

review

Arch-OS, software for buildings
by Gregory Little

new media/architecture

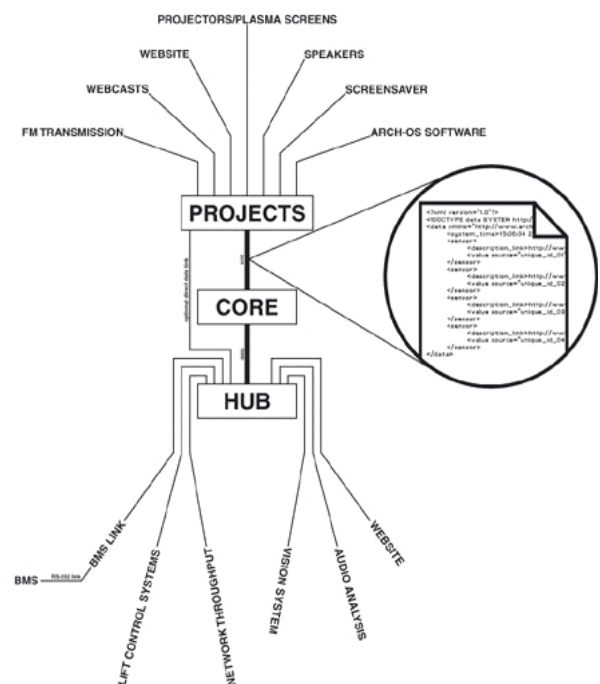
The entire electromagnetic spectrum is approximately 300,000,000,000,000,000,000,000,000,000,000 times larger than the human visible spectrum. [1] *Arch-OS: Software for Buildings* is an operating system for architecture that employs a wide range of embedded hardware and software technologies to gather audio, visual, and raw data from numerous sources to bring a small but significant slice of the imperceptible into our spectral range. Developed by i-DAT (The Institute for Digital Art and Technology) at the University of Plymouth in the UK, *Arch-OS* is incorporated into the fabric of the University of Plymouth's Portland Square building. Portland Square houses some of the University of Plymouth's most interesting research, with a wide range of research initiatives in biomedicine, neural-science, robotics, digital communications, interactive systems, and emergent media. *Arch-OS* captures data through the Building Energy Management System [BEMS], which monitors energy usage and environmental control through the integration of over 2000 sensors. *Arch-OS* also gathers data from the computer and communications networks, the flow of people, ambient noise levels, and environmental conditions.

During his presentation at ciber@rts Bilbao in April of 2004, Mike Phillips, Director of I-DAT, revealed a number of *Arch-OS* visualizations at work. Many of these examples are available at the i-DAT website, <http://www.arch-os.com/>. Phillips asserted that *Arch-OS* has been developed to "manifest the life of a building and provide artists, engineers and scientists with a unique environment for developing transdisciplinary work and new public art." [2] *Arch-OS* has indeed spawned an on-going cadre of research by musicians, composers, digital artists, and trans-media collaborators. For example, Eduardo Reck Miranda's digital audio composition, *PSQ Symphony #1*, was performed for the opening of Portland Square on 15 July, 2003. This generative sonic work feeds off real-time data from the *Arch-OS* Core to re-synthesize and model vocalizations sampled from a variety of monkeys, resulting in a variety of hybrid voices and drum-and-bass-like rhythmic sequences. Considering *PSQ Symphony #1* from a cybernetic point of view, it is interesting how data from the Core output is used to model this symphony, and that this mediation (the symphony) -- when amplified into the Portland Square interior -- becomes part of the updated Core input, initiating a recursive, self-generative feedback loop.

PSQ Symphony #1 is available for download at <http://www.arch-os.com/media/psq1.html>.

The *Arch-OS* website provides links to a number of projects in nascent stages of development; among the ones most interesting to me is the *Water/data-fall* project, where [BEMS] data from the *Arch-OS* Core -- mapping real-time water usage within the building -- is used to control the density of a projected waterfall in the Atrium. Over time, occupants of the building "learn to interpret the data flow, and this knowledge begins to influence their collective behavior to reduce water consumption." [3] During a conversation with Phillips on November 11, 2004, I learned that some funding for the *Water/data-fall* project has been secured, and that the project will be happening soon. Current projects include *Lab Culture*, an artist residency involving ten artists; Lucy Kimball's *Making a Difference* (<http://www.i-dat.org/projects/makingdifference/>); and Mike Phillip's own recent implementation linking the Portland Square site with the China Electronic Music Center, the Central Conservatory of Music, and the Department of Digital Art and Design at Peking University.

Arch-OS is clearly located within a trajectory of socially responsive architectures that includes *Archigram*, *Potteries Thinkbelt (PtB)*, and the *Fun Palace*. These visionary, post-war proposals marked "a shift from a





Works cited:

[1] Howard C. Hughes, *Sensory Exotica, A World Beyond Human Experience* (MIT Press: Cambridge and London, 2001), p. 7
[2] Mike Phillips, "Soft Buildings" in *Technoetic Arts* 2:2, (Intellect Press: Bristol, 2004), p. 98
[3] *Water/data-fall, Research and Development Projects*, <http://www.arch-os.com/projects/waterfall.html>. Accessed January 3, 2005
[4] Stanley Mathews, *Cedric Price and the architecture of 'calculated uncertainty': The Fun Palace and Potteries Thinkbelt*, Doctoral Dissertation, New York: Columbia University, 2001.
[5] E-mail correspondence between reviewer and Mike Phillips, 11/11/2004
[6] Peter Anders, "The Cybrid Condition, Implementing Hybrids of Electronic and Physical Space," in: Roy Ascott, ed., *Reframing Consciousness* (Intellect Press: Bristol, 1999), p. 237

determined and mechanical architectural paradigm to the fluid and indeterminate model of the information age" [4], defining a trajectory that *Arch-OS* builds upon and extends into the future. As Cedric Price's *PtB* proposed to utilize the vast railway networks of the North Staffordshires, the networked *Arch-OS* virtualizes, concretizes, and extends the agendas of *Archigram*, *Fun Palace*, and *Potteries Thinkbelt* through a proactive advance into a second-order social cybernetic model. According to Phillips, the intention is to re-engineer or re-program a buildings' inhabitants through the system. One could see it as part of a techno-ecological agenda which, through the integration of intelligent and responsive systems, engenders intelligent users. [5]

Arch-OS creates an architecture of becoming, responsive to social forces and conditions, a "cybrid" system, where "...physical and virtual domains become interdependent: actions in the material and virtual spaces mutually affect one another." [6]

Arch-OS is an extremely significant development in architecture, urban planning, and art. Through making the invisible elements of lived architecture tangible, Phillips and the members of the Institute of Digital Art and Technology have created a unique and dynamic interface for research, for collaborative, educational, and cultural interventions, as well as a truly humanitarian work environment.

