Virtual i-O i-glasses!

(Redirected from I-glasses)

i-glasses! (stylized as **i-glasses!**) were a series of head-mounted displays (HMDs) developed and manufactured by Virtual i-O from 1995 to 1997, and later by i-O Display Systems until 2013. These devices were among the first consumer-oriented virtual reality headsets to achieve mainstream distribution, offering an affordable entry point into VR and augmented reality experiences during the mid-1990s.[1]

i-glasses

History

Company Formation (1993-1995)

Virtual i-O was founded in 1993 by entrepreneurs Greg Amadon and Linden Rhoads in Seattle, Washington. The company spent three years developing their virtual reality eyeglasses technology before attracting seed capital from John Malone, CEO of Tele-Communications Inc., after demonstrating an early prototype using 900 pounds of computer and video equipment in his garage in Boothbay Harbor, Maine.[2] A working prototype code-named "PC Viewer" was shown privately to Microsoft and IBM engineers in 1993.[3]

Development and Launch

The production design was unveiled at Winter Consumer Electronics Show (CES) in January 1995 and shipped to U.S. retailers in May 1995.[4] The i-glasses were released as one of the first affordable home VR headsets, alongside competitors like the VictorMaxx CyberMaxx and Forte VFX1.[1] The headset was designed to be lightweight and comfortable, weighing only 227 grams (8 ounces), making it significantly lighter than many competing VR systems of the era.[5]

European Distribution

In July 1995, Virtual Products GmbH, a subsidiary of Escom AG, became the exclusive distributor of i-glasses in Europe. Escom developed a special PAL video standard version specifically for the European market.[3]

Company Decline and Restructuring

By late 1996, Virtual i-O faced significant financial difficulties. Internal company morale deteriorated, with widespread layoffs occurring in December 1996. A group of disgruntled former employees, known as "Deep Bile," actively circulated information about the company's troubles.[6] The company's struggles were later chronicled in Fred Moody's book "The Visionary Position," which documented five high-tech start-ups including Virtual i-O.[6]

Sluggish sales and high manufacturing overhead forced Virtual i-O into Chapter 11 bankruptcy protection in March 1997. Its assets were reorganized as **i-O Display Systems**, which continued to refine the product line through the 2000s, introducing the higher-resolution i-glasses SVGA in 1997 and the stereo-capable SVGA Pro in 2003.[6][7]

Technical specifications

Display technology

The i-glasses utilized dual LCD displays to create a stereoscopic 3D effect. The 1995 models employed two 0.7 inch active-matrix LCDs with a color sequential display system, which displayed red, green, and blue colors in sequence to create full-color images.[8] The displays were semi-transparent, allowing users to see through them in brightly lit environments, enabling augmented reality applications through a hinged, flip-up opaque visor.[9]

Key display specifications included:

- Brightness: 13 foot-lamberts
- Contrast ratio: 25:1
- Focus distance: 13 feet
- Eye relief: 25 mm
- 100% binocular overlap

The virtual display created the effect of viewing a large screen from a distance:

- Original i-glasses: Appeared as an 80-inch screen from 5 feet away[9]
- Later models: Created the impression of viewing a 52-inch screen from 6 feet away[9]

Models and versions

Virtual i-O and later i-O Display Systems released several versions of the i-glasses to target different markets:

Model	Year	Resolution (per eye)	FoV	Weight	Tracking	MSRP
i-glasses! Video	1995	300×200	30°	227g	None	$499[2]
i-glasses! PC	1995	640×480	30°	230g	3-DOF magnetic	$799[10]
i-glasses! PC 3D	1995	640×480	30°	230g	3-DOF magnetic	$799
i-glasses SVGA	1997	800×600	26°	200g	Optional stereo	$1,199 (2-D)[11]
i-glasses SVGA Pro	2003	800×600 (1.44M px)	26°	200g	Frame-seq 3-D	$1,499[7]

Head Tracking

The i-glasses supported optional 3 degrees of freedom (3DOF) magnetic head tracking through a separate device attached with Velcro straps. The tracking system featured:[12]

- Serial port connection to PC (typically COM1)
- 70 degrees pitch and roll capability
- Yaw, pitch, and roll detection
- 30-60 ms latency (governed by COM port polling rate)
- Integration with compatible software for head-controlled navigation

SVGA Model Features

The later i-glasses SVGA model, released by i-O Display Systems, included advanced features:[13]

- Resolution: 800×600 pixels
- Refresh rate: Up to 120 Hz (double the input rate up to 60 Hz)
- On-screen display (OSD) for adjusting:
  - Brightness and contrast
  - Audio balance
  - Horizontal centering
  - Color settings
  - 3D mode selection
- Support for frame sequential stereo with nVidia game drivers
- Line interlace 3D support with compatible hardware

Connectivity and Compatibility

System Requirements

The i-glasses were designed to be compatible with a wide range of systems:[3]

- Personal computers (PC)
- Amiga computers
- Gaming consoles (Sega, Nintendo, Sony, Nintendo 64, PlayStation)
- Television and VCR systems
- DVD players
- Any device with composite video output

Connection Methods

All versions routed video through an external breakout box that looped a VGA feed to a standard monitor while diverting RGB to the headset. The system included:[13]

- **PC Models**: VGA connection with a control box that included:
  - VGA IN port for PC video output
  - VGA OUT port for monitor passthrough
  - SERIAL/HEAD TRACKER port for optional tracking (9-pin serial)
  - 9-volt DC transformer for power (4W)[8]
- **Video Models**: Composite A/V connections (RCA jacks) for universal compatibility
- Stereo RCA inputs for audio
- 3.5mm audio jack pass-through

Software Support

Operating System Compatibility

Virtual i-O secured support from major software companies:

- Microsoft Windows 95 compatibility
- IBM OS/2 support (beta drivers announced but never finalized)
- DOS game compatibility
- Native support from the Amiga development community[3]

Applications and Games

The VGA pass-through allowed head-tracked support in several titles, most notably:[14]

- Descent (with fan patches)
- Doom (via community modifications)
- PC gaming with stereoscopic 3D support
- Virtual reality environments
- Television and video viewing ("virtual big-screen")
- Professional visualization
- Educational software
- Bespoke demos distributed with the SDK

Virtual i-O provided sample code for developers to integrate tracking functionality, available through their website and FTP site in 1995.[8]

Reception and Impact

Market Position

The i-glasses were positioned as an affordable alternative to high-end VR systems of the era. At $395-$799 depending on the model, they were significantly less expensive than professional VR equipment while offering consumer-friendly features like lightweight design and broad compatibility.[5]

Early reviews praised the unit's 227-gram mass, half that of rival Forte VFX-1, and competitive entry price, yet criticized its narrow 30-degree field of view and visible pixels.[15]

Commercial Performance

By late 1996, Virtual i-O reported moving roughly 300 units per month. The headset found an unexpected niche in medical applications, with dentists accounting for a quarter of sales as the glasses were used for patient distraction during procedures. *Wired* magazine noted that 30,000 sets had shipped to dental offices by 1999.[16]

Technical Limitations

Despite their innovative approach, the i-glasses faced several limitations:

- Limited field of view (26-30 degrees)[5]
- Low resolution compared to modern standards
- Maximum input resolution of 640×480 for early models[1]
- Complex cable setup requiring multiple connections
- No positional (six-DOF) tracking capability

Legacy

The i-glasses represented an important step in the commercialization of VR technology. While Virtual i-O ultimately failed as a company, their products demonstrated that consumer VR was technically feasible and could be produced at accessible price points. The semi-transparent display design with flip-up visor pioneered early augmented reality applications, allowing users to overlay digital content on their real-world view.[5]

Although eclipsed by later devices such as the Sony Glasstron and Oculus Rift, i-glasses demonstrated that consumer VR could be produced below $1,000 and influenced subsequent lightweight "video eyewear" designs.[17]

Preservation and Modern Use

Examples of i-glasses headsets are preserved in several technology museums including the Deutsches Museum, and in private collections. The devices remain functional with appropriate video sources, though finding compatible software and replacement parts has become increasingly difficult. The VR enthusiast community continues to document and preserve information about these early consumer VR systems.[1]

Teardown communities and retro-computing enthusiasts have documented modern modifications to keep the hardware operational, including:

- HDMI to VGA converters for modern video sources
- USB-C power modifications
- 3D-printed replacement parts
- Software emulation for DOS-era VR titles[1]

See Also

- List of virtual reality headsets
- History of virtual reality
- Forte VFX1
- VictorMaxx CyberMaxx
- Sony Glasstron
- 1990s in video gaming
- Head-mounted display
- Augmented reality

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