

SYSTEMS MAINTENANCE Installation by Perry Hoberman

Technical Information

1.0 REQUIREMENTS

1.1 Space

- at least 12 by 12 meters, with a ceiling height of at least 4 meters
- black walls preferable, controlled lighting conditions
- smooth level floor
- must be able to hang camera rig & projector rigidly from ceiling

1.2 Equipment

- video projector (at least 2000 lumens brightness, NTSC video)
(second video projector necessary for stereoscopic option)
- projection screen (at least 3 x 4 meters)
- at least eight controllable (dimnable & focusable) lighting instruments (mounted on ceiling)

1.3 Personnel

- 3 members for Adjustment Team (see below) for at least 4 hours a day during exhibition

1.4 Equipment Supplied by Artist & Hull Time Based Arts

- Roldec Pentium 166 MHz PC with 128 MB
- Diamond FireGL 1000 Pro Graphics Card
- Custom software written in C using OpenGL and GLUT windows library
- Windows 95
- Spaceball 2003 FLX controller with custom driver
- Rotary encoder assembly with custom driver
- Custom built aluminum camera rig with pivoting slip ring
- 2 color CCTV video cameras & cabling (NTSC)
- 2 video mixers (NTSC)
- Custom built floor covering (8 meters diameter)
- Platforms for PC & scale model
- Furniture & model furniture

2.0 ELEMENTS

2.1 Rotating Arm

An aluminum arm extends from a pivot attached to the ceiling at the center of the room. The arm measures nearly four meters from the center to one end, which has a video camera attached, and somewhat less than that to the other end, from which a counterweight hangs.

2.2 Rotating Camera

A video camera is attached to the underside of the rotating aluminum arm. It has a wide angle lens, and is pointed at the center of the room. A leg extends from down from the arm, by means of which the camera can be moved around on a circular path, always pointing at the room's center. The center pivot consists of a slip ring assembly, which transmits the video signal and power to the camera.

2.3 Furniture (Lifesize)

Around the room are a number of pieces of furniture. Each piece of furniture is mounted on small bearings so that it can be easily moved around the room. The furniture is fairly simple and abstract, painted. Chairs, tables, desks, couch, bookcase, dresser – about twelve objects.

2.4 Physical Model

A 1/8 scale model of the room (including all the furniture) is situated small circular platform to the left of the center of the room. This top of the platform is mounted on a turntable so that it can be rotated in any direction. Each piece of model furniture can be picked up and moved.

2.5 Fixed Camera

A second video camera is securely mounted on a metal pole (attached to the floor) at the front of the scale model, pointing at the center of the model. The position, height, angle and field of view are such that the fixed camera is in exactly the same relationship to the model of the room as the rotating camera is to the room itself.

2.6 Digital Model

A PC on a second circular platform is situated to the right of the center of the room. The computer monitor displays a 3D digital model of the room, with each piece of furniture represented. Using a Spaceball 6DOF controller mounted in the platform, each piece of furniture can be moved and rotated around the room (however, the furniture can't be lifted off the floor. The monitor can be rotated 360 degrees, and a rotary encoder mounted in the platform transmits this information to the host PC. The viewpoint always faces the center of the model, and can be rotated around the model in a manner analogous to the track camera. The position, height, angle and field of view of this virtual camera match that of the two video cameras.

2.7 Video Projectors and Screens

A video projectors is mounted on the ceiling, facing a large video screen. The video signals from the track camera, the fixed camera and the PC are

superimposed via a video mixer (their signals are combined additively, as in a triple exposure) and projected onto the screen.

2.7b Stereoscopic Projection (not yet implemented)

Using two pairs of video cameras, an additional video mixer, a silver (3D) projection screen, and an additional video projector, it would be possible to present a stereoscopic image, which would greatly enhance both the visual and interactive experience. Participants would wear plastic 3D polarizing glasses to view the image.

2.8 Lifeguard Chair (optional)

At one end of the room, opposite the video screens, is a very tall chair, somewhat like a lifeguard's platform. The chair is bolted to the floor. There is no way to climb up to sit in this chair.

2.9 Adjustment Team

At certain times during the exhibition, an Adjustment Team of three operators is employed. All three wear headset walkie talkies and converse in low tones to each other. One sits in the lifeguard chair (s/he brings in a ladder and leans it against the chair to facilitate climbing up to the seat). The other two move freely about the room.

3.0 OPERATION

3.1 Unattended Operation

When the Adjustment Team aren't present, the public is free to move the furniture and viewpoint of each version of the room. The track camera can be pulled around in a circle. The lifesize furniture can be rolled around the room. The model furniture in the physical model can be picked up and moved. The physical model can be rotated on its turntable. The digital furniture on the workstation monitor can be dragged around. The viewpoint of the digital model can be rotated around the model.

3.2 Attended Operation

As in unattended operation, the public is free to move the furniture and viewpoints of the three versions of the room. However, the Adjustment Team attempts at all times to match the current positions of the furniture and viewpoint in each version. They do their best to stay out of the way of the public. The operator in the lifeguard's chair (who has a good overview of the room and the screens) directs the other two operators as they move furniture and viewpoints. For instance, if someone moves a chair in the physical model room, the operator would roll the lifesize chair to the analogous position in the room itself, so that the two chairs were precisely superimposed in the video projection.

3.3 Goals

By moving furniture and viewpoints in each of the three models, visitors can match and mismatch the components of each model as they appear in the video projections. It is nearly impossible to distinguish the images of each model's furniture from those of the other models, resulting in some striking confusions of scale as hands, bodies and pointers mingle in the same combined space. (These effects may become even stronger when the various views are matched to each other, providing a kind of incentive.) The public becomes a kind of crew, simultaneously filling the roles of director, actor and audience in an ongoing collaborative spectacle. When the Adjustment Team is present there can be a kind of competition between the various parties: the operators attempt to maintain order, while the public supplies a source of continuous disorder. On the other hand, various kinds of cooperation may emerge.

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Technical Information on the Master Tape

The master tape is a MiniDV tape (NTSC), edited digitally from the original MiniDV footage. It is approximately 05'30" in length, and can be dubbed either with or without the voiceover track.