

CyberFin™

In partnership with the Cancun Convention Center, the AquaThought Foundation is developing CyberFin, an immersive dolphin-encounter simulator that will bring virtual dolphin contact to a massive audience.

CyberFin transports the user's point of perception into an underwater location populated with friendly and inquisitive dolphins. State-of-the-art virtual reality and neurotechnology are employed, making this a most engaging location-based-entertainment (LBE) attraction. The content, dolphin contact, is attractive to men, women, and children of all ages.

A stereo visual/aural recording created with the Underwater Telepuppet drives the various sensory output modalities of the CyberFin platform. This is a non-interactive, "canned" experience in its initial implementation. The platform itself is based on a VibraSonic ACV-8000 total sensory stimulation device. The participant lies on a liquid-crystal-filled mattress designed to distribute stress evenly against the body, closely approximating the feeling of floating in water.

The patented Liquid Crystal Floating Transducer Platform housed in the VibraSonic device "base drives" the participant's entire body with a stereo hydrophone audio signal. A neurophone is employed to com-

pletely simulate the feeling of massive acoustic energy perceived while underwater with a dolphin and its echolocation system. The neurophone transduces the incoming stereo hydrophone audio signal directly onto the participant's nerve pathways. This form of direct sensory input actually reproduces the mechanical skin-to-water coupling which occurs during a dolphin encounter. A CRT-based stereo viewer is lowered into position directly over the participant's eyes to provide high-resolution, 3D visual input. All 3D audio/visual content is synchronized when recorded (within the Underwater Telepuppet) to assure proper playback.

The pre-show introduces you to a talking dolphin, shows dolphins playfully interacting with people of all ages, describes dolphins' remarkable physiology and intelligence, and presents heart-warming stories about the altruistic and loving nature of these beings. Then you lie down on the table and wait while an attendant adjusts the stereo-optic display and attaches the neurophone electrodes.

The bed begins to gently undulate as a 3D underwater scene fills your vision. Suddenly, you hear and feel an intense explosion of sound sweeping around you and through you. As you try to orient

yourself to the direction of this strange and wonderful sound, a dolphin darts past you, giving you a comforting glance with his soulful eye. As the experience continues, you playfully encounter each of six dolphins and join their pod in a high-speed race around a beautiful reef. The five-minute experience ends with a grand and triumphant farewell as the six dolphins form a circle around you then skyrocket out of the water in a synchronized movement.

This virtual experience is truly a roller-coaster ride for the mind. The application of VibraSonic and neurophone technology delivers unsurpassed sensory realism. The objective is to immerse participants in the wonder, joy, and excitement of actually meeting a dolphin, so that they will leave the attraction with a greater understanding of our intelligent neighbors and an awakened interest in making contact with them.

Cancun Convention Center

The Cancun Convention Center, site of a new \$100 million immersive media and virtual reality attraction, has announced a cooperative agreement with the AquaThought Foundation to incorporate dolphin-human interaction at its new facility. The agreement will merge the latest in immersive virtual reality technology with the adventure of close contact with dolphins.

Scheduled to open in late 1994, the development includes a 7,000-person convention center; a fully immersive multi-sensorial center; a 54-store shopping mall with intelligent kiosks that inform, attract, and direct shoppers; an Iwerks 3D cinema with an interactive laser imaging system; a 600-foot-tall panoramic tower; and ShowScan simulated rides produced by George Lucas. The main attraction, according to Servando Braun, the project

director, is the multi-sensorial center with its virtual reality environments. The biggest challenge, according to Braun, was to find content which offered more than mindless violence. "An intense sensory experience does not dictate that higher-level intellectual functions be switched off," says Braun. "What we want for the Cancun Convention Center, in contrast to current VR amusement, is content which is both exciting and meaningful."

Meaningful content is exactly what the AquaThought Foundation has brought to the

facility. "Dolphin contact is one of the most intense experiences one can have. To swim with these intelligent beings is pure joy," says David Cole, Chairman of the AquaThought Foundation. AquaThought has demonstrated, through electroencephalographic studies, that close interaction with dolphins significantly changes the neurological state of the participant. In a field of alternative medicine – only now being taken seriously by the medical community – dolphin interaction therapy has been used for over twenty years to treat severe depression, cancer, Downs Syndrome, autism,

and other disorders. The new relationship with the Cancun Convention Center accomplishes one of AquaThought's long-term goals: to develop technology that allows unlimited numbers of participants to have the intense and potentially healing experience of swimming with a dolphin, without adversely affecting any dolphins.

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Emergent Technologies from Dolphin-Human Interaction



• Background

Foundation History, Human-Dolphin Interaction Research



• CyberFin

Virtual Reality Dolphin Encounter



• MindSet

Enabling Neuroscience Research

MindSet: Neurological Man/Machine Interfacing, An Emergent Technology From Human-Dolphin Interaction Research

The AquaThought Foundation's research in neurological imaging has led to the development of MindSet, a low-cost neuro-mapping electroencephalograph that makes advanced EEG research accessible. Designed for research and clinical use, MindSet incorporates the latest EEG signal analysis processes and a complete suite of standard neurological

protocols. It accommodates the novice user as well, with an easy-to-use interface and a hyperlinked neurological anatomy database.

Advanced features of the MindSet system include real-time 2D and 3D topographic visualization, neurometric analysis, routine EEG study, phase coherence analysis, compressed spectral array visualization, inter-electrode interpolation, a hyperlinked neurological anatomy database, MIDlbot™ feedback, neural network feature extraction, a light and sound machine interface, and a visual

programming interface for user-defined analysis (neurohacking). The MIDlbot™ tool allows MindSet users to generate MIDI commands from temporal, spectral, and spatial information within the EEG data.

As an educational resource, MindSet offers the user hyperlinked neurological anatomy information that can be accessed by clicking on a topographic montage. Potential applications for MindSet include clinical neurology, conventional and obscure brain/mind research, man/machine interface research, biofeedback, and discrete biological pattern recognition research.

The Exhibit

MindSet's primary focus in the this exhibit is man/machine neural interfacing. Using the neural-event and gesture-recognition functions, in combination with the MIDlbot™ interface, users can control a MIDI synthesizer and laser light show. Users also learn

to recognize the appearance of various neurological events as they are visualized on the topographic display. EEG data are collected throughout the exhibit and compiled into a QuickTime/AVI movie entitled, "Minds on The Edge" or a before-and-after topographic still compilation entitled, "This is your brain... This is your brain on SIGGRAPH." Also on display: several research projects that have been made possible by MindSet, including AquaThought's own human-dolphin interaction research. Attendees can examine how neuroscience is converging with visual and musical art, consciousness research, and virtual reality.

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