

Larry,

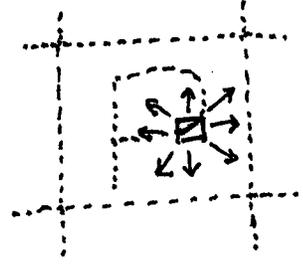
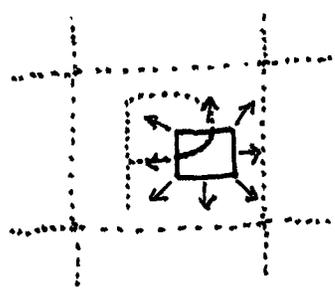
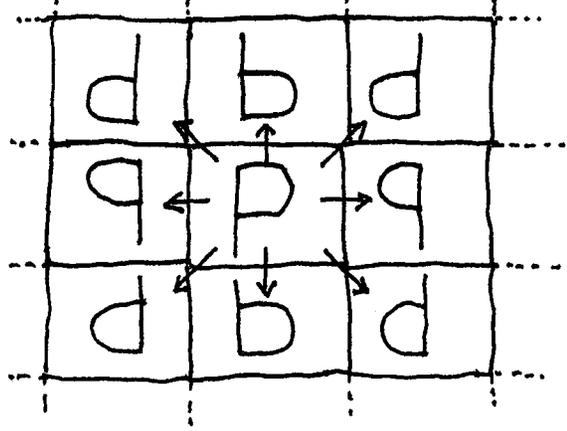
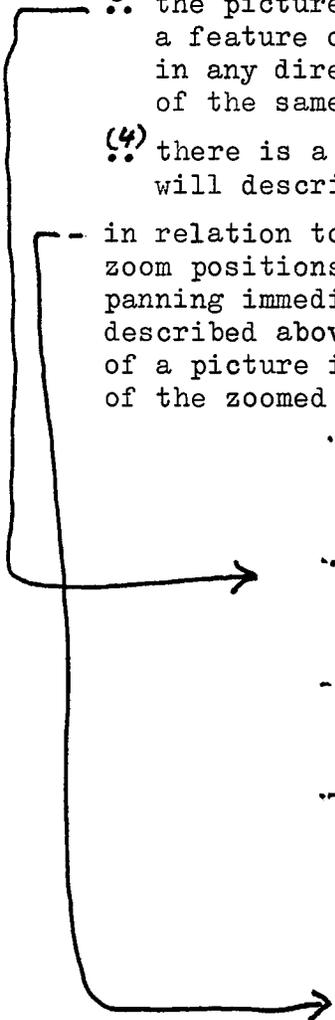
I thought it might be useful if I try again to write out in as ordered a way possible the specs of the system I would like to achieve.

(n.b. all 'options' mentioned are options desired)

- \* 1. **Main interactive features for spectator manipulation,** assuming a store of up to 40 images on the hard disc, and sixteen mono sound tracks from the eight stereo cassette decks:

**A... Panning**

- smooth panning left/right, up/down
- and if possible also in any diagonal direction as indicated from the the joystick control
- speed - I estimate that for a fast pan you could move a point from one side of the screen to the other in about three seconds, and a slow pan would do this in about eight seconds. Best would be a situation where I could control and choose the pan speed between fast and very slow
- what happens when you pan to the edge of an image? three options:
  - .1 the pan stops
  - .2 you pan over the edge of the picture into black
  - .3 the picture repeats itself mirror image in all directions (this is a feature of the Lumena software I believe). So you can pan in any direction as long as you want and you move through repetitions of the same image
  - (4) there is a fourth option where you pan to a new picture, which I will describe further in the para 'image architecture'
- in relation to the zoom function, panning is operational at any of zoom positions (though when you are fully zoomed out you would be panning immediatly outside the picture). The pan-over-the-edge options described above would be operative at any zoom position - and the 'edge' of a picture is always the edge of the total picture (not ~~just~~ the edge of the zoomed in part you can see on the screen)



B... Zooming

- ideally a smooth zoom in small steps
- less ideally in direct multiples (2,4,16 etc.) but then to get an impression of smoothness it would be good if I could cross-dissolve between steps, or.....
- speed - should match subjectively the speed of the pan
- furthest limit of the zoom - could be one pixel! from the original 512 x 512 image - but I'd like to be able to set it to say 16 x 16 blocks or whatever else suits a particular presentation
- focus of zoom - three options:
  1. always zoom to the centre of whats on the screen
  2. use a curser to locate the point you want to zoom towards
  3. use a box to determine exactly what you want to see fill the screen (this function is probably there in Lumena as a tool for image processing - and I don't see it so practical as an interactive tool for spectator use)

NB if one joystick is controlling pan and zoom function, (this means a spectator could be asking for pan and zoom movements simultaneously. And ideally that is what should happen. Alternatively one instruction would have to be given priority over the other.

C... Movement between different images (image changes)

- three options:
  1. instantaneously
  2. by means of one or other kind of wipe (e.g. from one side to another, or from top to bottom, or from centre out etc, etc.)
  3. by means of a 'cross dissolve' - the best and only way I can imagine this is by a random replacement of pixels of image A by image B - with the possibility then to make it happen slow or fast. You mentioned doing something with the colour map to get a dissolve but I don't exactly understand what this would achieve. Another way I could describe what I mean by pixel replacement is that image B comes on the screen but image A remains superimposed over it - then in random order pixels from image A disappear letting image B gradually come through  
(what about an analog cross fade - equivalent to what a video mixer does with two separate video signals?)

*these notions of cross-dissolve have a direct relationship of course to the time it takes to get a new image from the hard disc into memory - unless there's enough memory for alot of images as you seemed to indicate was possible with the Time Arts hardware.*

D... Image architecture

i.e. the planned arrangement of many images to establish how and when one replaces another on the screen

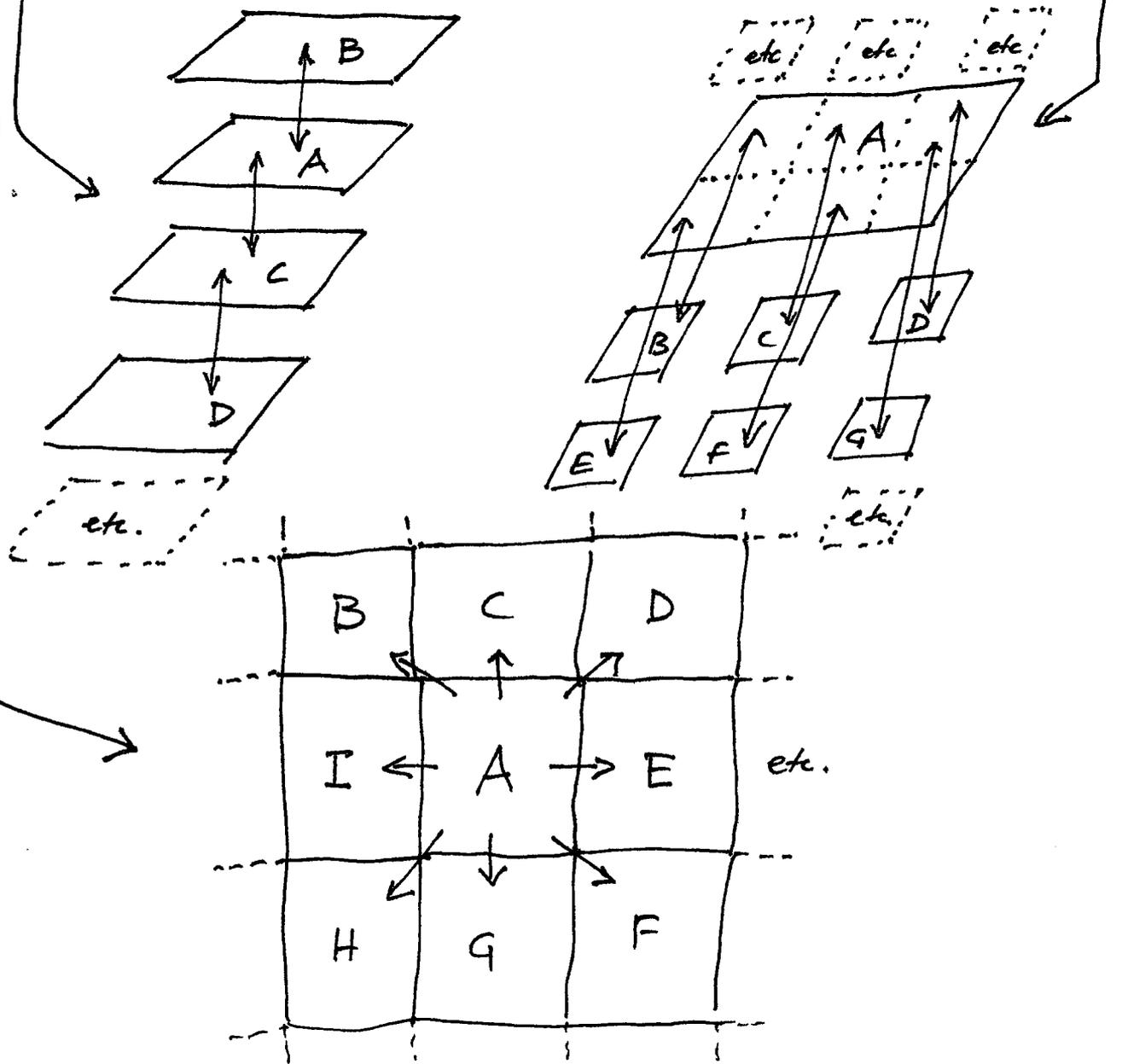
- two basic options:

! images are conceived as being above and below each other - you go from one image to another at a certain point of the zoom-in or zoom-out.

note - you can set the image change at any point of the zoom, even cancelling the zoom altogether so that the zoom control just effects image changes - and the other extreme is after the deepest points of the zoom

furthermore, more than one image could be set to be above or below another - which one is chosen depends on where you are in that image (pan position). This is the logic for instance of the 'Invisible Cities' project arrangement

? images are conceived as being side by side each other - you go from one image to another by panning - the new images are around the image your on - depending where you pan to you go another



E... Other possibilities of spectator interaction

- direct manipulation of colours and/or grey scale of the image (I've seen this done with a trackball control - rolling the X axis changes the colours, rolling in the Y axis the grey scale - the result is quite spectacular)

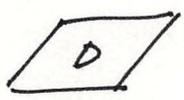
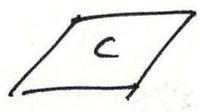
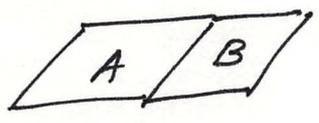
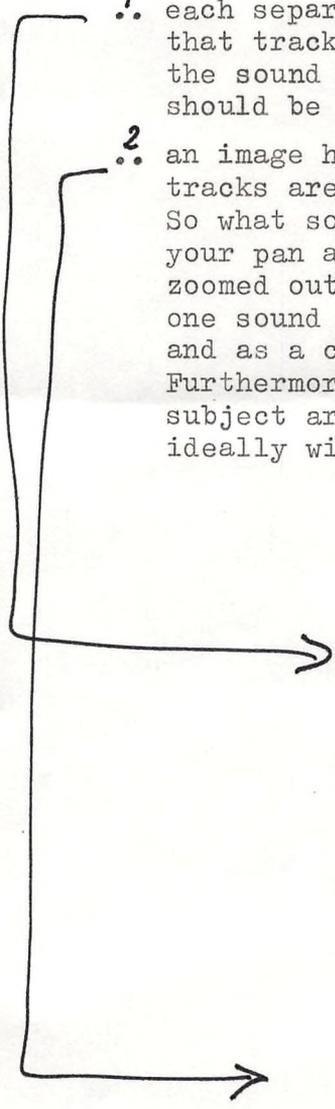
so I'm interested to have this possibility - with a joystick or trackball control - (and also if possible with an audio input so that sound can modulate colour and grey scale.)

F... Sound

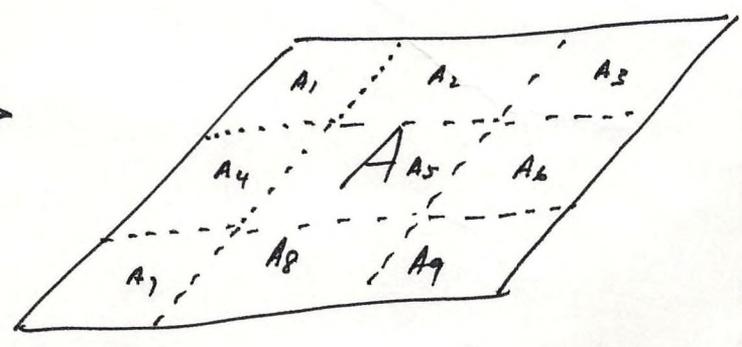
at the moment in the context of the 16<sup>+</sup> channel mono system I have where the only control is volume regulation on each channel via 16 voltage controlled amplifiers.

two basic options:

1. each separate image has a sound track assigned to it - you hear that track when you are seeing that image. When an image changes the sound also changes - ideally the visual cross-dissolve timing should be accompanied by an equivalently timed audio cross-dissolve.
2. an image has more than one sound track assigned to it - the sound tracks are assigned to specific areas (subject matters) of the image. So what sound tracks you hear will have a dynamic relationship to your pan and zoom activities on that image. For instance if you are zoomed out and see more than one subject area you will hear more than one sound track simultaneously. Zooming in will isolate subject areas and as a consequence will isolate particular sound tracks. Furthermore, panning about in an image will take you from one (or more) subject area to others - the sound tracks should change accordingly ideally with smooth dissolves, that are matched to the pan rate!



linked to soundtracks A, B, C, D.



- A<sub>1</sub> → soundtrack A
- A<sub>2</sub> → soundtrack B
- A<sub>3</sub> → soundtrack C
- A<sub>4</sub> → soundtrack D
- etc.

2. Image creation facilities

- A. The Lumena software for 2D and its animation possibilities
- B. A 3D software package??

3. Input and output facilities

- A. Real time full resolution video digitizing
  - from a video camera (*special camera?*)
  - from a video tape recorder (*special recorder?*)

- B. PAL video syncable
  - so that computer graphics can be recorded on video tape in PAL

- C. Video mixable
  - so that computer graphic imagery can be superimposed over a direct video image from a camera or recorder, and this composite picture can also be then recorded on tape
  - in this situation the camera or recorder video image does not get digitized - it just goes to the monitor and the computer graphic image is superimposed upon it *↳ using a A.G.B. + PAL monitor*

- D. Output to
  - colour matrix or ink-jet printer
  - video printer for slide or Polaroid hardcopy

- E. Audio input
  - as I mentioned in para 1E - music or voice to modulate colours and grey scale of the image

Larry - that's then the ideal configuration as I imagine it - now to face the possible limitations of the hardware and software that's actually available. Yet it should remain the goal as far as possible. (*I hope it's realistic!!*)

(A note on the audio - it seems my longer term ambition of having a fast random access sound system will be best achieved with the new generation of digital audio on floppy disc systems:- I saw one advertised for \$30,000 which is out of my reach - but the possibility is emerging.)

Looking forward to speak to you again soon

*Jeff.*