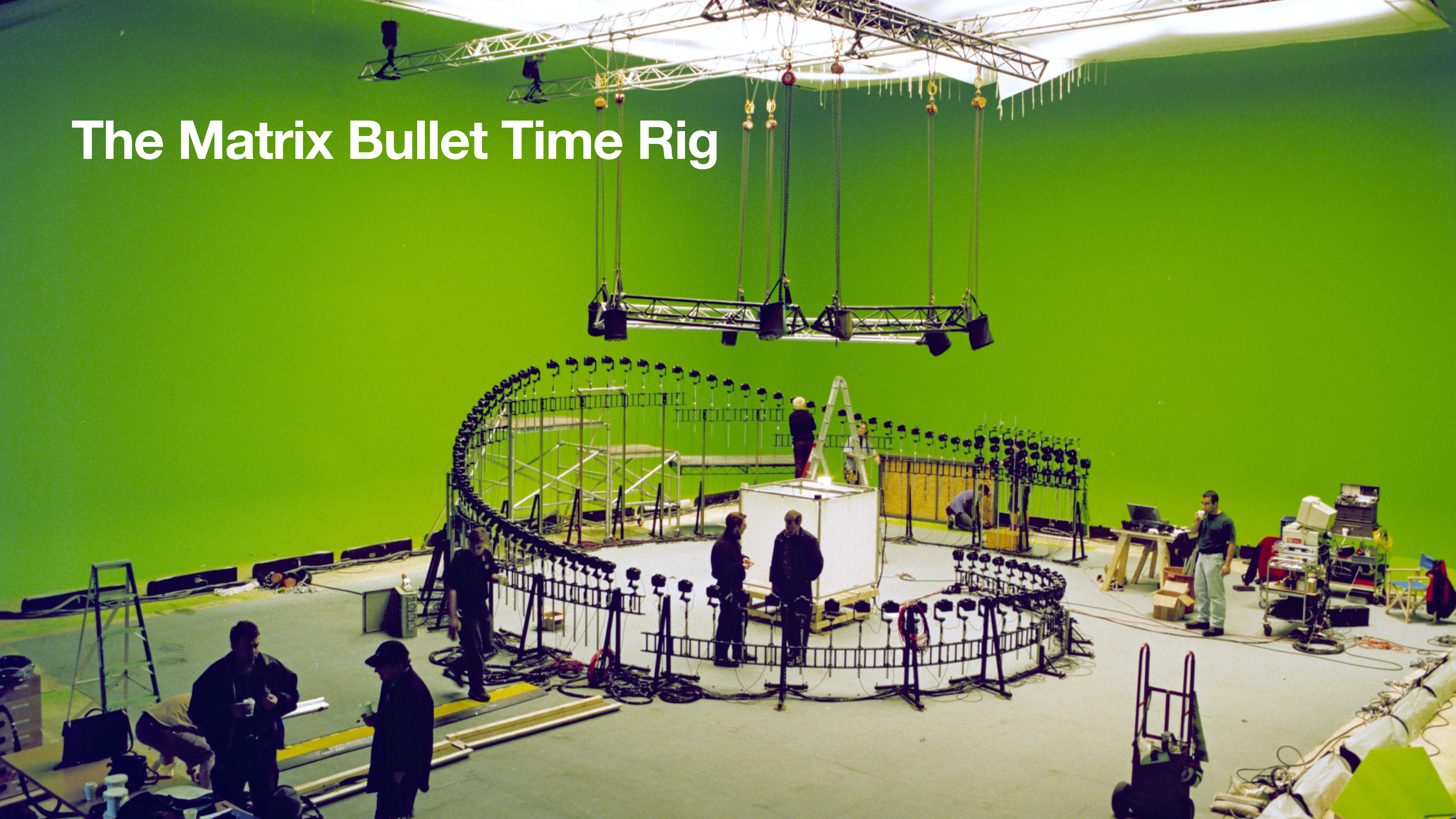
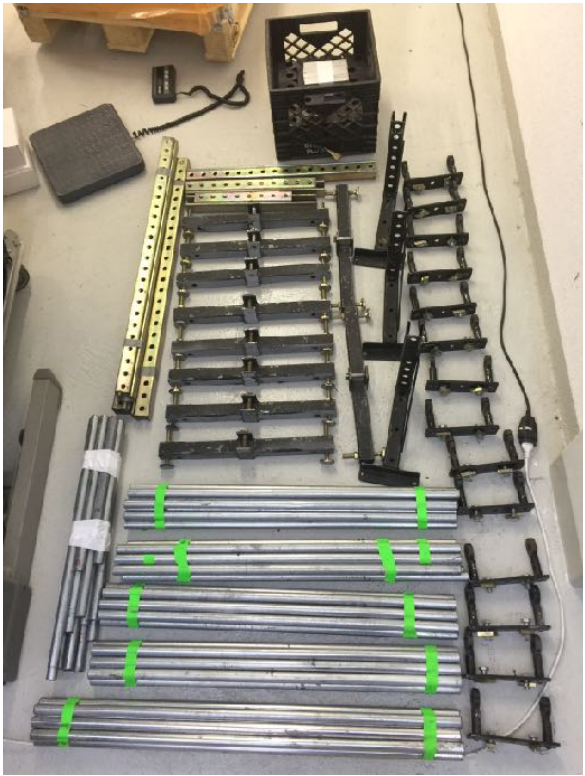


# The Matrix Bullet Time Rig



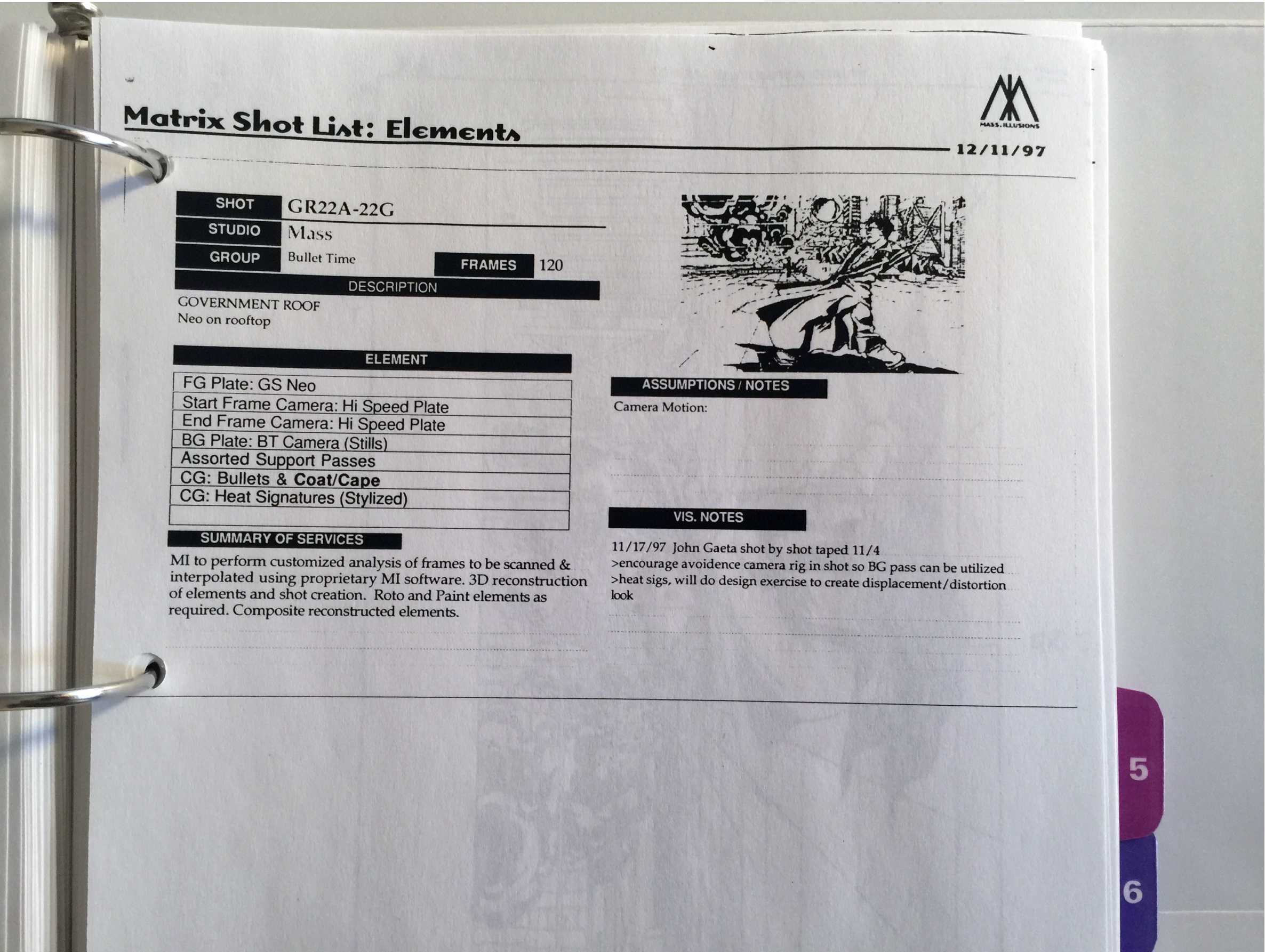


Complete rig restored with digital activation capabilities ready for shipping and exhibition.





Inside the white production notebook:



**DRAFT**

1/13/98 7:45 PM

**BULLET TIME CAMERA SYSTEM RESEARCH AND  
DEVELOPMENT REPORT**

SUBMITTED BY INNOVATION ARTS

On December 8, 1997, Innovation Arts was contracted by Mass.Illusions to develop the camera technology and techniques which would make possible the filming of what has become known as the BULLET TIME EFFECT for the Warner Brothers' feature, THE MATRIX.

Herein are the results of that study with descriptions, specifications and drawings, cost estimates and recommendations.

**OVERVIEW**

To film the Bullet Time effect by conventional means would require the use of a motion picture camera in ways which defy the laws of physics. A typical shot would call for the lens and camera to move through space, around or about a live-action subject, at a velocity too high to be possible via dolly move, or other such technique.

Thus, a new way needed to be devised which would accomplish the same result. And, perhaps, in the process to add to our palette of filmmaking possibilities and dramatic content.

Visual time/space manipulation, as is called for in the Bullet Time effect, is currently in the process of development by a number of vendors. For example, there is a sequential still camera array system known as [REDACTED], which is underway by the team at [REDACTED]. On another tack, Dayton Taylor, by employing a contiguous filmstrip with shutter arrangement, is attempting to produce similar results. At present, both systems - while having merit - are too limited (in our considered opinion) for the purposes of this production.

However, both efforts are united in their intent:

- To mimic the path of a High-Speed Motion Picture Camera traveling around a live action subject at high velocity.

And so must we.

All within the cost and time constraints of this production.



## Bibliography -

### Publications before *The Matrix*

**1994.12.21** Taylor, Dayton. *US Pat. No. 5,659,323; 6,154,251; 6,331,871; 6,933,966; EU Pat. No. 799,547; 1,296,179; CA Pat. No. 2,208,556; Aus. Pat. No. 715,590*

**1996.09.01** Taylor, Dayton. "Virtual Camera Movement: The Way of the Future?" *American Cinematographer* 77.9 (1996): 9

**1996.11.01** Stix, Gary. "Special Effects: Pictures Worth a Thousand Cameras." *Scientific American* 275.5 (November 1996)

**1997.03.21** Blair, Dike. "Dayton Taylor's Timetrack Camera" *Purple Prose* (Spring - Summer 1997)

**1997.09.10** Lindsay, David. "The Patent Files: Muybridge Squared" *New York Press Weekly* 10.37 (10-16 September 1997)

**1997.12.01** Thompson, Andrew O. "New Products: Timetrack Camera System" *American Cinematographer* (December 1997)

**1998.06.01** Cheplic, Matt. "If You Want Something Done Right..." *Millimeter* (June 1998) 19

**1998.06.01** Hammer, Owen. "Bedtime for Deadtme" Visual Effects Headquarters Website (June 1998)

**1998.06.01** Ruiz, Mario. "Freeze-Frame Filming in 3D" *Time Digital* (June / July 1998) 12

**1998.10.26** Vagnoni, Anthony. "Frozen Moment is Hot Idea" *Advertising Age* (October 26, 1998)

**1998.12.10** Jennings, Peter. "Cutting Edge" *ABC World News Tonight with Peter Jennings* (December 10, 1998)

### Publications after *The Matrix*

**1999.04.01** Magid, Ron. "Techno Babel" *American Cinematographer* 80.4 (1999): 46-5

**1999.04.01** Ascher-Walsh, Rebecca. "Realty Bytes: The Matrix, How'd They Do That?" *Entertainment Weekly* (April 1999) 32

**1999.04.01** Kaufman, Debra. "John Gaeta" *VFXPro* (April 1999)

**1999.04.01** Borshukov, George. "Manex Shines in The Matrix" *Softimage Magazine* (1999)

**1999.07.01** Okon, Chris. "A Customized World in Bullet Time" *Advanced Imaging* (July 1999)

**1999.11.06** Wachowski, Lilly & Lana. "Matrix Virtual Theater" *Warner Brothers Website* (November 6, 1999)

**2003.05.01** Silberman, Steve. "Matrix2, Bullet Time Was Just the Beginning" *WIRED* (May 2003)

**2003.05.01** Gaeta, John. "Bullet Time" *Matrix Fansite* (May 2003)

**2004.09.01** Drewery, Brant. "Siggraph 2004: The Need For Speed" *Broadcast Engineering News* (September 2004)

**2005.11.01** North, Dan. "Virtual Actors, Spectacle, and Special Effects: Kung Fu Meets 'All That CGI Bullshit'" *The Matrix Trilogy: Cyberpunk Reloaded* (2005) 48-61

**2006.12.01** Wolf, Mark. "Space, Time, Frame, Cinema" *New Review of Film and Television Studies* (December 2006) 4. 167-181

**2007.10.01** Bob Rehak. "The Migration of Forms. Bullet Time as Micro-Genre" *Film Criticism* 32 (1), 2007, S. 26-48.