

# Cycloramas Re-Imagined

Michael Naimark

Institute for Creative Technologies  
USC

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Thank you Paul...

I'm working to connect some dots here so please forgive me if it's a little clunky. Grateful for your feedback.

Also, old farts like me are easily drawn into digressions. I have a lot of material to cover so will need to keep them to a minimum.



# michael naimark

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## Cycloramas Re-Imagined

*reality rooms done right*

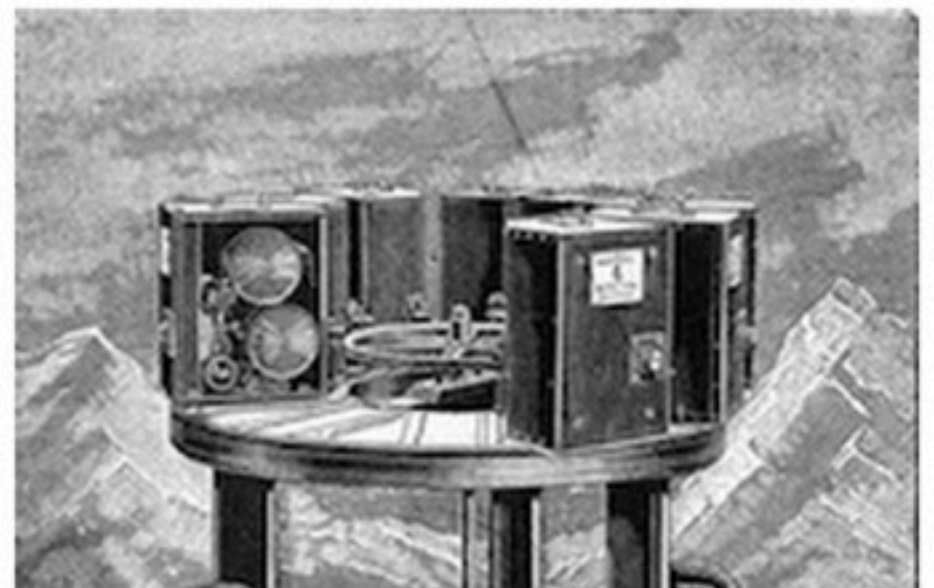
posted Nov 2013

Imagine walking down a long hallway then up a spiral staircase onto a large circular platform where you're entirely surrounded by state-of-the-art, industrial strength, stereoscopic motion picture projection, showing synchronized imagery of an actual place, complete with surround sound and perhaps some degree of interactivity. It could conceivably be live.

Of course, the imagery doesn't need to be only realworld, but the concept of such a space has a good hundred years of history to learn from. These spaces were called [Cycloramas](#), and the hundred years were throughout the 19th Century. Cycloramas were among the most popular forms of entertainment through much of the modern world until the birth of cinema.

So how would it be done today?

This is an early-stage proposal to simultaneously develop the camera system, the display environment, and content. (Please see the most recent slideshows below.)

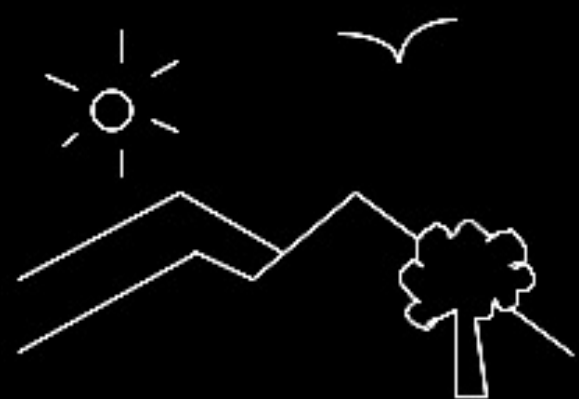


Tagline. At risk of being snarky, intend this as a provocation. I actually don't believe it'll ever be exactly like being there, ... Yet, imagine standing on an elevated platform, surrounded by 6 best giant stereo 4K projection, playing synchronized realworld imagery. May be interactive, conceivably could be live. That was the baseline vision beginning last summer. But first, some basics as I see them.

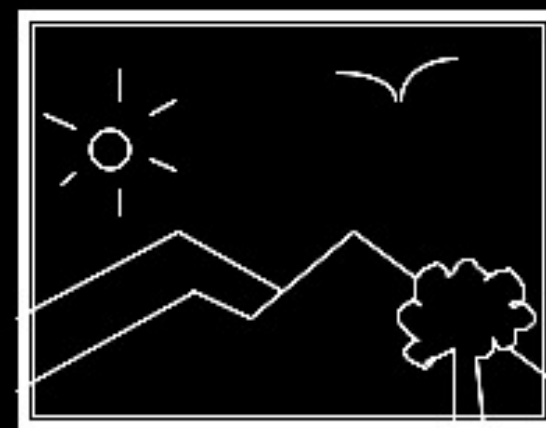
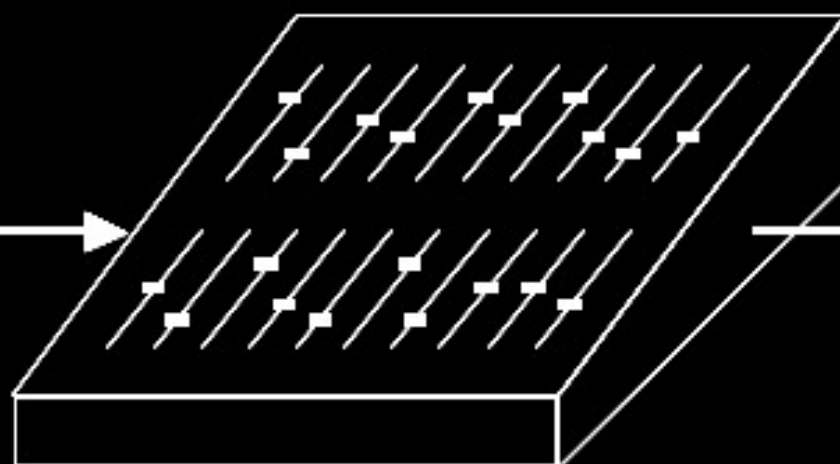
How do you know  
I'm not a movie?

Got a lot of mileage out of this, esp with kids.  
You KNOW I'm now a movie (ear is easier to fool than the eye)





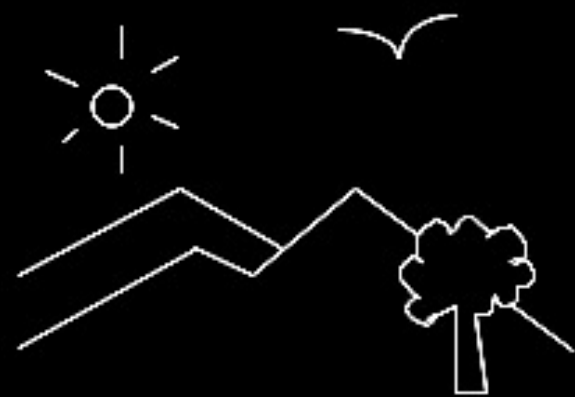
**subject**



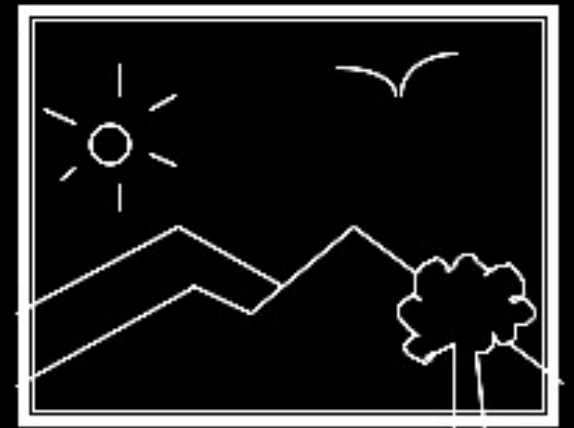
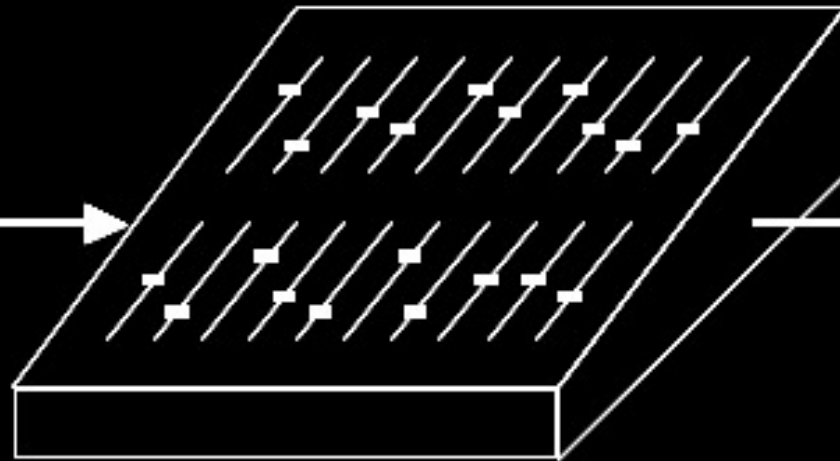
**representation**

one way to look at this. verisimilitude.

**(“Elements of Realspace Imaging”)  
 (“Presence and Abstraction in the Age of Cyberspace”)**



**subject**



**representation**

I used to write papers about this.  
When the sliders are not all known and pushed up to 10s,

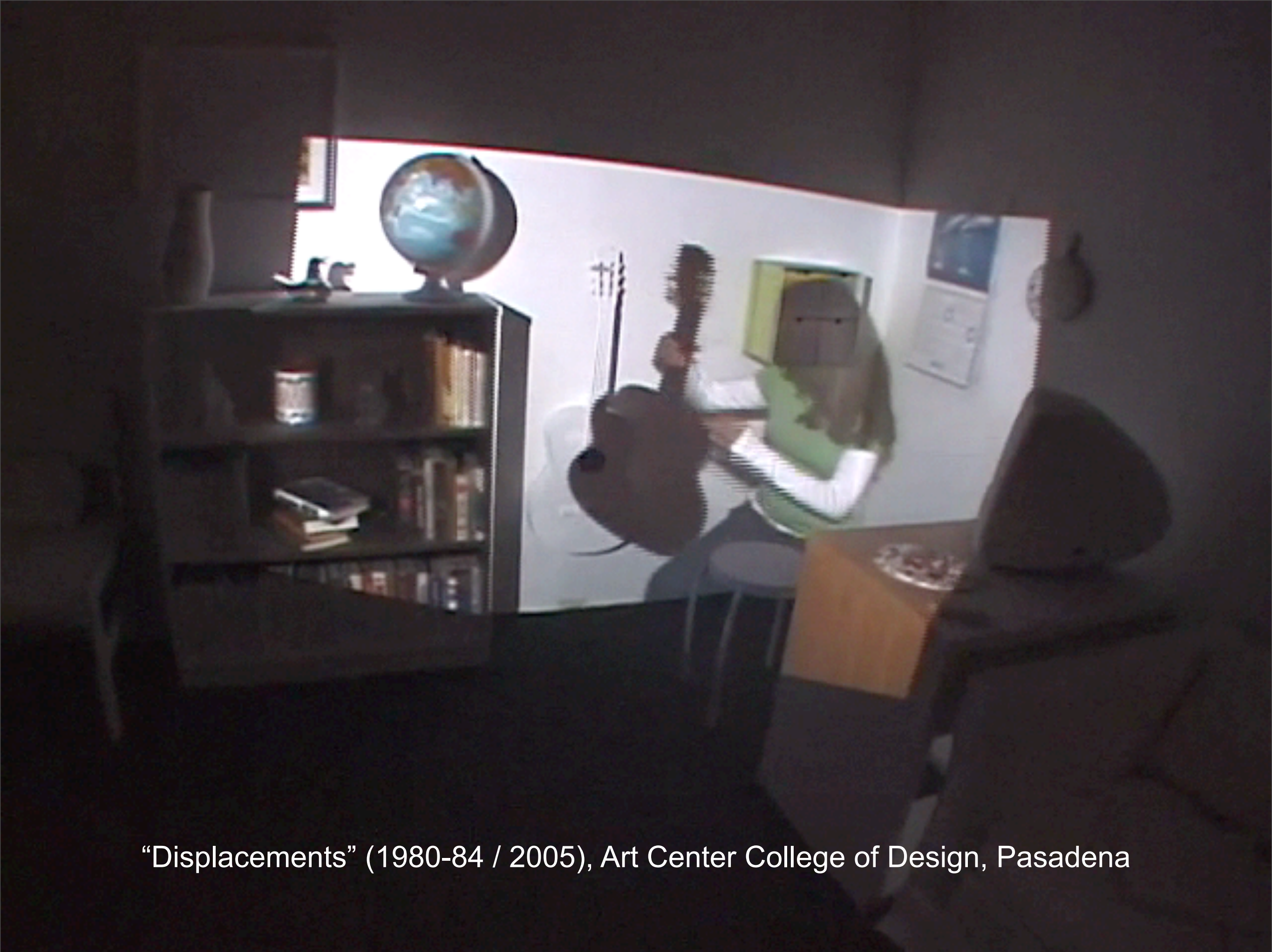
# Artifacts

funny word  
in computer graphics bad  
in art good (“evidence of the hand”). For example...



David Hockney (SF DeYoung last year)  
(video)





“Displacements” (1980-84 / 2005), Art Center College of Design, Pasadena

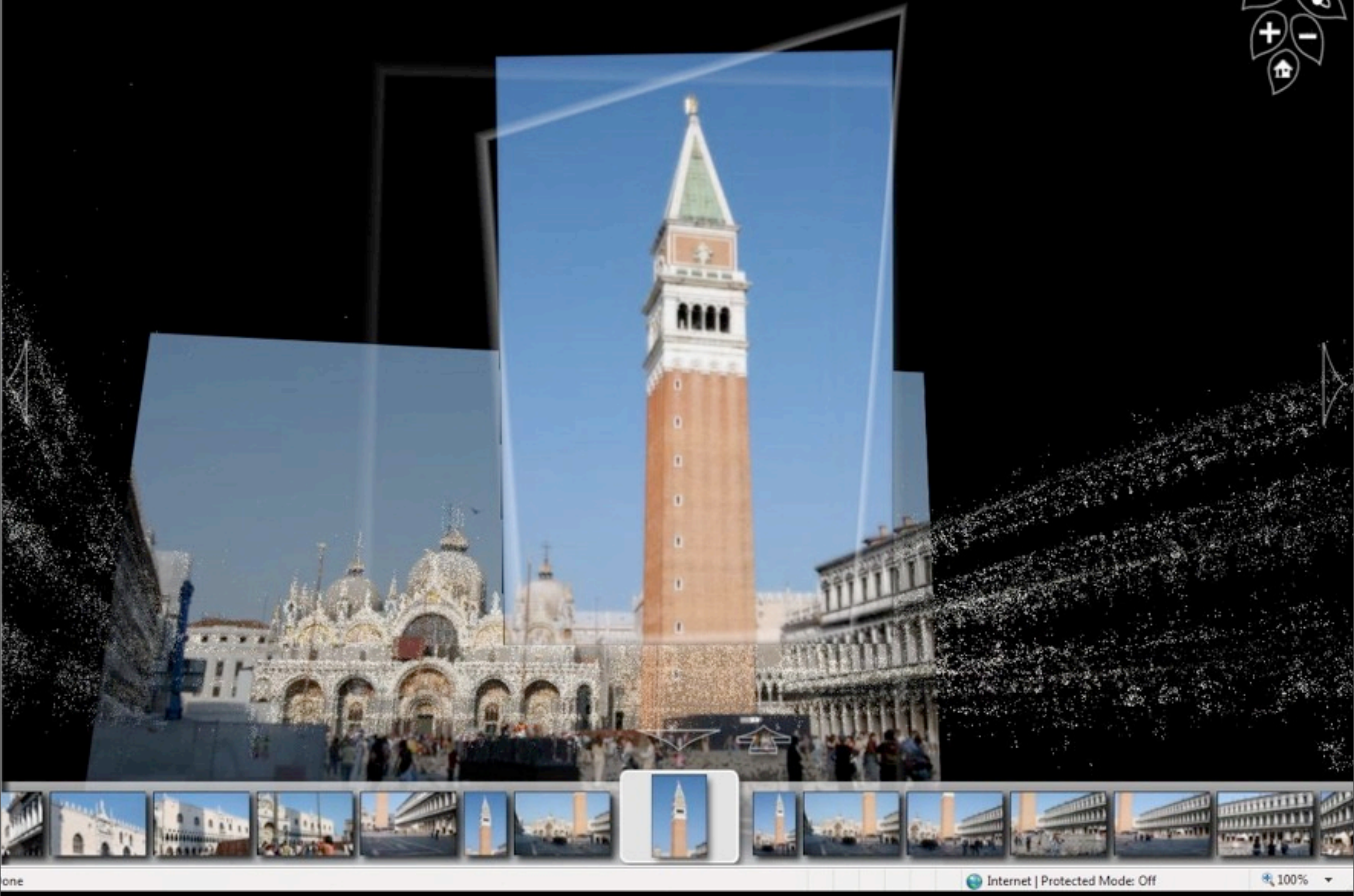
want to squeeze this in.  
the relief projection looked very real, but the artifacts of moving things in and out of registration  
(video)





On the other hand, artifacts in Google Earth integrating Street View (2010) doesn't look "real" (too weird, took it down)





artifacts in Photosynth (2010)  
also took it down (too weird)  
For this presentation, want to focus on maximizing realness or verisimilitude  
while being forthright about the artifacts (and there will always be artifact).

OK let's begin.

# Cycloramas

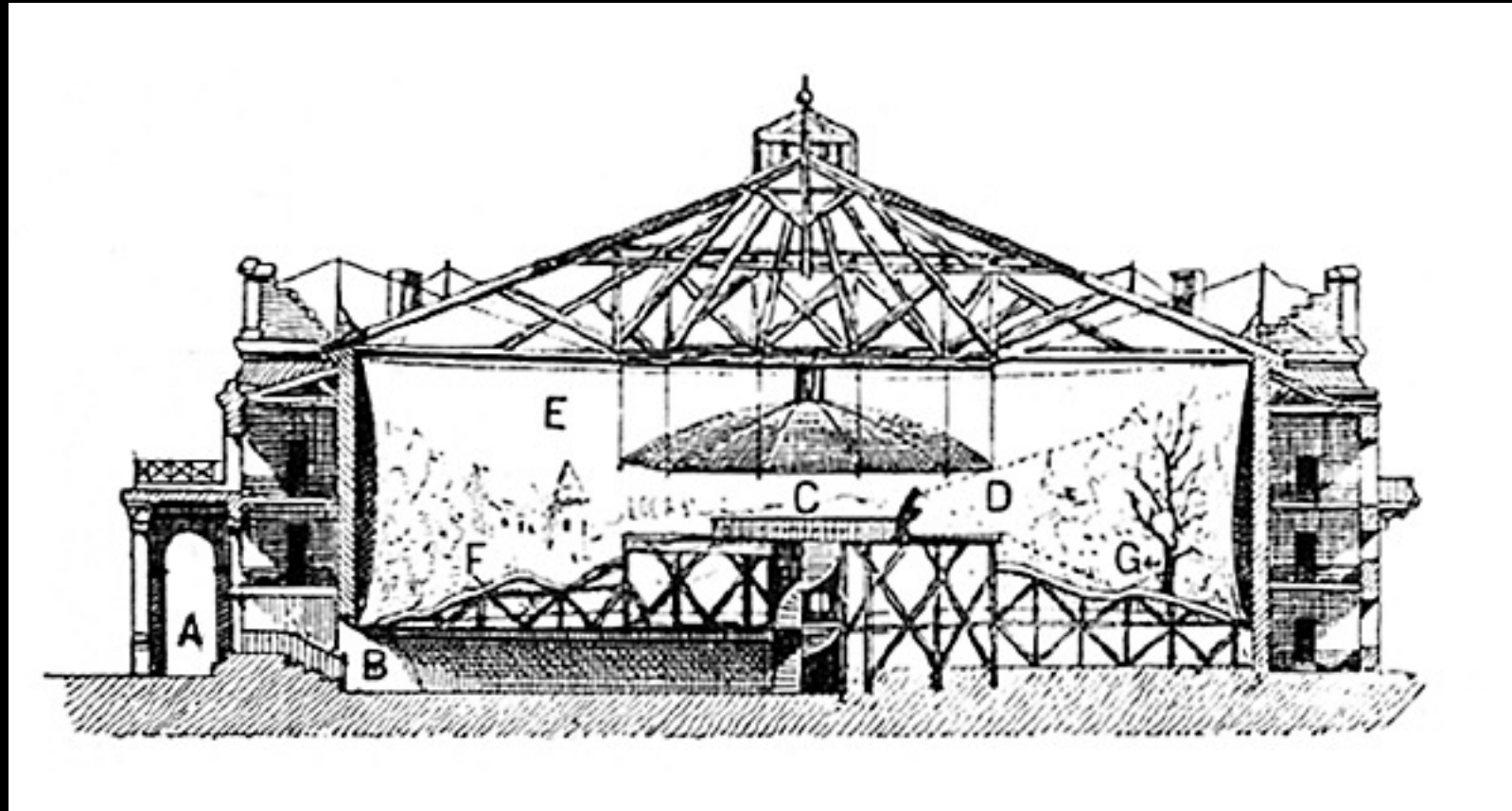
(1792 - ~a month ago)

It really does seem like a lot has changed very recently.

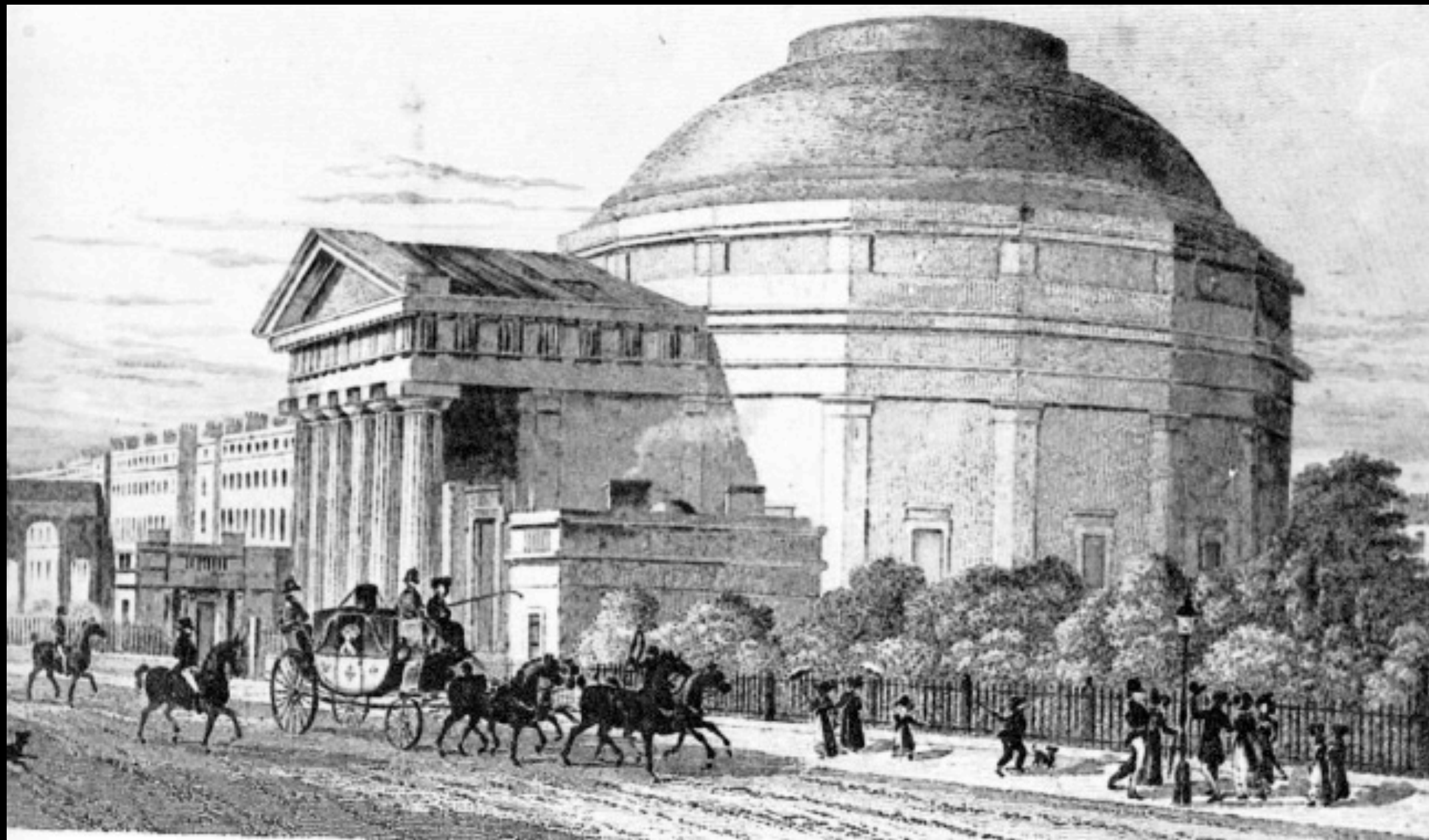


In 1792, English painter Robert Barker coined the word “panorama” to describe his giant cylindrical painting of Edinburgh, Scotland.

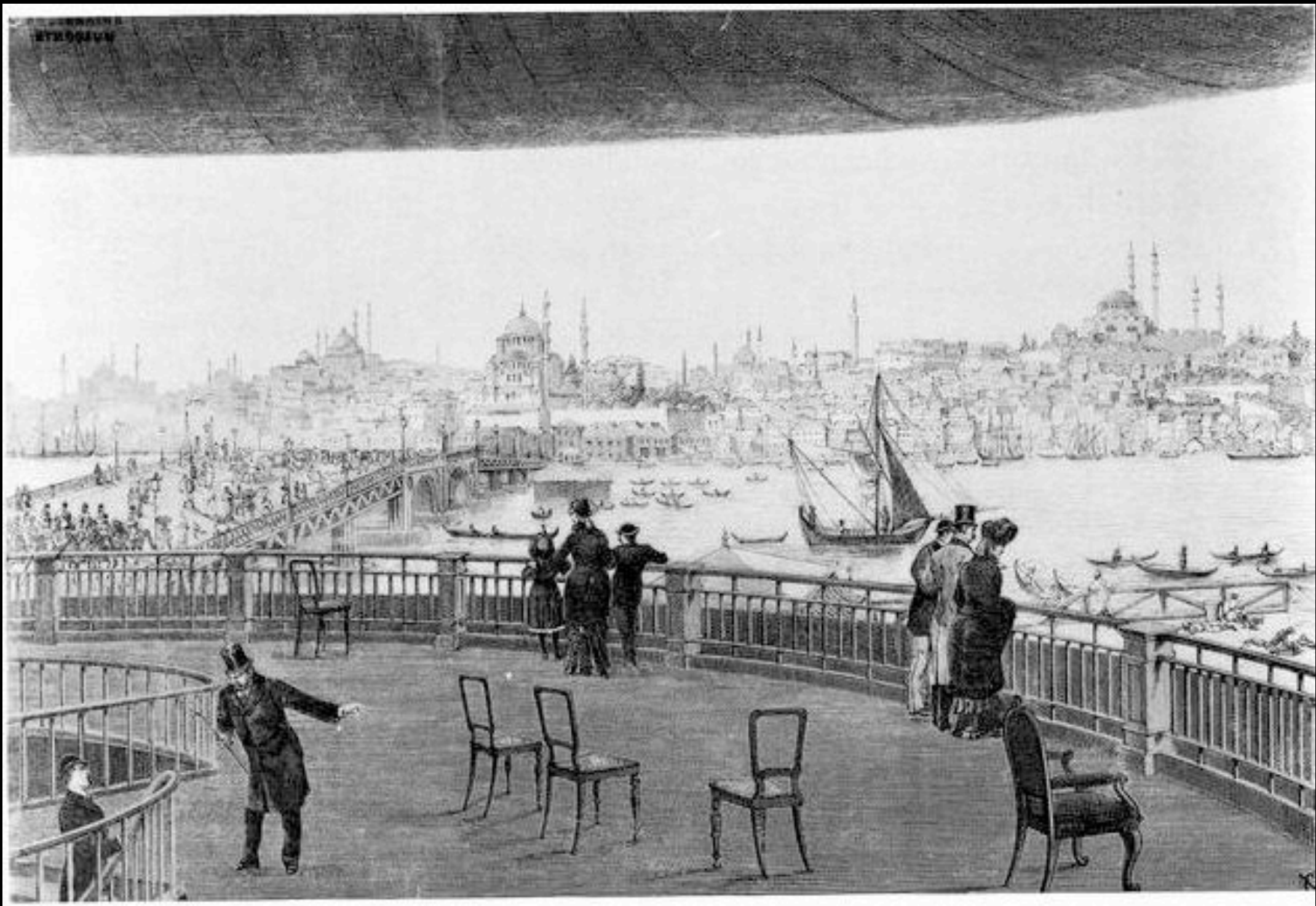




The following year, it was exhibited in London in a specially-built cylindrical building, with a skylight to provide even lighting and an elevated viewing platform.



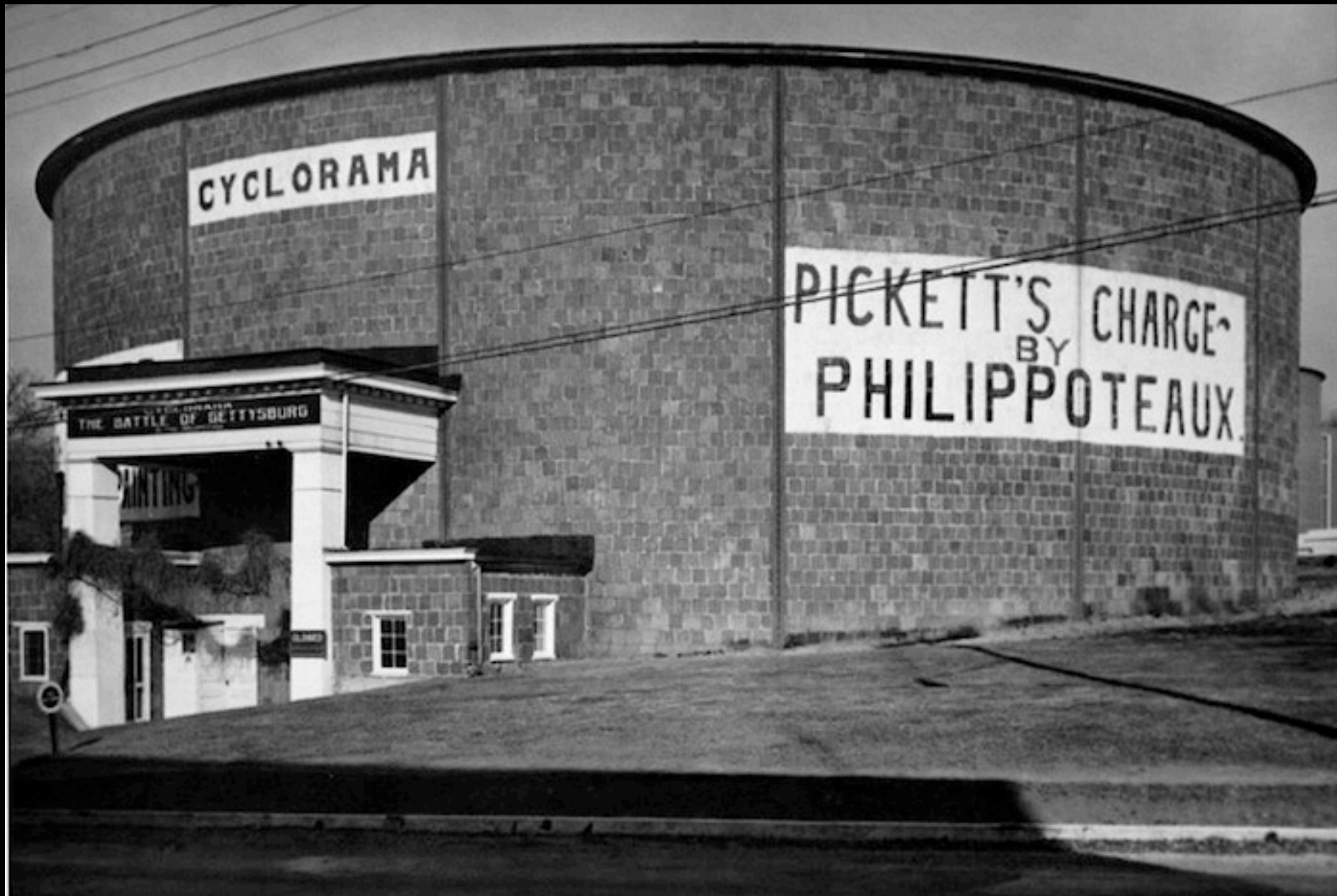
Panoramas and “Cycloramas” were built all over the world. They were a most popular artform throughout the 19th Century.







**Mesdag Panorama, The Hague, 1881 (restored)**  
actual sand and 3D props were used in foreground



**The Battle of Gettysburg, Boston Cyclorama, 1891**

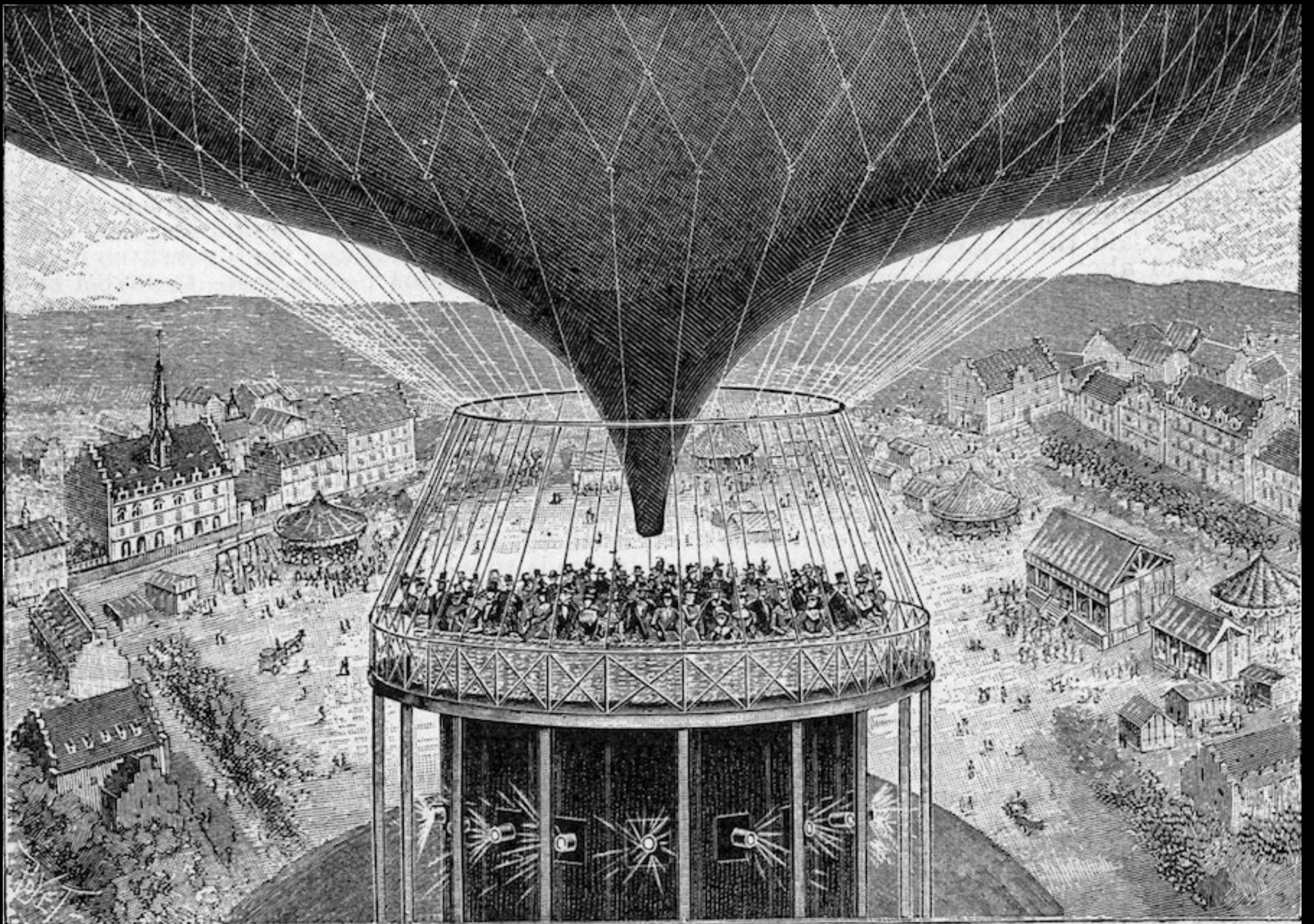




Painting dimensions: 27 by 259 feet  
(and VERY high resolution!)  
(note the narrow vertical field of view)

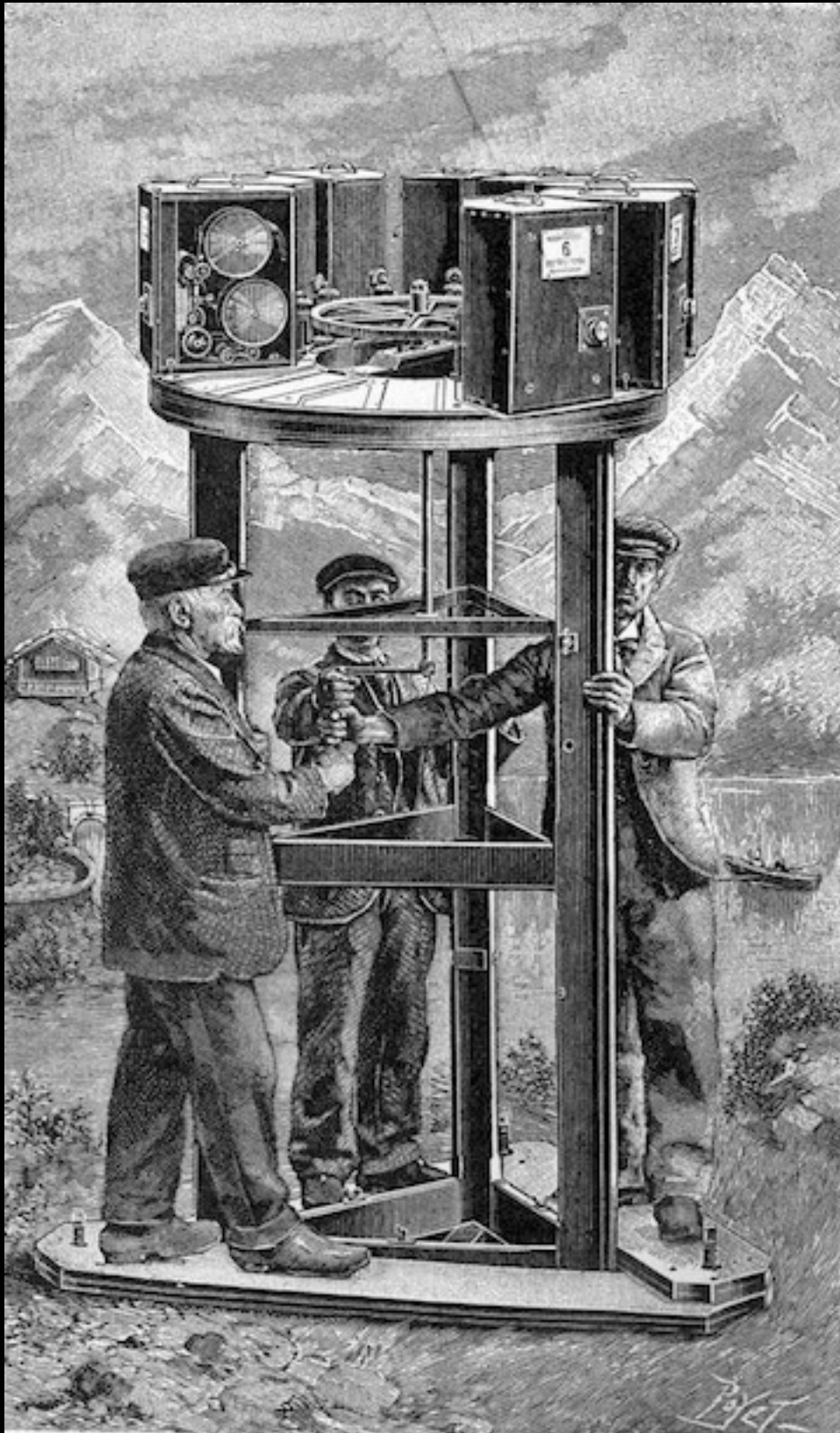
Note the narrow vertical field of view





Less than 5 years after the birth of cinema, “Cinéorama”, used ten motion picture projectors below the audience, and a fake balloon above, for the 1900 Paris Exposition.

Never publicly open. Fire hazard.



Cinéorama camera system  
with single crank  
for all cameras





**“Napoleon”, Abel Gance, 1927**  
3 x 35mm “PolyVision”

Premiered at the Paris Opera House, 15 minute standing ovation  
but 1927, talkies...

Last year, Oakland Paramount Theater, live orchestra.



**“Napoleon”, Abel Gance, 1927**  
3 x 35mm “PolyVision”  
(used for montage as well as panoramas)

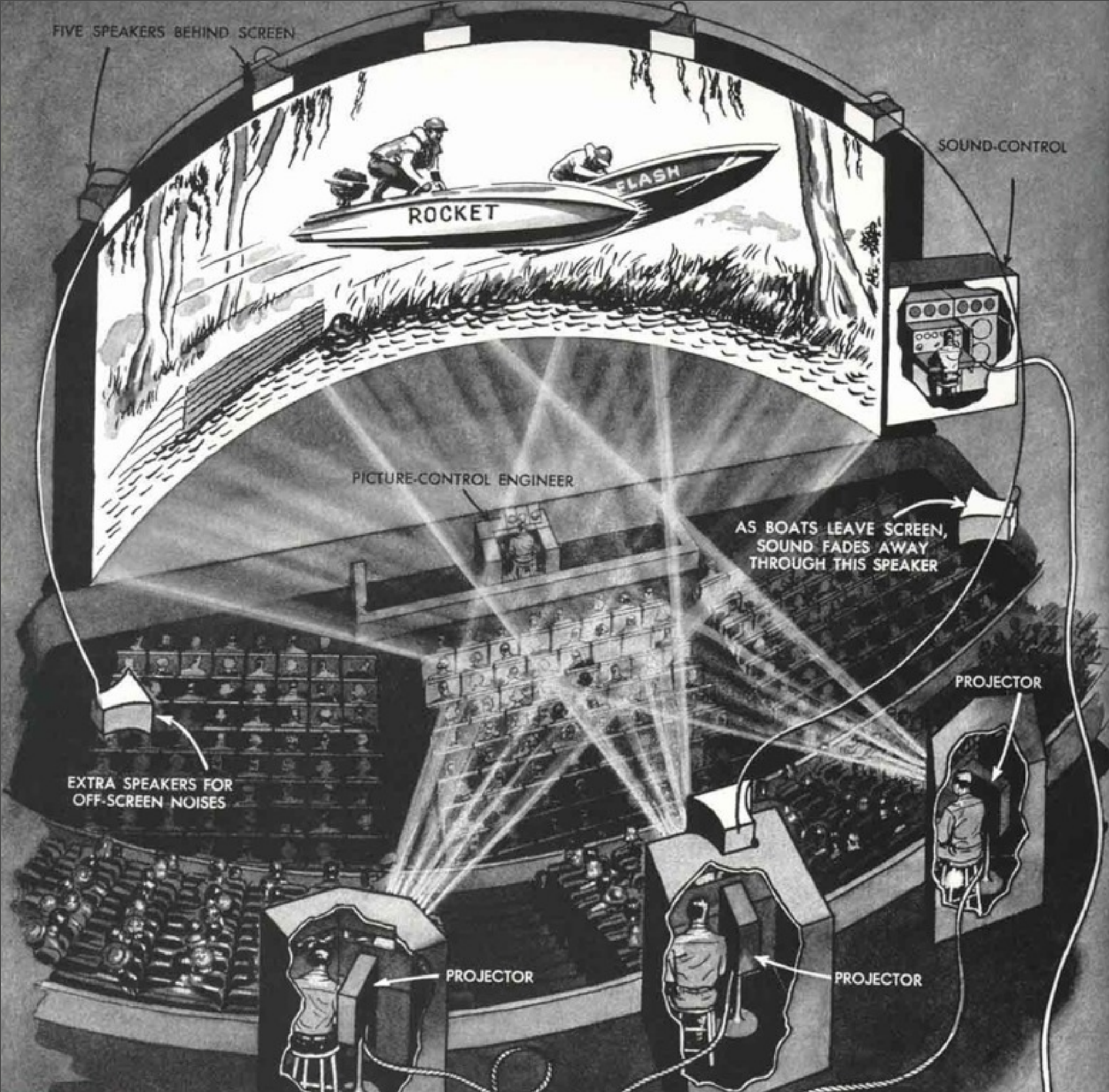
Noteworthy that Gance became equally attracted by “non-real” montage as well as sweeping panoramas.





“This is Cinerama”, 1952





**3 35mm projectors**

**146 deg hor FOV**

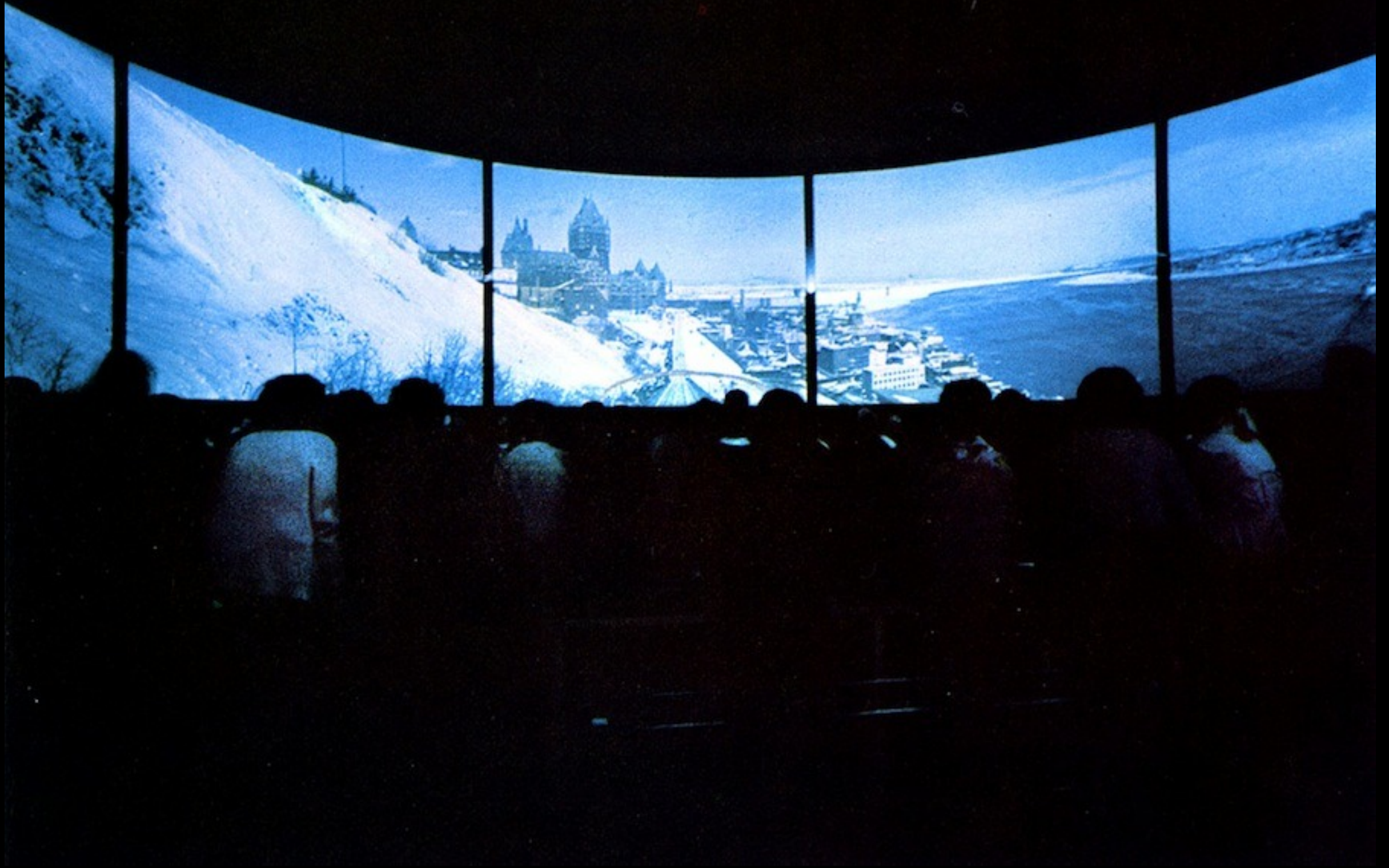
Not quite 180 degrees but close (and aud not in the center)  
Count 5 operators!





Cinerama camera - 3 x 35mm





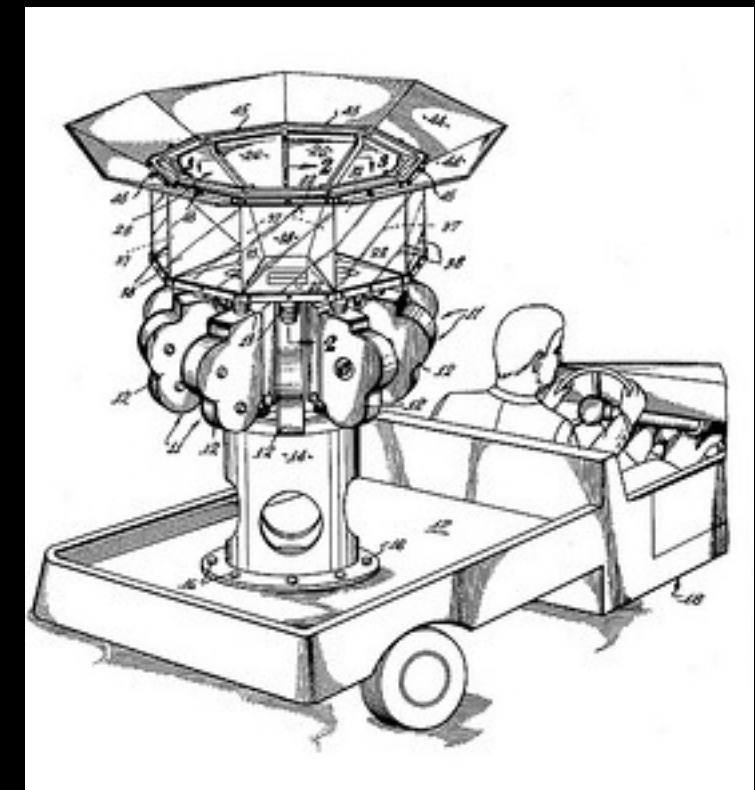
**“CircleVision”, Disneyland, 1955**  
used nine 35mm motion picture projectors  
(note the narrow vertical field of view)

A few years later.  
Note the narrow vertical field of view



## HIGH DEFINITION VIDEO CIRCLEVISION360 PRODUCTION

The CircleVision camera rig holds nine cameras shooting straight up into mirrors angled at 45 degrees (see photo on right of Jim Dickson's rig). The cameras are mounted this way because the perspective of the 360 degree view is perfect only when the center of the lenses of every camera all line up (the theoretical shared middle point is called the node) so the cameras are mounted as close together as possible. Our recommended format is super 16 film which provides optimal dynamic range for shots of varying brightness. The rig is also compatible with 35mm Mitchell cameras and most high definition video cameras including Sony 900, Panasonic Varicam and Panavision Genesis.



Director of Photography- Bob Ennis (top right) on the set of the Disney CircleVision 360 film 'Portraits of Canada' where he set up 86 Circle Vision shots over a one year production schedule.

CircleVision camera system employed mirrors to prevent "nodal point" offsets

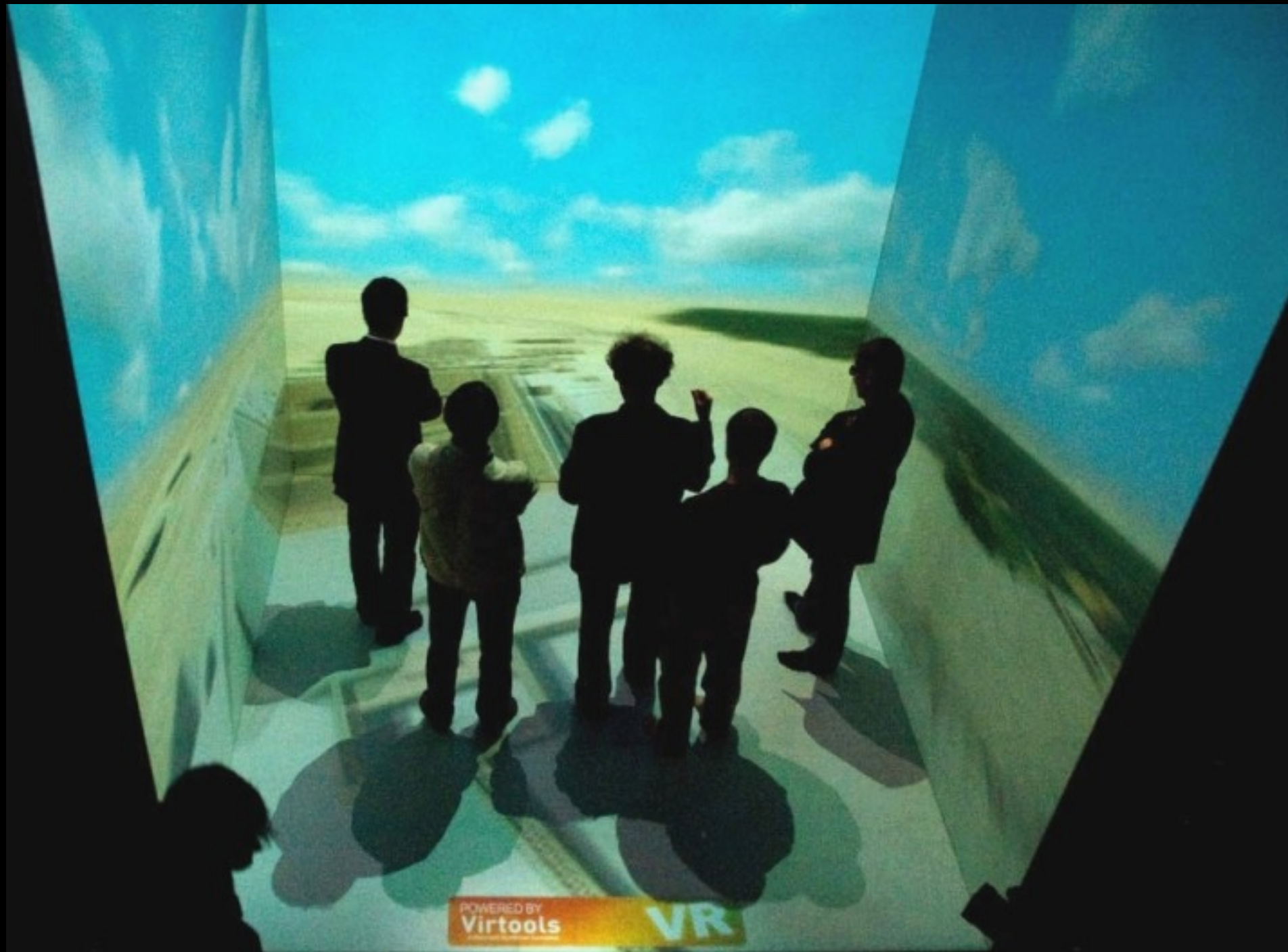
Name	bandwidth (35mm 24fps)	film gauge	fps	no. of projs	screen
Imax 3D	20x	70mm 15perf	24	2	3D rectangle
Imax Solido	20x	70mm 15perf	24	2	3D dome
Imax HD	20x	70mm 15perf	48	1	rectangle
Imax Magic Carpet	20x	70mm 15perf	24	2	2 rectangles
Showscan 3D	16.6x	70mm 5perf	60	2	3D rectangle
Imax	10x	70mm 15perf	24	1	rectangle
Imax Omnimax	10x	70mm 15perf	24	1	dome
CircleVision	9x	35mm 4perf	24	9	cylinder
Showscan	8.3x	70mm 5perf	60	1	rectangle
Hexiplex	6x	35mm 4perf	24	6	cylinder
Iwerks 870	5x/6.25x*	70mm 8perf	24/30	1	rectangle or dome
Omni Films	5x	70mm 8perf	24	1	dome
Iwerks Imagine 360	~2.5x**	70mm 8perf	24	1	cylinder

## “Special Venue” systems at Expo '92 Seville

from Naimark: “Expo ‘92”. Presence, vol. 1, no. 3, MIT Press, 1992.

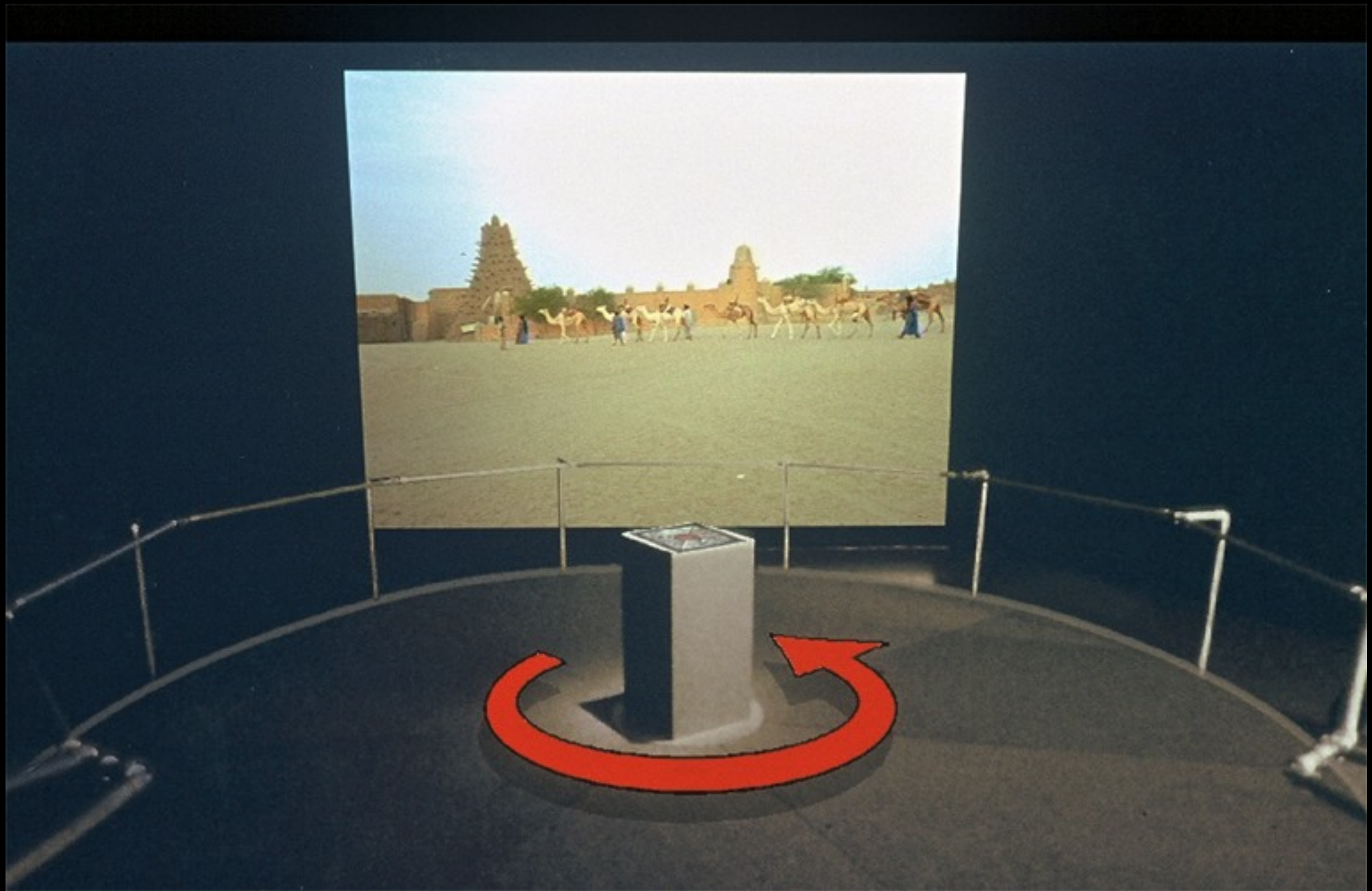
(Spend a moment on this.)  
In the end, it's all about content.





**CAVE, Tom Defanti / Dan Sandin, University of Illinois, 1991**  
immersive, 3D projection of computer-based imagery (no cameras)  
(note the super large vertical field of view)

Immersive space for 3D models, no cameras  
Note the super large vertical FOV!



**“Be Now Here,” Michael Naimark, Interval Research and UNESCO, 1995**  
3D panning motion picture and rotating floor

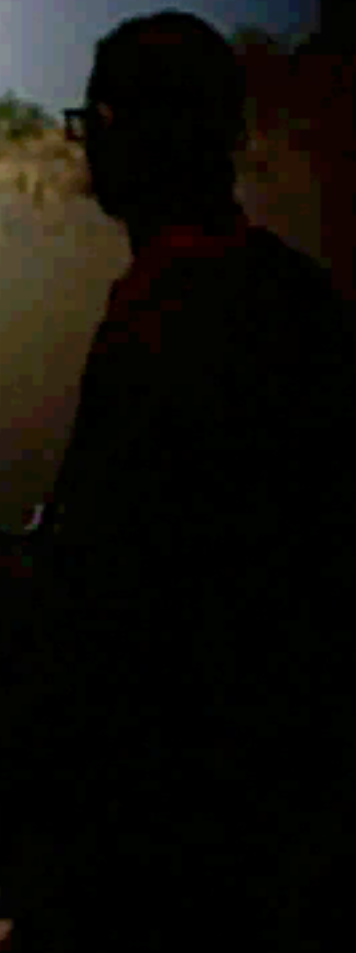




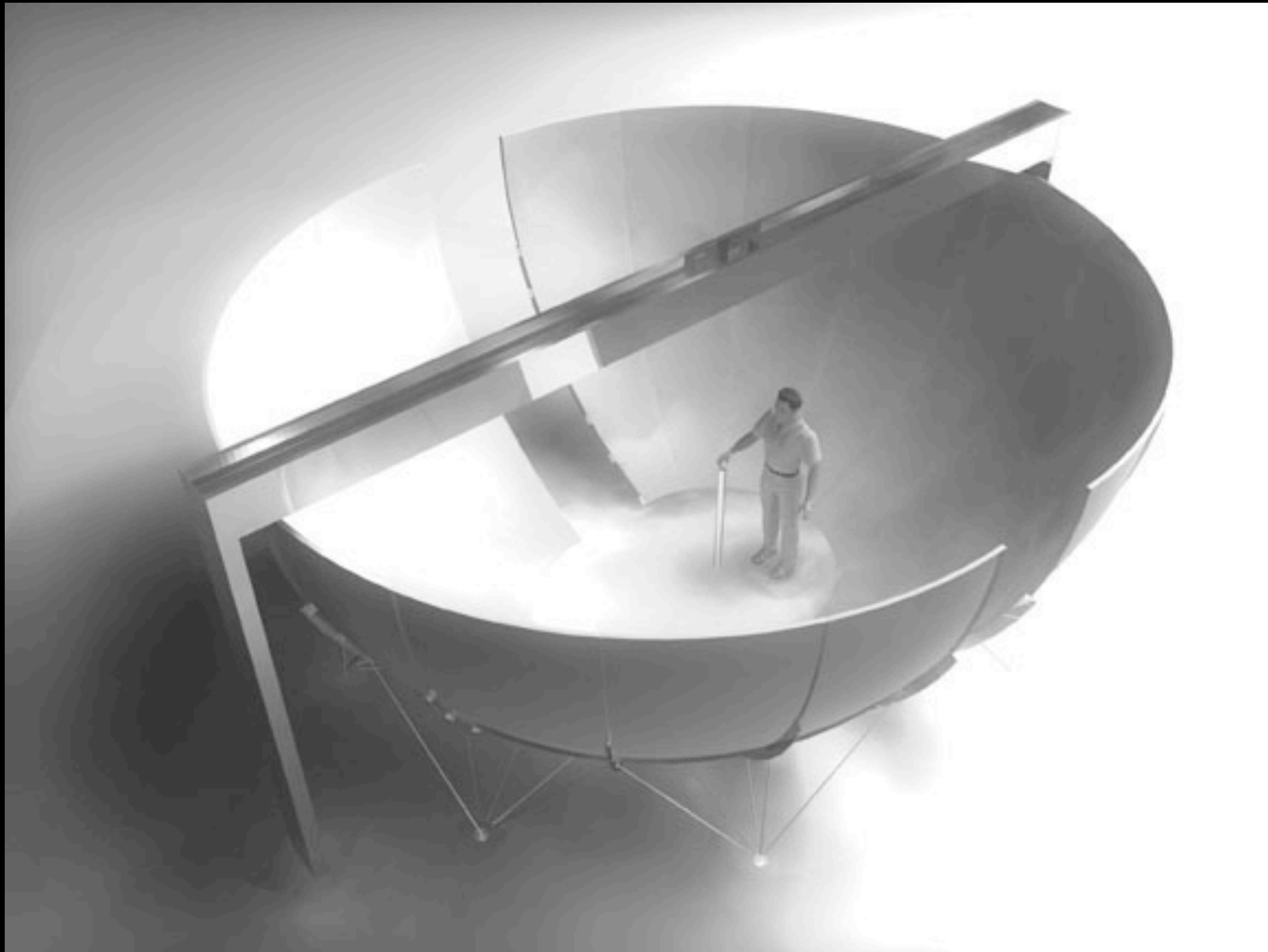
Be Now Here 1 rpm rotating stereo motion picture camera system

Rotated about the left camera's nodal point. (Not that anyone could tell.)





(video)



**Panoscope 360, Luc Courchesne, U Montréal, 1999**  
single 2D fisheye projection (hence not high resolution)  
Larger versions now exist (plus a 60' projection dome, 2013).



**“R2 360” camera, Clifford Ross w/Applied Minds, 2006**  
9 2D video cameras with mics

Big Picture Summit (NYU / USC when?)  
Camera by Applied Minds  
Display system never built (very narrow vertical FOV)



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CONTRAPTIONS  
BAD-ASS CAMERA

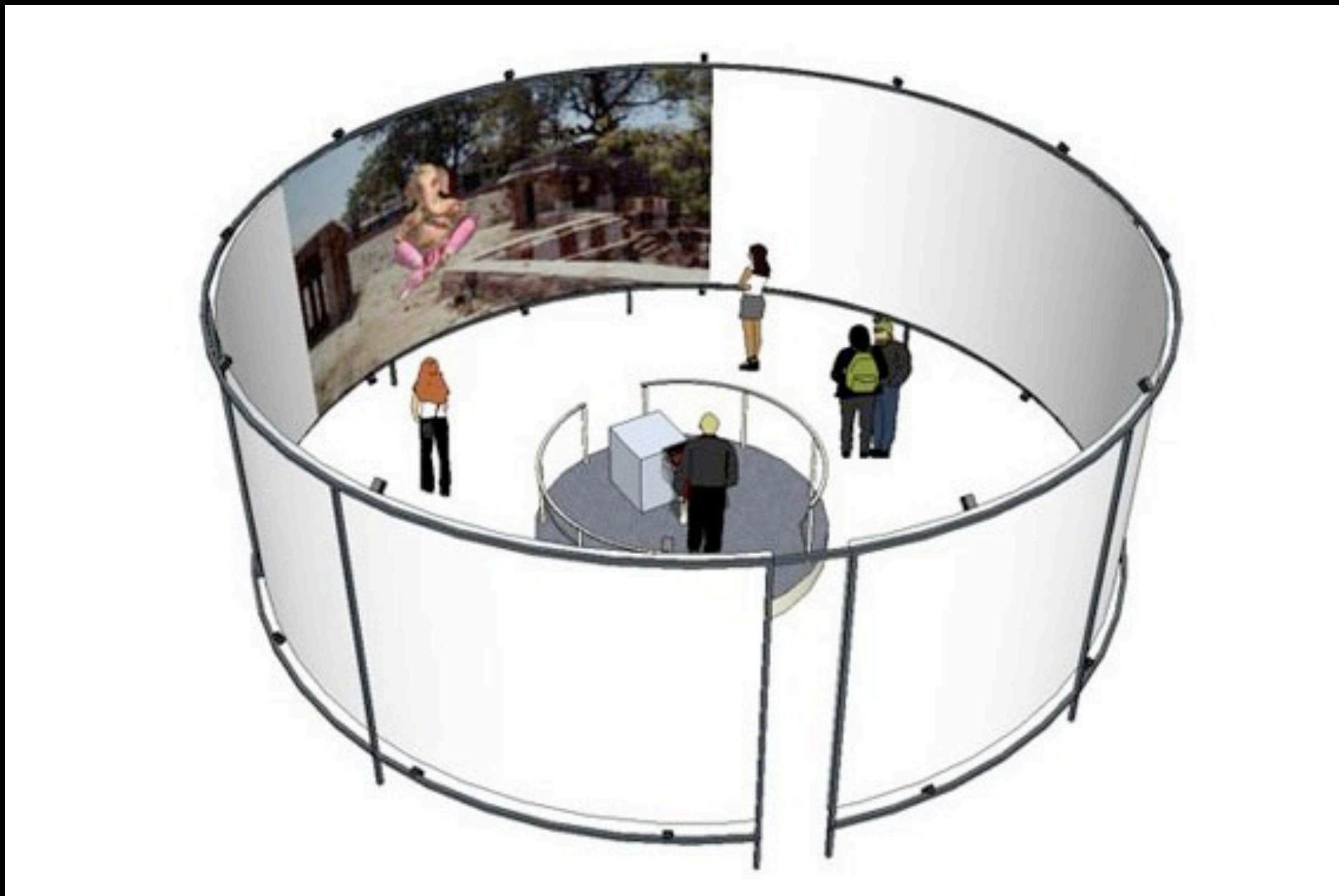


Three years ago, the artist Clifford Ross unveiled the R1, a still camera of his own design and construction—a Rube Goldberg assemblage of cadged and commissioned parts. Although it used film, it captured far more detail than any other camera, digital or not; the resolution was five hundred times as high as that of your run-of-the-mill digital point-and-click. In Ross's giant landscapes, you can make out the

woodgrains on barn shingles thousand of feet away, and see mountain trails seven miles off. The pictures seem to be made not of pixels but of vision itself.

The subsequent curiosity and admiration of scientists turned Ross, who had previously made abstract paintings and photographs of ocean waves, into a congregator of technical minds—a high-res den leader—and before long he began conceiving a successor to the R1, which would draw on the expertise of his new genius friends, and, of course, enable him to make art.

Behold the R2. On one of those stifling days a couple of weeks ago, Ross took his new camera for an inaugural outing in Central Park. The test was in anticipation of its deployment, a few days later, to a wetlands preserve in southwestern Brazil, for a shoot—a Fitzcarraldo kind of adventure," as Ross put it—arranged and underwritten



**Place-Hampi, Jeffrey Shaw/Sarah Kenderdine, ZKM, RPI, UNSW, CityU HK, 2006**  
Rotating projection and floor, stereo-panoramic still images

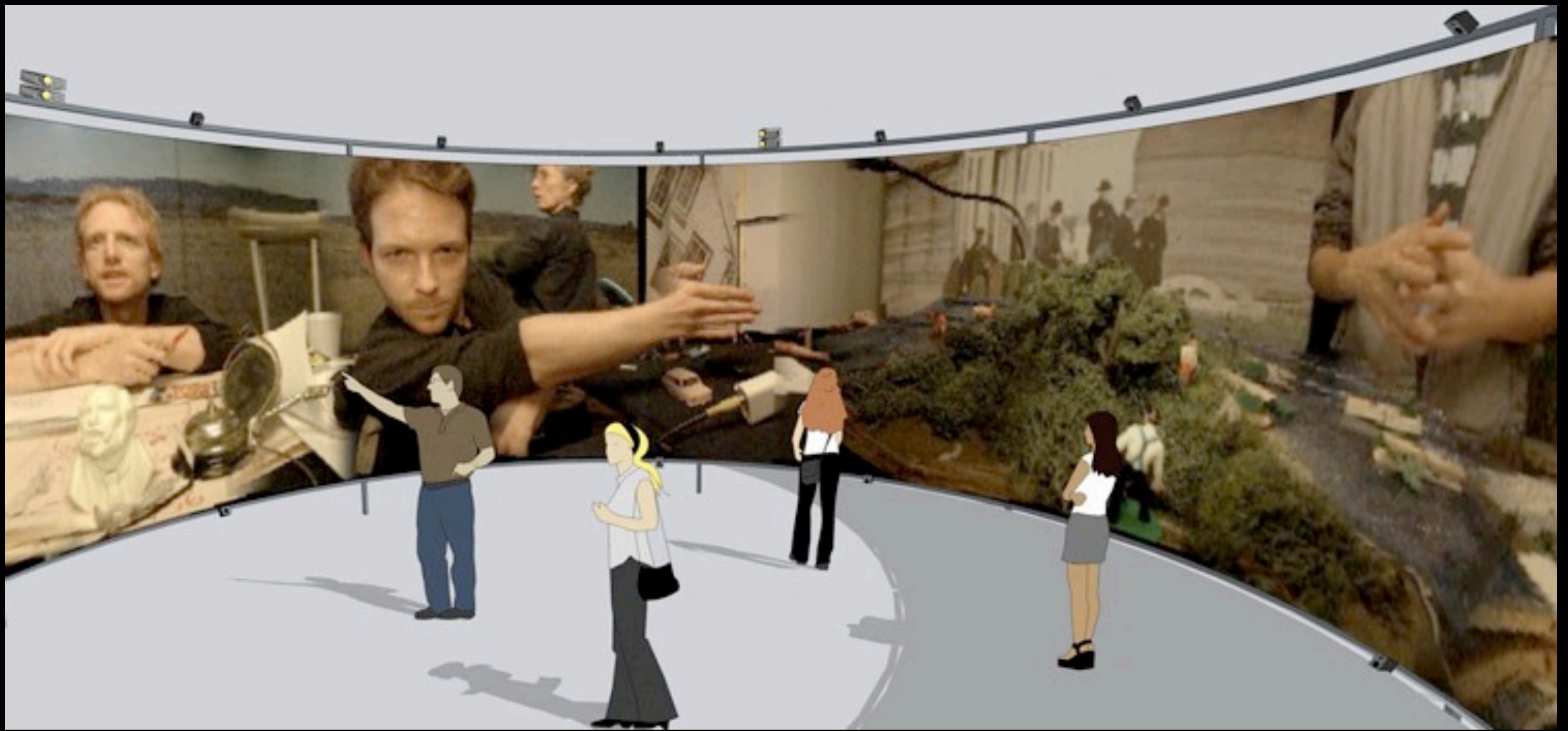
Jeffrey is all over the place, mainly Dean at City University, HK  
(RPI = EMPAC)





Place-Hampi stereo panoramic still slit camera system  
(It takes about a minute to complete a rotation.)

Note camera: 1D sensors (slits in lens cover)  
1 min rotation



**“Interactive Panoramic Cinema”, Jeffrey Shaw, UNSW, ZKM, RPI, 2007**  
six-projector 2D projection (later stereoscopic)

Later stereoscopic





**“Be Now Here x3”, Michael Naimark, USC, 2008**  
3D, motion, sound, but same footage spatially offset  
3 screens over 180 degrees

20 sec per screen / time artifacts (people walking but not clouds)

“Cinerama standard” 3 screens 60 deg hor fov each

I spent a lot of time staring at the mullions, there is a disparity bump there, but surprisingly good (incidentally I’d keep the mullions to mask out this artifact, arguable).



**“Liquid Galaxy”, Jason Holt, Google, 2009**  
8 2D plasma screens (no camera)  
(note the large vertical field of view)

note large vert fov

Digression: magnifying sheets... (Explo installation, uncanny good)





Gigapan "Epic"



Peace River "PixOrb"

**Panoramic "tiling" cameras**  
Automatically sweeps the scene over time  
Very high resolution but may have time artifacts

experiments with 2 camera stereoscopic versions  
it works



Immersive Media "Dodeca"



Point Gray "Ladybug"

**Other popular panoramic cameras**  
Simultaneous coverage  
but also 2D not 3D





**“Trekker”, Luc Vincent, Google, 2012**



15 5 megapixel cameras for simultaneous coverage  
2D, still images, large vertical field of view  
but no 3D, motion, or sound

On vehicles is augmented with LIDAR scanners.  
Not bad reconstructed stereo.

## Earlier Spatial Capture Cameras



Aspen Moviemap, MIT, 1978  
bike wheel triggered pano cams



Golden Gate Flyover, Exploratorium, 1987  
gyro-stabilized tracking cam



Karlsruhe Moviemap, ZKM, 1990  
odometer triggered wide-angle cam



See Banff Kinetoscope, Banff Centre, 1994  
baby jogger triggered stereo cams

I could go on about this. After 16 years, decided it was dumb idea. (Camera cars)  
Started working with John Woodfill, Harlyn Baker, and Paul on dimensionalization.





**“DIVE into World Heritage 3D”**  
Panasonic and UNESCO, 2012

5 off-shelf Panasonic 3D video cameras  
simultaneous coverage, 3D, motion, sound  
but narrow vertical field of view and nodal point offsets  
non-orthoscopic display

The is current state of the art for realworld stereo panoramic motion pictures  
With all due respect, we can do so much better.





# Some New Immersive Cameras

Concentrating on camera side more than display  
I'm good with "Cinerama Standard" for projection (60 deg/projector x 3, eg 4k ea)



### H3PRO7HD (360 VIDEO IN SUPER HD)

**Our Price: \$595.00**

[ADD TO CART](#)

Ultimate 360Heros full spherical, 7 HD camera system. One Piece High Strength Aircraft Flexible Nylon. No Screws required!

Creates 360 by 120 - 360 Video using this patent mount orientation.

Incredible high strength all one piece High Strength Aircraft Flexible Nylon. You can change the cameras in seconds! No Screws required!!!! [▶more info](#)

[Compare](#)



### H3PRO10HD (360 VIDEO IN SUPER HD) (12,000 x 6,000)

**Our Price: \$745.00**

[ADD TO CART](#)

Ultimate 360Heros full 360 by 180 spherical 360 Video, 10 HD camera system. One Piece High Strength Aircraft Flexible Nylon. No Screws required!

Creates 360 by 180 - 360 Video using this patent mount orientation.

Incredible high strength all one piece High Strength Aircraft Flexible Nylon. You can change the cameras in seconds! No Screws required!!!!

[▶more info](#)

[Compare](#)



### H3PRO7 (GREAT FOR 360 VIDEO CONCERTS)

**Our Price: \$595.00**

[ADD TO CART](#)

Ultimate 360Heros full spherical, 7 camera system. One Piece High Strength Aircraft Flexible Nylon. No Screws required!

Creates fill spherical 360 by 180 - 360 Video using this patent mount orientation.

Incredible high strength all one piece High Strength Aircraft Flexible Nylon. You can change the cameras in seconds! No Screws required!!!! [▶more info](#)

## Big 360Heros

Here are some big 360 Heros.





### H3PRO6N (GREAT 360 VIDEO ON HELMET OR UAV'S)

Our Price: \$495.00

[ADD TO CART](#)

H3Pro6N create SEMI spherical 360 by 120 - 360 Video using this patent pending cubical mount orientation.

Incredible high strength all one piece High Strength Aircraft Flexible Nylon. You can change the cameras in seconds! No Screws required!!!! [more info](#)

[Compare](#)



### H3PRO6 (GREAT STARTER FOR 360 VIDEO)

Our Price: \$495.00

[ADD TO CART](#)

H3Pro6 create fill spherical 360 by 180 - 360 Video using this patent pending cubical mount orientation.

Incredible high strength all one piece High Strength Aircraft Flexible Nylon. You can change the cameras in seconds! No Screws required!!!! [more info](#)

[Compare](#)



### 360H6 (GoPro Hero2 or Hero3 Cameras)

Our Price: \$295.00

[ADD TO CART](#)

One Piece 360 Heros Patent Pending Nylon Holder. The works great for all weather conditions however does require assembly with GoPro™ housings.

This is also the starter towards 360 Video underwater using the ScubaH36 [more info](#)

## Small 360Heros

Here are some small 360 Heros  
Chris Milk used one for his Oculus Beck music video (must see)

## 3D 360Video



360Heros

3DH3Pro12

[Compare](#)

### 3DH3PRO12 (3D 360 VIDEO/PHOTO GEAR)

Our Price: \$995.00

[ADD TO CART](#)

Ultimate 360Heros video gear that creates full spherical 3D video using 12 GoPro Hero3 Black or Hero3 Plus Cameras. A unique one Piece High Strength Aircraft Flexible Nylon.

Creates 3D 360 video a full spherical 360 by 180 using this patent mount orientation.

Incredible high strength all one piece High Strength Aircraft Flexible Nylon. You can change the cameras in seconds!

[more info](#)

### 3DH3PRO14H (3D 360 VIDEO/PHOTO GEAR)

Our Price: \$995.00

[ADD TO CART](#)

Ultimate 360Heros video gear that creates full spherical 3D video using 14 GoPro Hero3 Black or Hero3 Plus Cameras. A unique one Piece High Strength Aircraft Flexible Nylon.

Creates 3D 360 video a full spherical 360 by 180 using this patent mount orientation.

Incredible high strength all one piece High Strength Aircraft Flexible Nylon. You can change the cameras in seconds!

[more info](#)

### 3DH3PRO12H (3D 360 VIDEO/PHOTO GEAR)

Our Price: \$995.00

[ADD TO CART](#)

Ultimate 360Heros video gear that creates full spherical 3D video using 12 GoPro Hero3 Black or Hero3 Plus Cameras. A unique one Piece High Strength Aircraft Flexible Nylon.

Creates 3D 360 video a full spherical 360 by 180 using this patent mount orientation.

Incredible high strength all one piece High Strength Aircraft Flexible Nylon. You can change the cameras in seconds!

[more info](#)

## 3D 360Video



360Heros

3DH3Pro14H

[Compare](#)

## 3D 360Video



360Heros

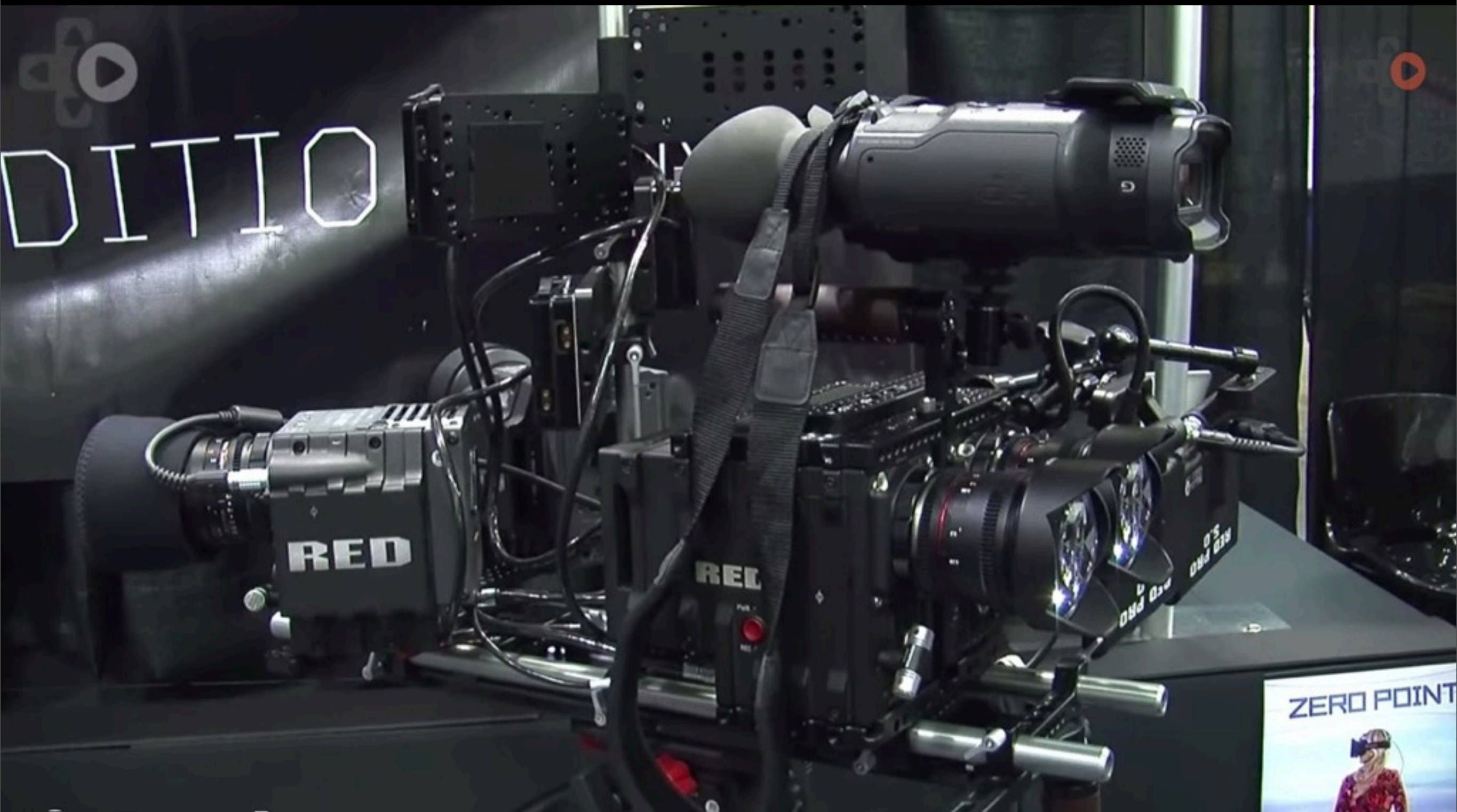
3DH3Pro12H

[Compare](#)

**3D 360Heros**

I don't think these were there a month ago!





## ConditionOne “Zero Point” - array of RED Epic cameras (2D/3D)

ConditionOne is interesting because the founder Danfung Dennis is a young former war photographer.



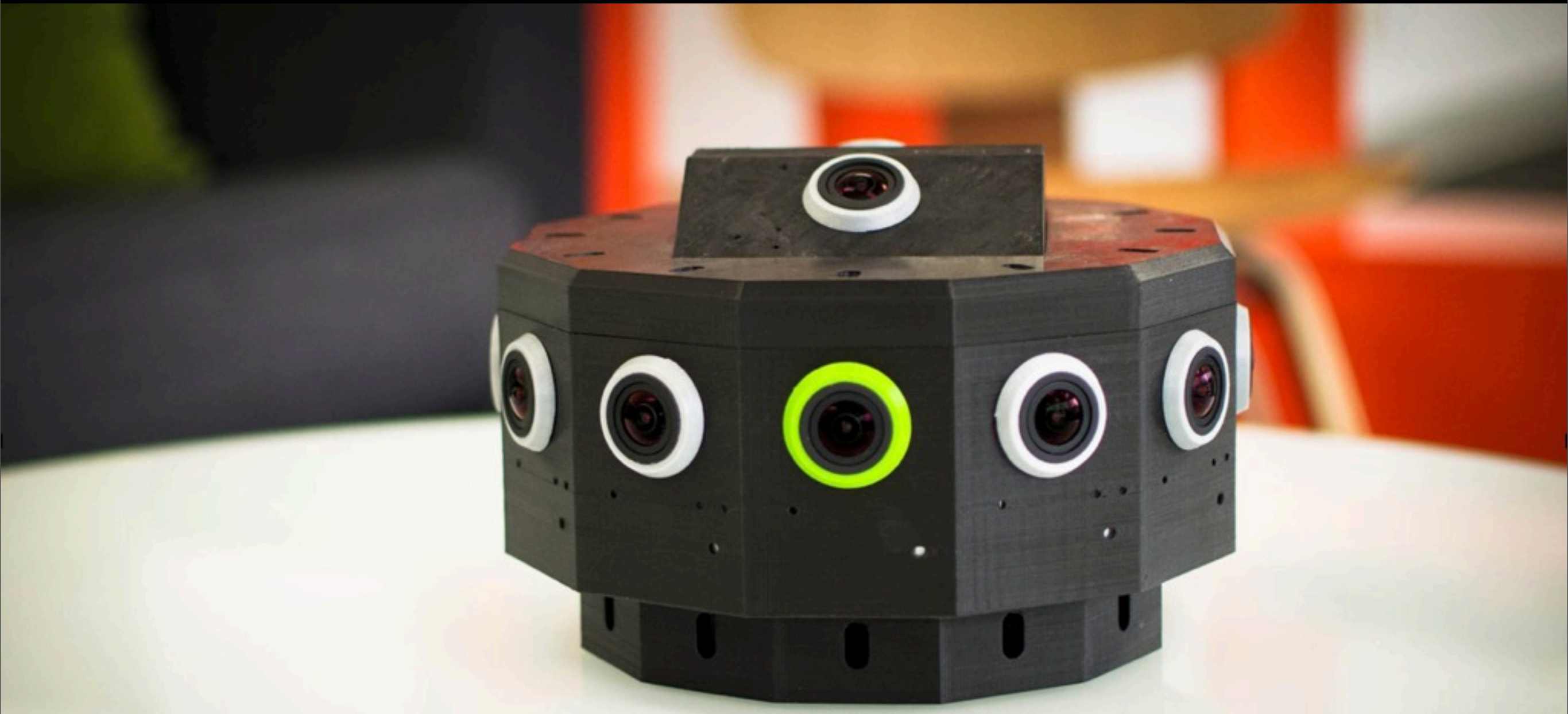
**Panocam 3D**



**“Spherigraph”**  
concept / proposal  
[donytamazone.blogspot.fr](http://donytamazone.blogspot.fr)

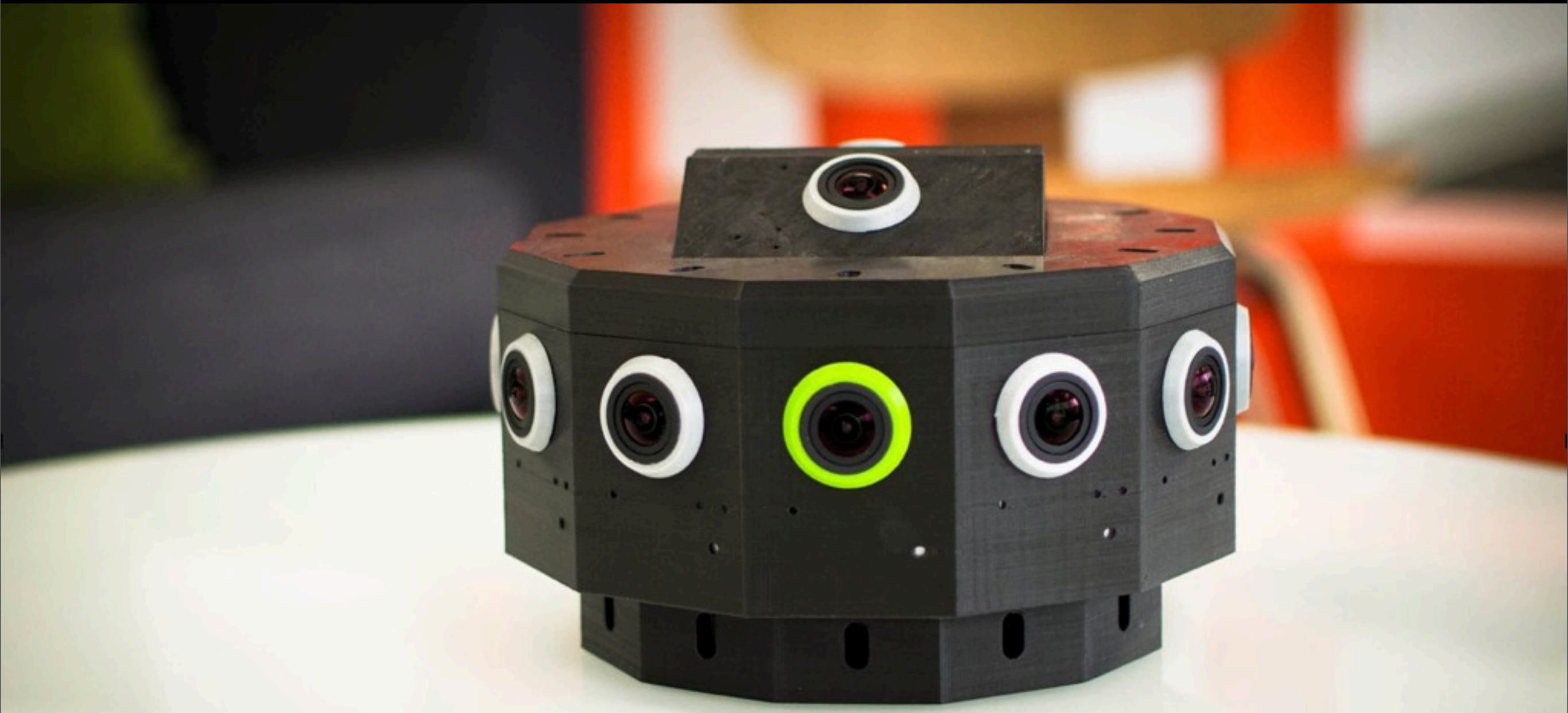
Stereo pairs. Viewable raw. But with some disparity issues like the 3-screen Be Now Here





**Jaunt VR camera**

Announced a couple weeks ago.



## Jaunt VR camera

Jaunt received \$6.8M in Venture Round funding. (4/3/14)

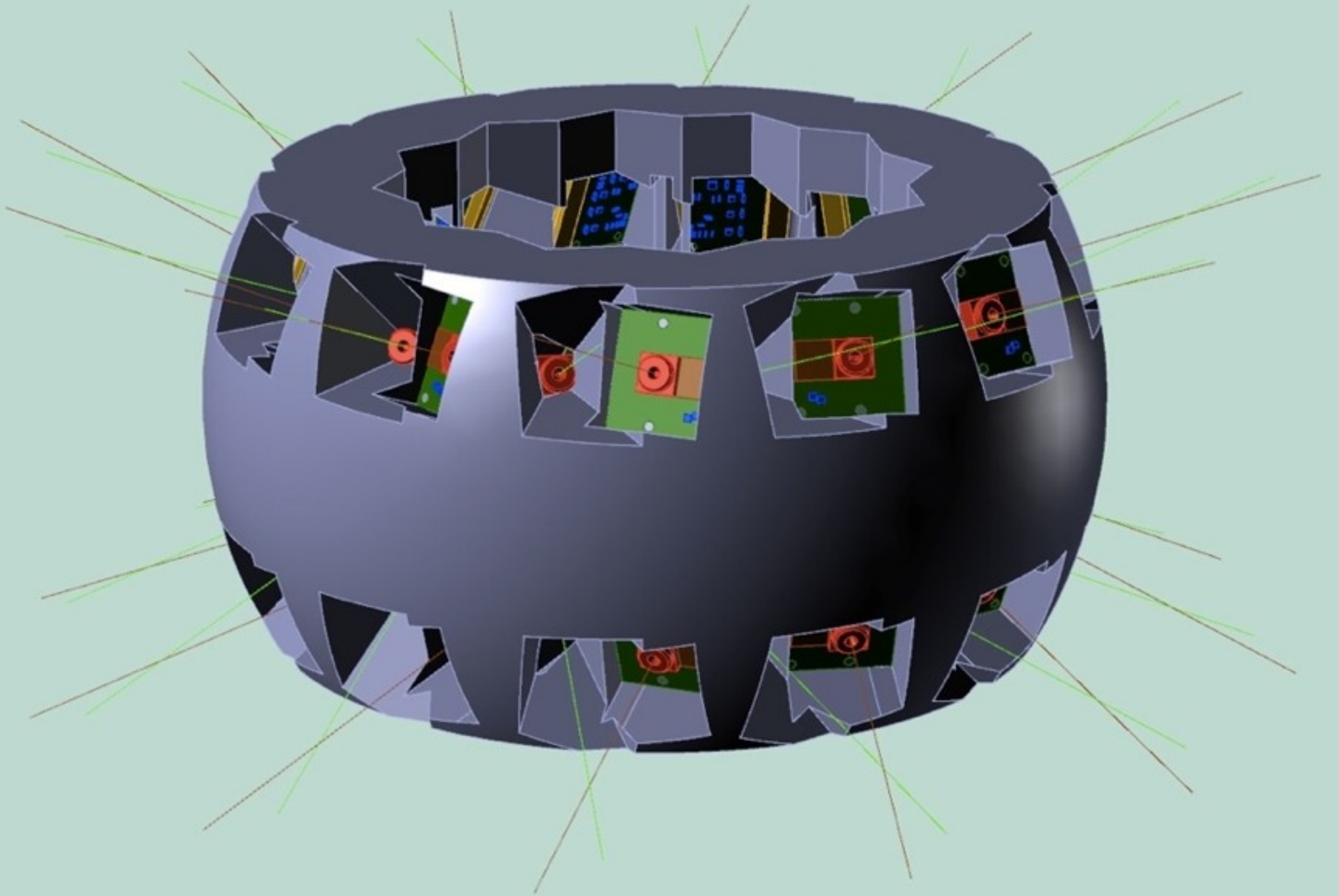
*Posted 4/3/14 at 6:55pm via [finsmes.com](http://finsmes.com)*

Jaunt received \$350k in Seed funding. (12/24/13)

*Posted 12/24/13 at 1:43am via [techcrunch.com](http://techcrunch.com)*

And funded!





**Camlot A - "Cross Eye" sensors**  
Concept: Harlyn Baker + Sandin, Dawe, Defanti (UCSD/UIC)

Clever design. Like the Panocam 3D, has parallel stereo pairs, just not adjacent, and is viewable raw.





# Approaches to Stereo Panoramic Motion Picture Capture

Here's what I think the range is.

## VIEWABLE RAW

### Single Stereo Pair

Stationary Scanning or Fisheye ("Viking lander problem")

Moving (Spherigraph proposal, FakeSpace Molly c1990)

Spinning (Naimark proposal based on Shaw 2006)

If you want VIEWABLE raw, pretty much viewable without processing...  
Describe my proposal. Phantom 1,000 fps camera. Water balloon bust at 25,000 fps



## VIEWABLE RAW

### Single Stereo Pair

Stationary Scanning or Fisheye ("Viking lander problem")

Moving (Spherigraph proposal, FakeSpace Molly c1990)

Spinning (Naimark proposal based on Shaw 2006)

### Multiple Stereo Pairs

No mirrors (Panasonic, 3D 360Heros, Panocam 3D, CamLot)

Mirrors (Shaw proposal based on Naimark 2008)

## VIEWABLE RAW

### Single Stereo Pair

Stationary Scanning or Fisheye ("Viking lander problem")

Moving (Spherigraph proposal, FakeSpace Molly c1990)

Spinning (Naimark proposal based on Shaw 2006)

### Multiple Stereo Pairs

No mirrors (Panasonic, 3D 360Heros, Panocam 3D, CamLot)

Mirrors (Shaw proposal based on Naimark 1995)

## PROCESSING REQUIRED

2D Pano +D via lidar (Google)

Multiple (non-stereo) cameras (Jaunt, +ETH, Disney, Fraunhofer...)

Lots of lively work here, (but arguably not "cinematic" quality).



## VIEWABLE RAW

### Single Stereo Pair

Stationary Scanning or Fisheye ("Viking lander problem")

Moving (Spherigraph proposal, FakeSpace Molly c1990)

Spinning (Naimark proposal based on Shaw 2006)

### Multiple Stereo Pairs

No mirrors (Panasonic, 3D 360Heros, Panocam 3D, CamLot)

Mirrors (Shaw proposal based on Naimark 1995)

## PROCESSING REQUIRED

2D Pano +D via lidar (Google)

Multiple (non-stereo) cameras (Jaunt, +ETH, Disney, Fraunhofer...)

FORGET IT. CONSTRUCT a 3D+t model



Bigger Issues



## Raw v Processed

Huge issue in Hollywood versus Silicon Valley. Consider FRAME RATE:

Peter Jackson and Doug Trumbull lobby for [high frame rate](#)

while Sony and Samsung develop [motion interpolation](#). Crazy.

Raw will always be more expensive and probably look better, and in the end, it will also inform better processing.

Raw v Processed

Stereo or not

360 horizontal FOV or less

Vertical FOV

- I once read that 14% of Americans tested fuse but don't see stereo (Digression: Renwick Museum)
- 360 has problems with light bouncing on opposite screens, I kinda like 180
- Vert FOV, indulge me in a funny digression...



**Dr. Sheldon Cooper** @TheRealSheldonC

14 Jan

I think google street view ran over a donkey in Botswana;

[maps.gstatic.com/m/streetview/?...](https://maps.gstatic.com/m/streetview/?...)

Expand

Last year. Botswana Street View footage had just been released.  
Second country shot in Africa.



eng  
ss is approximate







GOOGLE IMAGES

**The images show the donkey on its side in tire tracks.**

Although it seems to be an open-and-shut-case, a Google spokesperson claims that the truck was not responsible for the donkey's apparent death.

[nynews.com/.../prostitute-takes-stand-defense-father-so...](#)

The story went viral quickly.

This from the NY Daily News, repeated by Al Jazeera, among many others.





If Google explained, and if the press understood, that the camera cars cannot see underneath, but completes lower panorama by cleverly using parts of adjacent frames...





GOOGLE IMAGES

**The images show the donkey on its side in tire tracks.**

it would realize that this is an artificially composited image. (look at it) (duh!)



google donkey botswana

**Web** Images Maps Videos More ▾ Search tools

About 330,000 results (0.46 seconds)

[Google: No, we did not kill a donkey in Botswana | Internet & Media ...](#)



[news.cnet.com/.../google-no-we-did-not-kill-a-donkey-in-botsw...](#) ▾

by Casey Newton - in 1,054 Google+ circles

Jan 16, 2013 – The company responds after imagery shows the animal lying in the wake of a Street View car. Read this article by Casey Newton on CNET ...

[Google denies killing a donkey in a Botswana hit-and-run | CTV News](#)

[www.ctvnews.ca/.../google-denies-killing-a-donkey-in-a-botswana-hit-and-...](#)

Jan 16, 2013 – **Google** released a cheekily-worded statement today denying its mapping team ran over and killed a **donkey** in **Botswana**.

[Google donkey: Google forced to deny killing donkey with Street ...](#)

[www.dailymail.co.uk/.../Google-donkey-Google-forced-deny-killing-donk...](#)

Jan 18, 2013 – The search engine confirms the **donkey** from the Kweneng region of **Botswana** is 'alive and well', after members of the public accused the ...

[Did Google run over a donkey in Botswana? \(No, it's just walking ...](#)

[www.news.com.au/...google...donkey...botswana/story-e6frfo0-12265544...](#)

Jan 15, 2013 – Twitter user @TheRealSheldonC tweeted a picture yesterday of a **donkey** - presumably dead - lying on the road in **Botswana**. The **Google** ...

[No, Google Did Not Run Over a Donkey in Botswana - The Next Web](#)



[thenextweb.com/.../no-fox-news-google-did-not-run-over-a-do...](#) ▾

by Emil Protalinski - in 840 Google+ circles

Recent search. IMHO Google blew an opportunity.  
I recognize that this may be a small deal, but it can't be good for Google.  
Especially as they move into more remote countries.

Raw v Processed

Stereo or not

360 horizontal FOV or less

Vertical FOV

So vertical FOV is sometimes considered very important,  
important enough to fake and not spill the beans.



Raw v Processed

Stereo or not

360 horizontal FOV or less

Vertical FOV

Movies v Models

Finally, there's the issue of where movies (lots of 2D frames) fit in the future.

Remember that Street View is a movie wanting to be a model.

(Some may say games are models wanting to be movies.)

Take a poll: Will all movies of the future actually be, or at least go through a stage, of 3D +t models?



# Even Bigger Issues

So far about how to capture and display the real world.  
Last part is about why. (Hang on. Shifting gears.)  
Good story. Sit back relax...





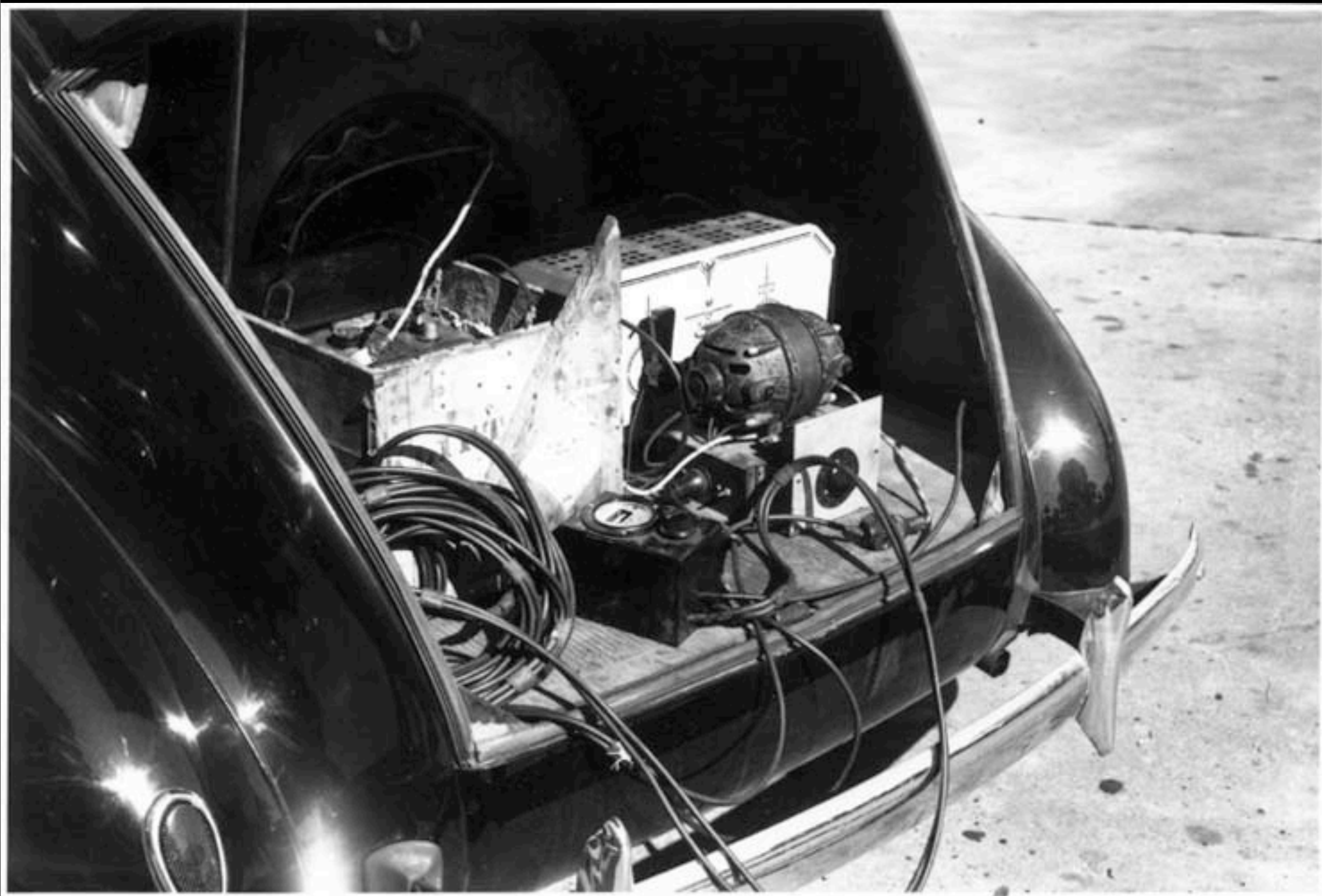
Story begins in the 1860s in Central Texas where Alan Lomax's father John Lomax grew up  
Cowboy country





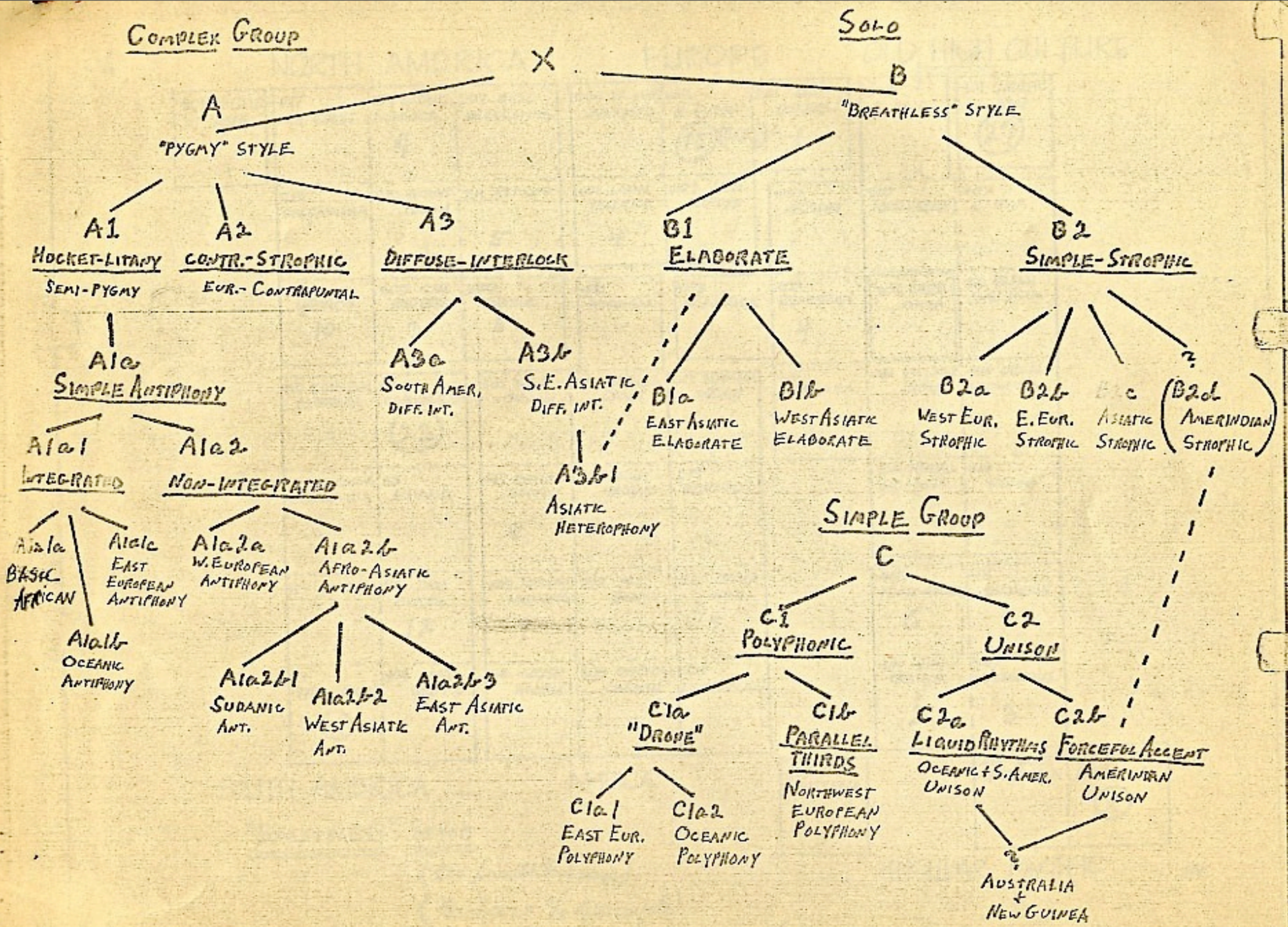
Real cowboys. With cows. Following the river valley near his home.  
He heard their songs. Grew up to be a folklorist, a very early ethnomusicologist





In the 1920s, made some of the world's first field recordings, with his teenage son Alan assisting. Recorder given to them by Thomas Edison's widow. Made portable. 500 pounds. Basis for the US Lib Cong Folksong Archive. But Alan continued. For decades. In other countries. And others were sending recordings to him. 1000s. Alan thought he heard patterns.

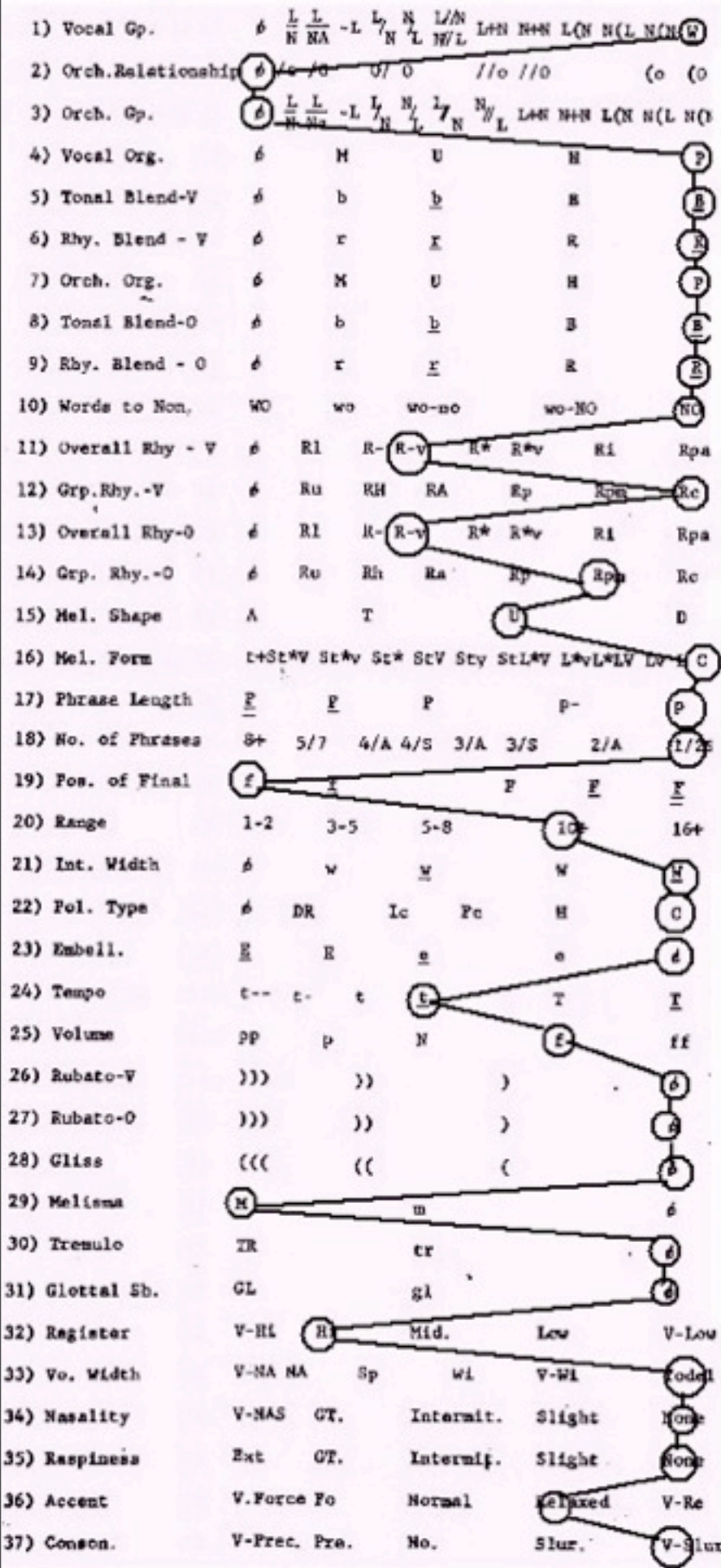




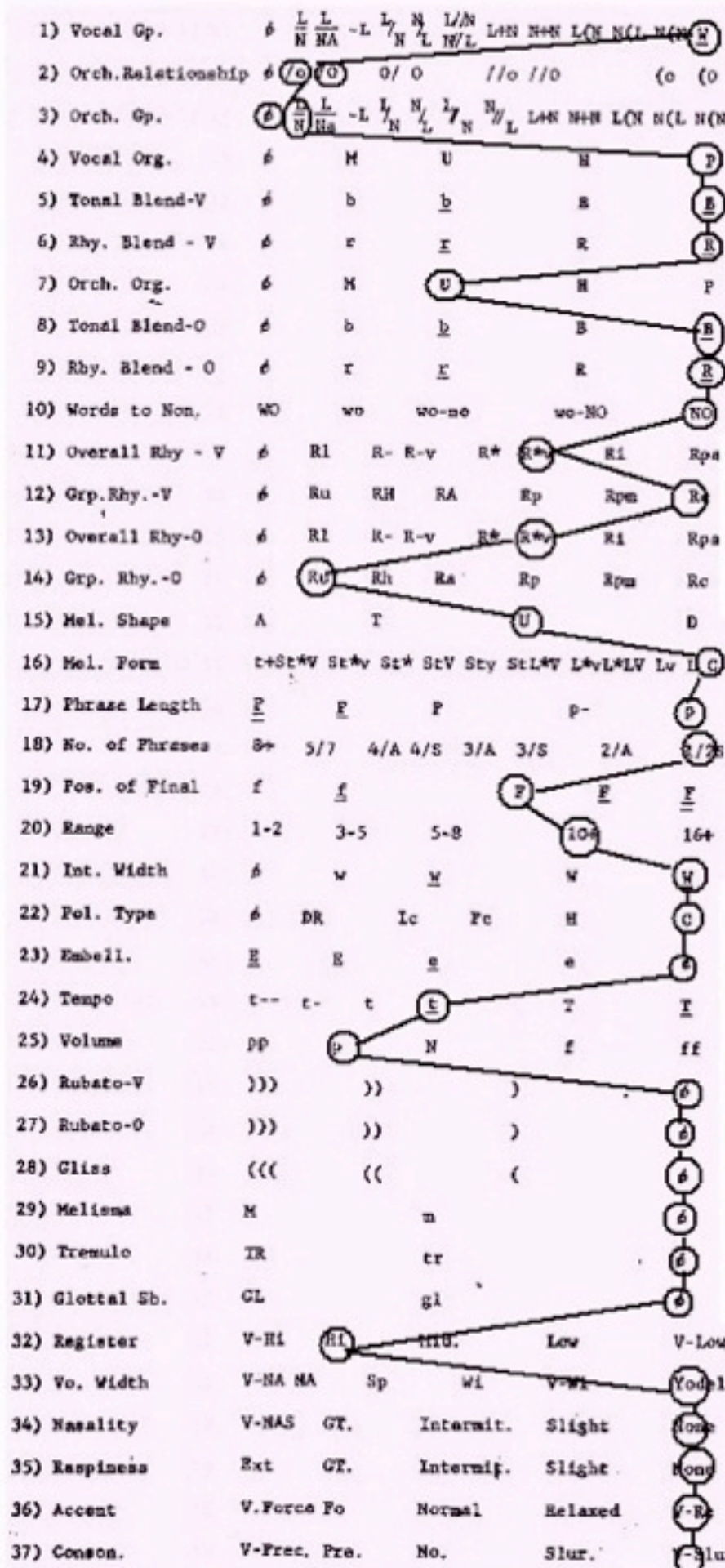
In early 1960s at Columbia University in NY, began serious research. Called this study Cantometrics (he later did the same for dance called Choreometrics).



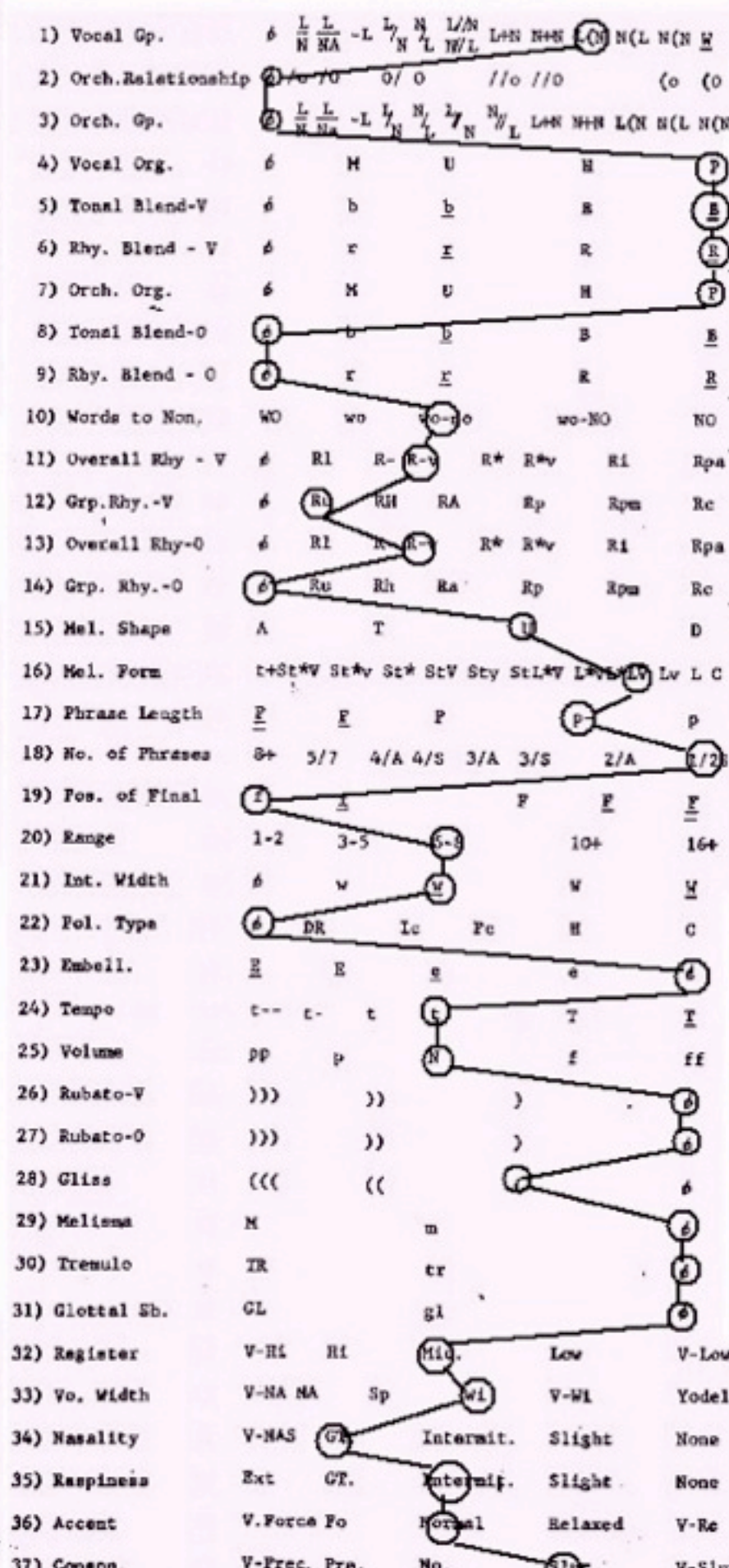
African Pygmies -- Modal Profile



Bushmen (Ju'hoansi) -- Modal Profile



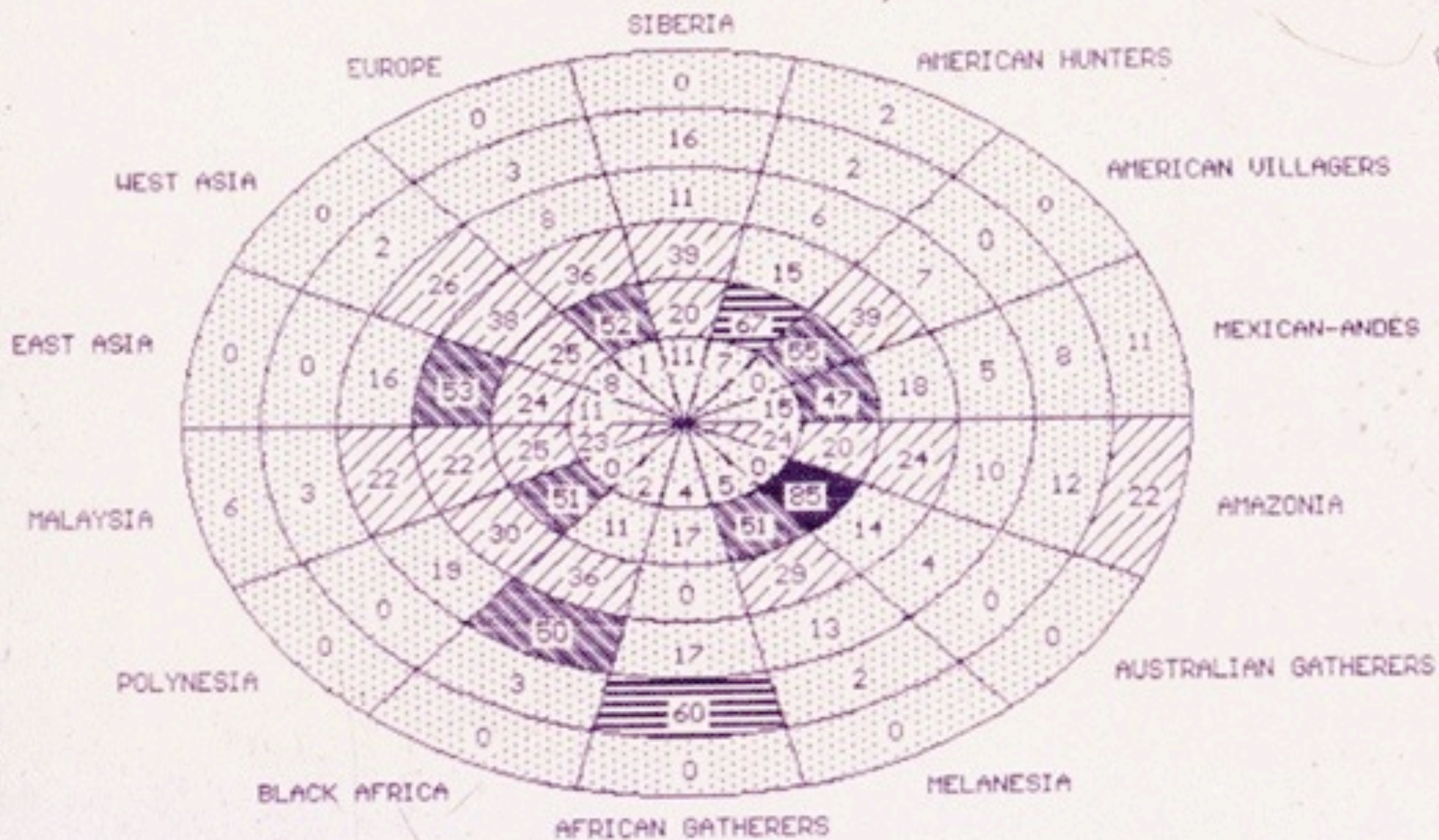
African Farmers & Herders -- Modal Profile



37 parameters made to represent all world music. Songs coded manually.  
 Could look for statistical correlations. But very slowly. Punch cards.  
 Here are 3 similarities.



# World Regions



## Vocal-Group



- Int-Het
- InterLok
- Overlap
- Sim. Alt.
- Unison
- Hetero.

### KEY

- 0-19% [Dotted pattern]
- 20-39% [Diagonal lines /]
- 40-59% [Diagonal lines \]
- 60-79% [Horizontal lines]
- 80-100% [Solid black]

Bigger correlations: Central Africa and Georgian Russia. Inuit and Patagonian **music**.  
 Correlations doesn't mean causality, but this is pretty strong, romantic, provocative stuff.  
 But there's **more**.



Table 1  
*Average Percentage of Male Participation in Activities in Societies From the Standard Cross-Cultural Sample*

Predominantly masculine activities	Index (%)	Quasi-masculine activities	Index (%)	Swing activities	Index (%)	Quasi-feminine activities	Index (%)
Hunting large aquatic fauna	100	Butchering	92.3	Generation of fire	62.3	Fuel gathering	27.2
Smelting of ores	100	Collection of wild honey	91.7	Bodily mutilation	60.8	Preparation of drinks	22.2
Metalworking	99.8	Land clearance	90.5	Preparation of skins	54.6	Gathering of wild vegetal foods	19.7
Lumbering	99.4	Fishing	86.7	Gathering small land fauna	54.5	Dairy production	14.3
Hunting large land fauna	99.3	Tending large animals	82.4	Crop planting	54.4	Spinning	13.6
Work in wood	98.8	Housebuilding	77.4	Manufacture of leather products	53.2	Laundering	13.0
Fowling	98.3	Soil preparation	73.1	Harvesting	45.0	Water fetching	8.6
Making musical instruments	97.6	Netmaking	71.2	Crop tending	44.6	Cooking	8.3
Trapping	97.5	Making rope and cordage	69.9	Milking	43.8	Preparation of vegetal food	5.7
Boatbuilding	96.6			Basketmaking	42.5		
Stoneworking	95.9			Burden carrying	39.3		
Work in bone, horn, shell	94.6			Matmaking	37.6		
Mining and quarrying	93.7			Care of small animals	35.9		
Bonesetting	92.7			Preservation of meat or fish	32.9		
				Loom weaving	32.5		
				Gathering small aquatic fauna	31.1		
				Manufacture of clothing	22.4		
				Pottery-making	21.1		

*Note.* Data are from Tables 1–5 of “Factors in the Division of Labor by Sex: A Cross-Cultural Analysis,” by G. P. Murdock and C. Provost, 1973, *Ethnology*, 12, pp. 207–210. Copyright 1973 by the University of Pittsburgh Press. Reprinted with permission. Each index represents the average percentage of male participation in each activity, as calculated by Murdock and Provost (1973) from 185 societies of the Standard Cross-Cultural Sample (Murdock & White, 1969). Each index was calculated for a given activity such that each society received a weight indicating whether the activity was exclusively male (1.0), predominantly male (0.8), equally performed by both sexes (0.5), predominantly female (0.2), or exclusively female (0). The weights were summed across societies in which the activity was performed and then divided by the number of societies. Murdock and Provost identified the four clusters of activities on the basis of this index and the variability in the index across geographic regions. The swing activities were more variable than the quasi-masculine or quasi-feminine activities, which were more variable than the strictly masculine ones.

George Murdock’s Ethnographic Atlas. (Here’s a random page found online. Funny. Not much change.)  
 Alan looked for statistical correlations between music and culture.  
 Found: lateral knee movement/pottery, narrow step dance/narrow row planting,  
 rasp in male song/raised for independence over team players, high tonal blend/women food production  
 ---> Initially sent by apple mm lab (based on cold letter), later brought the project to Interval --->1992 video





1992  
(video)





Gideon D'Arcangelo  
producer

At Interval, we produced Alan's only GJB demo. Hypercard, Laserdisc. Very 1998.  
Can easily find it on YouTube.



Alan died in 2002. His daughter Anna Lomax Wood is now running the show.  
Another 9 years pass. Then some news.

HOME » CULTURE » BOOKS » BOOK REVIEWS

## Alan Lomax - The Man Who Recorded The World: review

The remarkable story of Alan Lomax - a man who inspired a generation of musicians.

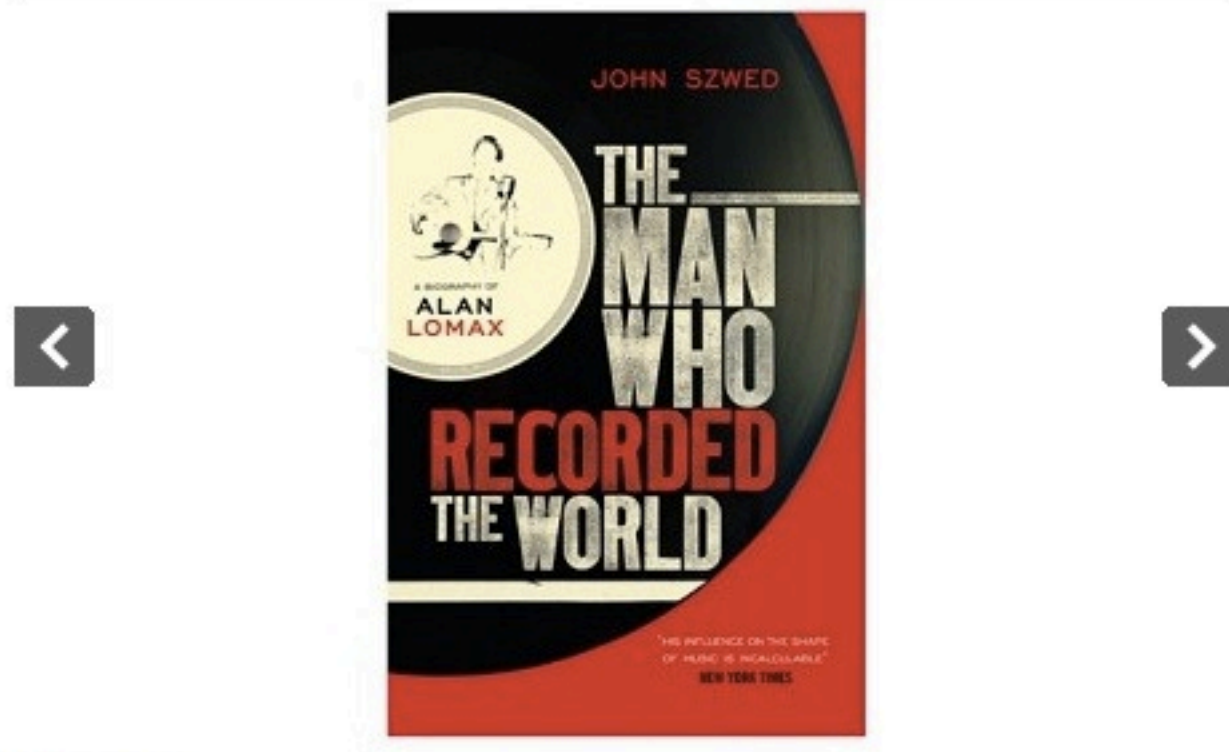


Image 2 of 6



By **Martin Chilton**, Digital Culture Editor

1:08PM GMT 10 Jan 2011

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Alan Lomax, the leading musicologist of the 20th century, was hailed by Bob Dylan as a 'missionary'.

John Szwed's excellent new biography does full justice to a man whose

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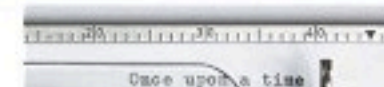
### Book Reviews

[Culture » Books » World, Folk and Jazz » Martin Chilton »](#)



[Telegraph Book Shop](#)

IN BOOK REVIEWS



2011. 400 page book. Really did inspire musicians: Generally credited as discoverer of "Leadbelly" (Huddy Ledbetter), Jellyroll Morton, and Woody Guthrie. Bob (Bobby) Dylan (who crashed in his apt). Worked at LibCon Pete S parents, watched him grow up. **And** had popular music show on BBC in the 50s, watched by Lennon, McCartney, Townsend, Clapton. Rolling Stones took their name...





### Folklorist's Global Jukebox Goes Digital



Alan Lomax/Association for Cultural Equity

The collection of the folklorist and ethnomusicologist Alan Lomax is being digitized for dissemination. Above, a photo he took at a church in Portsmouth, Va., in 1960.

By LARRY ROHTER  
Published: January 30, 2012

The folklorist and ethnomusicologist Alan Lomax was a prodigious collector of traditional music from all over the world and a tireless missionary for that cause. Long before the Internet existed, he envisioned a "global jukebox" to disseminate and analyze the material he had gathered during decades of fieldwork.

A decade after his death technology has finally caught up to Lomax's imagination. Just as he dreamed, his vast archive — some 5,000 hours of sound recordings, 400,000 feet of film, 3,000 videotapes, 5,000 photographs and piles of manuscripts, much of it tucked away in forgotten or inaccessible corners — is being digitized so that the collection can be accessed online. About 17,000 music tracks will be available for free streaming by the end of February, and later some of that music may be for sale as CDs or digital downloads.

- RECOMMEND
- TWITTER
- LINKEDIN
- E-MAIL
- PRINT
- REPRINTS
- SHARE



#### Multimedia



Multimedia Feature

Listening to the Globe



2012. Putting everything freely online.  
First time press used "Global Jukebox" so it got some great exposure.

Gideon (in the video) and I met with Anna last year. Little has changed. They're struggling financially. Gotta say. Coolest project then, still is. Think Pandora but with a connection back to place. Everyone has roots, getting more complex as people move to cities. Strong ecological message here.





Alan Lomax on the Sacred Harp (1982)  
by AlanLomaxArchive  
13,722 views



Demonstration video for the Global Jukebox (1998)  
by AlanLomaxArchive  
2,447 views



Sid Hemphill: The Carrier Line (1942)  
by AlanLomaxArchive  
4,795 views



Bessie Jones with Hobart Smith, Ed Young, and friends:  
by AlanLomaxArchive  
7,144 views



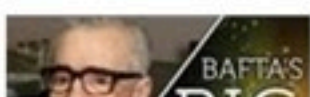
Son House - Field Recordings 1941 & 1942  
by Vibracobra23  
28,286 views



The Paper Town Academy: John Green at TEDxIndia a  
by TEDxTalks  
79,570 views



Pt.1 - ELVIS MITCHELL interviews TARANTINO (2008)  
by FlyingBearFilmMorgue  
691 views



Martin Scorsese: Big Questions  
by BAFTA Guru

### Martin Scorsese in support of the Alan Lomax Archive and ACE



AlanLomaxArchive · 354 videos

Subscribed

680 views

7 likes, 1 dislike

Like

About

Share

Add to

Analytics

Report

Published on Dec 12, 2012

Please help ACE raise \$50,000 by December 31st!

Support AlanLomaxArchive

Choose amount

December last year. Just to raise \$50k.  
Digression: RCA story. Mick Jagger.

world, locate his roots, and trace his links to peoples and cultures never imagined.

Alan himself was no computer expert, but he had been working innovatively with communications technology ever since the early 1940s, when he and Jerry Weisner were editing records and experimenting with multitracked recordings in the Library of Congress. If this new idea seemed utopian in the pre-Web, pre-Google days of digital enthusiasm, Lomax was in fact dreaming up what later would be called metadata, huge banks of data from which other data could be derived; in conceiving of discrete features of music as predictors of style, he was imagining the concept of predictive algorithms; and in foreseeing that average people could make reliable judgments about complex style systems, he was anticipating the digital concept of folksonomy—collaborative categorization and indexing. All he needed were some smart young people to work on these ideas, and he found them in Michael Del Rio, Gideon D’Arcangelo, Michael Naimark, and others, who contributed fresh musical, technical, and aesthetic ideas. Once again Lomax was attracting the interest of people with money and equipment: Apple, the MacArthur Foundation, and Interval Research Corporation (headed by Paul Allen, who with Bill Gates had created Microsoft) all helped, and were then followed by the National Science Foundation, which gave him a grant of a million dollars. He was back in business.

An Apple Macintosh IIcx with CD-ROM and laserdisk players constituted the hardware for the Global Jukebox; HyperCard was used as a data management program, and four thousand songs and one thousand dances were selected for its software database. For demonstration of the device there was an LCD projector, a low-resolution LCD panel, and a high-luminosity overhead projector. A prototype was constructed, and Alan, now seventy-six years old, was once again on the road, dragging bulky electronic equipment with him as he demonstrated it to the world. It excited everyone who saw it, with corporate executives spinning out ideas for their own uses on the spot or rushing to the phone to call their colleagues. They had never seen such masses of data organized electronically, and it fired their imaginations. But in the end none of them followed through. Michael Naimark concluded that their failure to invest in the Global Jukebox was part of a central problem of the multimedia industry:

The Global Jukebox has fallen into an abyss between academic and pop culture, between world-saving and money-making, and between content and technology. And in the new media industry, the technology folks seem to drive the content, rarely the other way around . . . it’s too bad, since most of the planet’s cultures have the content but not the technology.

---

The 2011 book on Alan ends talking about the GJB.  
Mentions Jerry Weisner, metadata, and folksonomy.



world, locate his roots, and trace his links to peoples and cultures never imagined.

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It seems inevitable to me that soon we'll have a "One Earth" 3D model,  
since all 3D Earth models can be commonly indexed by lat, lon, alt, and time.





## Events

### Conversations Series

### Upcoming Events

### Past Talks and Colloquia

### Past Major Events

### Webcasts

## Michael Naimark, "Place Representation and the 'One Earth' Model"

Michael Naimark, "Place Representation and the 'One Earth' Model"  
Monday, May 02, 2011 | 2:00pm - 3:30pm

**Location:** [MIT Media Lab, E14-633](#)

**Speaker:** Michael Naimark

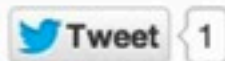
**Host/Chair:** [Hiroshi Ishii](#)

Professor Naimark's [presentation is available online](#).

[click link to view in your browser; right click or control click to download]

Much of the history of representation, as both an art and a science, has concentrated on conveying sense of place. Representing actual places presents unique opportunities and challenges because—unlike fantasy places—actual places share common frames of reference as indexed by latitude, longitude, altitude, and time. Thus, all real-world representations can cross-correlate into a singular, unimaginably giant Earth model, containing as much detail as is chosen to add.

## Share This Page



And this has been my stump talk for several years now, in part based on a class at NYU ITP.  
6 parts, hard to present in under 1.5 hrs

So with this One-Earth model, it seems to me that bouncing around is a good way to travel.



APRIL 3, 2008, 4:14 PM

## A 3-D Viewfinder for a Shoebox of Digital Photos

By JOHN MARKOFF

The tension between computing technology that augments human activity and technology that automates it goes all the way back to the 1960s.

It can be seen in [Viewfinder](#), a demonstration of a photo-sharing or photo-placing system developed by a group of researchers and digital artists at the University of Southern California. The system, which was created with the help of a research grant from Google, is an intriguing alternative to [Photosynth](#), a project developed in 2006 by Microsoft Live Labs and the University of Washington that automated the proper placement of two-dimensional digital photographs in a three-dimensional virtual space.

ViewFinder Fly through





# viewfinder

How to seamlessly "Flickrize" Google Earth

A collaboration between  
the Interactive Media Division  
and the Institute for Creative Technologies



[Home](#) | [The Vision](#) | [Basics](#) | [Related Work](#) | [Our Approach](#) | [Results to Date](#) | [Future Directions](#)

## Abstract

"Viewfinder" is a novel method for users to spatially situate, or "find the pose," of their photographs, and then to view these photographs, along with others, as perfectly aligned overlays in a 3D world model such as Google Earth. Our objective is to provide a straightforward procedure for geo-locating photos of any kind, and our approach is to engage a community of users for a certain amount of human help. We specify that a 10-year-old should be able to find the pose of a photo in less than a minute, and we are convinced that this goal is achievable. While we are not entirely there yet, we are getting closer. This is our progress report.

April 3, 2008



*Demo video showing the possibilities of Viewfinder.*

*Download the .kml file containing the poses used to create the video.*

[Next: The Vision](#)

[Acknowledgements](#) | [Patents](#) | [References](#) | [Credits](#) | [Contact](#)

Began in 2006, received Google support in 2007.





# viewfinder

How to seamlessly "Flickrize" Google Earth

A collaboration between  
the Interactive Media Division  
and the Institute for Creative Technologies



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## Credits

### Core Team

**Will Carter**, Principal Programmer/Designer, USC IMD

**Paul Debevec**, Associate Director, Graphics Research, USC ICT, and Research Associate Professor, USC Computer Science

**Perry Hoberman**, Research Associate Professor, USC IMD

Andrew Jones, Research Programmer, USC ICT

Bruce Lamond, Programmer Analyst, USC ICT

**Erik Loyer**, Design Consultant, USC IMD

Giuseppe Mattiolo, Visiting Research Assistant, USC ICT

**Michael Naimark**, Research Associate Professor, USC IMD, and Viewfinder Project Director

### Additional Collaborators

Marientina Gotsis, Lab Manager, USC IMD

Andrew Sacher, Sacher Interactive

**Holly Willis**, Associate Director, USC Institute for Multimedia Literacy

### Photo Credits

In order of their appearance in the video:

**Tourists at the Walt Disney Concert Hall**

Photo by jucyrai

**Walt Disney Concert Hall**

Photo by souver

**July 2006\_Flight Sydney-LAX-NY (16)**

Photo by Michael Berger

Great team.



(video) So how cool would it be, to seamlessly “bounce” from realworld place to realworld place

Using a 3D Earth model like Google Earth as the connecting tissue?

- In a hugely immersive space, ideally (for me) collective and public, or via Oculus
- Could be interactive (aud choice where to go next), could have a live component
- Realworld, with a documentary or ethnographic sensibility-
- Cultural Preservation is a ripe and opportune area for VR to explore



thank you

[www.naimark.net](http://www.naimark.net)  
[michael@naimark.net](mailto:michael@naimark.net)