made more significant than it is now. Artificial Intelligence has great implications for improving the interaction.

The ~~the~~ dialogue must be centered around some idea or goal or product. In game playing i.e. Star Trek the goal is to kill all the Klingons. In creating positions of a stick figure the goal is to create the position you find desirable. The interaction is disguised by ~~making you think~~ having the goal dominate. The problem is to make the interaction dominate, or at least seem substantial. Some kind of goal(s) is necessary otherwise nobody would sit down and do anything. The feedback received is the goal. Input is the users thoughts and responses. Output is the feedback. What goes on in between is the programs manipulations of input (your thoughts and resp)

~~De~~ Duchamp's statements of the creative process as being one where the artist perceives. Then takes these perceptions and through some artistic aesthetic equations (conscious or unconscious) a work of art is produced. Can this opinion be equated to the idea that perception is input - Juggling of perception in the mind is the program - and the work of art is the output. This is a very simplified view.

Nub n  
18

~~18~~  
19

use Nub 15 To make Nub as

11/10 ~~Let~~ Let the computer figure out the patch connections for the Fu and some of the dial positions

Osc 2  
# of output patches

1 → ~~4~~  
if a patch coming out of mixer (~~at~~ mflag)  
Then set mixer dial values of

each Jack in or out should have a flag associated with it as to its status of use.

1-0  
2-0  
3-0

control everything by switching flags on and off and making lists of possible places to go. Lot of Matrices!

Osc 2  
Mixout → can go to

Osc 2 11/2ct  
Osc 2 control  
VAC signing  
VAC cutoff freq  
DTG 1 or 2

control the frequency of Osc by picking High or low and

1 2 3 4 5

can control probabilities of picking where  
to go by repeating places in lists

ie  
cutoff  
DTE

UAC sig inf  
UAC sig inf

Osc 2 1/2 oct  
Osc 2 1/2 oct  
Osc 2 1/2 oct  
Osc 2 1/2 oct

} means a 50%  
chance of  
picking Osc 2 1/2 oct

control UAC Freq 1 2 3 4 5 or variable  
amp  
Q control

Bp shrink up in Fill  
not due to

$$L_2 \leftarrow (L_1 [ ] - L_2 [ ]) \dots \text{Move } L_2$$

or  
L1 Rot L2

problem is at

$$L_2 \leftarrow L_2 \text{ Rot Angue} [ \text{count} ], R \text{ line}$$

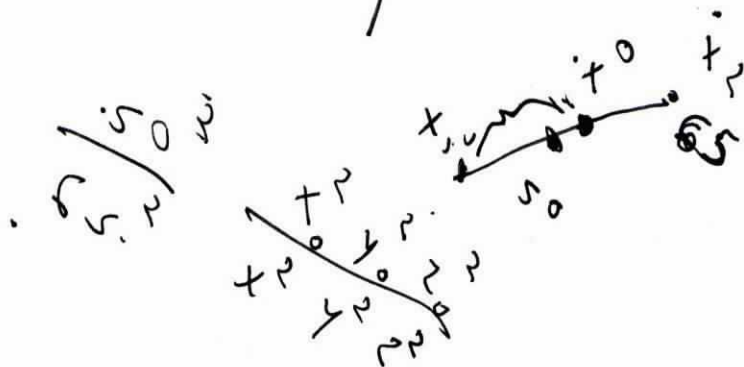
prob may be with dis fn

Dist L1; L1

$$\begin{aligned}
 & \left( (L_1 [1;2] - L_1 [2;1]) * 2 \right) + \left( (L_1 [1;3] - L_1 [2;3]) * 2 \right) \\
 & + \left( (L_1 [1;4] - L_1 [2;4]) * 2 \right) * \dots
 \end{aligned}$$

$$\text{oldsize} \leftarrow (\text{oldsize} = 0) \dots 10000001$$

New Dis  
Old





Line 2

$$(x_3 - x_1)$$

new  
old

$$x_3 - x_1$$

$$x_1 + \left( (x_3 - x_1) \cdot \frac{\text{New}}{\text{Old}} \right) = x_3$$

~~$x_3 - x_1$~~

$$x \leftarrow \text{Line}[1;2] + \left( (\text{Line}[2;2] - \text{Line}[1;2]) \cdot \text{Rat} \right)$$

$$y \leftarrow \text{Line}[1;3] + \left( (\text{Line}[2;3] - \text{Line}[1;3]) \cdot \text{Rat} \right)$$

z ←

$$\text{Line}[2;2;3;4] \leftarrow x, y, z$$

IT works!

He 48

LS - 54

RS - 51

RUA - 89

RFA - 75

RH - 21

RHiq - 28

~~LT - 103~~

LT - 103

LC - 78

LF - 35

SP - 163

---

The Body now moves like the human body does  
The arms and legs and all bp's Trace out arcs  
instead of straight line. This is done by  
simply keeping the lengths of the bp's constants  
within a linear interpolation (ANIMA)

change BAnima to Fill

and



Make syntax as follows

~~to~~  
R ← I Fill Pos ← □

This may allow you to enter  
Pos names without quotes

10 Fill Nub1/Nub2

[ ] I ← I ÷ I

For filming purposes let the  
number of filling positions be equivalent  
instead to seconds  
so

~~to~~ 3 Fill Nub1/Nub2

means take 3 seconds for  
the movements

set a Timeswitch ← ~~on~~  
' on ' |

also for filming  
go from 0 → .9

instead of 1  
do one less than ~~the~~ ~~the~~ ~~the~~ .50

The key frames are not drawn twice and mark  
 + Jump

change condition in Fill (new one) from

$$\rightarrow (1 \geq J \dots)$$

$$\rightarrow (1 > J \dots)$$

In Fill say  
 $\rightarrow (\text{Timeswitch} = 'on') / \text{Timeset}$

Top:  




$$\frac{\text{secs} \times \text{fps}}{18} = \frac{1}{36}$$

Timeset: Time ~~18~~ 18

$\rightarrow$  Top

Time FPS

Time FPS is # of seconds wanted and changed to Trans Incremental  
 FPS is frames per second film will be shown at  
 speed shot at is single frame

$$[1] \frac{1}{I} \leftarrow 1 \div \frac{1}{I} \times \text{FPS}$$

▽

n/n

$$I \leftarrow \left( \left( \text{switch} = 'on' \right), \left( \text{switch} = 'off' \right) \right) / \left( \frac{1}{I} \times \text{fps} \right) (I)$$

For E<sub>c</sub> control system  
 Mat of Names of all  
 Jmat

The # of the names  
 gives you a 1 or 0  
 1 means in use  
 0 means open

- Jmat
- 0sc1 M: x
  - 0sc1 s: n
  - 0sc1 sam
  - 0sc1 ram
  - 0sc1 tr:
  - 0sc1 IV
  - 0sc1 pwi
  - 0sc1 con

~~LP:  $\rightarrow (\#Jmat[\text{count}] = \phi) / \text{out}$   
 $\rightarrow (\text{line count} \times \text{count} + 1) / LP$~~



Inmat is list of all possible input - Jack

outmat - all output Jack

Inmat

Osc1 con

Osc1 pwi

UAF sig

UAF cct

UAF oct

DEG1in

DEG2in

Osc2 con

Osc2 pwi

LoF sig

VCA sig

VCA gai

Osc mix

sin

San

Tri

Ram

~~DEG out~~

DEG1out

DEG2U

UAF Hig

Ban

Low

Not

LoF out

Osc1

Osc2

UAF

VCA

DEG

Low Filter

$\rightarrow (\neq \text{outmat}[\text{count}] = 0) / \text{Do it}$

$\rightarrow (Lin \geq \text{count} \leftarrow \text{count} + 1) / Lp$

Do it: A decision where to put Jacks ~~from~~ from out  
by using index from outmat point to a map  
whose rows correspond to outs and  
cols to possible ins for that particular  
out

Points

outs order

possible in # corresponds to order of ~~ins~~ <sup>ins in</sup> ~~inmat~~

Osc 1 mix

Osc 1 sin

Osc 1 saw

Osc 1 ram

Osc 1 tri

Osc 1 pul

Osc 2 mix

Osc 2 sin

Osc 2 saw

Osc 2 ram

Osc 2 tri

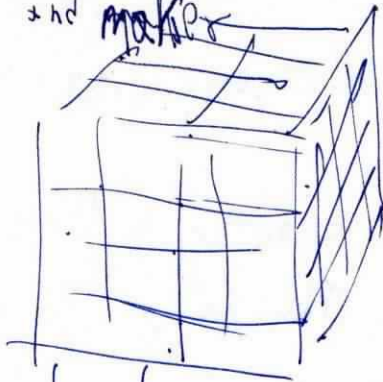
Osc 2 pul

UAF hig

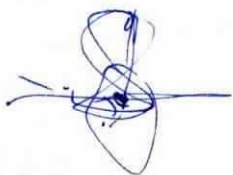
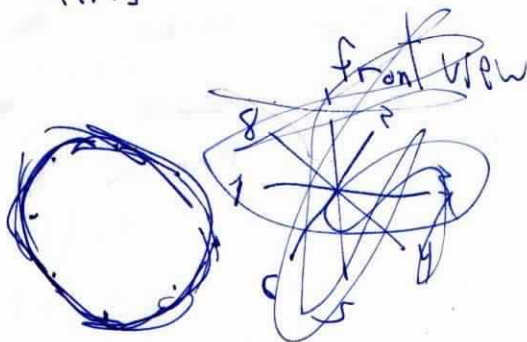
UAF low

UAF ban

4/12 need a path controller and make



Use sphere 27  
specific central point and radius



pick two points and central  
find line  $\perp$  and intersecting center  
find that angle and then ~~divide~~ divide by # of  
desired points and create the path  
only works perfectly for symmetrically  
equivalent points to center.

11/14

Define a scene as x units of time

specify a time range and  
the action to occur in it.

Limits	Verbs	<del>Parameters</del>	Nouns.
1-50	<del>None</del>	<del>None</del>	Body
	Banima	NVB1/Nvb2	

4 Banima 'Nvb1/Nvb2'  
 1 Banima 'Nvb2/Nvb3'  
 1 Nvb3/Nvb4'  
 1 Nvb4/Nvb5  
 .8 Nvb5/6  
 .8 Nvb6/7  
 .7 Nvb7/8  
 .9 Nvb8/10  
 1.5 Nvb10/Nvb10A  
 2.0 Nvb10A/Nvb11  
 18 Frames of Nvb11 still  
 .8 11/12  
 .7 12/13  
 .7 13/14  
 .7 14/15  
 .7 15/16

.6 16/17  
 .6 17/18  
 .6 18/65  
 .8 85/15  
 .8 15/85  
 .8 65/16  
 .8 16/17  
~~.....~~  
 .3 18/19  
 .3 19/20  
 .4 20/21  
 .7 21/22  
 .6 22/23  
 .6 23/24  
 .6 24/25  
 3.5 1/2  
 .9 2/3  
 .8 3/4  
 .7 4/5  
 .6 5/6  
 .6 6/7  
 .6 7/8  
 .7 8/10  
 1.2 10/10A

100 10A/11  
 4 Frames 11 still  
 1.2 11/12  
 .4 26/27  
 .4 27/28  
 .4 28/29  
 .4 29/30  
 .4 30/31  
 .4 31/32  
 .5 32/33  
 .5 33/34  
 .5 34/35

~~2~~ 3/0  
 2 3/0

43.9

2 in 10secs



Draw 3 Bodies  
and then pan around  
them moving

• while showing Nubl  
Go back to -2000

Reset By saying  
36 Do 'Foo' → Foo  
In -56  
Draw Nubl

Go To up 1000

Must reset between  
each one to avoid  
going over bodies

up

foo

~~Barima~~



inside Barima

50 up 27

Draw Pix



upvec ← ~~36 27~~

up ↑ upvec

upvec ← 1 φ upvec

Reyeset



upvec ← + 36 p27  
Reyeset

• 02778 Anima 'TNUBI/TSNUBI'

WS EYEBALL

~~'foo~~

~~Right 100~~

Look

Stand

Draw - 200 + 360 Move 5size Body

Draw • 200 + 300 Move 5size Body

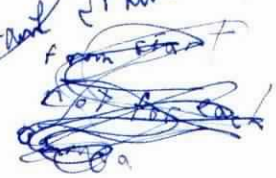
Right ~~100~~ 50

WS EYEBALL

1 Barima 'Nubi/Nube'

Take the ~~Anim~~ First Frame

drawn out



Path will be

~~972~~ 972 Light

radius 1000

center at ●

512 ~~390~~ 0

1362

78  
162

380:

2.2°

---

Light reading

5.2

, fig

8.2

2 fig

7.1

with Floor

11/16

Movie

1 straight run through  
Then

1 Banima 'Last / Nub1'

Load Eyeball  
Reset

02778 Anima 'INubi / TSNUbi'

Then

1 Banima 'Nub1 / Nub2'

2 / 3

3 / 4

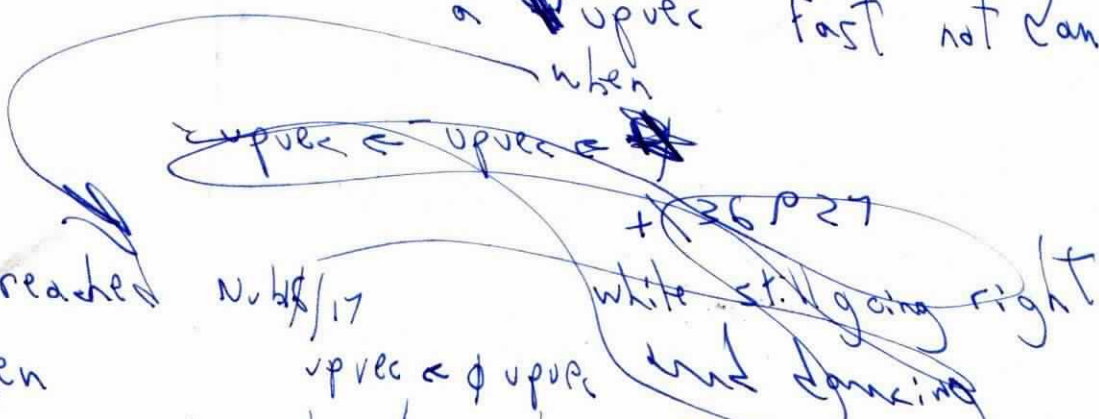
4 / 5

5 / 6

In Focus

Look
Stand
Draw
<b>Draw</b>
Right 100

Then come down by making  
a ~~upvec~~ upvec fast not dancing..  
when



Then

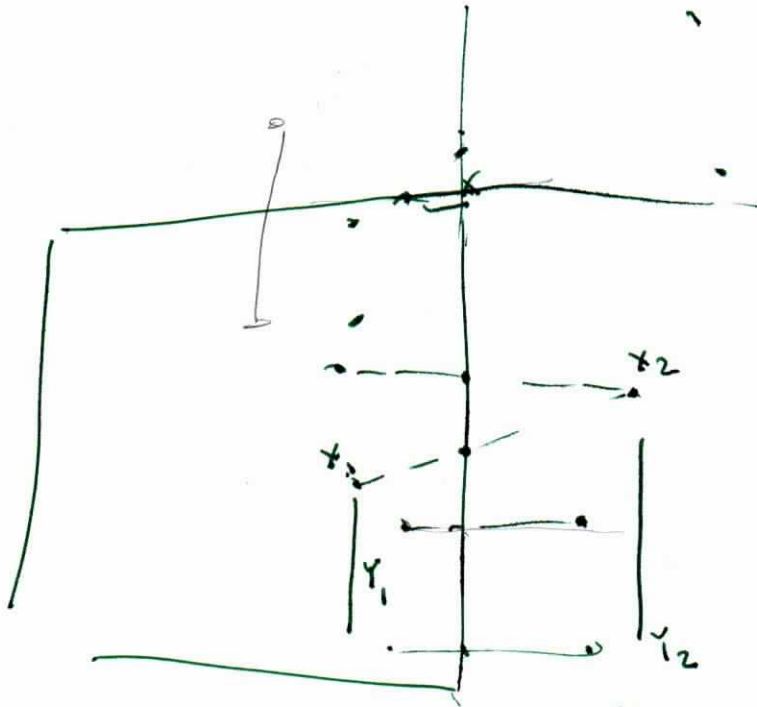
02778 Anima ~~TNub17 / TSNUbi17~~  
TSNub17 / TNub17

922 945 ...

all positive

$$[1] \rightarrow 2x(512 < |x-512|) \vee 390 < |y-390|$$

[2]



$$y_1 + (y_2 - y_1) \frac{(x_2 - x_1)}{x_2 - x_1}$$



$$(x < 0) \wedge (y > 780)$$

$$(x < 0) \wedge (y > 0) \wedge (y < 780)$$

$$(y < 0) \wedge (x < 0)$$

$$(x > 0) \wedge (x < 1024) \wedge (y > 750)$$

$$(x > 1024) \wedge (y > 0) \wedge (y < 780)$$

$$(x > 0) \wedge (x < 1024) \wedge (y < 0)$$

$$(x > 1024) \wedge (y < 0)$$



slip

~~Line ← OB~~ Line ← Line, [1] OB  
~~(if y < Line) / 0~~

→ Lab x (size | x - size) v 390 < | y - 390

In Draw say for first point

Line ← 0 512 390 0

◁ < slip

~~Line ← Line, [1] OB'~~

~~Line ← Line, [1]~~

Line ← OB, [1] Line

Line ← 2 4 ↑ Line

~~memtop ← 1 4 ↑ Line~~



x ← Line [1; 2]

y ← Line [1; 3]

→ Lab x (size < | ..... )

Lab: Mem x ← x

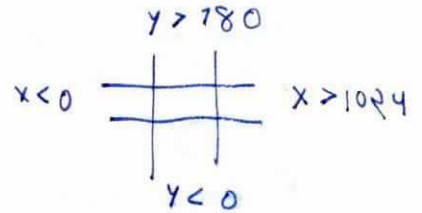
Mem y ← y

x1 ← Line [2; 2]

y1 ← Line [2; 3]

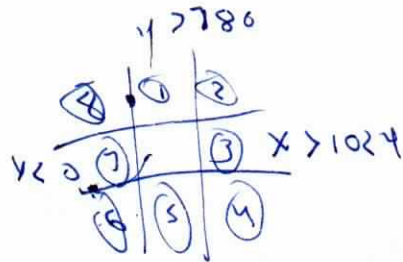
x2 ← Line [1; 2]

y2 ← Line [1; 3]



Mem x ← x

Mem y ← y



~~→ ((y > 780), (y < 0), (x < 0), (x > 1024)) / Top, Bot, Left, Right~~

Flag1 ← ((x > 0) ∧ (x < 1024) ∧ (y > 780))

Flag2 ← ((x > 1024) ∧ (y > 780))

Flag3 ← ((x > 1024) ∧ (y < 780) ∧ (y > 0))

Flag4 ← ((x > 1024) ∧ (y < 0))

Flag5 ← ((x > 0) ∧ (x > 1024) ∧ (y < 0))

Flag6 ← ((x < 0) ∧ (y < 0))

Flag7 ← ((x < 0) ∧ (y > 0) ∧ (y < 780))

Flag8 ← ((x < 0) ∧ (y > 780))

~~→~~

→ (Flag1, Flag2, Flag3, Flag4, 5, 6, 7, 8) / F1, F2, F3, F4... F8

F1

F3

F5

F7

F2

F4

F6

F8

$$F1: (x_1 + (x_2 - x_1) * ((780 - y_1) \div (y_2 - y_1))), 780$$

~~Line [1; 2; 3]~~ ← PT → output

1024,

$$F3: (y_1 + (y_2 - y_1) * ((1024 - x_1) \div (x_2 - x_1)))$$

~~Line [1; 2; 3]~~ ← PT → output

$$F5: (x_1 + (x_2 - x_1) * ((0 - y_1) \div (y_2 - y_1))), 0$$

~~Line [1; 2; 3]~~ ← PT → output

$$F7: (y_1 + (y_2 - y_1) * ((0 - x_1) \div (x_2 - x_1)))$$

~~Line [1; 2; 3]~~ ← PT → output

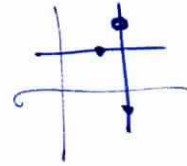
output ← OB ← PT  
 OB ← ~~Line [1; 2; 3]~~ A maybe ~~Line [1; 2; 3; 4]~~  
~~Line [1; 2; 3]~~ ← mem x, mem y

$$F2: PT \leftarrow (x_1 + (x_2 - x_1) \dots - 780 - y_1) \quad \boxed{A \text{ As } F1}$$

~~PT [1] >~~

$$\rightarrow (PT [2] > 1024) / F22$$

~~Line [1] > PT~~  $\rightarrow$  output



~~F22~~

$$SF2: PT \leftarrow \text{As } F3$$

$$F4: PT \leftarrow \text{As } F3$$

$$\rightarrow (PT [2] < 0) / SF4$$

$\rightarrow$  output

$$SF4: PT \leftarrow \text{As } F5$$

$\rightarrow$  output

$$F6: PT \leftarrow \text{As } F5$$

$$\rightarrow (PT [1] < 0) / SF6$$

$\rightarrow$  output

$$SF6: PT \leftarrow \text{As } F7$$

$\rightarrow$  output

$$F8: PT \leftarrow \text{As } F7$$

$$\rightarrow (PT [2] > 780) / SF8$$

$\rightarrow$  output

$$SF8: PT \leftarrow \text{As } F1$$

$\rightarrow$  output

Decl: ~~int~~ x; y; ~~int~~ x1; y1; ~~int~~ x2; y2; flag1 - 8; PT

Make Line and get x y  
check if in or out

→ (if in) / 0

Get x1 y1 ~~x2~~ y2

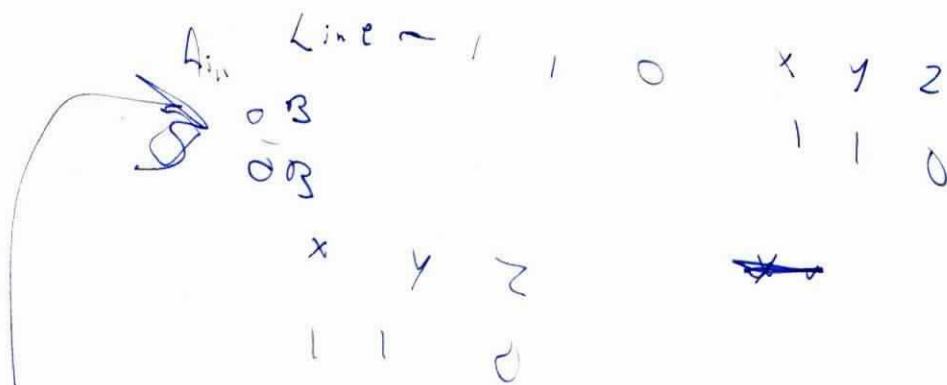
set flags

calculations F1 → F8

Gets PT

PT is Line[ij] clipped

Obj ← PT





$$x_{12} \leftarrow \cancel{(\lambda x_1 - x_2)}$$

$$\cancel{x_1} \rightarrow x_{12} \leftarrow x_2 - x_1$$

$$x_{12} \leftarrow ((x_2 - x_1) = 0), ((x_2 - x_1) \neq 0) / \text{SM}; x_{12}$$

$$y_{12} \leftarrow ((y_2 - y_1) = 0), ((y_2 - y_1) \neq 0) / \text{SM}; y_{12}$$

11/20 Create interactive situations

The Art Critic  
Type in my artist and get an opinion or  
statement,

Simulated News Broadcasts

various visual news items  
put together in a random-structured way  
with visuals and beeps

Interactions can be made to simulate many things. The entire x/y  
of the discussion can relate to any kind of art (music-dance graphics  
painting sculpture)

---

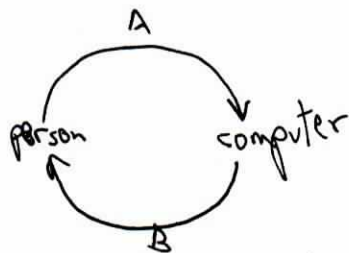
The way the theoretical eye exists in computerspace  
transferred to a real camera in real space  
set a path. This calls for a flying camera  
\* you set boundaries of "screen" → land and a point  
for vanishing point. Technology doesn't exist  
yet for this "flying camera" would need something to  
take out the vibrations of flight.

This kind of set up exists on a small scale  
and is how STAR wars was done. The  
model spaceships ~~were~~ stood still and  
the computer controlled camera flew around  
it.

How does the final product of the interaction relate to the interaction? Does it have too? Product is result of programs jumbling of inputs.

The concept of interaction in art has been around for a long time in questions like: Does a work of art exist if no one is there to see it? Does the viewer's act of looking constitute part of the creative act? This kind of questioning led to happenings and new theater

Interaction means a two way flow of information  
∴ a loop



what kind of informational differences are there between A & B?

Flow A is tailored to program's questions and answers B  
If A goes out of range of acceptable input then either program blows up or misinterprets info.

What does misinterpretation mean?

That one piece of info is ~~taken~~ mistaken for another.

~~write~~ wrote a program which always mistakes the input.  
This programmable mistake would produce  
the response for one input that was logically meant for  
another



11/5)

Need capability of creating positions by  
~~part~~ assembling it from other pos. in library

~~BP~~  
Body ← BP From Pos

[1] S Body ← Body

[2] Body ← Pos

[3] ~~BP~~ NExtract

[4] ~~BP~~  
Part ← BP or Part ← ~~BP~~

[5] Body ← S Body

[6] NExtract

[7] BP ← Part

BP' ← Part'

[8] ATTACH

[9] Mapper



~~Make a Library system~~

# Make a Library system

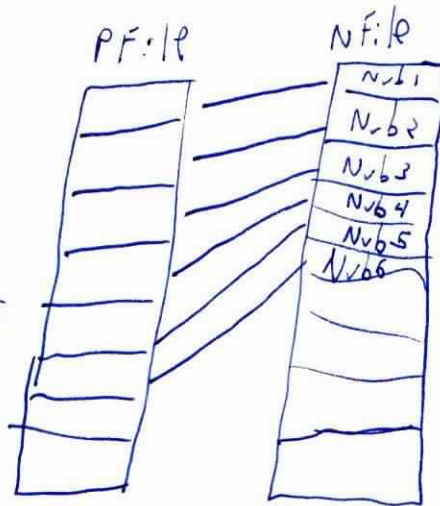
□ Enter Name

Name → □

Vfile at X ← Name

PF:le at ~~X~~ ← NAME

Name Position  
in NFile is  
position of values  
in PF:le



Poslib \* NPoslib

~~Enter Name~~

Use 'Poslib'  
Use 'NPoslib'

Enter Name

Name → □

Ex ← ~~Exist~~ 'NPoslib' at 2500

Index = (NEX) / 2500

( 'NPoslib' AT Ind ) set 'Name'  
( 'Poslib' AT Ind ) set 'Name'

Maximum # of records

To write

To Read The P.P

~~Enter Name~~

Enter Name

Name  $\leftarrow$   $\square$

~~count~~  $\leftarrow$  1

Lp  $\leftarrow$  ~~(TNA~~ get 'NPosh' ~~count~~) = Name) ~~Doit~~

$\rightarrow$  (Lins count a count + 1) / Lp

Doit  $\leftarrow$  Name  $\leftarrow$  Get 'Post: b' At count

~~11/27~~  
11/27 News ~~Info~~  
Information

Yesterday  
Today

The Shah of Iran  
President Carter  
Billy Carter  
Begin  
Sadat  
South Africa

was - quoted as ~~being~~  
heard to say that  
reported to have said that  
believed

The situation  
catalysm meeting was critical  
averted  
desperate

12/1

for Movie  
size of screen  
 $8\frac{1}{2} \times 6\frac{1}{2}$

Rollit in Nunbiam

Rollit ?

Reyesel

f(f(f(c)))



Do  
get edit (A) (A) |  
put

put (get (i)) ; (J < I < I + 1)  
+ I > I + 1

Don-Libes  
277-2063  
Bell 335

12/6

Randomly Assemble Positions  
by using The From fn. and  
put Together pos. This should give  
realistic looking pos, but they will  
be random!

( ) From Nub ↑ ? 65

Scan down all  
The elemental bp's (18)

⊕ "Bname" From "Nub", Num ↑ It's 65



12/12 Use Fuzzy to make some smart conversations

extremely  
very  
? is 'good' } Build up a net  
Bad )  
is A

---

Action sequence  
world is 3D set of cubes  
as oppose to squares on floor  
for the blocks world.

Action consist of

Arm

BP

Points



in cubes of space

moves by passing from cube to

cube with a set time sequence

\* An action is then defined as these  
parts which have BP's which have points matching  
The cube movement sequence

probably a shitty way of defining a movement  
as from cube to cube.

might take a lot of storage for one  
simple movement so break down  
movement to key cube and curve  
fit the rest.

Problem: what about close movements  
which don't match exactly but  
are very probable,  
could have some tolerance factor  
like  $c$  in follow

Could characterize common dance movements  
in this way. Increasing the  
tolerance could give related  
movements etc... and further on  
down the line.

12/13

Cezanne painted a kind of Bloepix type of vision  
Arnason ~~implies~~ <sup>implies</sup> the eye sees in the infinite  
accumulation of information and puts together  
a scene ~~from~~ from the abstract ~~data~~ data  
cubism was the shuffling about of these  
essential elements.

~~Further~~ <sup>and</sup> Abstraction is the extraction of certain essential  
elements from these elements.

~~Problem~~ Problem is that Bloepix does not  
make any kind of groupings and just averages  
the view into discrete color areas.

Pattern recognition is on the road to determining  
the laws of grouping together basic forms  
into a meaningful structure.

Does this mean that there is a structure to the  
way we perceive things

Can this mean that there is a structure  
to the way we perceive motion?  
If so what ~~is~~ is it and how do we  
do this structuring?

Is there a structure to the way we perceive motion?

Given a field of view  
and an object or image in motion

Motion detected by  
Translations rotations parallel overlapping

Given a momentary stationary field of view some  
objects - light ~~that~~ hits ~~and~~ consecutive different  
areas of the retina.

Motion is relative - if you exactly follow an object  
(car) its motion can be stationary relative  
to field of view. Still perceive motion because  
of an equal and opposite ~~motion~~ displacement of rest of  
field.

Dance as an art of motion.

So what does all of this do for  
~~making~~ a new kind of image or perception?

The way Bloopix is to color  
? is to motion



Color is Color

Motion is Motion but how do you show an averaging of motion - by direction and speed

and extract the color then move it by those averaged laws

The movement of that color is the motion and averaging the movement would be a combination of blobpix and avmov.

(average movement)  
Don't have to use blobpix ~~but~~ but for a computer it would take forever to handle real world resolution. Would be nice to have a fine blobpix say  $128 \times 128$  so the object is still easily recognizable  $256$  or  $256$  and the essential motion comes through.

---

Average the motion of hints on screen and put into discrete units. Pixels of motions.  
Could be used to study perception of motion the way Blobpix used to study percept of ~~the~~ aspects of vision.



12/14

Intelligent Conversation of a critic

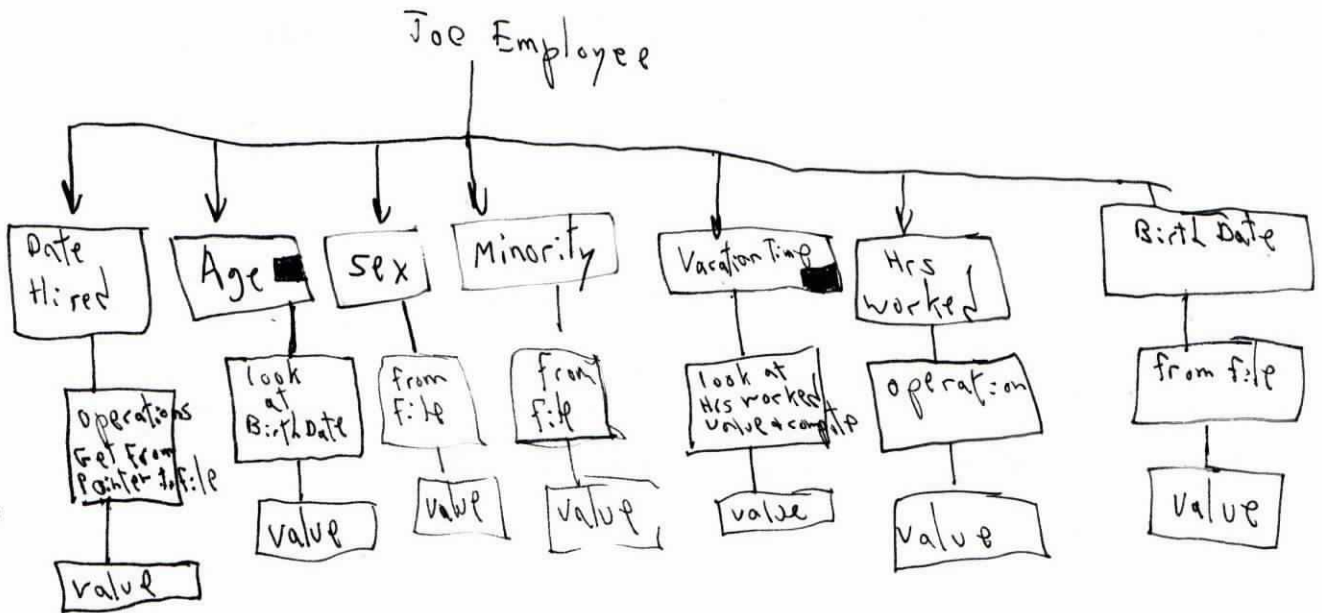
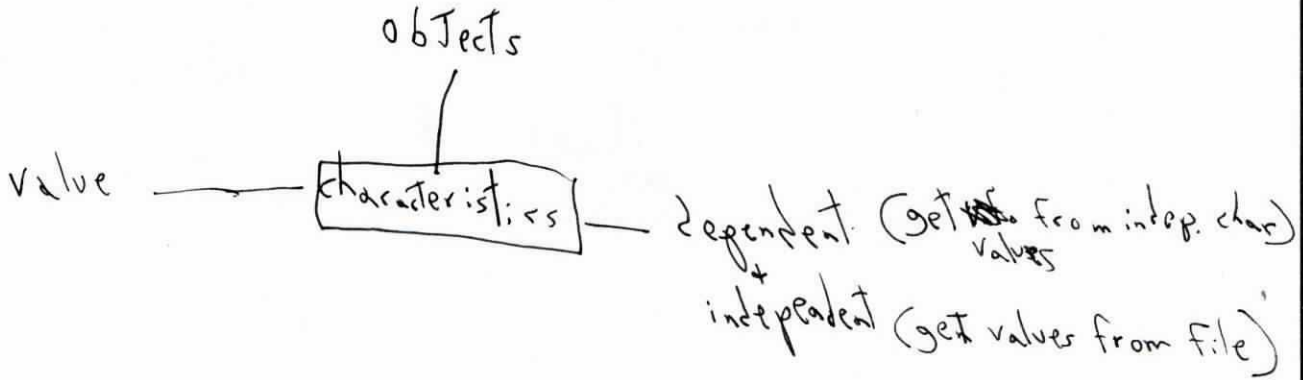
Ask questions  
be curious  
by reading  
by being told } from Winston  
pg 252

Is there a way of dynamically creating Demons  
where are these progs. aware of s



1/15 Data Bases

Given a mass of data assign certain characteristics to the data

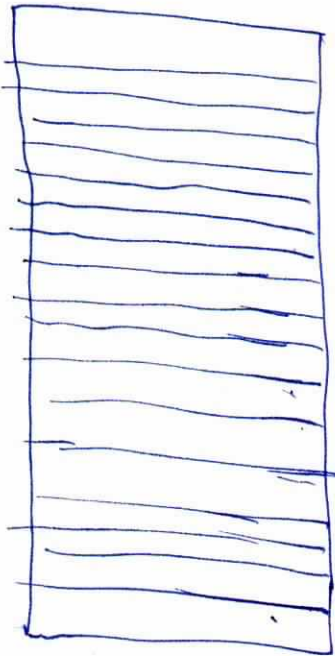


■ - means it is a dependent characteristic

Can group together chars. by giving all grouped chars a group flag

# 1/17 Indexed files

of some sort for managing Body as a data base



$$HE \leftarrow OB[1:2]$$

good to do this for lots  
of data say if dealing  
with real body data base

good looking  
spheres

## Cloth For Dance

must remember the full interpolation

~~to get~~  
remembers only endpoints of desired cloth segment

$$FRET[1:2]$$

$$LFCL \leftarrow LFCL[1:2] \quad LF[1:2]$$

$$RFCL \leftarrow RFCL[1:2] \quad RF[1:2]$$

Then draw line from hip for example to  $LFCL[1:2]$

Also get rid of hip the cloth is originating from

~~possibly~~  
possibly draw line from origin of cloth  
to whole endpoints.

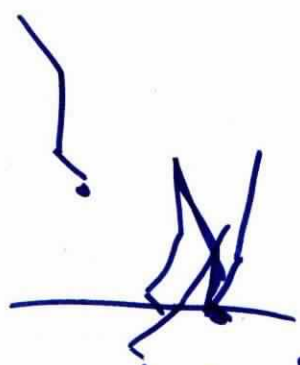
1/29 Need capability of automatic positioning on floor  
 i.e. walking

The portion of body which touches floor  
 (PT)  $\leftarrow$   $\left[ \frac{(L/Body[i3])}{21 \uparrow P Body} \right]_i$

remaining in same spot and you  
 MOVE rest of body  
 until spots match

Body  $\leftarrow$  ( was ) - ( Am ) Move Body

PT  $\leftarrow$  PT  
 PT  $\leftarrow$  ((PT) : 4), 4)  $\uparrow$  PT



To get low pt For each transformation there is only one low pt.

PT  $\leftarrow$  Body  $\left[ \frac{((L/Body[i3]) - Body[i3])}{21 \uparrow P Body} \right]_i$

3  
 ravel  
 here  $\rightarrow$

if more than one then deal with first  
 PT  $\leftarrow$  1  $\uparrow$  PT  $\leftarrow$  ((PT) : 4), 4)  $\uparrow$  PT  $\leftarrow$

Need program controlled positioning  
to synthesize position and complex  
movement like walking

pure movement - no organization  
semi system - some ideas like time space  
style  
content  
psych

Fully organized framework - ballet.



<sup>Dance</sup>  
~~Choreography~~ can be said to be the first art ~~to~~ ~~as~~ ~~soon~~

~~man became aware of his own existence he moved.~~ Movement is inherent to our being and to ~~we~~ make art out of this movement is most natural. How does one approach

choreography and even start to conceptualize a dance. <sup>Some</sup> ~~Just start moving~~ <sup>with a idea then</sup> and see what feels good. <sup>(Source List on pg 33 see also dance)</sup> OTHERS

might observe the actions around us and transform them to ~~the~~ dance. <sup>(New Dance pg 54 55)</sup> ~~Still~~ another approach is to try and find certain similarities and groups of movements which can then be put together in certain ~~ways~~ ways to form a dance. Ballet is an example of this last approach. ~~The~~ Ballet has its own language of positions and movements and follows some rules for putting them together. With ~~at~~ this language the classical ballets would never have survived to the present day. This language of movements and positions is the notation of ballet. One of the most important functions of <sup>dance</sup> notation is to enable the survival of ~~the~~ ~~works~~ works.

It is possible to conceptualize a ~~the~~ <sup>dance</sup> ballet by simply putting together the words (notation) ie ~~the~~ first position to plie to 3rd position to pirouette...etc.

~~Labanotation~~ of Labanotation is very detailed and difficult to learn but it is accurate. ~~There~~ There are people who choreograph dances by writing down Labanotation but they are surely very few.

~~After the choreographer has had the brilliant idea and recorded~~

There is a need for a tool whereby choreographers can record their ideas in a way that when ~~looked at~~ <sup>reviewed</sup> at a later time the idea is clearly transmitted. Many choreographers have therefore invented their own personal notation systems\*

~~A personal notation system is fine~~

The problem with this is that no one but the inventor can read the notation. ~~And~~ <sup>And</sup> once taught to someone is useless for anyone else.

~~The computer~~

A fully developed computer choreography system would be an ideal notation. A choreographer could sit down at a computer terminal and twist some knobs or push some buttons and watch a stick figure's limbs move all around. ~~After~~ Once a collection of desirable positions have been done you push in or type another command and watch the figure move through all of the positions (chore).

I must emphasize that this type of system is not a fantasy and with existing technology and programming techniques could be a very usable reality. The system so far developed at Rutgers goes a long way towards this reality, and its only real but major limitation is lack of real time animation. By this I mean that the equipment available could physically not show anything move. Movement is accomplished by ~~using~~ single frame animation of the images displayed. Work is currently under way to translate the system over to real time animation.



Facilities recently acquired by Rutgers

MANUAL

First lets examine the conceptual possibilities of the existing systems and then the future possibilities. One can create stick-figure positions by manipulating the figure with a variety of commands on the computer. The figure resides in a computer-simulated three-dimensional space which acts almost like real space. We can observe the figure from anywhere in this space by moving about a theoretical eyeball and looking wherever we want. (usually the stage) see illustrations

To start up the system you type GO and this puts you into "Command Mode". You may now issue one of many commands. Following is a list of commands and what they do:

Com list and explanations  
and illus

Given the above-commands lets look a sample terminal session and the results we can get.

Sample Session with illus

The above session deals with those capabilities within command mode. Outside of this we have additional capabilities such as changing timing scheme existence of ground plus the option of writing very specialized programs (if desired). Once a choreography

  
BI

gets used to the way the system operates ideas are stimulated by the way it acts and is structured. For

Example motion is dealt with as a series of ordered positions. Well the computer can very easily randomize

this order and make "random dances". Another

possibility is to ~~at the com~~ make the computer "chuck" together positions from previously existing positions.

For example Take the left arm of pos 30 and RA of pos 40 and put on pos 50. One can even program

the limitations of the human body and have the

computer synthesize ~~the~~ positions by randomly

generating positions within those restrictions of the body

you could create computer figures which could take positions not possible by humans and ~~make~~ it

dance and this could be considered ~~a~~ dance of

sorts. Many possibilities are available, once you understand how the computer deals with problems.

These possibilities and the conceptualizations of these forms of dance would not be possible without the

aid and influence of a computer. The computer and choreographer are interacting in a very different

way from the interaction of dancer and choreographer.

One can even say that the art is in the interaction.



part of the reason the interaction is different is because ~~you are~~ <sup>broken</sup> interacting with the computer you are working within a given structure. It became fairly simple to conceive of the structure as the sum of many sub ~~structures~~ <sup>structures</sup>. The combinations of sub-structures <sup>put</sup> into a variety of results can stimulate other combinations and possibilities only ~~evident~~ <sup>evident</sup> through use of a computer. For example the previously talked about random dances come from re-ordering some sub-structures. ~~the still remaining thing the whole~~ "chucking" together different limbs from different bodies is very "natural" because every body is merely a collection of lines <sup>"chucked"</sup> together ~~to~~ in a specific manner such that they happen to resemble a stick figure. Without a computer structure such an idea would be very strange ~~and~~ probably inconceivable and surely impractical. For the conception of movement, with such a computer structure it is possible to watch the ~~top~~ <sup>base</sup> of one ~~body~~ <sup>base</sup> on the legs of another. Top half of

---

What is a notation system? A way to record ~~is~~ <sup>is</sup> some ~~form~~ <sup>form</sup> fashion the information desired in such a way that the information can be reconstructed from the notations. The ~~creation~~ <sup>creation</sup> for evaluating a ~~good and bad~~ notation is ~~complexity~~ <sup>simplicity</sup> its ease of use and accuracy. The term ease of use can be broken down into the components reading and writing. The ideal dance notation system would be one which is easy to read, easy to



write as well as accurate. Current notation systems do not fill these requirements. Lab notation is very accurate ~~but~~ tough to read and harder to write. Sutton and Benesh notations are easier to read and write but sacrifice accuracy. ~~but~~ ~~so~~ A computerized notation system has the potential of being ~~easy~~ easy to read write and very accurate. Although an ideal computer system does not exist ~~it~~ yet the ~~currently~~ developing system ~~is~~ (BOTangles) is a start in the right direction. ~~It is~~

~~totally accurate~~ IT's accuracy is ~~dependent on~~ ~~it~~ can be total. Readability is like watching a film but better because (with a real time animation system) you could view it from any angle and even single out dancers or sections of dancers like legs. To write it you would just twist some knobs and ~~set~~ make the position. The current system is very readable and accurate but the writing is too slow and need a real time animation system. The ~~is~~ existence of a fully practical computer notation system is dependent on a real time animation facilities and the ~~development~~ <sup>transference</sup> of the current state of ~~the~~ work to such a system is crucial.

The system as it stands now is a valid experiment proving that a computer based dance rotation system can be done. A real time animation system fully developed would make the experiment a practical real world tool.

1/31

~~Next~~

Way to specify path of eye ( $\Delta$  point is eye)

eye becomes endpt of line with center at

$\Delta$  center

for arcs

lines

use ~~arc~~ sphere

pick two pts on sphere same way as for positioning and rotate line going from center to 1st point in increments dependent on the time

2/1

For path movement of eye  
pick 2 spheres  $z$ . It

First  
make the b. sphere

MF  $\rightarrow$  sphere<sup>27</sup>[~~x~~; 2 3 4]

ML  $\rightarrow$  sphere<sup>27</sup>[y; 2 3 4]

Find angle between

sphere<sup>27</sup>[1; 2 3 4] } sphere<sup>27</sup>[y; 2 3 4]  
sphere<sup>27</sup>[x; 2 3 4] }



then  $\perp$  at vertex



P/9 Simulation of a style of an Artist  
Sol Lewitt

uses a cube as basis of structures

Pick a base grid of  $x$  by  $y$  size  
 $x$  times  $y$  is total base area

~~Then pick sub~~

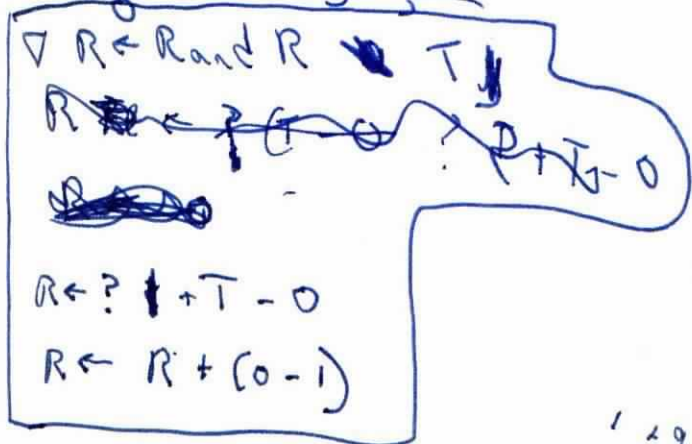
Then start making volumes

Every 5th point is LL corner of square

				25
				20
	13	14	15	
6	7	8	9	10
1	2	3	4	5

Pick a square at random  
and create a volume on top  
of it within a range of value  
i.e. 1 2 or 3 cubes high.

~~Rand R: 0..T~~



x

13-17

10-15

13

(9-1)

20

1+2

10-15

5+1

13

1, 2, 9

6+9

~~Range~~

1,

$R \rightarrow 1 \text{ RandR } (X \times Y)$

~~Gives Range of~~

Give Random # in Range

Pick  $z(X \times Y)$  # of pts

scale ~~pts~~ volume in x y & z directions  
within  $\epsilon$  ( $\approx \epsilon$ )

check that the scaling does not push  
cube past edges



$$X_{\text{LimP}} \leftarrow \sqrt{\epsilon / \text{Base} [i, 2]}$$

$$X_{\text{LimN}} \leftarrow \epsilon / \text{Base} [i, 2]$$

$$Z_{\text{LimP}} \leftarrow \sqrt{\epsilon / \text{Base} [i, 4]}$$

$$Z_{\text{LimN}} \leftarrow \epsilon / \text{Base} [i, 4]$$



After volume is randomly scaled  
if vol is volume

Base is rotated  
Back into space

~~$V / (r/vol[;2])$~~

$(V / ((xlim < r/vol[;2]), (xlim > L/vol[;2]),$   
 $(zlim < r/vol[;4]), (zlim > L/vol[;4]))) / \text{Scale Again}$

{2} AOK

To pick the pts on Grid (Base)

~~$r / (PBase) : 5$~~

$R \leftarrow ? (PBase) : 5$

To set Lim  
(# of pts picked on  
Base)

$Vol \leftarrow \text{Base} [ (R \times S) ; ]$

Put cube

Do it sparsely at  
first

The scale it

~~Lim~~

$((PBase) : 5) \div 10$

$Vol \leftarrow ? (R \times S) \text{ scale } Vol$

check vol

OK

~~$Vol$~~   $Vol_s, [i] Vol$

~~$(Lim \geq cnt \leftarrow cnt + 1) / Ag$~~

2/12 H.R. copy

~~7/1/15~~

The ~~dialogue~~ <sup>dialogue</sup> between a choreographer and a dancer is very different than the dialogue between chor. and computer.

~~A dancer can interpret very general commands such~~

~~as move with feet~~

~~The chor-dan dialogue is a ~~simple~~ cycle of ~~get~~~~

interaction  
~~events~~

the chor. has an idea, ~~teaches~~ <sup>teaches</sup> it to the dancers. They move and rehearse until the dance is satisfactory and that's it.

~~The chor-comp. dialogue is only half of the cycle ~~step~~ for creation.~~

The chor-comp dialogue is also a cycle of interaction with the chor creating and modifying positions until satisfactory. The next step is to get someone to dance what is stored in the computer.

~~And~~ This dialogue with the comp. is a powerful tool because it is making a notation structure interactive. If ~~you~~ <sup>you</sup> wanted to create a dance with Labanotation ~~then~~ <sup>you</sup> would ~~not~~ be able to make adjustments until you saw it danced.

with a visual dialogue on a computer you could ~~constantly~~ <sup>keep</sup> keep changing the positions until you got it right. The final result is not a dance (because no dancers were yet involved) but

a very clear idea of what the dancers should do.  
In a sense this system becomes an extension of the  
char. mind in that it ~~make~~ forces one to clarify  
one's ideas to the point where they can be easily realized  
when with the dancers.

---

To attach pts on figures

~~then~~ specify a pt on fig 1

" " " " fig 2

Then move together until touch<sup>d</sup>

~~If you see~~

when you spec. a bp use the lower pt

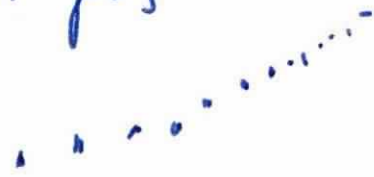
BP [2:]  
which fig does it most or both?

---

char's line prog.

Type in a list of pos

then you see





chocus; Temp; Lim; Fmat; cnt  
~~mat~~ 'Type in pos (one at a time)'  
top Temp ← 0

→ (0 = P Temp) / Display  
Fmat ← Fmat, [1] Temp  
→ Top

must  
set eye first

Display: cnt ← 1  
~~Fig~~ Lim ← 100 Fmat

ID: ~~Draw Ssize~~

~~Body~~ Body, Fmat[cnt;]

Plot  
Draw Ssize ((cnt × 100), 0, (cnt × 100)) Put Red

→ (Lim ≥ cnt ← cnt + 1) / ID

A de-plot routine To reconstruct full body from  
shrunken plot body

✓ DPlot: Body

LH ← Body

RH ← Body

Attach  
Mapper  
Group

result is in Body

All  
When this works convert all N.b.s,  
to plotting version

Need a PAnima - plotting anima

✓ Psize Bod  
~~Body~~

also need a low  
Attach

(it calls a  
different size)



# Clipping

From pg 123 Interact. graphics.

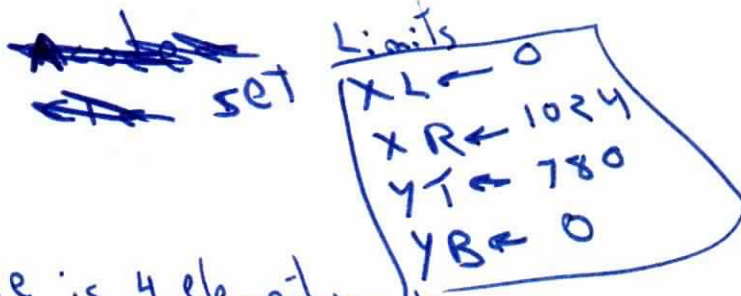
~~Given~~

Given 2 (x y) pts

A clip B

A & B are only x + y  
no op codes

Generate the 4 bit codes for line



A code is 4 element vector

$$Acode \leftarrow ((A[X] \geq YT), (A[X] < YB), (A[Y] > XR), (A[Y] < XL))$$

$$Bcode \leftarrow \dots$$

$\rightarrow (0 \neq Acode, Bcode) / \text{Display}$



if logical intersection  $\neq 0$   
then off screen

	off	on
	0 0 0 1	0 0 0 0
	0 1 0 1	0 0 1 0
	1 0 0 0	0 0 0 0
	1 0 1 0	1 0 0 1

if there are

if Acode, [1] Bcode

2/16 Strouls class

compare sculptural aesthetics of minimalism & modernism

Read - Min-Art

- Tony Smith article

Art & objecthood

Notes on Sculp I & II by Morris

The Recentness of Sculp. Greenberg

The New Art

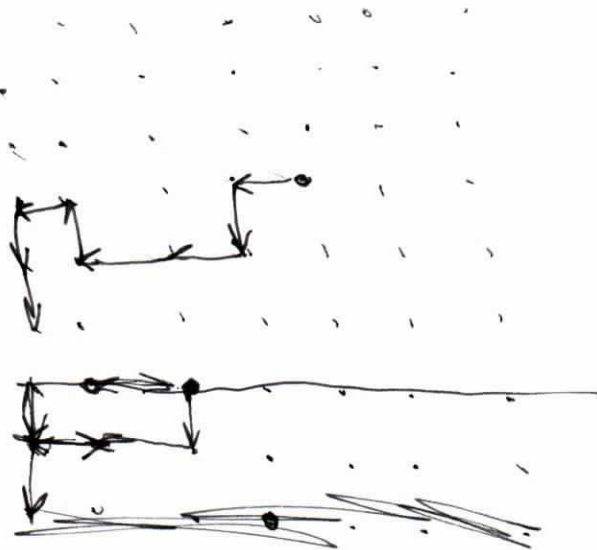
Modernist Sculp

xLJ)



2/24

# Stuff for Stravel



~~stuff~~

- Left is 1
- up is 2
- Right is 3
- Down is 4

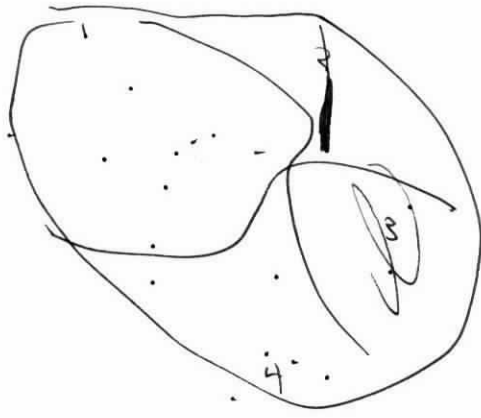
LX  
 RX  
 TY  
 BY

} Limits of Grid

Generate a direction by ? 4  
 Then check if that move goes past bounds

for a 1 direction check against LX  
 2 TY  
 3 RX  
 4 BY

Also check if that position is occupied

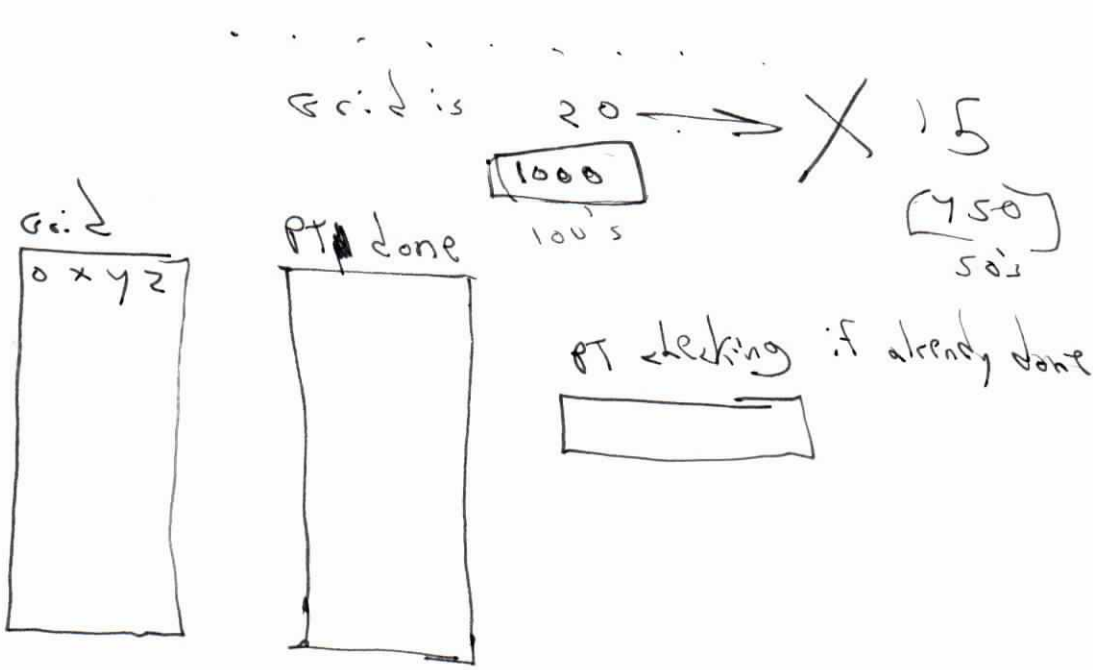


1 3 4 1 1 2 4 1 3 1 4 1 1 4 1



Starting at lower left might decrease probability  
of boxing self out.





need fn which will take one pt  $1 \times 4$   
and check if it exists in another  $n \times 4$  matrix

$\Delta$  Ans  $\leftarrow$  pt checker Mat

(1) ~~PT~~ ~~PT~~  $\leftarrow$  1 4 P PT

cmat  $\leftarrow$  ((19 P Mat), 4) P PT

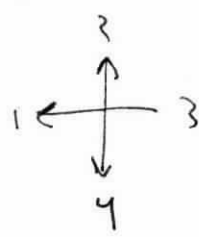
(2) Ans  $\leftarrow$  1 / 1 / (cmat[3 2 3 4] = Mat[2 2 3 4])

// if Ans is 1 then pt exists in mat //

Figgen; Lim; cat; stpt; memstpt; MC; 1000s needed

ptdone ← stpt ← Grid [1, 2]  
pickpt: stpt ← memstpt  
ok: MC ~~MC~~ ← ? 4

// lower left pt //  
Lx ← L / Grid [1, 2]  
Rx ← R / Grid [1, 2]  
Ty ← T / Grid [1, 2]  
By ← L / Grid [1, 3]



Memstpt ← stpt  
stpt ← (MC = 1), (MC = 2), (MC = 3), (MC = 4)

- (-100 0 0 Move stpt),
- (0 50 0 Move stpt),
- (100 0 0 Move stpt),
- (0 -50 0 Move stpt)

if doesn't work  
Make each move statement a character var and i it

// check if stpt exceeds bounds //

→ (v / (stpt [1, 2] < Lx), (stpt [1, 2] > Rx), (stpt [1, 3] > Ty), (stpt [1, 3] < By))

→ (stpt checker ptdone) / pickpt

ptdone ← ptdone, stpt

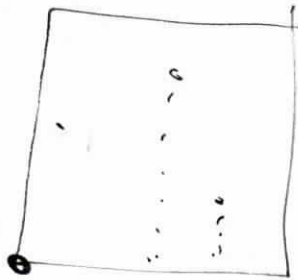
~~ok~~ → (lim > cat ← cat + 1) / ok

~~Fix up A change and over it~~

set Lim and start for cat

Pickpt

Then must close the figure

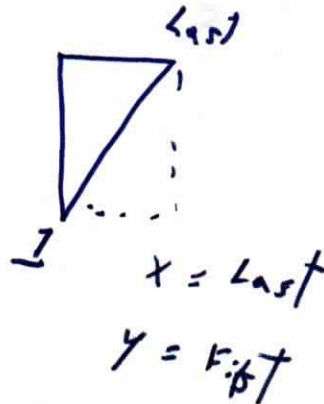
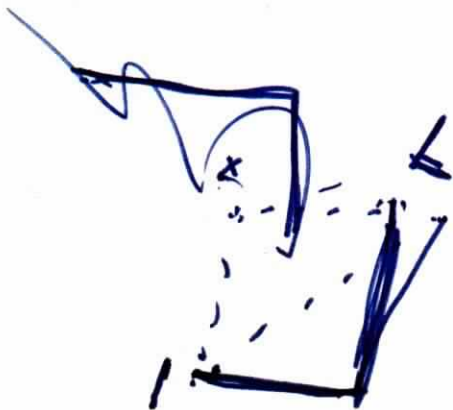


For starters just say a line to be from

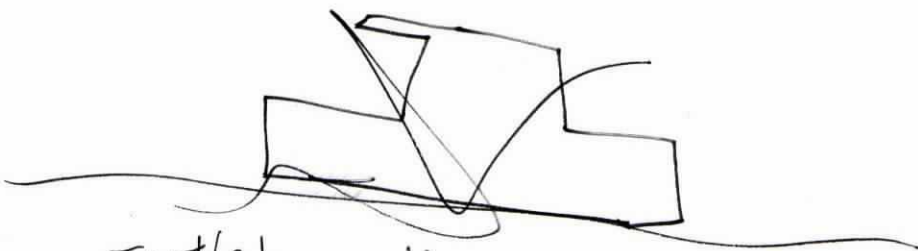
$pt\_done \leftarrow pt\_done, [i]$   ~~$(pt\_done[-1] \uparrow pt\_done)[2]$~~   $(0, 0)$

$pt\_done \leftarrow pt\_done, [1]$   $(1, pt\_done[2, 3, 4])$

Then draw it



2/ks



synthetic walk  
(like lumber way)

make two figure in action  
and one ~~one~~ stationary

used twice at beginning and end

determine distance of stride

$$\cong 300$$

input a vector on floor  $\rightarrow$  pts on stage  
and must figure out a way to pt them in  
right direction.



Make a vector test line  
not attached to bodies  
but pointing in forward direction  
like the original walkers

Then attach [i] of <sup>resp</sup> line  
to [i] of direction line.

Then can determine ~~o~~ and routine  
 next attack  
 begin body  
 and spin ~~o~~ around routine

next find how many ~~o~~ active bodies  
 needed  
 1 every ~~o~~ 2 or 3 hundred units

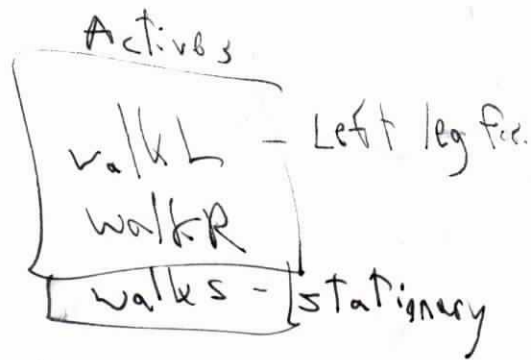
3. Dist Dirvec \*

i.e.  $D = 1000$

stridedist = 200

$$\frac{1000}{\text{stridedist}} = 5 \rightarrow \text{Number}$$

5 bodies



and S are stationary  
 alternate actives

ActR (2 3 4) orb

need to generate indices

put walk name in  
 matrix

Act ~~1 2 3 4~~ (P Act) ~~1 2 3 4~~ (S 0 P 22)

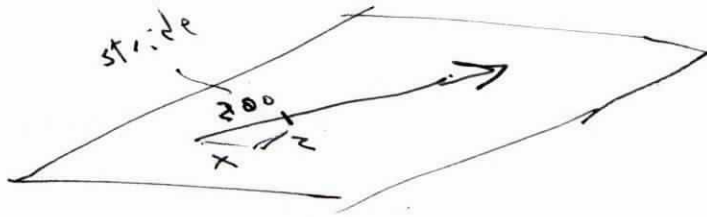
Act ~~1 2 3 4~~ - 1 ~~2 3 4~~ 2 Number

enough for 100 Active's

The use Act as pointers in NameList



Need a way of spacing along line by striderist



~~find an x and z value~~

determine the x y pt (stride) away  
and the pt body on it.

$$y = mx + b$$

$$200 = \sqrt{x^2 + z^2}$$

2/a

Pos input

For Sol Lewitt stuff.

go through all permutations for  
1 2 and 3 cubes

For a  $5 \times 5$  grid

125 combination of single cube

To many for 2 cubes

~~Not Lewitt~~

Go through permutations of a single  
cube the unfinished types of Sol Lewitt  
then use these as basis for some  
grided structure.

12 lines and draw any attached  
combinations of them

From 1 to all 12

How to check if a piece is floating.

Neither pt exists in rest of matrix  
shade sides of Lewitt cubes

3/12

Sign Maker for work

num, cnt

Give lines  $L_1 \rightarrow L_n$

cnt ← 1

~~is line a title~~

Ag:  $\phi 'L', cnt \leftarrow (1000, size, 1)$  Abscissa

~~Ans~~

space ← 10

$\Rightarrow (num \geq cnt \leftarrow cnt + 1) / Ag$

How many lines?

num ←

size ← (size - 5)

~~size~~ row ← 0  
size ← 770 - num

put:  $\phi 'L', cnt, num$   
row ← 0

(0, ~~row~~, 0)

put  $L, cnt$

row ← row + space +

size + space

$\Rightarrow (1 \leq cnt \leftarrow cnt - 1) / put$

To scale letters in X

Ag ~~val ←~~  $\left( \frac{r}{(L', font)[i, 2]} \right) - \left( \frac{L}{(L', font)[i, 2]} \right)$

~~val ←~~

$$XS \leftarrow \left( (val \geq 1000), (val < 1000) \right) / 1000, val$$

~~Ag.~~  $L', font) \leftarrow (XS, size, 1) \text{ Abscale } L', font$

$$\rightarrow (numL \geq cnt \leftarrow cnt, 1) / Ag$$

~~script for hand~~

Need a hip joining routine but not to match exactly, necessarily in y so only move in x+z

Pos1 Hip Pos2; ~~dx~~  
DX; DZ

$$DX \leftarrow Pos1[4;2] - Pos2[4;2]$$

$$DY \leftarrow Pos1[4;4] - Pos2[4;4]$$

Pos2  $\leftarrow$  (DX, DY, 0) Move Pos2

if pt 4  
is hip

or you can attach in x y+z and then use Crown

3/15

▽ Pos2 Extra Pos2

[15]



3/29 Strad's class

In Idea Art,  
Art & Words by Rosenberg

In Changing The Dematerialization of Art. - Lippard

4/4 For Marathon  
Name  $\leftarrow \square$   
BD  $\leftarrow 2 \uparrow \square$

Decisions Tab  
3 ~~entries~~ entries for each  
month values to  
~~with~~ compare

~~signs~~  
$$s_i \leftarrow \text{signs} \left[ \text{DT}[\text{BD}[1]; 2 + (\text{BD}[2] \geq \text{DT}[\text{BD}[1]; 1])] \right]$$

this forecast is made just for Name

[ ] Name,

[ ]  $s_i$ , resp [ ]

20 is a 4

DT

20	3	4
21	4	5

$$s_i \leftarrow \text{signs} \left[ \text{DT}[\text{BD}[1]; 2 + (\text{BD}[2] \geq \text{DT}[\text{BD}[1]; 1])] \right]$$

IF Responses are long  
make them a plane of 30 mat

Resp [Rnum]; j

4/5

Random kind of attempt to reach some vague goal but some major specific goal must be reached so you try to get it until you do. Like shaky drawing. A loose description of some outline / a sketch of an unskilled drawer.

Art after philosophy I + II  
Joseph Kosuth

Describe & detail various aspect of  
Post-Minimalism  
4/12

F pump

class = X

// Exec F pump

// Input DA OSN =

, Disp = 5hr

20 sec IO  
+ epu

> EDIT ↘

sys stuff on DK8

EDI DK1:File.FTN

> For DK1:File = DK1:File

> TKB ↘

> DK1:File = DK1:File

> [ ] File: b. 01b/Lb

> /

> Enter 0-p

> ASG = Grø: 1 ↘

> Common = DF:le: RW

> //

Grind a while

.TSK file made

Boot

Ins DF:le

Run [56, 66] File

EDIT 706  
To Get out EX

TCP  
Bot  
DPI  
N

-to go for

Boo

>HELLO  
ACCOU: LEVY  
PASSWORD: FRAISE  
>BOOT DKØ: [1,54]RSX11M,6RA  
XDT: 18  
XDT> G

            
            
>SET /WC=[1,1]  
(>MOUNT DKØ: /OVR)  
>INSTALL DFILE  
→ RUN DRAW                   { DKØ: [1,1] DRAW.TSK }  
                                  DFILE.TSK }

---

>PIP  
TASK NOT FOUND           reason is DK1:  
{>RUN \$PIP}

>RUN DKØ: [1,54] PIP

~~DKN: XXXX~~

DKØ: [L, W] XXX.XXX;X /LI }  
                                  /DI } directory  
                                  /BR }

PIP> TT: = FILE

/DElete  
/FRee



N.Y.

142 Greene St

sculpture Now

→ Lyman Kipp

write a critique

At.

Susan Calderell

383 West Broadway

008

Eyeball

Look → Δcenter

Stand

340 1 Bed  
 170 Eff.  
 century



ERN

Beuce - 932-8051  
 Laker  
 Exec TL. AFT.

Int 184

by selection

same parking lot

1st floor

Thurs - 1:  
 at Hill