Hertzian Tales and Sublime Gadgets

The [Manufacture d'Armes de Saint-Etienne] catalogue itself, however—its actual existence—is rich in meaning: its exhaustive nomenclatural aims have the resounding cultural implication that access to objects may be obtained only via the pages of a catalogue which may be leafed through "for the pleasure of it," as one might a great manual, a book of tales, a menu.
—J. BAUDRILLARD, *THE SYSTEM OF OBJECTS*

This chapter includes a commentary on five conceptual design proposals for post-optimal electronic objects: Electroclimates, When Objects Dream . . . , Thief of Affections, Tuneable Cities, and Faraday Chair.

Each proposal is a material tale, a process of investigation. They are "value-fictions": they try to maintain a degree of technological realism while exploring values different from those current. Their subject is the role of electronic objects in the aesthetic inhabitation of a rapidly dematerializing, ubiquitous, and intelligent environment. They explore ways of presenting conceptual designs as investigations and processes rather than as finite things in themselves. Each proposal is a radio, an interface between the electromagnetic environment of hertzian space and people. Each explores different forms of realism: technical, functional, social, and psychological.

The proposals are not intended for mass production or even prototyping, but for mass consumption through publication and exhibition. They ask questions rather than provide answers and should stimulate discussion in the way a film or novel might. Each focuses on different design issues. "Thief of Affections"

explores designing role models and psychosocial narratives. From "Electroclimates" emerges ideas for genotypes, pseudo-interviews, and poetic products. "When Objects Dream . . ." offers alternative conceptions of the smart object as dreamy object, and new tools like the gaussmeter for mapping hertzian space. "Tuneable Cities" explores overlapping electromagnetic and urban spaces using a car and scanner to experience a city. Architectural models emphasize radio as environment rather than medium, and video stresses the design of experience rather than that of objects. "Faraday Chair" investigates a conceptual approach to the aesthetics of hertzian space and the object.

Electroclimates: Abstract Radio

This proposal developed from my desire to create a post-optimal object that answered aesthetic needs within a context of everyday life. It would be an aid for poetically inhabiting the electrosphere, a contemplative object revealing the hertzian nature of our environment.

I began the investigation with the realization that hertzian space is not isotropic but has its own electromagnetic "climate" that is related to an electro-geography defined by wavelength, frequency, and field strength, and it interacts with urban and natural environments as discussed in chapter 6.

To make visible minute atmospheric changes, antique meteorological devices such as barometers, hygrometers, and thermometers often use unusual means that reveal the sensuous materiality of space. For example, to indicate humidity, some hygrometers exploit the expansion of hair and skin when moisture is absorbed, and the transparent design of early barometers shows they measure the "weight of the sky." My object would be an electronic relative of the early radio detectors which also employed ingenious means of indicating the presence of radio waves (figure 7.1).

My original proposal was a radio that converted electroclimatic changes into abstract sounds using a wideband radio scanner. It would allow one to notice patterns and become familiar with the flow of activity within a particular area. On another level, Electroclimates is a response to the communications that invade domestic spaces. When a scanner is used in the privacy of the home to listen in on a telephone conversation outside it, the user is seen as the invader but, seen from another viewpoint, the radio signals from cellular telephones are invading the home. Electroclimates uses an aesthetic language to gently draw attention to this new and problematic interface between private and public space.
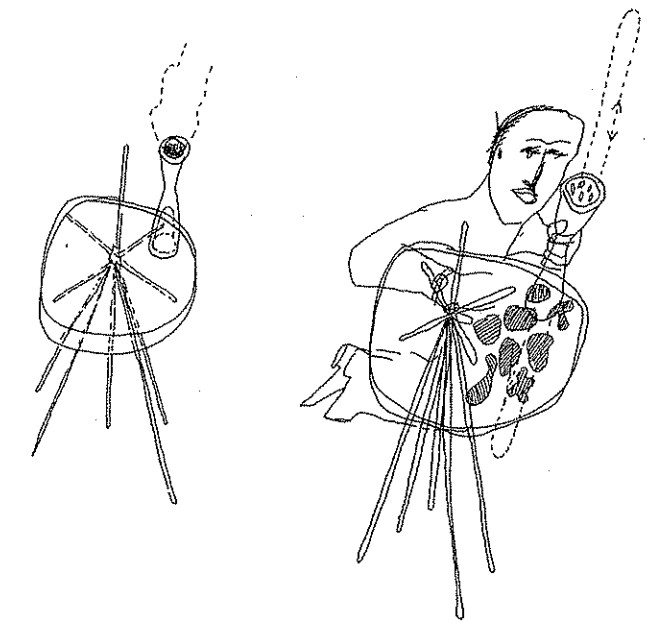

Figure 7.1 Concept sketch.

An opportunity to use LCD screens arose. The first reaction was hesitancy. Screens are like "supermatter": once switched on, all attention turns to them, and their material qualities are demoted to the status of package or container as the viewer searches for the real content, information. Unlike sound, which can be nondirectional, screens tend to give a space a specific orientation.

To explore subtle and evocative uses for the monitor as a material, I found a way to use a screen to communicate gently and impressionistically, by experimenting with different plastics. When thin sheets of sanded fluorescent polycarbonate are held close to the screen they interact with its light to produce a hazy effect. I made a simple animation that slowly changed color and gently pulsated.

I then explored the physical nature of Electroclimates through rough sketches and scale models. By arranging the screen horizontally, I could view it from any direction, overcoming the dominance screens have on the layout of rooms. The two main areas of investigation were into Electroclimates as a piece of furniture such as a small table or a ceiling fixture, and a portable device.

I decided not to simulate industrial production but make a handmade geno-type, an object designed to communicate the essence of the idea that could later be developed for mass or batch production if the occasion arose. The entire object would be made from one material so that the screen appeared to dissolve into it.

As I experimented with the scanner and considered how Electroclimates would be used, one time of day became particularly interesting: late at night, as callers sleepily said good night to each other from their beds. This led to the idea of interacting with a product at the moment when boundaries between reality and dreams begin to merge. Electroclimates became a "pillow."

Electroclimates responds to local changes in the radio frequency environment by switching itself on when it detects signals stronger than the general background. It turns electrical space invasions of the home into flickering patterns of light and distorted sounds, when a head is placed on the pillow the distortion clears revealing what is actually being received (e.g., telephone conversation, fax transmissions, or garage door openers). Through a slow, gentle interaction, the owner would gradually learn to read his or her electromagnetic environment through the object's responses.

The final design consisted of an LCD screen encapsulated within a fluorescent polycarbonate box that is suspended in a clear PVC inflatable pillow (figure 7.2) and connected by a lead to a wideband discone aerial. Discone aerials
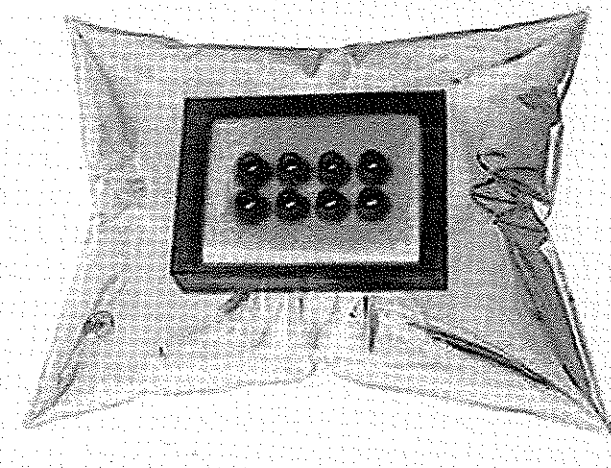

Figure 7.2 Final design for Electroclimates.

are usually located outside the home; this one is indoors to emphasise that radiowaves are penetrating domestic space.

The semi-working object was shown in the Monitor as Material exhibition at the Royal College of Art, which while demonstrating the potential of LCD screens, also provided an opportunity to test public receptivity to the idea of electronic products for answering poetic needs. When fully explained to visitors, Electroclimates elicited an enthusiastic response. Without an explanation, however, most people saw it only as an exhibition piece rather than a potential product.

As a result of feedback from exhibiting Electroclimates, I made a pseudo-documentary video in collaboration with Dan Sellars and Fiona Raby. An elderly woman in her home describes how she thought she would live with an object like Electroclimates, how she came by it, when she used it, and what she used it for. We explored where she would keep it, how often she would use it, and how her friends and neighbors might react (figures 7.3–7.6).

The intention was to steer between a number of established approaches: user-testing requires that the object works fully; product clinics test consumer reactions to a product based on how things are now, as are Design Age sessions with the University of the Third Age; "Informance" aims to persuade an audience
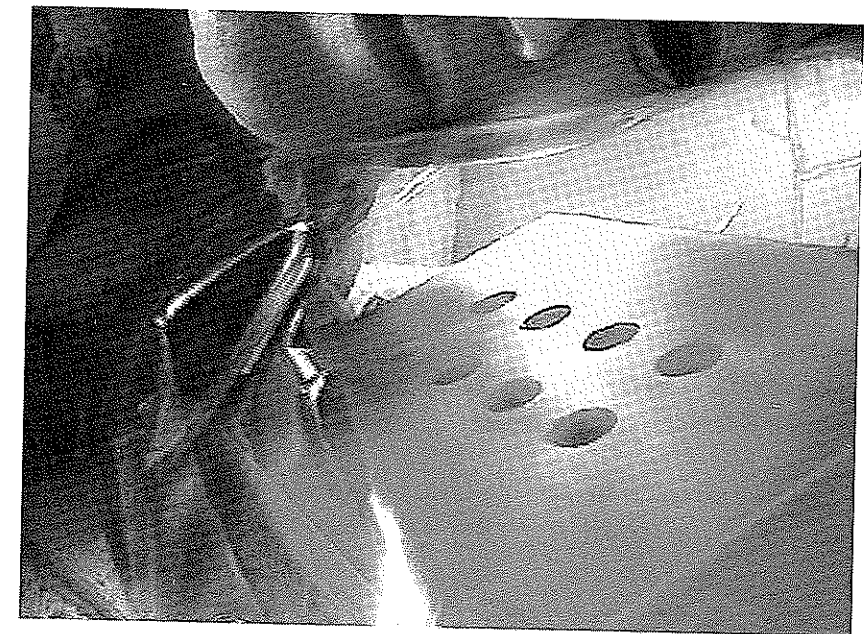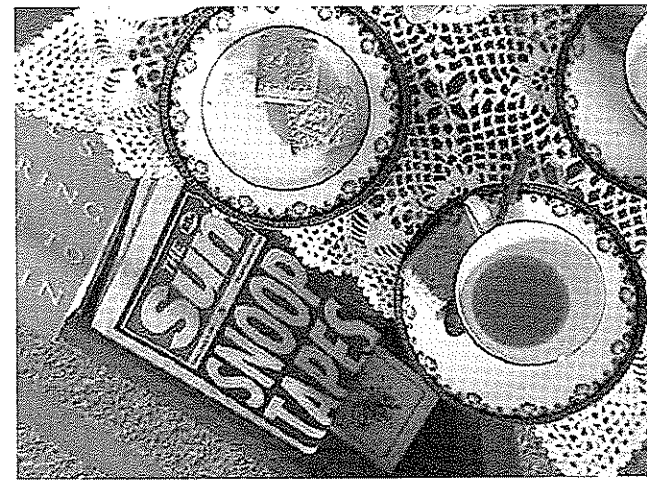

Figure 7.3 Still from *Pillow Talk* video.

Figures 7.4–7.5   Stills from *Pillow Talk* video.

Figure 7.6   Still from *Pillow Talk* video.

that a product fits in and has a place. But here the aim was not to convince an audience of a need, but to draw them into a "what if . . ." scenario, a "value-fiction" to stimulate a desire for change. The interviewee is a knowing participant in a fiction.

In some ways, Electroclimates "fails": it is too seductive to be a "critical design" in that the values it embodies are not strange enough.

When Objects Dream . . .

Most people are aware that products like desktop computers, faxes and televisions emit low level electromagnetic (EM) radiation, but it is still unclear if it is harmful. This proposal started as an object for electromagnetic spaces generated by electronic products.

It developed simultaneously along three different paths: ways of sensing and indicating the presence of fields, uses for registering the presence of fields, and the physical nature of the object itself.

My first idea was for small containers that avoided electromagnetic fields. They would be kept on a desktop and move away from the fields they detected. Another

idea was to incorporate compasses into a tabletop so that fields from devices placed on it would become visible through the deflecting needles. But compasses are not sensitive enough to be influenced by radiation emitted by computers. Both ideas were for "enchanted" objects that would mysteriously come alive.

I looked at equipment for measuring VLF (very low frequency) and ELF (extremely low frequency) emissions from products, but these were beyond the budget of this project. So I used a gaussmeter a device for measuring the magnetic component of electromagnetic fields to measure and draw fields produced first by televisions and later by a computer, answerphone, printer, and fax machine arranged on a table (figure 7.7). The gaussmeter revealed an alternative vision of electronic objects as fields, which led to the idea of "dreamy objects" (see chapter 6). It was chosen as the technical basis of the project.

I explored more design ideas: adhesive nipples that vibrated when they sensed fields, warning the wearer to move back, seat backs with vibrating nodules that indicated radiation was passing through the sitter, and parasitical lights that only worked if positioned in fields emitted by domestic products.

Most of these ideas appeared either too whimsical or, in the case of the lights, too feasible. I returned to the idea of the electronic product as a dreamy object and decided to develop an "object for seeing the dreams of consumer products." (From this point on, When Objects Dream . . . was developed simultaneously with Electroclimates as part of the Monitor as Material exhibition.)

A "glove" was considered first, as though the wearer were caressing the invisible skin of the electronic product, locating its true limit. But this seemed too intimate: there should be more distance between the person and the dreams of products. I decided the device should only work when placed "at arms length" into the leaky field of an electronic object, a space we can never sense.

The frequency, wavelength, and intensity of the victim object's "dreams" influenced the color fields and sounds emitted by an LCD screen encased in fluorescent polycarbonate (figure 7.8). The final object was not made to look like an injection molding but to appear abstract and brutal. The part of the object touched by a person was made from a square block of wood, emphasising that the human qualities are not in the form but in what the device does. Two headphone sockets allowed the sounds to be shared.

Like Electroclimates, When Objects Dream . . . is a semi-working genotype designed for the Monitor as Material exhibition. Its screen shows a video of a computer animation. Ideally it would be presented juxtaposed with a consumer product like a television.
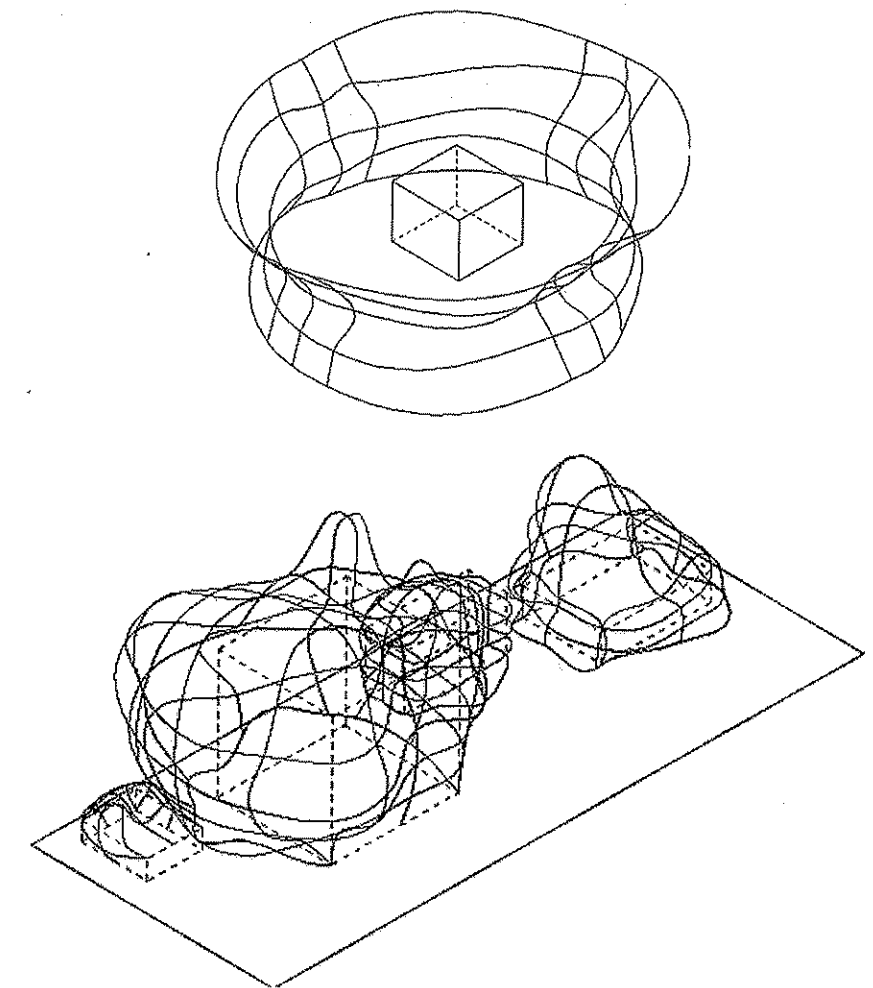

Figure 7.7 Drawings of fields from a televison and other domestic objects.
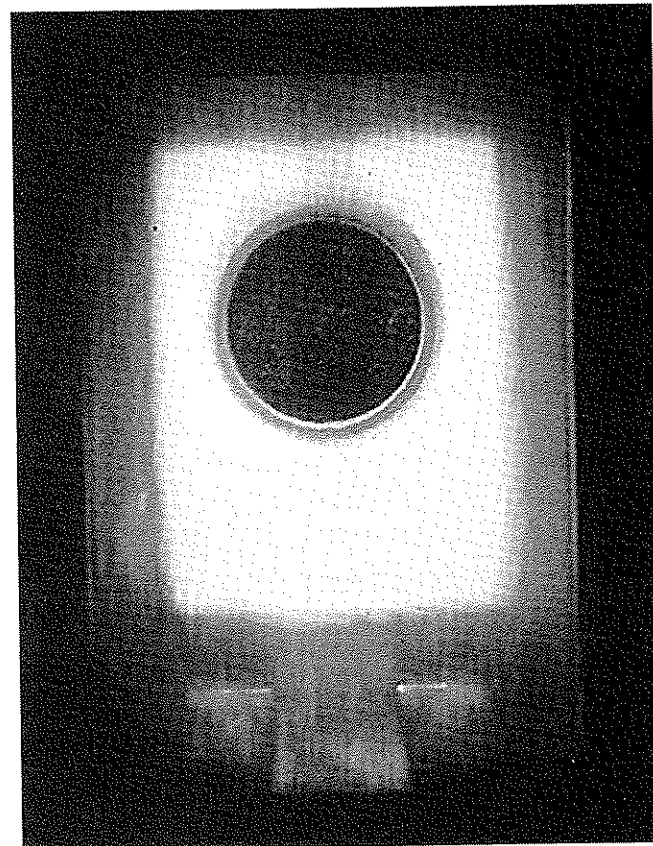
Figure 7.8 LCD screen encapsulated in fluorescent polycarbonate.

Thief of Affections

This proposal is based on the realization, discussed in chapter 4, that electronic products are "role models" and that when we use them we become the generic user they are modeled on.

Thief of Affections started with my desire to design an object that embodied an alternative model of a user, a "perverse" role model. This project is grounded in perversity: not sexual perversion but the desire to rebel, to deny the system the satisfaction of total conformism. Its use would place the user, now a protagonist, into a new relationship with the familiar, providing a new narrative dimension to everyday life.
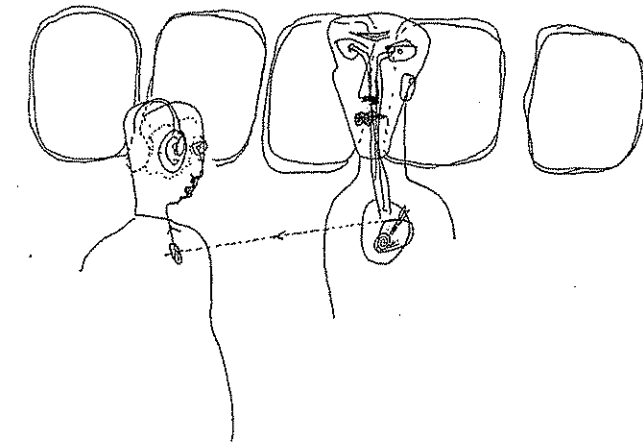

Figure 7.9 Concept sketch.

The approach was similar to those architectural projects described as "a house for . . ." where a specific psychological model generates an unusual set of functional requirements. In this case the proposal was to be a walkman for an "otaku," a term used in Japan to describe an obsessive person, usually male, slightly perverse and socially dysfunctional. The design of the personality became part of the product.

My misreading of "Doppler Danse: Some Novel Applications of Radar" by Steve Mann (1992) led to the idea of using radar to caress the internal organs of unsuspecting strangers: the otaku, perversely attempting to experience intimacy by technologically groping the victim's heart (figure 7.9), would become a thief of affections. The caress would be converted into vaguely erotic sounds.

The project began to follow two lines of investigation: a technological investigation of the "caress" and how "affection" could be stolen, and an exploration of the physical nature of the "walkman."

At first I mistakenly assumed that different frequencies of radar penetrate the body to different depths rather than reflecting off its surface. I considered ultrasonic scanners, which do penetrate the body to different degrees, but they require the transducer to be placed in contact with a gel spread on the skin. When I discovered that the body gives off a very weak electromagnetic field, the idea of the thief stealing very weak radio emissions from the body appeared feasible. But these signals are so weak that highly specialized and bulky equipment

would have to be used, and at very close range. And the technology had to be believable if the proposal was to be a "value-fiction" not a "science fiction."

I then considered the physical nature of the device. It could easily become a black box, an alternative walkman, or be incorporated into existing objects like clothing or the body (as an electronic tattoo for instance). Although it could be argued that the experience produced by the electronic technology alone is the product, I felt that the nature of the object itself was as important. The juxtaposition of experience and object counted in the sense discussed in chapter 1.

To generate the object I looked again at the character of the thief. Being "perverse," the thief would resist the trend towards miniaturization and absorption of electronics into existing objects or the body. Hypersensitive to technology penetrating his own body, he would favor glasses over contact lenses, baggage and walking sticks over pockets. The final object would be separate from the body, like a walking stick. The physical configuration of the object was then explored through sketches.

Considering how close technology can come to the body before it becomes invasive led to the pacemaker, the ultimate technological invasion of the body, which transmits weak radio signals. The thief would steal the radiation given off by the artificial heartbeat of a radio heart, becoming the "Thief of (Radio) Affections," placing himself in a new form of intimacy with his unsuspecting victims (figure 7.10).

The weak radio signals emitted by the pacemaker could be picked up by a test-probe of the kind normally used to measure stray electromagnetic emissions from domestic appliances. Although relatively expensive they could form a technical basis for the device. Essentially it would be a radio tuned to a very narrow part of the electromagnetic spectrum.

I then started exploring the physical design through scale models. I decided it should be audacious. The thief would display the fact he was engaged in some unconventional activity, but simultaneously provide himself with a conspicuously voyeuristic mask. The object became more decadent, like a riding crop. Originally conceived as being made from neutral materials it was now to be made of leather, referring to both its status as luggage and skin. The thief would be conservative, so brown leather was chosen.

While developing the device's physical aspects, I was torn between making it a utilitarian tool, a prop for a specific narrative, or an abstract design object. The tool was rejected on the grounds that the contrast with its non-utilitarian function would be two obvious. The first leather version worked well as a film

Figure 7.10 Object of desire: pacemaker.

prop, but less well as an object in its own right, the object's slightly antique appearance, meant it could be mistaken for a curious antique object, and its poor workmanship made it look too flimsy to be convincing. A second version was designed to explore the expressive possibilities of highly synthetic materials such as upholstered technical fabrics creating a less familiar image for the device. This version was an abstraction of the earlier version and it was covered in thin foam and flesh coloured fabric suggestive of prosthetic limbs and sex toys. The abstract form restrains the overt imagery of the fabric. It yields few clues about its function, other than it is easily wiped clean. Two straps and a plastic ear-nipple offer more suggestions.

Thief of Affections would be presented in a "shoe box," marked with the size of the object (S, M, L, or XL). And the device itself would be designed to last for as long as possible and would not be adjustable. The weak signals picked up by the device would be converted into sounds played through an "ear-nipple" of "prosthetic beige" plastic. The sounds, developed by Jayne Roderick, would range from vaguely masculine to vaguely feminine depending on preference.
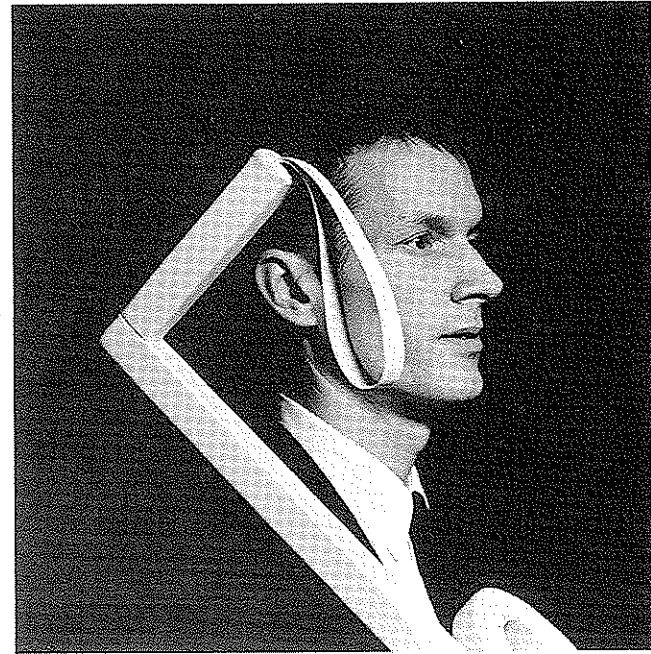
Figure 7.11 (see opposite)

The object would be carried, swinging by the side, and would be hoisted to the shoulder for use. The change in position would cause a tilt switch to activate an automatic scan of a range of pacemaker frequencies, locking onto any close signal. Interaction with the object is minimal. Interaction through the object with unsuspecting victims is more important. The device could also be rented for short periods to provide new experiences.

From the start the object was viewed as neither a conventional nonworking mock-up nor a fully working prototype, but as a prop for a series of photographs inspired by a mixture of anthropological and medical photography. I worked with photographer Lubna Hammoud developing a series of scenarios that focus on the psychology of the owner as well as the object, emphasizing the psychosocial narrative possibilities of an electronic object as a role model (figures 7.11–7.12).

The strangeness of the behavioral model embodied in this proposal draws attention to the fact that all electronic products embody models about behaviour and it questions just how distinct our own identity is from those embodied in the electronic objects we use.

Figures 7.11–7.12 Preliminary studies for a portrait of the Thief of Affections.

Tuneable Cities

Tuneable Cities investigates overlapping electromagnetic, urban (and natural) environments. It uses the car as a found environment/object, the product designer's entry point into urbanism. With its built-in radio, telephone, navigator, and even television, the car is already an interface between hertzian and physical space.

The proposal began during a drive across Ireland. While the changing landscape is visible, the car isolates its occupants from corresponding cultural changes and the changing radioscape. The car radio reinforces this by automatically retuning to a station selected at the start of the journey. But if the radio instead tunes automatically to local stations, changes in the landscape would be
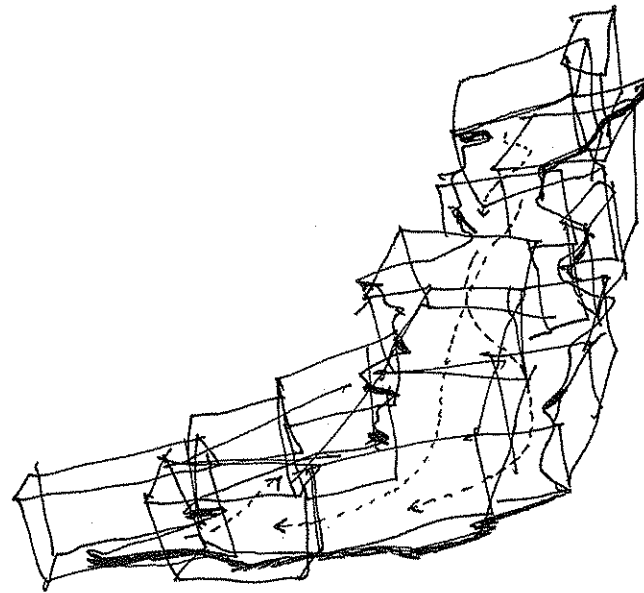
Figure 7.13 Sketch of local radio blocks.

matched by changes in culture, interest, and dialect revealing the vernacular qualities of hertzian space. The car would link its occupants to the environment rather than isolating them from it (figure 7.13).

This proposal was connected with an earlier unsubmitted idea for a competition to design a monument for Shepherd's Bush Green roundabout in London. My proposal was an abstract radio sculpture that would produce a radio environment designed to penetrate passing cars. Other transmitters could be located around London, so that when the car radio is tuned to a "public utility" frequency, the car environment becomes a mobile capsule of abstract sound as it moves through the city.

The next stage, in collaboration with Fiona Raby, used a car, wideband radio scanner, scanner directory, and street map to search for interesting overlaps between electromagnetic and urban environments in London. The scanner read interstitial urban radio spaces. British Telecom's research laboratories provided computer models of interactions between cellular phone signals and urban environments that encouraged us to think of these radio spaces as environments.

The scanner was programmed to search for illegal bugging devices as we drove around Park Lane, Gray's Inn, Fleet Street, and Mayfair. It registered pos-

sible bugs by momentarily "clicking" on known frequencies that were then marked on a map. We found our first definite bug in Mayfair. By parking close to two edges of a building, we picked up a bugged conversation that we registered on the map.

We then programmed the scanner to receive transmissions from babycoms (baby monitoring intercoms) and drove to suburban Chiswick, a district favored by new families, and were surprised at the extent babycoms were transmitting domestic sounds into the street. We marked our findings on a map and found that on some streets almost half the houses transmitted domestic soundscapes.

We video-recorded some of the areas we had explored, digitised the tapes, and produced short video clips visualizing the radio events as environments and experiences. This stage experimented with different languages of representation. The videos aimed to convey a sense that radio is not only a medium, but is environmental: it can be occupied, extending conventional architectural spaces to blur boundaries between private and public.

Alternative sources of radio were explored. Two further possibilities emerged: mobile fields of abstract sound produced by radio-tagged birds, and natural radio produced by atmospheric events. For *Radio Birds* (figure 7.14), birds (possibly
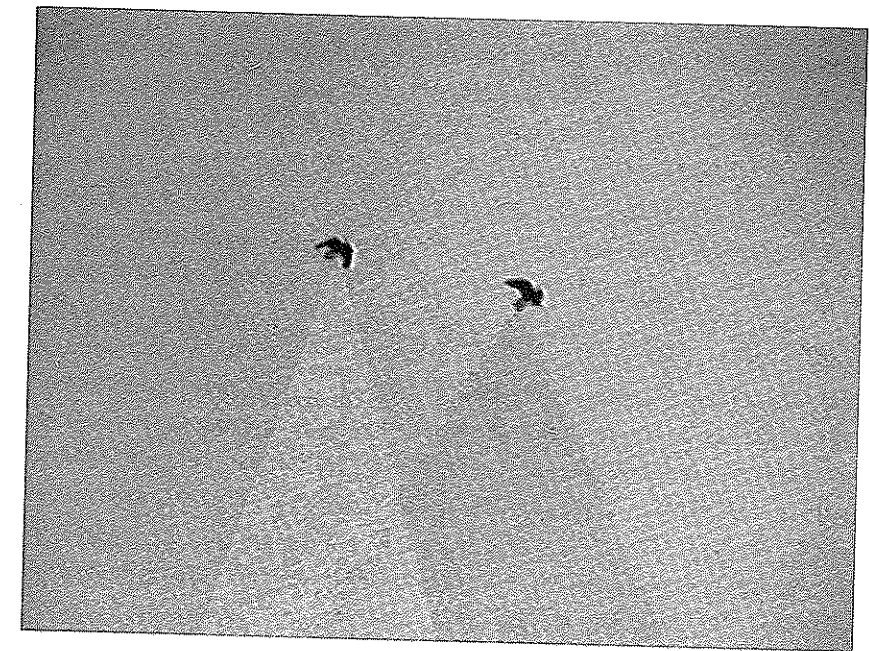

Figure 7.14 Video still from *Radio Birds* video.

already tagged by scientists) would become radios generating seasonal fields of abstract sound as they migrate. They would either transmit directly to the car or reflect signals transmitted to them from arrays of antennas positioned at ground level or on buildings, which would in turn be transmitted to the car. Alternately, arrays of antennas, functioning as perches, would amplify and transmit the signals to passing cars (figure 7.15).

Public Utility would consist of zones of speed-trap radar. When cars entered these zones their presence would affect the signal they were receiving so that the sound environment of the cars would be directly affected by the cars using the roundabout.

We then used the language generated by the earlier video experiments to present a development of *Public Utility* and *Radio Birds*. We chose two more London sites: Waterloo for *Public Utility* and Trafalgar for *Radio Birds*. Three-dimensional architectural models using synthetic materials and silk-screened
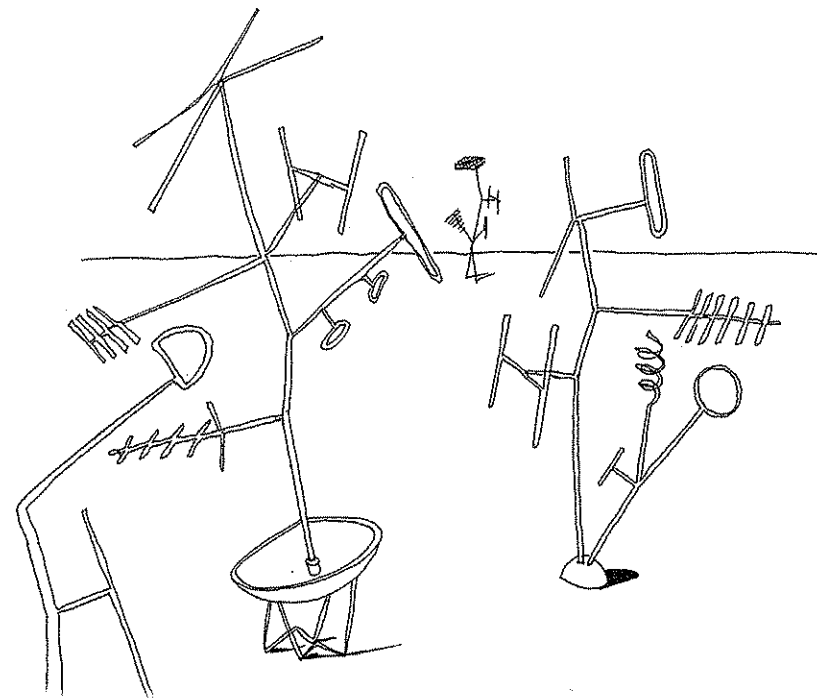

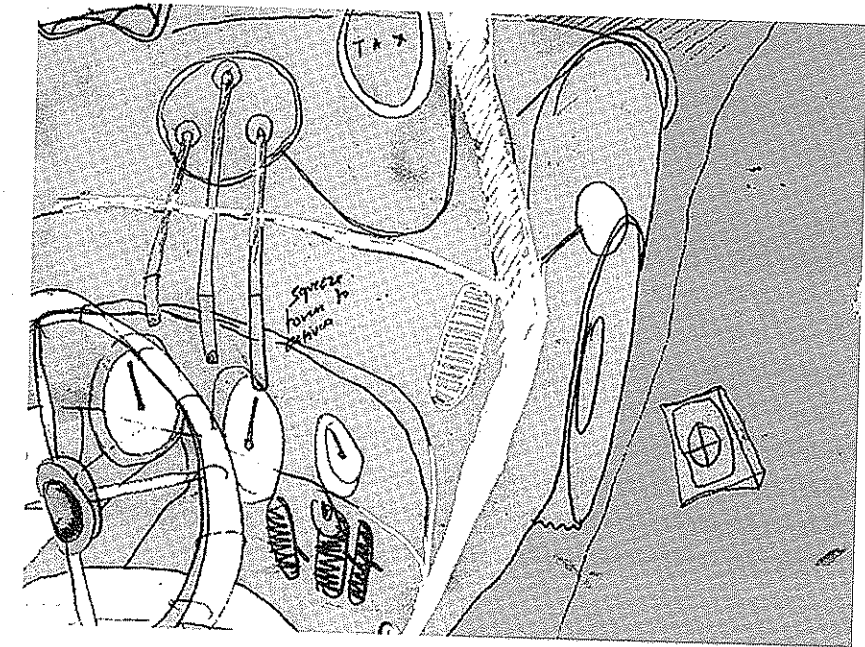**Figure 7.15**   Sketch of *Radio Birds* antennas.

Figure 7.16   Sketch of car radio.

maps were also made for each environment to reinforce the shift in emphasis from radio as energy to radio as space.

The final stage of Tuneable Cities shifted attention back to the physical nature of the car radio itself. At first the radio was going to be a clip-on car accessory, an alternative use of the existing car radio slot, or something to do with adhesive patches and tax discs (figure 7.16), but I felt that the essence of this project is the reengineering of a radio as design's potential for subversion lies in the product's function rather than its form.

Ideally, the design of the radio would have been given to an established commercial design practice and aimed at a particular market. As that was beyond the scope of this project, images of existing car radios were modified to show alternative functions organized as legal/illegal, urban/rural, and private/public pairs (figure 7.17). Some presets for Sferics, bugs, babycoms, *Public Utility*, and *Radio Birds* were also included.

The design process behind this proposal acknowledges the electromagnetic spectrum as a social space, where new definitions of private and public are

Figure 7.17 Treated car radio image.

currently being worked out. Illegal bugging devices, and babycoms that unintentionally act as bugs, provide extensions of private spaces into the public realm. Embassies, legal districts, and suburbs are already part of a tuneable city. *Radio Birds* explores relationships between people and an artificial nature mediated by cars, while *Public Utility* draws attention to the disembodied public space shared by transient mobile communities of car drivers.

The Tuneable Cities proposals question which part of a design process needs to be communicated, and how. They take the car as a found environment/object and revisit the city using mass-produced products to explore public and private space, artificial nature, public art, and overlaps between electromagnetic and urban environments. They suggest a role for electronic products as shapers of urban experience.

Faraday Chair: Negative Radio

Science tells us that radio is everywhere at all times. Whenever an electron changes its motion, the disturbance brings about an electromagnetic wave with radio frequency. This means that as you turn the pages of Radiotext(e), you're creating radio waves. So handle this anthology carefully—radio waves never die."
—N. STRAUSS, *RADIOTEXT(E)*

During a project about electronic space, I realized that today all space is electronic, and that the challenge to designers is to create an "empty" space, a space that has not existed for most of this century due to the explosion of uses for the electromagnetic spectrum. This proposal is not concerned with dramatic aesthetic expressions of electronic phenomena but with providing a "conceptual buzz."

My proposed object for presenting a non-electronic, radio-free volume would use a faraday cage to show the ubiquitous nature of radio space and make perceptible the absence of radio. The object would ask: if the inside is empty, what is outside?

My first ideas were for literal faraday cages that, containing something natural like fruit, would imply that natural objects needed to be protected from electromagnetic pollution. But the mesh was easily interpreted as a decorative device and, although the earth lead for the cage conveyed an impression of electrical functionality, it made it look scientific in a quaintly Victorian way. So I sought less technical-looking shield materials and a more powerful subject for enclosure.

The sculptor Jannis Kounellis uses a harsh steel bed frame to represent the absent human. This made me realize that the human body should be what is contained, and that even when unoccupied the object should still refer to the body. In Kounellis's piece, the bed's power as an image stems from both its human scale and the fact that we are born and die on it.

The use of chairs to express prevailing values and ideas about design is well established. Chairs also echo the human body and can communicate new images of man. For example, the bean bag expressed the new informality of the 1960s. The Faraday Chair could provide a new image of the technological person: not of a cyborg fusing with technology, or of a master of technology, but of vulnerability and uncertainty about the long-term effects of the technologies now so enthusiastically embraced.

While exploring ideas for the Faraday Chair, and as a reaction to the awkwardness of the chairs, the daybed suggested an elegant image of an object whose occupant escaped not into a fantastic world of VR but to enjoy the conceptual buzz of a pure electronic radiation-free space. But the calm repose of the daybed seemed too decadent. The awkwardness of the chair conveyed desperation, and its cramped space lent preciousness to the pure space it contained. The final object even if a daybed, should not be too luxurious as it might appear utopian. There should be something not quite right about it. Its origins should appear uncertain.

By this stage I had moved from metal meshes and sheets to tinted acrylics or glass, and to silk-screened conductive inks or conductive films and coatings that were visually transparent but radio-opaque. I rejected fabrics because radio-opaque versions were only available as visually opaque and it was important to highlight the difference between visual and radio transparency.
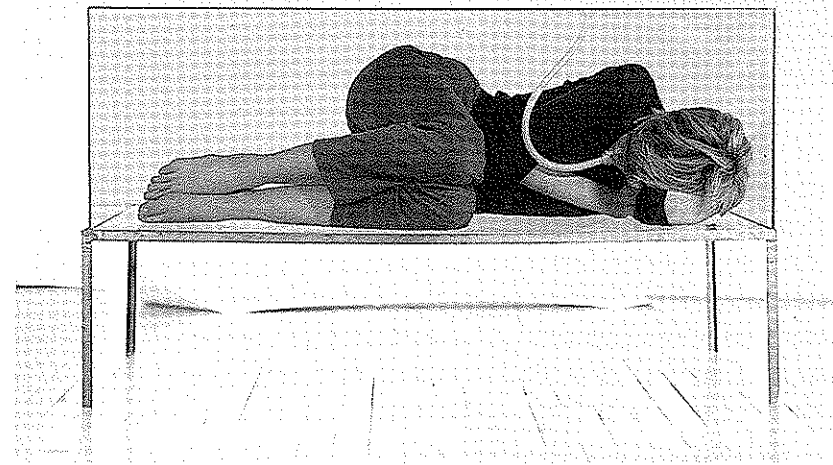
Figure 7.18 Final version with occupant.

Although the final object was a smaller version of a daybed, requiring the occupant to adopt a fetal position (figure 7.18), I kept the title Faraday Chair to suggest that, once electromagnetic fields are taken into consideration, conventional assumptions about everyday objects need to be reexamined. The final proposal is a compromise between the awkwardness of the chair and the abstract elegance of the daybed. A snorkel mouthpiece attached to a silicone air tube was added to hint at the darker psychological side of the proposal and counter the object's formal elegance (figure 7.19).

I developed a series of photographic scenarios with Lubna Hammoud for this object, too. The emphasis was on portraying the vulnerability of its user. Photography was chosen over video as very specific moments could be constructed and more left to the viewer's imagination.

This proposal draws attention to aesthetic differences between sensual and conceptual approaches to the electronic object. The object is stripped back to its essentials, learning from Electroclimates, the Faraday Chair is less seductive and more difficult to accept.

Figure 7.19 Close-up.

Material Tales

The design proposals described in this chapter function as conceptual test-pieces that, through their strangeness, make visible some of the social and psychological mechanisms that shape aesthetic experiences of everyday life mediated by electronic products. Their apparent unusability creates a heightened sense of "distance." This can be because the objects do not work technically or, preferably, because they are conceptually difficult to assimilate. Through use, or at least by modeling a scenario of use in the mind, the observer discovers new ways of conceptualizing reality. They challenge how we think about extensions to our "selves" in ways that do not simply magnify but, rather, transform our perception and consciousness of our relation to our environment.

They are material tales that allow complex interactions between reality and imagination. Driven by poetry, imagination, and intuition rather than reason and logic, they have their own sense, an alternative to our everyday scientific-industrial one. These are tales about the space between rationality and reality, which in an industrial society have come to be synonymous.