

I N P U T S

Sound source positions & orientations
 Listener positions & orientations
 Acoustic environment characteristics
 Wall reflection & transmission attributes



. O U T P U T

AudioReality

Acoustetron IITM

AudioReality[™] Sound Server

The Acoustetron II is a stand-alone, turn-key sound system offering audio realistic, interactive, three-dimensional sound for real-time graphics workstations.

Applications The Acoustetron II adds AudioReality—the full spectrum of 3D sound, including Doppler shifts, spatialization, and acoustic raytracing of rooms and environments—to high-end graphics workstations, such as the Silicon Graphics line of computers.

In all of today's exciting computer simulation applications, like vehicle and industrial training, video conferencing, location-based entertainment, and architectural walk-throughs, sound plays an absolutely integral part. And the only sound that does justice to these types of applications is AudioReality—sound that completely immerses a listener by simulating reality in as many aspects as possible.



AudioReality creates sounds that originate from exact positions in 3D space and exhibit Doppler shifts as they travel past a listener. Additionally, sounds exist in a custom acoustic environment—such as a room, a cathedral, or even outdoors—where they bounce off surfaces, travel in the atmosphere, or pass through materials. All of these effects are reproduced in real-time by the Acoustetron II.

The System The Acoustetron II is a stand-alone, spatial sound processing system (the audio server) that is controlled from a central simulation computer (the audio client) over a communication line (RS 232 by default). The client sends information such as audio source and listener positions to the server via RS232. The server continually computes source, listener, and surface relations and velocities, and renders up to 16 separate spatialized sound sources accordingly. The audio output can be presented over headphones, nearphones, or speakers.

Sounds can originate from digitized sound samples (wave files), or external live inputs such as CD tracks, or microphones. The sounds are processed at the rate of 44,100 16-bit samples per second (CD quality) for 8 simultaneous sources, or 22,050 16-bit samples per second for 16 sources.

Use of Crystal River Engineering's AudioReality applications programming interface guarantees a stable software interface for your applications, and eliminates costly software changes as hardware configurations evolve. The ANSI C functions allow for

fast, high-level development of 3D sound spaces, and easy integration of AudioReality into existing virtual environments. At an update rate of 44 Hz, sounds are rendered at their exact position and orientation in space, as perceived by the listener and appear to move seamlessly in your virtual environment.

General

- Spatial Mode and Doppler effects:
8 concurrent wave files and spatial sources per system at 44,100 Hz sample rate, 16 concurrent wave files and spatial sources per system at 22,050 Hz sample rate
- 8 Mbyte of wave file playback memory (expandable to 16 Mbyte)
- 320 Mbyte of wave file storage (expandable to 1.5 Gbyte)
- Audio output headphone amplifier
- Compressed 256 coefficient/ear—equivalent HRTF filters (patent pending)
- 486DX2 based host system
- Controllable from any RS232 compatible computer (specific drivers for PC and SGI systems available)

- Supported by several simulation toolkits, such as Coryphaeus' EasyScene,™ Paradigm's Vega,™ Sense8's WTK,™ Division's dVs,™ and Autodesk's CDK.™
- 4 Motorola 56001 DSPs (80 MIPS)
- Update rate: 44 Hz
- Input: 64 x oversampled, 16-bit A/D converters
- Output: 8 x oversampled, interpolating filters
- Stereo crosstalk: 100 Hz-100 dBV, 1 KHz-80 dBV, 10 KHz-60 dBV

Options

- Acoustic raytracing mode:
4 concurrent wave files and spatial sources per system at 44,100 Hz sample rate
- Wave file recording and editing studio software
- High-speed communication protocol
- Quad speaker output
- Development option to control additional input and output devices from 486DX2 host