

# Seattle

**SpatiaLight, Inc.**

**Product Marketing**

**May 2007**

# Proposed Spec for Seattle

Specification:	HMD
Type	See Through
Resolution	1920 x 1080
Screen Size (S)	80" at 8 ft. (horizontal FOV 45 deg.)
Brightness	300 cd/m2
Pixel Resolution	1 mrad (~0.05 deg.)
Contrast	NA
Weight	Less than 6 oz./170g (4 oz./110g target)
Dimension	Less than 8 mm thick (<5mm target)
Video Input	HDMI, Dual DVI
Display Panel	0.74" LCoS
3D	Option via Dual DVI PC input
Audio Out	Under 1W (?)

# Markets for HMD

## Entertainment



## Mobile Computing



## Industrial



# Where Seattle will be?



**Game Industry – Specifically Game Consoles**

# Why Game Industry?

- ✓ Market size of game industry (\$28 billion world wide, 2005)
- ✓ SL's T3S's features are more suitable for HMD application compare to mobile product due to power consumption requirement.

# Why Game Industry?

- ✓ 2004, the world wide sales for game industry recorded \$25 billion.
- ✓ 2005, the world wide sales increased 8.4% to \$28 billion.
- ✓ Average annual sales growth of 18.7% is expected until 2009.
- ✓ The game console sales expect to grow from \$17 billion in 2005 to \$25 billion in 2009.

## Game Industry Size World Wide (Unit: US\$ Million)

Item	2004	2005	2006	2007	2008	2009
Game Console	18,049	17,094	19,510	23,623	24,303	<b>24,607</b>
PC Game	3,450	3,408	3,322	3,170	3,073	2,981
Online Game	2,360	3,758	5,945	9,087	12,298	15,371
Mobile Game	1,547	3,269	5,566	7,843	10,088	11,646
Total	25,406	27,529	34,349	43,723	49,762	54,605

Data sourced from PWC

# Characteristics of Game Console Industry

- Product life cycle – 5 years
  
- Special features of latest game consoles:
  - ✓ Chip capability
  - ✓ Strengthen graphic feature
  - ✓ Strengthen network connection features
  - ✓ Evolvment as total entertainment product (compatible with PC products)
  - ✓ Enables owner to download movies and music via Internet and view them from home TV.
  - ✓ Merge two different game business (console and PC) as one via online. This requires game developers to consider converged features.



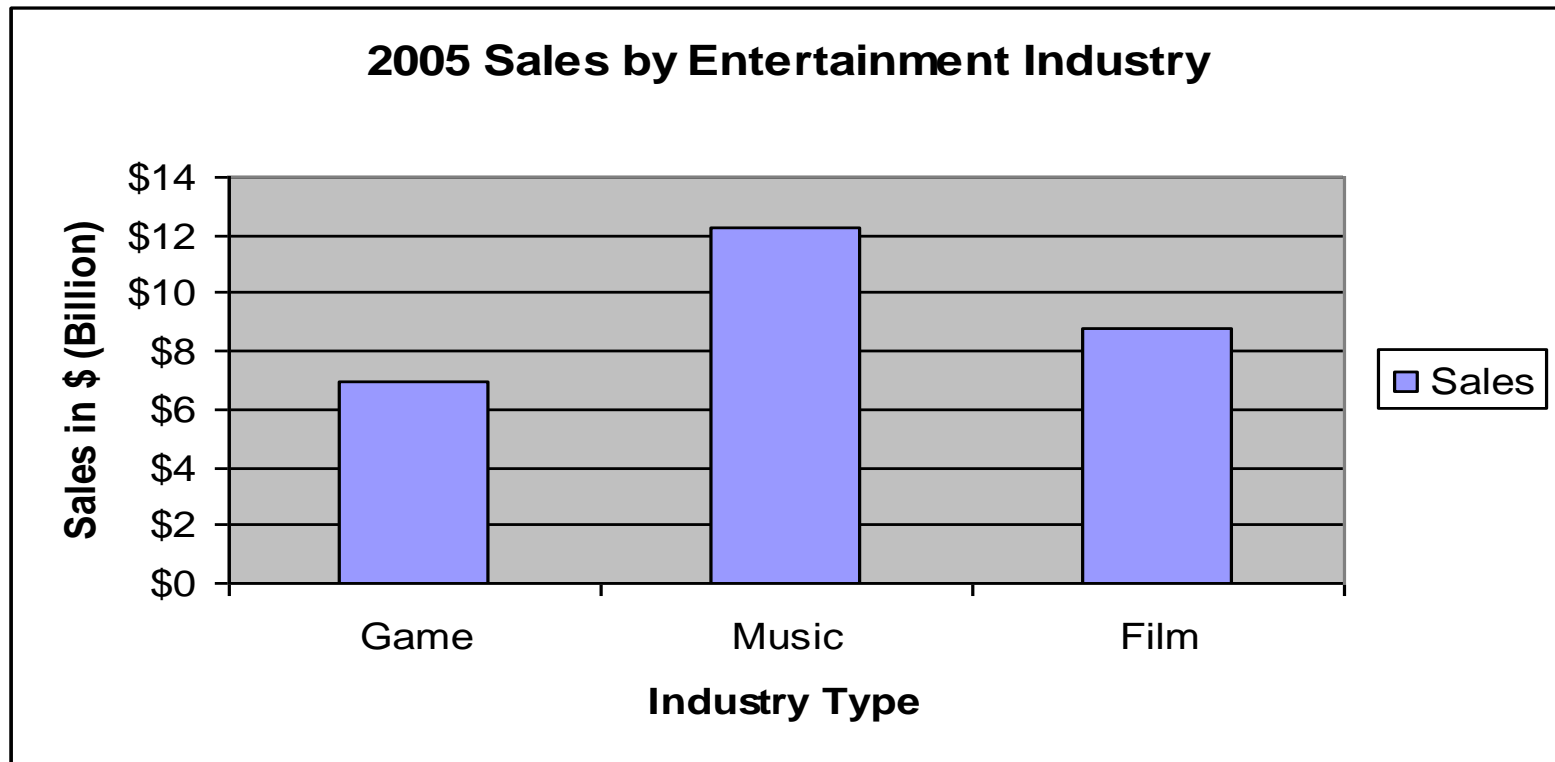
# Target Customer for Seattle

- ✓ Age: 25 ~ 35
- ✓ Gender: Both female/male
- ✓ Region: Primarily US, Japan, Korea.
- ✓ Own next-gen game consoles such as PlayStation 3 or XBox360
- ✓ Play 3D on-line games such as newly released StarCraft 2.

# Market Character: US

- ✓ Various age group play games including parents in their 30 ~ 40.
- ✓ Per ESA's research, the average age of American who play game is 33.
- ✓ 38% of game players is female.
- ✓ 69% of head of household play game.
- ✓ 25% of overall game players is age of 50 or older.
- ✓ The growth of game industry occurred when those game players from 80s became parents.
- ✓ Per ESA, 35% of American parents play game. 80% of them play games with their children.

# Market Character: US



Data sourced from RIAA, The Numbers

# Market Character: Japan

- ✓ 2004, market size of \$6.3 billion.
- ✓ Strongly leads world console game market (owns game console & game developers).

**Japan's Game Market Size (Unit: \$ Million), Data Sourced from PWC 2005**

<b>Japan</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>05~10 /CAGR (%)</b>
<b>Overall</b>	6,373	7,178	8,724	9,201	10,040	10,872	10,933	8.8%
<b>Console Game</b>	3,944	4,531	5,850	6,106	6,708	7,315	7,158	9.6%
<b>Arcade Game</b>	1,606	1,687	1,785	1,886	1,995	2,101	2,206	5.5%
<b>Mobile Game</b>	402	478	545	612	671	729	780	10.3
<b>PC Game</b>	219	203	182	168	152	135	119	-10.1%
<b>Online Game</b>	202	289	362	429	514	592	670	18.4%

# Market Character: Japan

- ✓ Like US market, Japan's game market will show strong growth due to release of next-gen game consoles.
- ✓ Unlike usual product life cycle of 5 years, Japan's market is 1 year quicker:
  - 1) Japan's gamers have high expectation for new consoles (both portable/next generation)
  - 2) Shows quicker reaction to new products, more active game market.
- ✓ Network features of wireless LAN with new game consoles.

# Market Character: Korea

- ✓ The growth of game market was mainly based on on-line game.
- ✓ The on-line game shares more than 70% of overall Korea's game market with 30% growth rate.

	2003	2004	2005	2006	2007
<b>PC Game</b>	937	534	427	384	365
<b>Video Game</b>	2,229	1,866	2,146	2,682	3,219
<b>Mobile Game</b>	1,458	1,617	1,989	2,387	2,816
<b>Online Game</b>	7,541	10,935	13,242	16,542	19,836
<b>Total</b>	12,165	14,952	17,804	22,005	26,263

(Unit: Billion KRW)

# Market Character: Korea

- ✓ 85% of gamers from popular on-line game sites such as “Shot Online” are mid age range (average age 44.5).
- ✓ Highest level achiever for popular game, Maple Story, is male gamer in 40s.
- ✓ The growth of mid aged gamers is rapidly growing:
  - the mid age group began to view game as par of leisure.
  - game developers are expanding their target customer to mid age group.
- ✓ The mega-hit online game, StarCraft’s 2<sup>nd</sup> version in 3D was released. The world wide shipped units for StarCraft 1 was 9.5 million, where 4.5 million units were sold in Korea.

# Shipments of Game Consoles in North America

**(Data for April 2007 NPD Game Hardware and Software Report for North America)**

- ✓ Overall game sales down 1% to \$399 million.
- ✓ However, overall hardware and software sales up 20% to \$839 million.
- ✓ Nintendo DS dominated the month's hardware sales with 417K units sold, Nintendo's Wii console sold 360K.
- ✓ In April 2007,
  - Xbox 360 sold 174K units.
  - PlayStation 2 sold 194K units.
  - PSP sold 183K units.
  - PlayStation 3 sold 82K units.
  - Game Boy Advance sold 84K units.
- ✓ Notable trend for the month:
  - a surge in portable hardware sale – up 43% over the previous year to \$99 million.
  - Console hardware was up 56% to \$239.4 million due to Wii's success and higher price the new system.



# Competitor: eMagin Z800 3DVisor

- ✓ Formats: SVGA+: 852 (x 3) x 600 pixels  
SVGA 3D: 800 (x 3) x 600
- ✓ Pixel Aspect Ratio & Pitch: 15  $\mu$ m squares
- ✓ Color Pixel Arrangement: R,G,B vertical stripe | >16.7 million colors
- ✓ Viewing Area: SVGA+: 12.78 x 9 mm (0.61 inch diag.) | SVGA 3D: 12 x 9 mm (0.59 inch diag.)
- ✓ Display Aspect Ratio: 4:3 or 16:9
- ✓ Mechanical Envelope: 19.78 x 15.2 x 5 mm
- ✓ Weight: 1.8g
- ✓ Color Gamut: >75% of NTSC gamut | Up to 256 gray levels
- ✓ Uniformity: >85% (area uniformity as per VESA FPDM Standard)
- ✓ Contrast Ratio: >800:1
- ✓ Luminance Nominal: 400 cd/m<sup>2</sup> (color) | 5500 cd/m<sup>2</sup> (green) | 2000 cd/m<sup>2</sup> (white)
- ✓ Operating Temperatures: SVGA+: -40°C to +65°C (commercial/military) | SVGA 3D: 0°C to +40°C
- ✓ Humidity: 85% RH non-condensing



# Competitor: i-glasses Video 3D Pro

**i-glasses™**



**VIDEO 3D Pro**

**Resolution:** 800 x 600

**Field of View:** 26 Degrees Diagonal

**Virtual Image Size:** 70" at 13'

**Color Depth:** 24 Bit Input

**IPD Adjustments:** None Required

**Eye Relief:** 25mm

**Exit Pupil:** 17mmH x 6mmV

**Convergence:** 7' 10", 100% Overlap,  
TBR

**VGA / SVGA / XVGA Input:** Scaled to  
SVGA (800 x 600)

**Refresh Rate:** Flicker Free 100hz

**Audio:** Full Stereo

**Weight:** 7 Ounces

Adjusts to Fit all Individuals

**Control Features:** On / Off, Volume  
Control

**Power Supply:** 100 - 240V AC Power  
Cube

**HMD Cable Configuration:** Audio 1/8"

**Power:** Barrel Connector

# Competitor: Headplay's PCS



# Competitor: Headplay's PCS

## General:

Product Type: Personal Cinema System

Type of Use: Multi-media viewing, downloading and storage

Key Components: Liberator, Viewer, Navigator

Action Buttons: On Navigator, lock control button, directional navigation buttons, settings adjuster buttons; on Liberator, power button; on Viewer, IPD and focus sliders

Technology: Freefall - Advanced video compression

Applications: Personal video theatre, PC console gaming, virtual reality 3D gaming, 3D movies

Color: Black

# Competitor: Headplay's PCS

## **Supplied Accessories:**

Liberator, Viewer, Navigator

Case (protective or carrying)

AC Power Adapter

Polymer Lithium Battery (only included with deluxe model)

RCA – S-Vid adapter

Registration Card

128MB Flash Card

Ear Buds (in three different gel sizes)

# Competitor: Headplay's PCS

- **Component Specifications:**

Electronics:

- Human Machine Interface controls
- Liquid Crystal on-silicon display
- Low Voltage Differential Signalling receiver
- Light Emitting Diode driver
- Analog VGA, NTSC and PAL video inputs
- Multi-stream video decoder engine

# Competitor: Headplay's PCS



## Liberator:

- Analog video and audio inputs
- Video processing engine
- USB 2.0 Host interface: 2
- USB 2.0 Client interface: 1
- Compact Flash IDE interface
- Compact Flash memory mode
- Compact Flash IO mode
- Audio jack
- AC power connection
- AV plug-in
- VGA input

# Competitor: Headplay's PCS



## Viewer and Navigator:

User Controls: On-screen cursor up, down, left and right; on-screen cursor direction select; volume up; volume down; control lock

On-Screen Display: Program selections; Audio Settings (volume, mode); Video Settings (brightness, contrast, saturation, hue, mode)

Focus adjustment sliders: +3 to -6 diopter

IPD adjustment sliders: 53 to 75 mm

Eye Relief: 15 mm

Exit Pupil: 6.2 mm



# Competitor: Headplay's PCS



## **Display and Graphics:**

Field of View: 34 degrees diagonal

Virtual Image Size: 52" diagonal at 6'

Display Technology: LCOS

LCOS Refresh Rate: Up to 120 Hz

Color Depth: 18 bits

Native Resolution: 800 x 600 pixels

Supports Resolutions up to: 1024 x 768 pixels

Video Output: 360 color fields per second

Audio: Stereo Sound

3D video; built in