

## Sky Ear: concepts and final design

Sky ear flew once and it's going to fly again!

The maiden flight was in early July 2004 in Fribourg Switzerland; it flew as part of the Belluard Bollwerk International.

After three years of dreaming and planning and one year of full-time design, construction and preparation, finally the work was done, the test-flights over and the weather cleared for us. Sky Ear broke free from the confines of gravity and drifted like a glowing jellyfish above us....

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The story begins in my studio in Japan several years ago. I was wandering around trying to find good reception on my radio. I realised that this was similar to the way I wandered around trying to find good signal on my mobile phone. I started to imagine the undulating qualities of an invisible topography that surrounded me: the varying electromagnetic fields (EMF) that are present everywhere and that guided me to certain parts of the room.

I realised that these intangible phenomena affect the way we related to space and to each other in much the same way that traditional architectural elements do -- they make us move to certain parts of a building, they condition the movements we make and how we make them and, through devices like mobile phones, they have a direct impact on the way we associate with other people. Apart from issues arising out of being in contact virtually anywhere, anytime, the mobile technologies through which we conduct our daily lives have made us far more aware of the electromagnetic environment that envelops us.

We are concerned about the health effects of electromagnetic radiation (from power lines or mobile phone handsets) and this has further spatial implications. Yet these waves often exist as natural phenomena in the form of radio waves emanating from distant stars, gamma rays coming from elements here on earth or even electrical waves from inside our own skulls. Humans have only recently begun contributing to the cacophony with their pagers, medical devices, televisions broadcasts and mobile phones.

This is an abundant, invisible territory, that is altered in shape and intensity by both natural and human-constructed landscapes. Interactions with built fabric are even more clear with the implementation of wireless computer networks, for example the 802.11 standard that is increasingly being used in homes and offices to create local area networks. In such networks the positions of furniture, the thickness and material qualities of walls, doors and windows or the distance from a base station contribute to the varying quality of a network connection, and therefore feedback on the way we use such spaces. These variations in field strength suggest a richly textured ethereal cartography of space that affects us but which we only know about through use of our instruments.

With Sky Ear, I wanted to give form to this space, to make visible the invisible. The original concept was to create a "radar sweep" that would move through space and light up as it encountered varying intensities of EMF. I planned to create a large structure, of about 25m in diameter, that would float up into the sky sampling the electromagnetic environment as it moved, and changing colours as it encountered different qualities of space. I realised that by embedding mobile phones inside the cloud and then calling into them, one could actually change the local EMF to create different patterns of response.

The final design was a carbon fibre frame consisting of 37 circles joined to form a non-rigid structure to which 1000 extra-large helium balloons are attached. The balloons function both as buoyancy/flotation devices and as diffusers for the 6 ultra-bright LED (which mix to make millions of colours) controlled by individual sensors inside each balloon. The balloons can communicate with each other via infra-red; this allows them to send signals to create larger patterns across the entire Sky Ear cloud.

As visitors call into the different mobile phones in the cloud, they listen to the distant electromagnetic sounds of the sky (called whistlers and spherics, which are the audible equivalent of the Aurora Borealis). Their mobile phone calls change the local electromagnetic topography and cause disturbances in the EMF inside the cloud that alters the glow intensity and colour of that part of the balloon cloud. Feedback within the sensor network creates ripples of light reminiscent of rumbling thunder and flashes of lightning.

The cloud shows both how a natural invisible electromagnetism pervades our environment and also how our mobile phone calls and text messages delicately affect the new and existing electromagnetic fields. As an art project, Sky Ear encourages people to become creative participants in an electromagnetic performance; as an architecture project, Sky Ear makes visible our daily interactions with the invisible topographies of hertzian space.

Sky Ear will be open to the public at 7pm on September 15, 2004 at The National Maritime Museum, Greenwich Park, London and is financially assisted by the Daniel Langlois Foundation for Art, Science and Technology. More information about the project is available here: <http://www.haque.co.uk/skyear/>