

Philips Multiview 3D Display Solutions

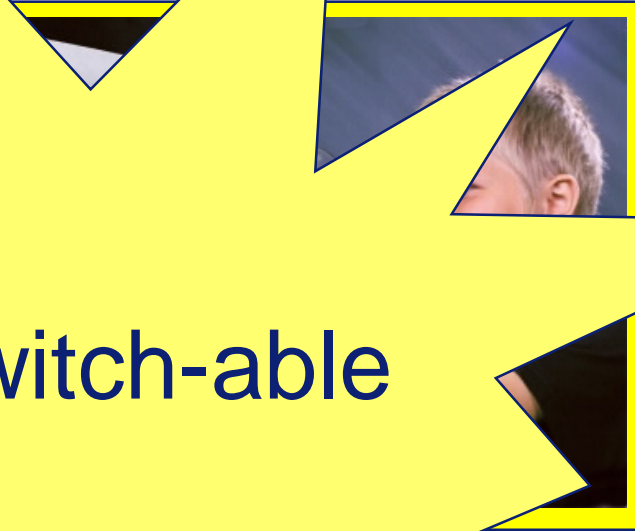
Cees van Berkel

Autostereoscopic 3D Displays

- Autostereoscopic
- Any size LCD
- High Brightness
- Cost

• 2D/3D switch-able

• 2D/3D conversion



Pixel Density

Why 3D ?

- The gaming community is consistently seeking the best possible experience. 3D can offer an additional dimension
- User Interfaces are becoming 3D as differentiator and as means to simplify access to complex functions
- (Mobile) operators can increase service revenues via (3D) picture/video downloading & sharing, games, etc.
- TV/Movies in 3D can offer a better experience than in 2D
- Professional applications seek enhanced visualization



Games



User Interfaces



Pictures



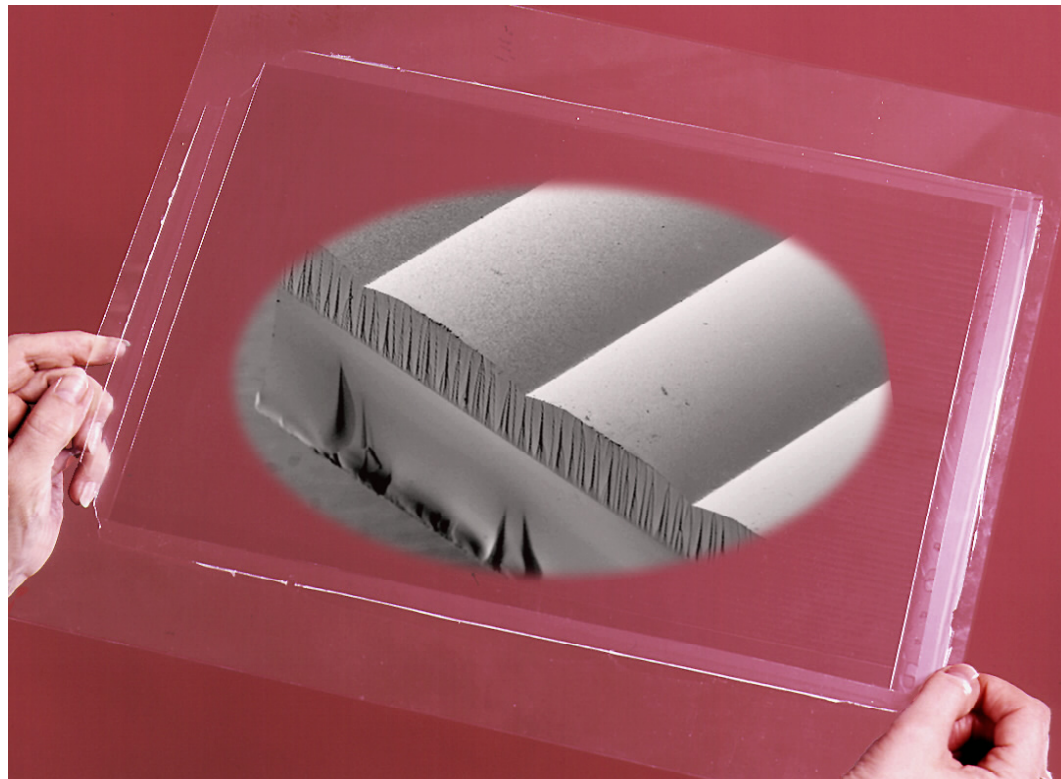
TV/Movies



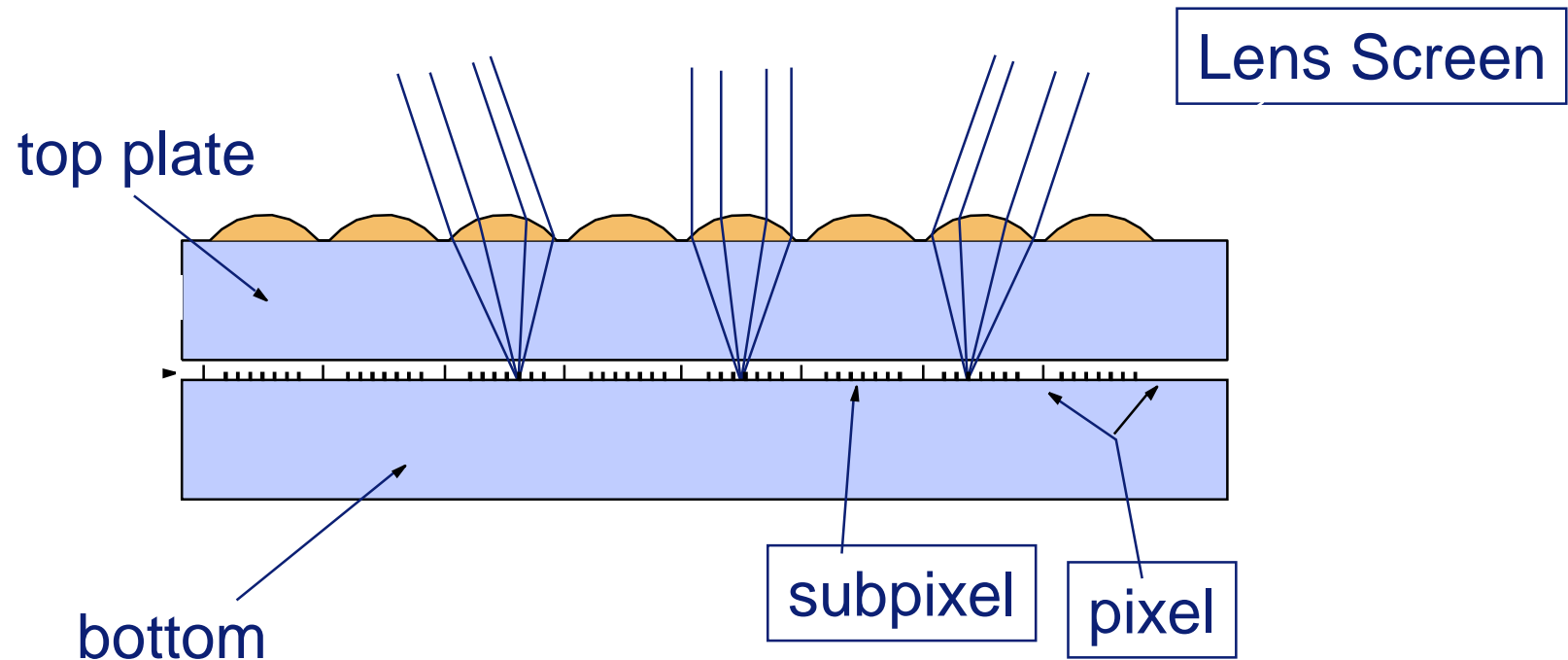
Professional

Lenticular Lens Screens

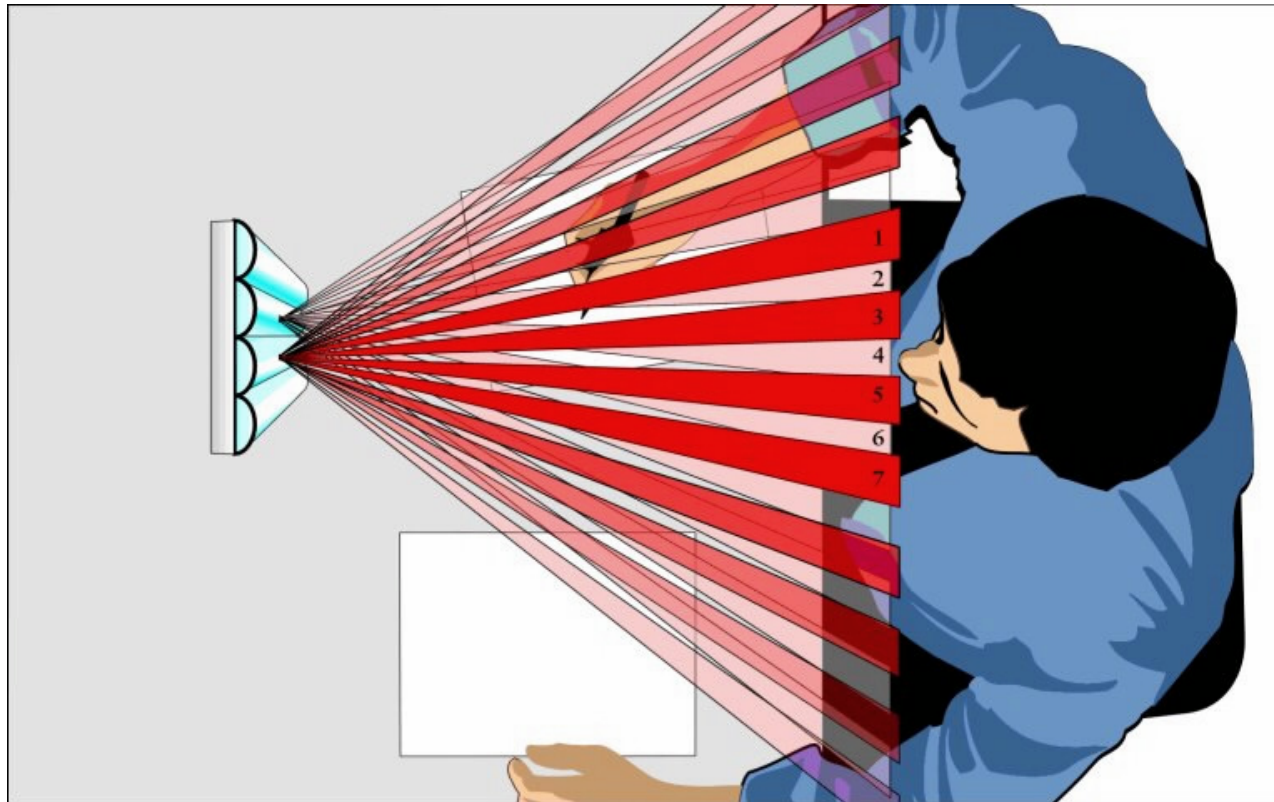
To make LCDs into 3D displays you need lenticular screens.
Philips has this technology



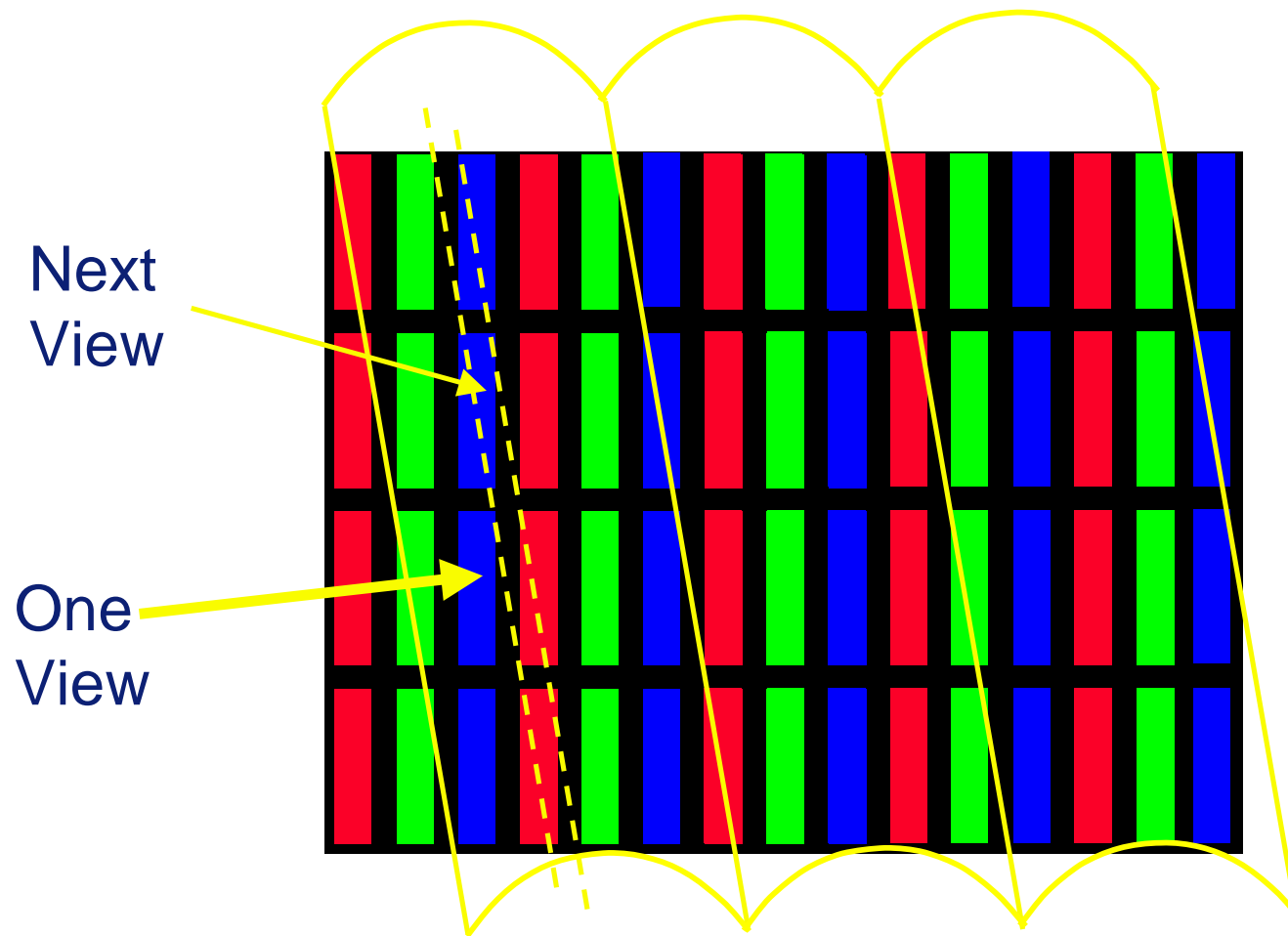
3D-LCD Technology



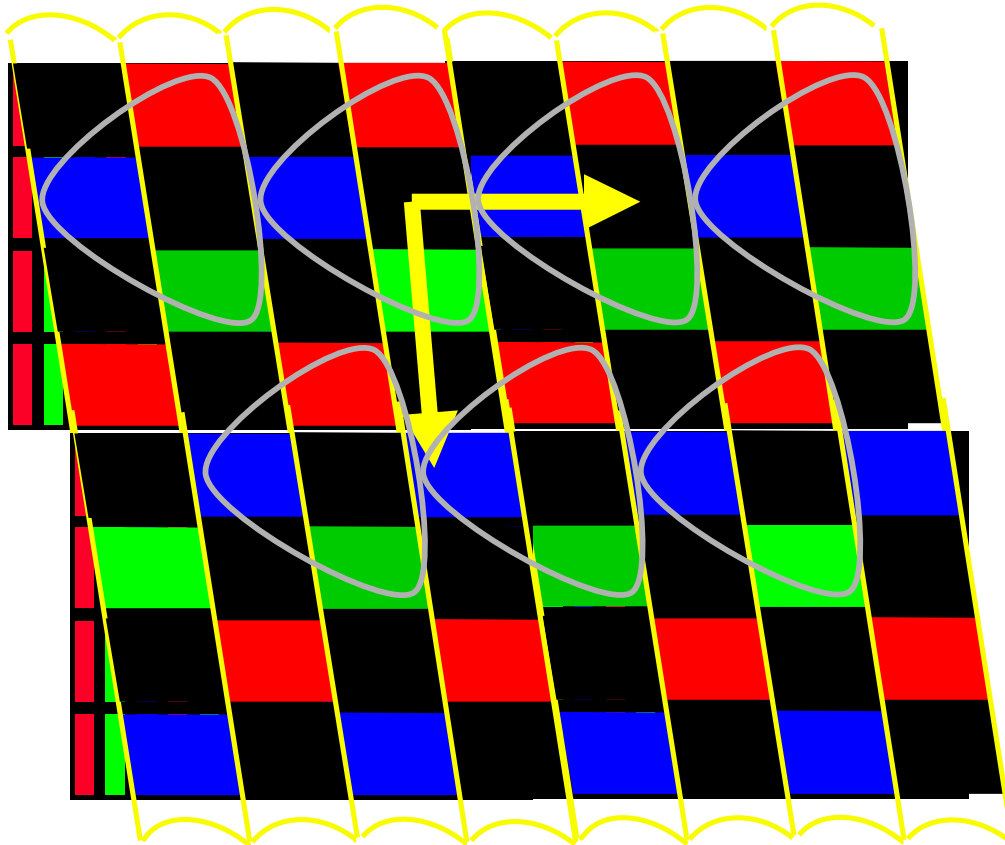
Overlapping Viewing Zones



Slanted lenticulars



Slanted Lenticular Resolution (9 View)



Horizontal Pixel Count

$$\frac{1600 \times 3}{4.5 \times 2} = 533 \quad \frac{1}{3}$$

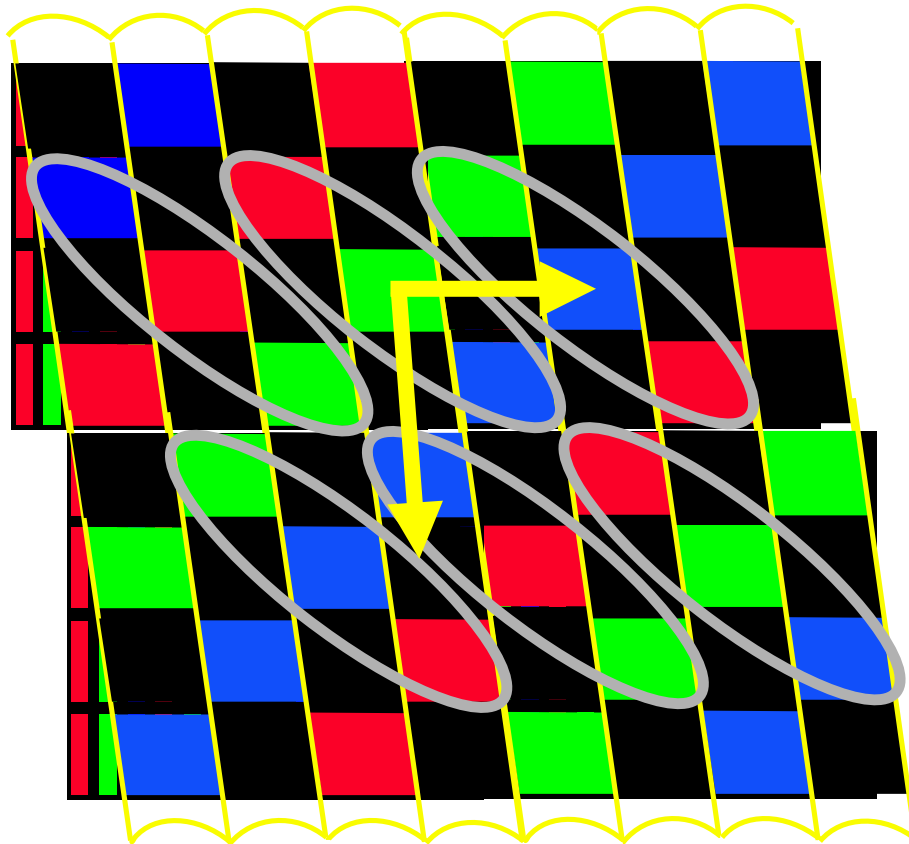
Vertical Pixel Count

$$\frac{1200}{3} = 400 \quad \frac{1}{3}$$

Note:

$$\frac{533 \times 400 \times 9}{1600 \times 1200} = 1$$

Slanted Lenticular Resolution (7 View)



Horizontal Pixel Count

$$\frac{1024 \times 3}{3.5 \times 2} = 686 \quad \frac{1}{2.3}$$

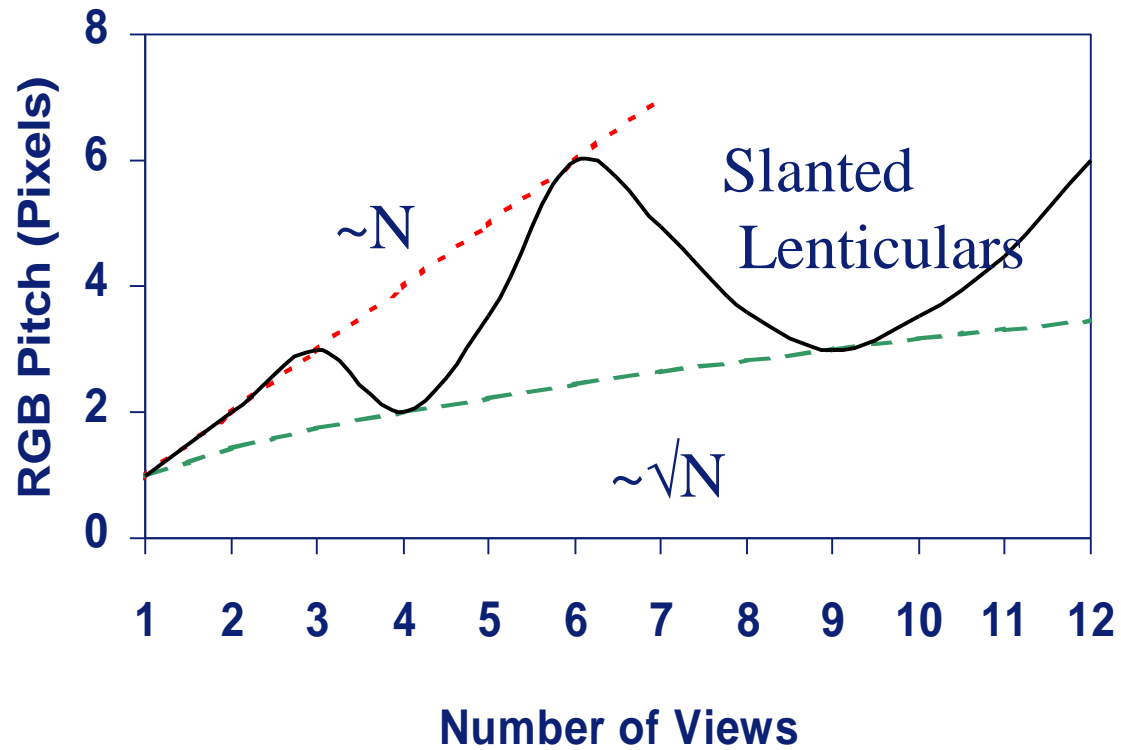
Vertical Pixel Count

$$\frac{1200}{3} = 400 \quad \frac{1}{3}$$

Note:

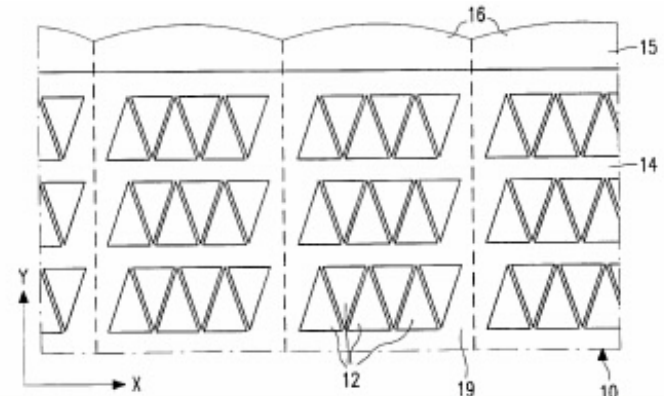
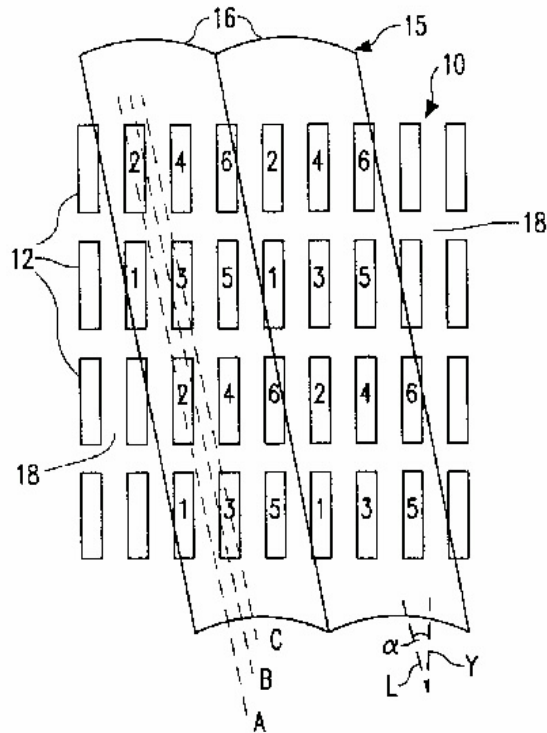
$$\frac{686 \times 400 \times 7}{1600 \times 400} = 1$$

Colour Stripe Pitch



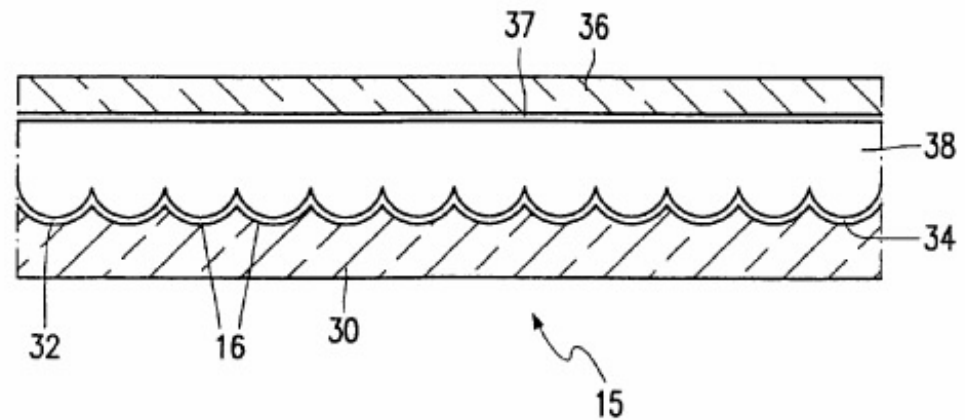
Philips Key Patents

US6,064,424 (May 2000)



US6,118,584 (Sept 2000)

US6,069650 (May 2004)



3D Solution

Is Content available ?

Does 3D fit mainstream silicon ?

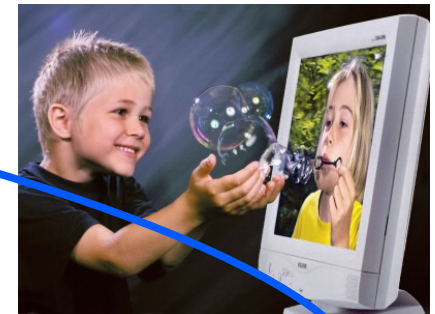
Does 3D fit mainstream Displays/Devices ?



Content Creation & Distribution

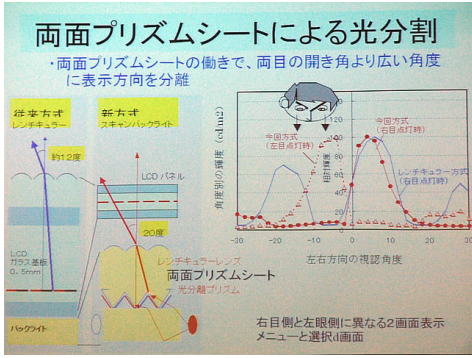
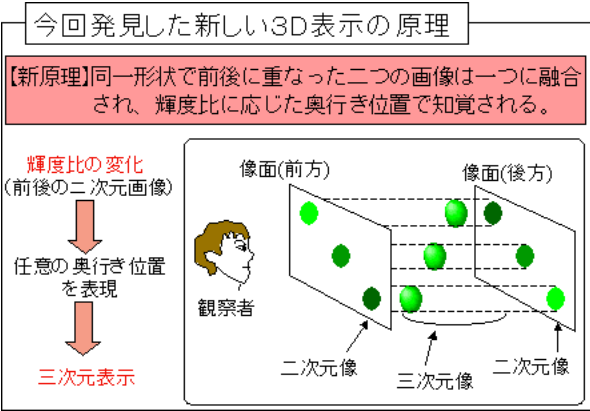
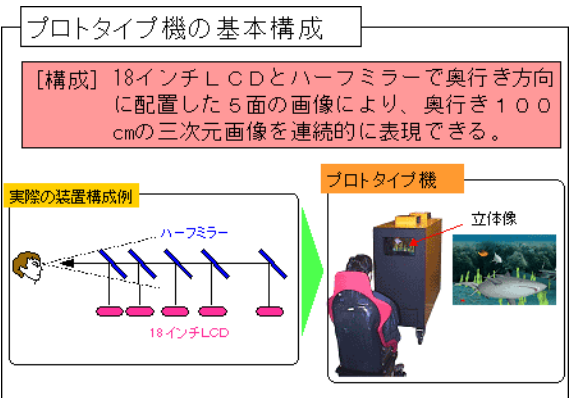


Processing

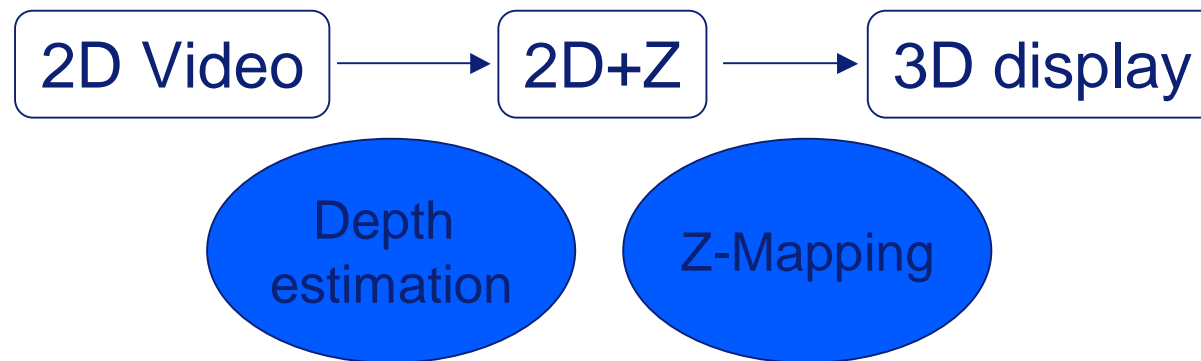


Displays

Many 3D displays for many applications



Content Chain



“Championing an optimal 3D content chain for a wide spectrum of applications”

- Mobile
- Monitor
- TV

Conclusions

- Philips has excellent 3D display solution
 - Multi user
 - Flexible in viewing angle and distance
 - 2D/3D Switchable
 - Low cost
- Philips has high quality 2D/3D conversion
 - Expertise in signal/display processing
 - Real time depth estimation
 - Image Quality & Resolution
- Philips is active in 3D opportunity
 - Discussions with partners
 - Focus on Mobile, TV & Monitors
- Pluralistic 3D future
 - A universal family of interfaces. Objects, z maps & views