

Realidade Virtual e Interfaces Modernas

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Sistemas de Displays em Realidade Virtual

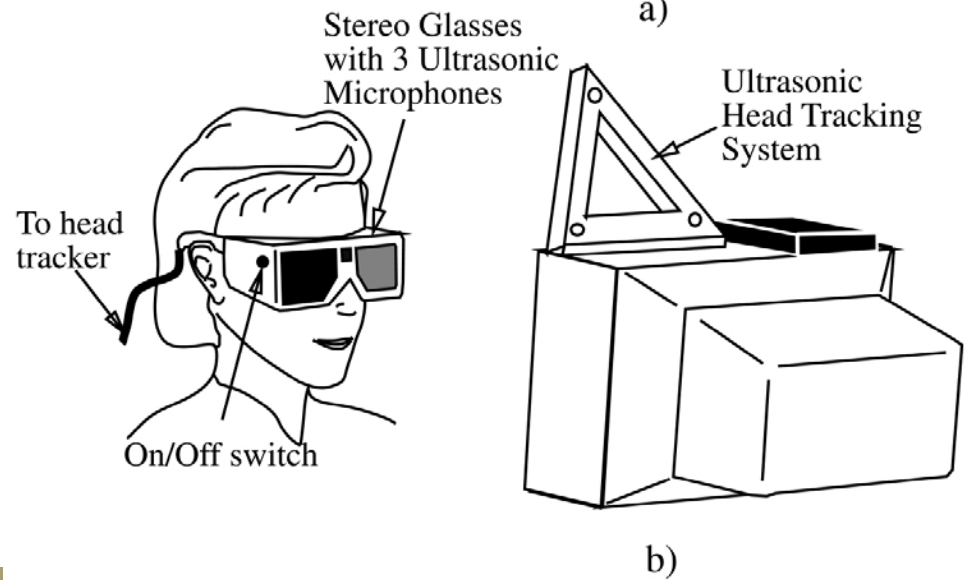
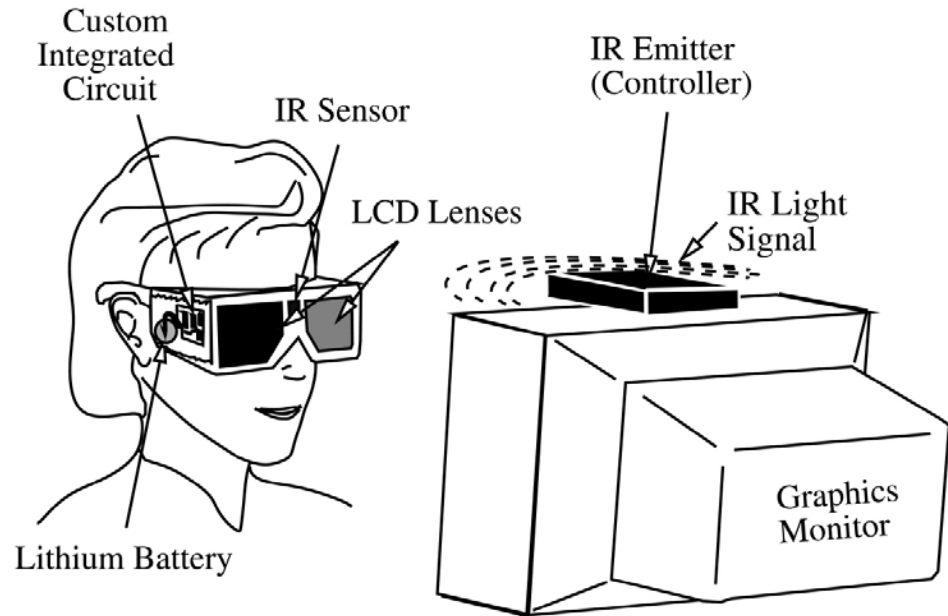
Sistemas de displays

- Shutters / Fishtank VR
- HMDs
- Binóculos, Telescópios, Microscópios ...
- BOOM
- CAVE
- etc

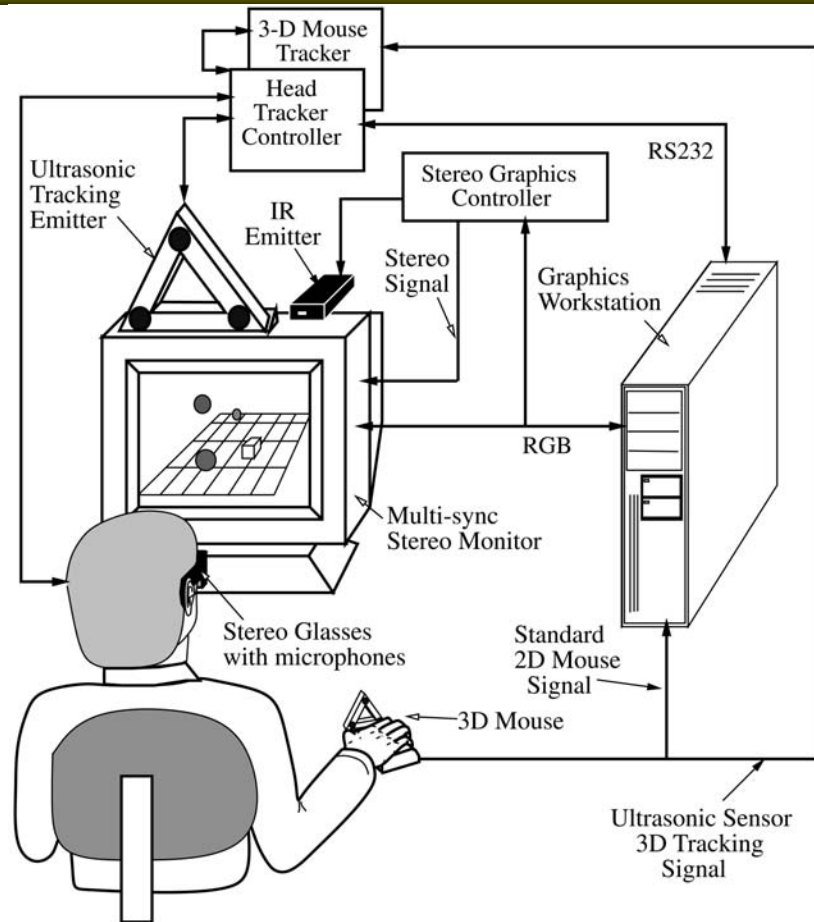
Desktop VR

- Fish-tank VR
- Baseada em tela 3D ou visão estéreo com shutters

Shutters



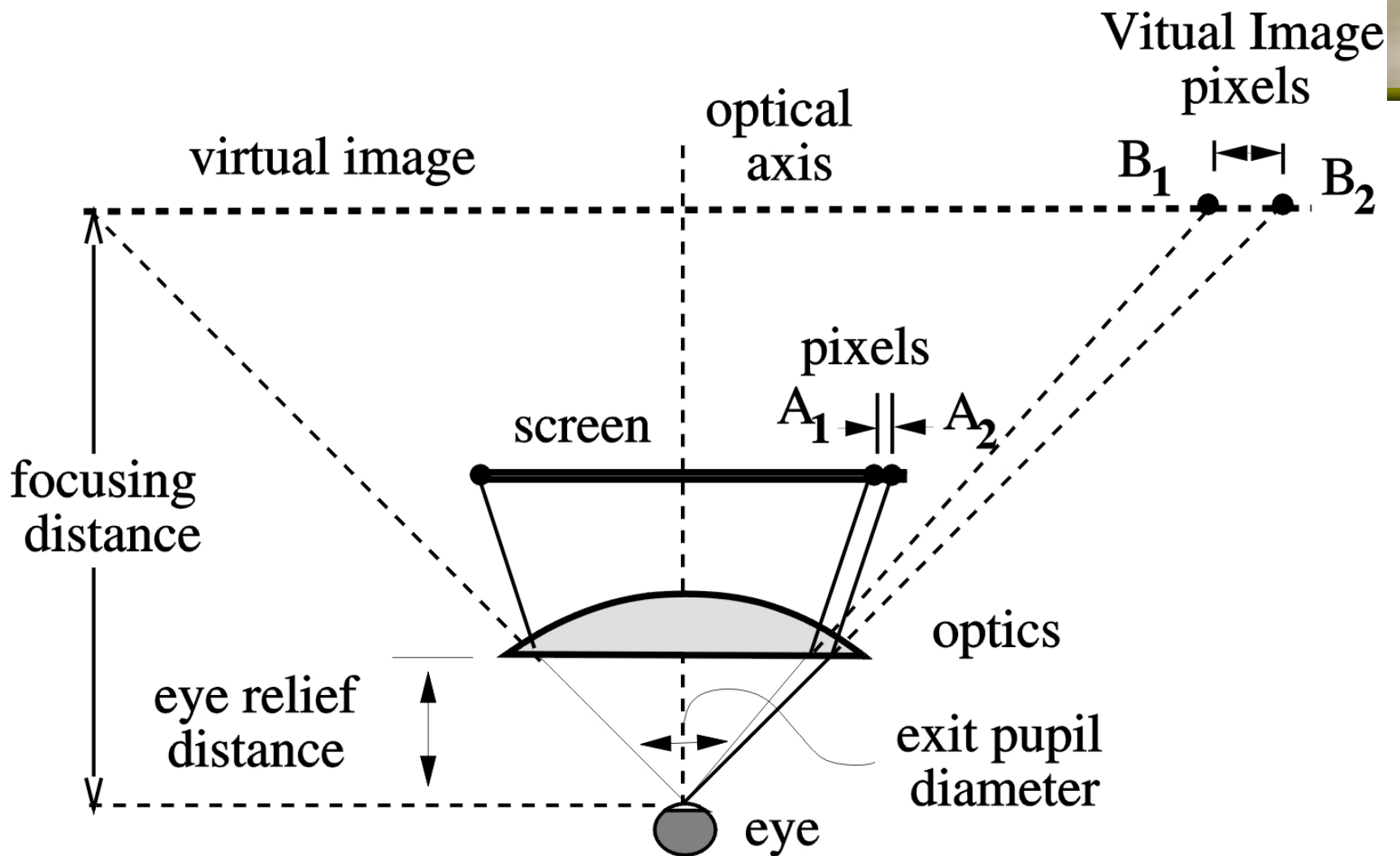
Shutters



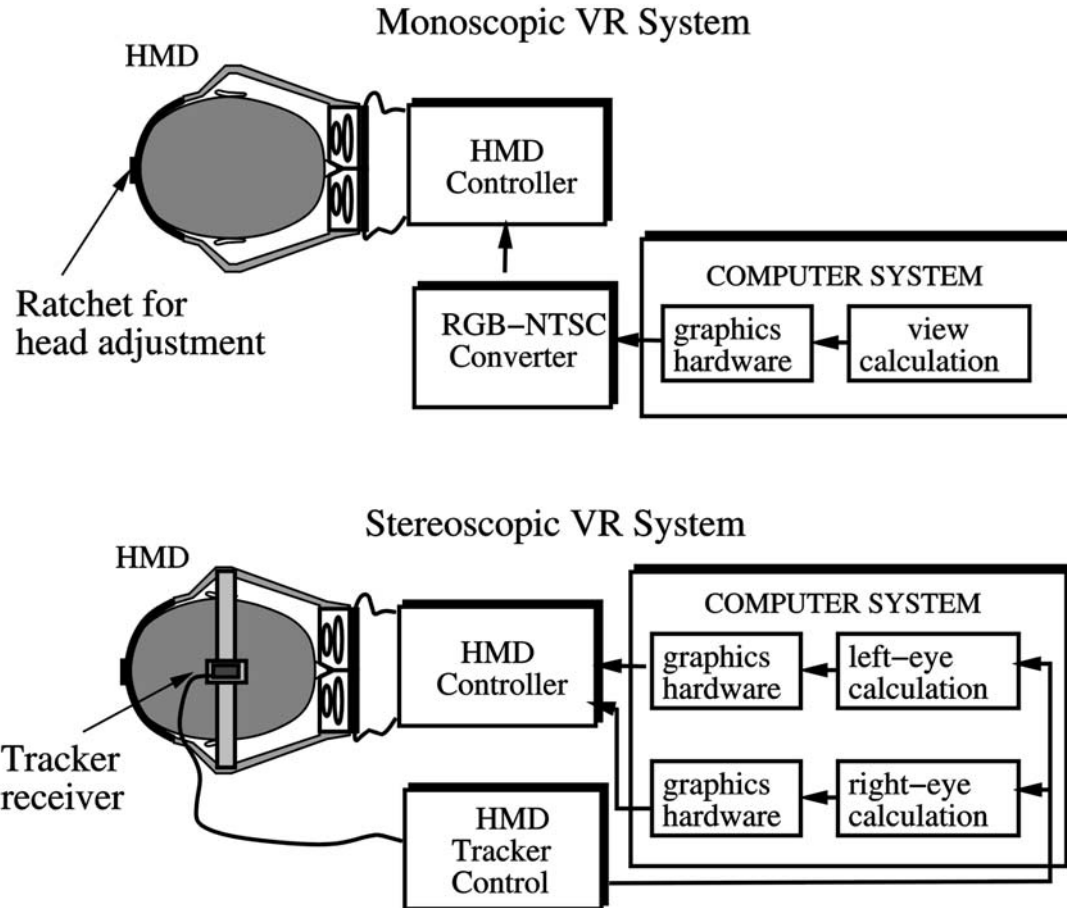
HMD



HMD



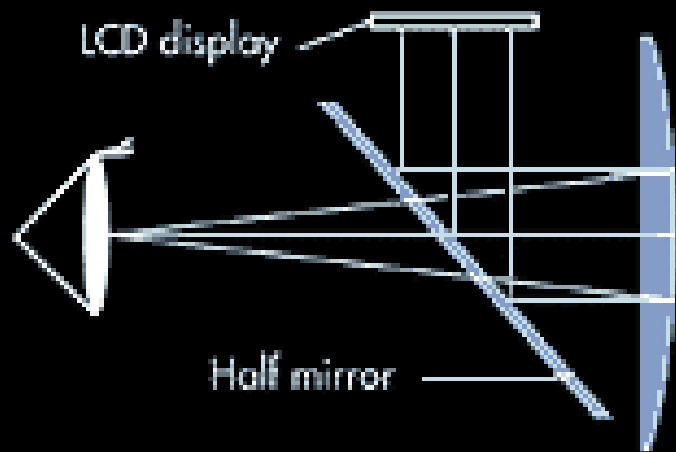
HMD



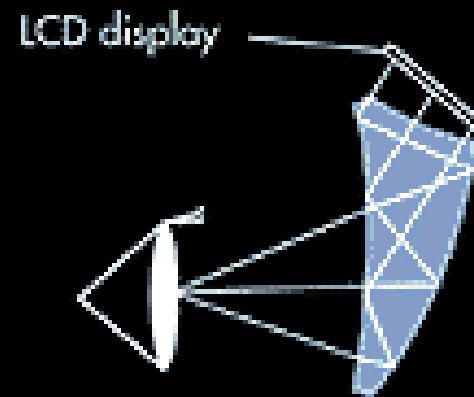
HMD



Traditional Concave Optics



Free-Shaped-Prism



HMD

Samsung Emagin z800 OLED HMD

Weight 8 oz

PC connection - USB, RGB input

SVGA resolution (800x600 pixels) stereo

Tracking - 360 degrees pan

60 degrees pitch

899 USD www.3dvisor.com

infosyncworld.com

ISW

HMD

- Baseados em LCD ou CRT
- LCD mais barato, mais leve
 - Trade-off resolução vs campo de visão
 - Eyephone (primeiro HMD LCD) monocromático, óptica LEEP, campo de visão largo, baixa resolução

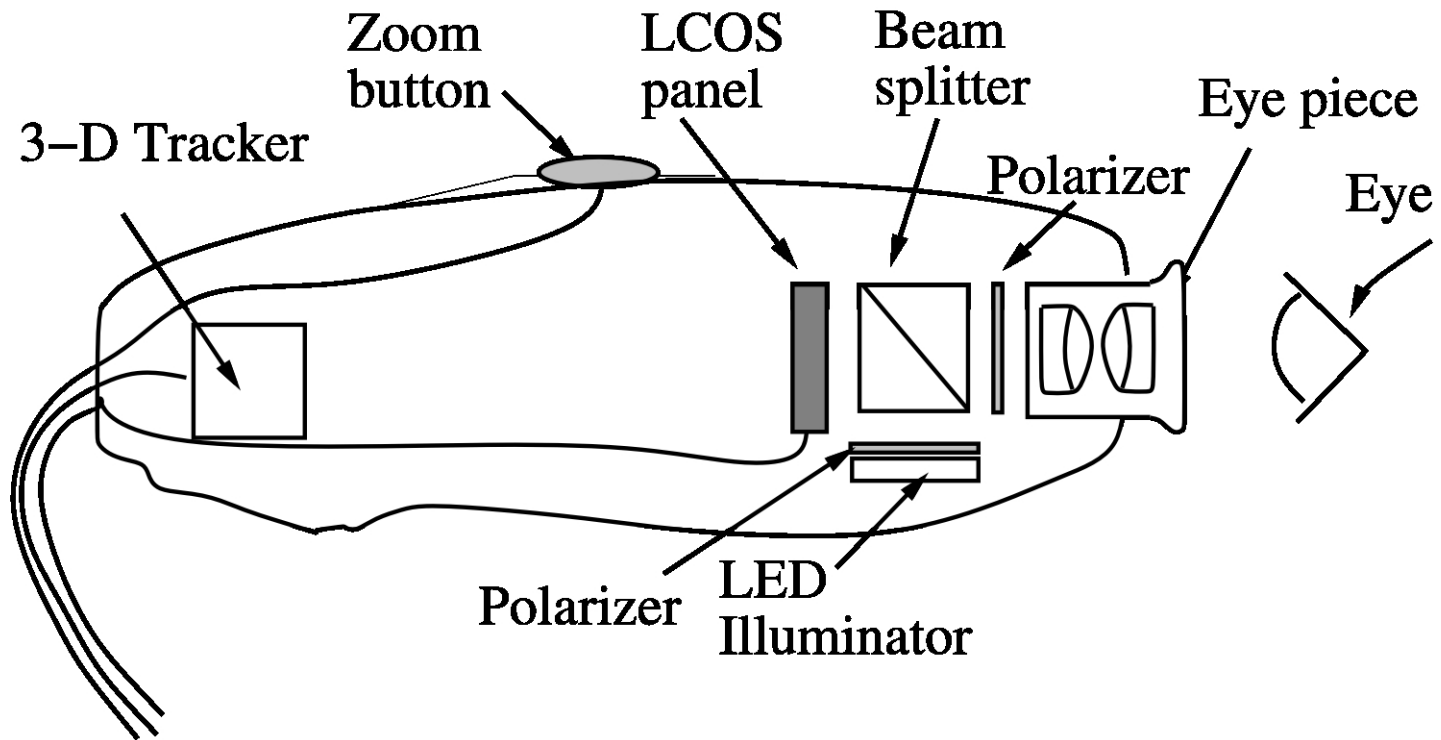
HMD

- Private-eye low cost HMD
 - Array de LEDs + espelho móvel
 - 720x280 pixels (vermelho)
 - Fotossensor responsável por determinar a posição do espelho para sincronização

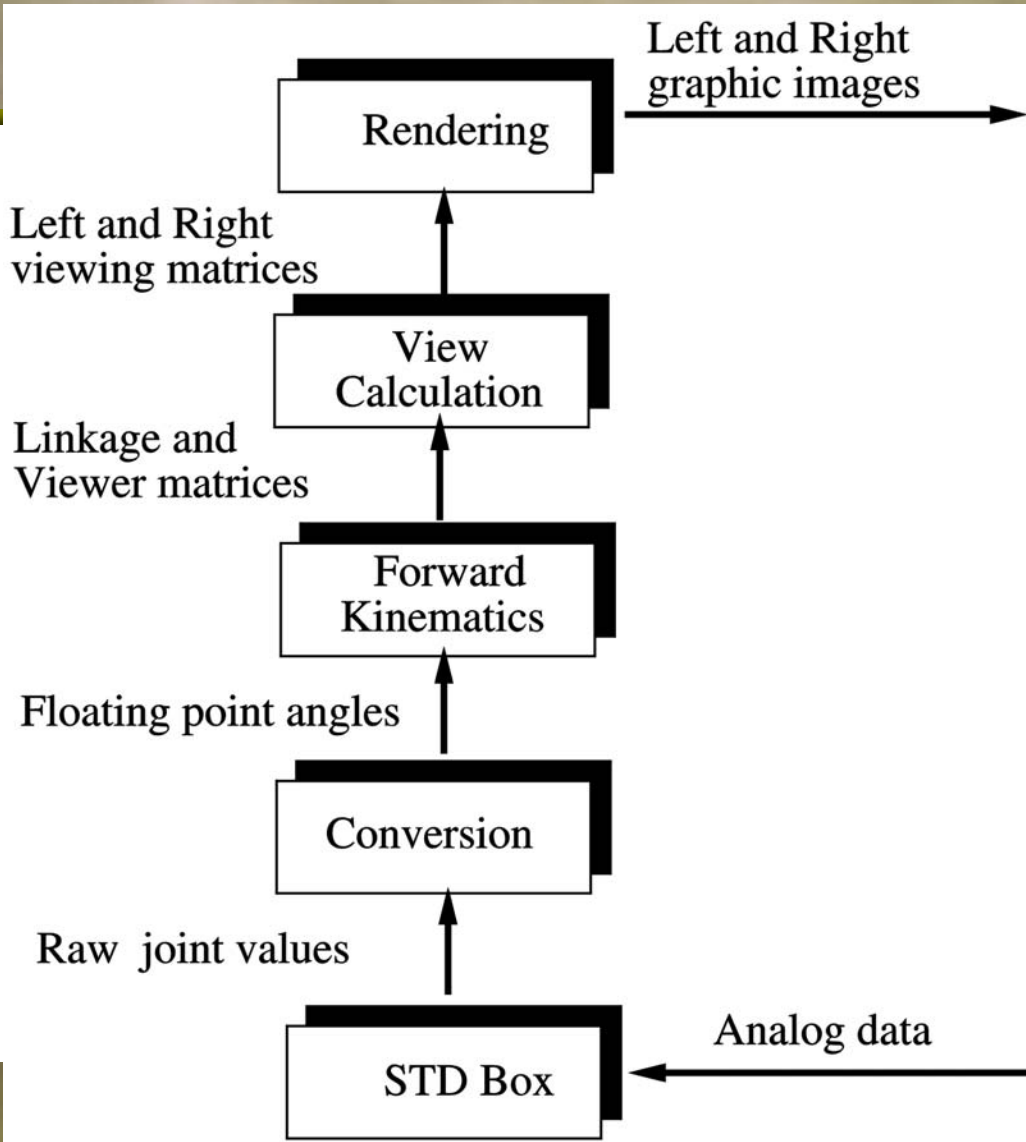
HMD

- Características importantes
 - Fonte de vídeo (LCD?)
 - Binocular/monocular
 - Colorido/ Monocromático
 - Resolução
 - Campo de Visão
 - Distância olho-imagem
 - Descanço do olho (distância à tela)
 - IPD (distância inter-pupilar) (ajustável?)
 - Peso
 - Entrada (NTSC?)

Binóculo



BOOM



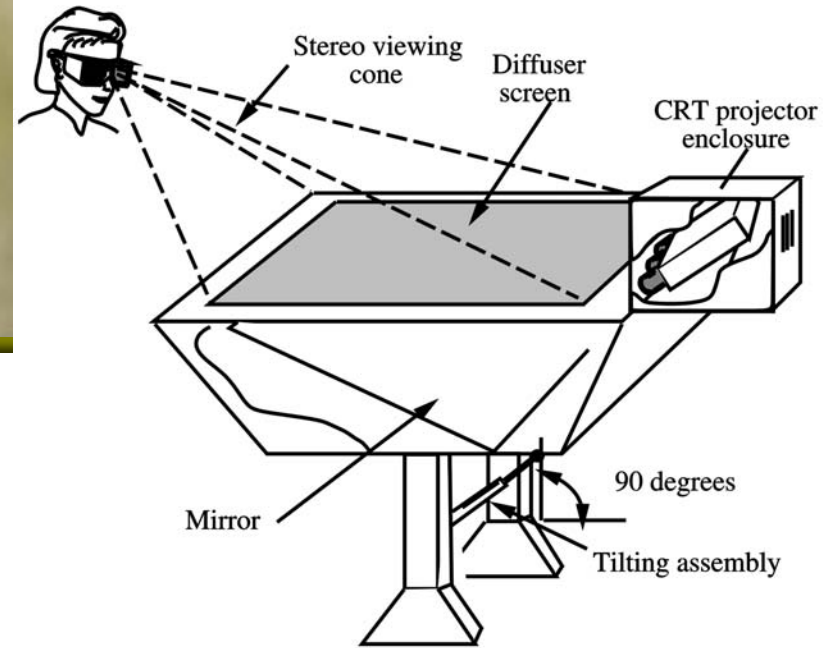
BOOM

- Binocular Omni-Orientation Monitor
 - Contrapeso
 - Rastreamento opto-mecânico (encoders)
 - 6 graus de liberdade
 - Preciso e baixíssima latência
 - Monousuário
 - Ocupa as mãos
 - Usuário pode interagir por teclado

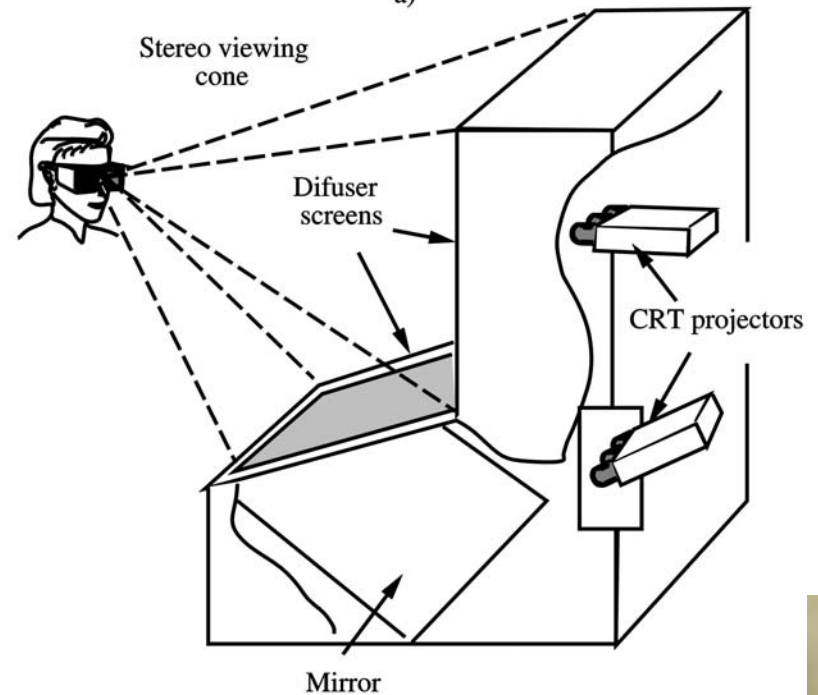
BOOM (Window in the World)



Workbenches

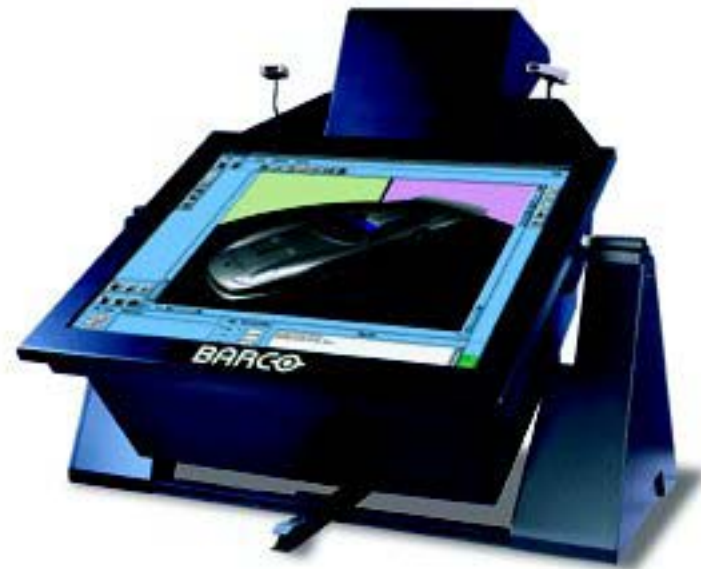


a)

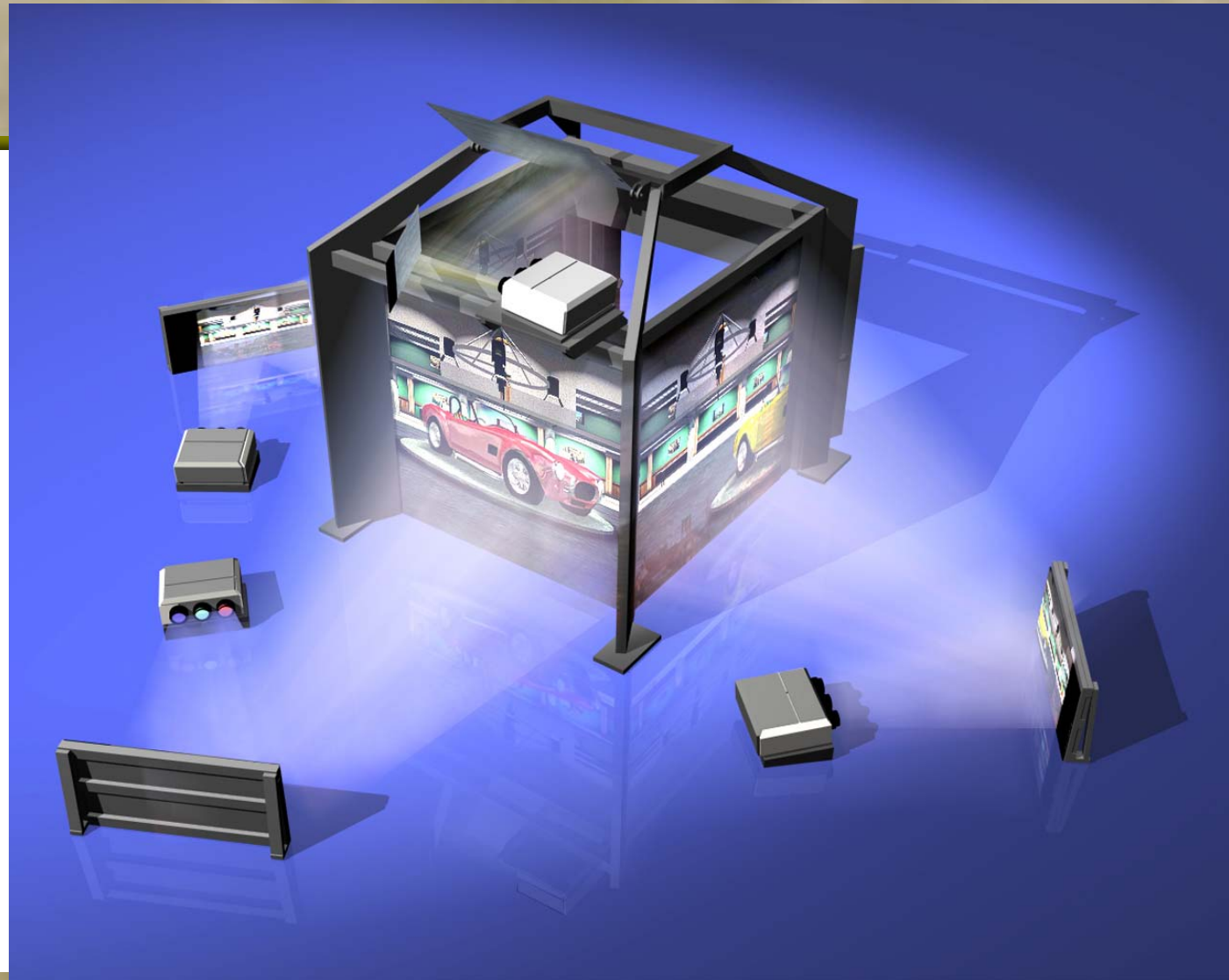


b)

Workbenches



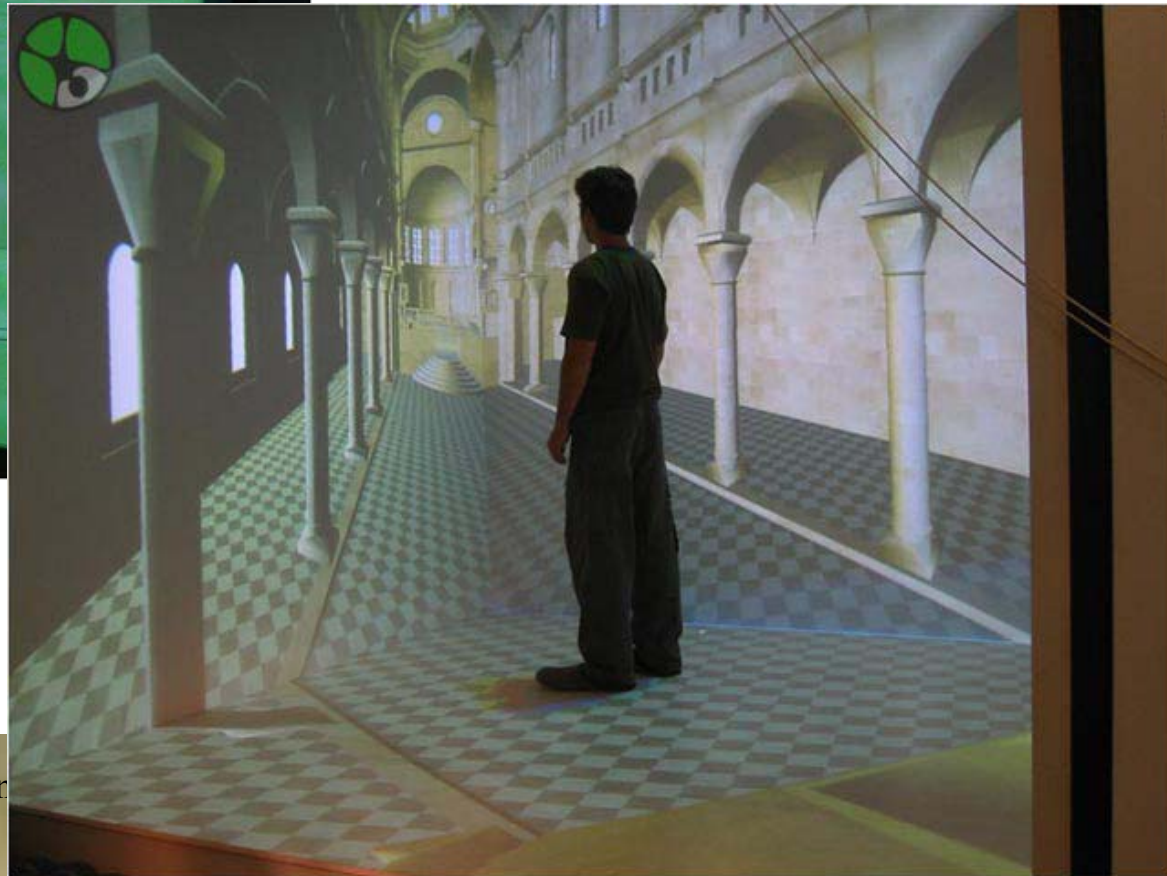
CAVE



CAVE

- A **Cave Automatic Virtual Environment** (better known by the [recursive acronym CAVE](#)) is an [immersive virtual reality](#) environment where [projectors](#) are directed to four, five or six of the walls of a room-sized [cube](#). The name is also a reference to “The Simile of the Cave” in [Plato](#)’s Republic where a philosopher contemplates perception, reality and illusion.
- The first CAVE was developed in the [Electronic Visualization Lab](#) at [University of Illinois](#) and was announced and demonstrated at the [1992 SIGGRAPH](#).

CAVE na USP



Displays Largos

- Large Volume Displays
 - Allow several co-located users to view a monoscopic or stereoscopic view of the virtual world;
 - Can be classified as *monitor*-based large
 - volume displays or *projector*-based large
 - volume displays.
 - Allow more freedom of motion vs. personal displays.

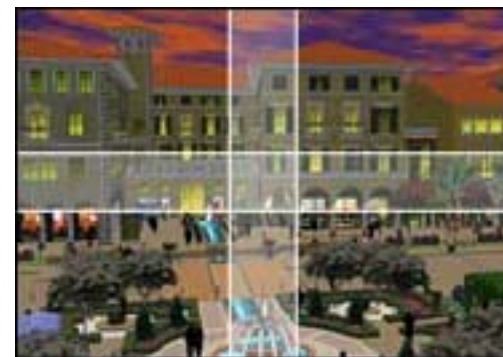
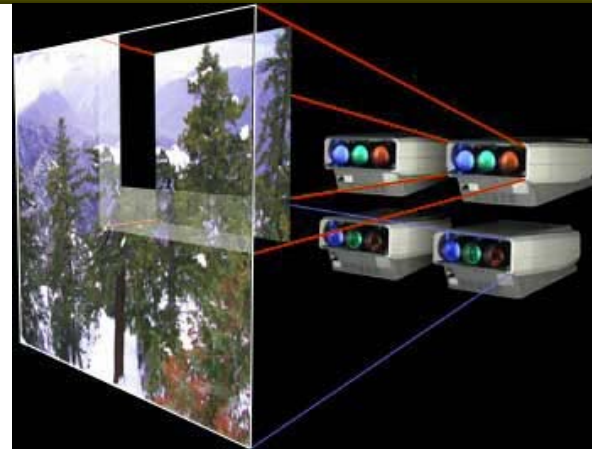
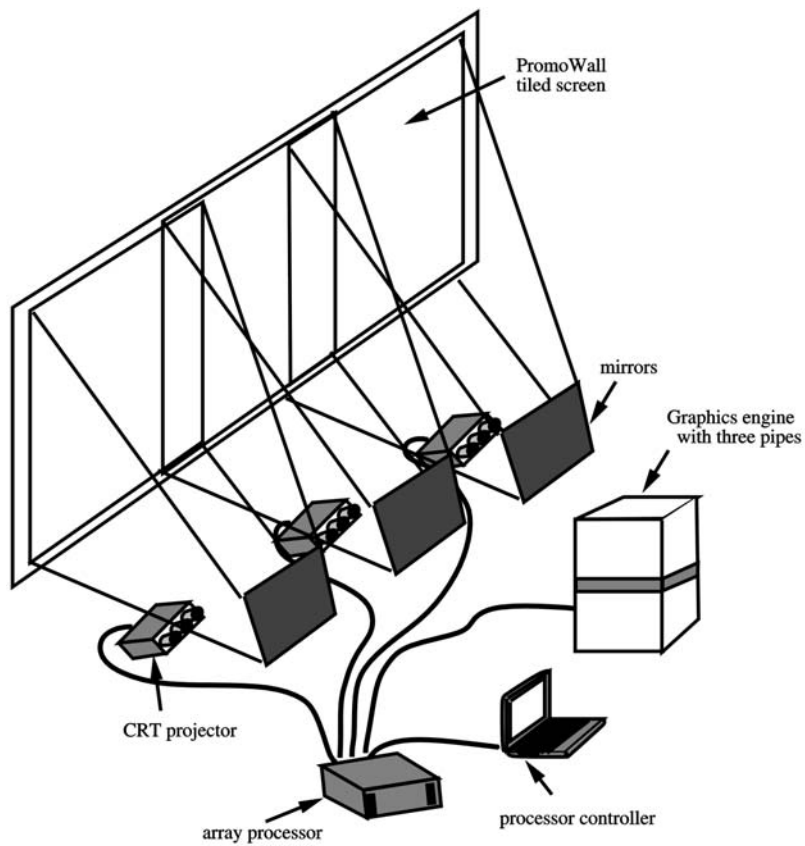
Monitor-based Large Volume Displays

- Use active or passive glasses;
- Several users can look at a monitor;
- Can have a *single* monitor, or *multiple* side-by-side monitors;
- If side-by-side, image continuity becomes an issue.

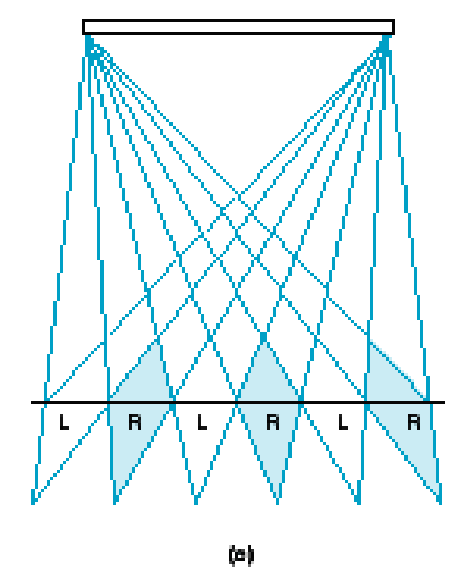
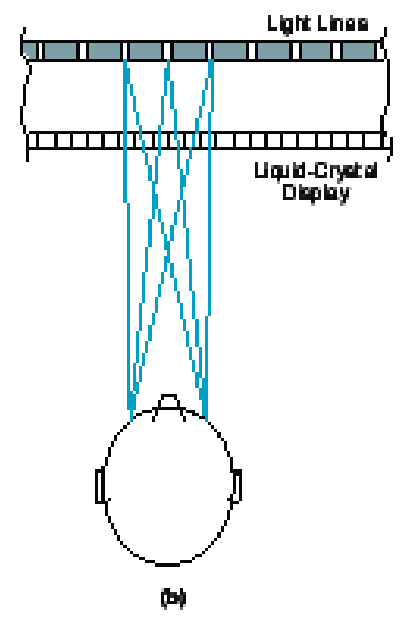
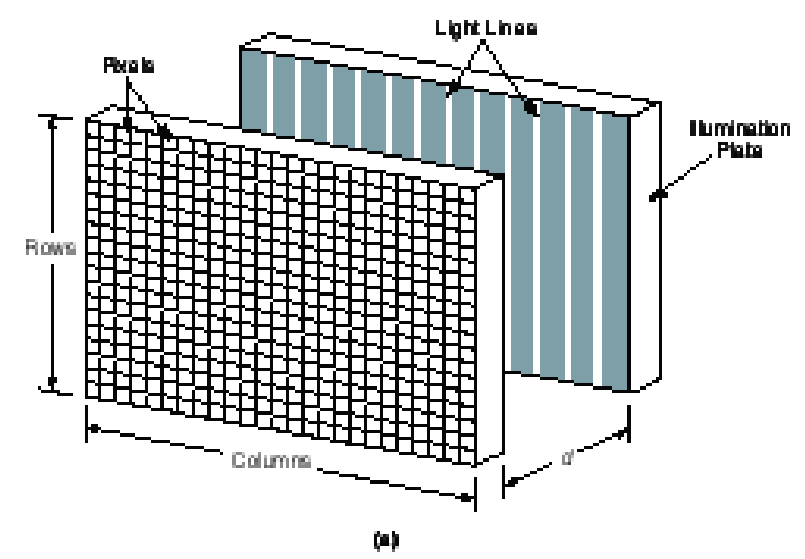
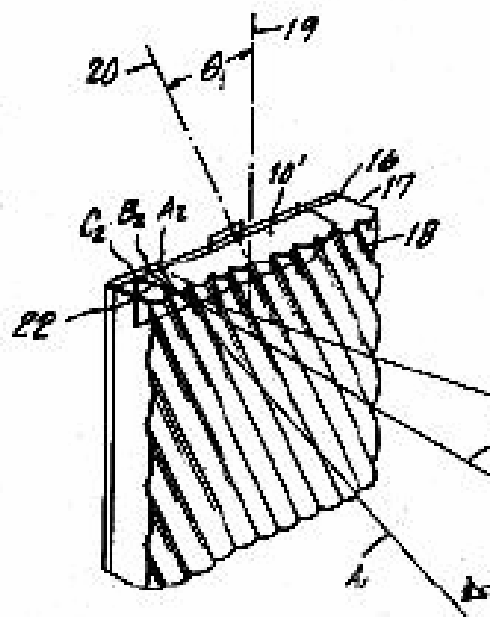
Múltiplas telas



Múltiplos projetores



Displays 3D



Displays 3D

Active tracking
accommodates ± 25
degrees
change in view
direction

