

The Aotearoa Digital Arts Reader
Edited by Stella Brennan and Su Ballard
Designed by Jonty Valentine
© 2008 the artists and authors.

All rights reserved. Apart from fair dealing for the purposes of private study, research, criticism or review as permitted under the New Zealand Copyright Act no part of this publication may be reproduced without permission.

"Internet; Environment" copyright © Julian Priest 2007, GNU General Public License.

ISBN: 978-0-9582789-9-7

A catalogue record for this book is available from The National Library of New Zealand

Title: The Aotearoa Digital Arts Reader
Author/Contributor: Brennan, Stella (ed); Ballard, Su (ed)
Publisher: Aotearoa Digital Arts and Clouds



Aotearoa Digital Arts Trust
www.aotearoadigitalarts.org.nz



Clouds
PO Box 68-187, Newton, Auckland 1145
Aotearoa New Zealand
www.clouds.co.nz

Every effort has been made to trace the copyright holders of the illustrations reproduced in this book. Unfortunately, this has not been possible in all cases. The editors and publisher would be pleased to hear from any copyright holders whom they have been unable to contact and to print due acknowledgement in subsequent editions.

Unless otherwise noted, all images are reproduced courtesy of the artists.

Editing a book takes a long time, and many people have helped along the way. Stella and Su would like firstly to thank the authors and artists who have contributed to this book, and the institutions and individuals who shared their image archives with us. We would also like to acknowledge the work and support of the following: Nova Paul, Leoni Schmidt, Col Fay, Khylla Russell, Justine Camp, Letitia Lam, Pam McKinlay, Geoff Noller, Sarah McMillan, Robert Leonard, Melinda Rackham, Mercedes Vincente, and Gwynneth Porter, Deborah Orum and Warren Olds from Clouds. And of course, Jonty Valentine for the hours spent in design. Thanks also to the ADA community, and especially to the other ADA trustees, Janine Randerson, Douglas Bagnall and Zita Joyce.

Thanks most of all to our families: Nathan, Moss and David.

The *Aotearoa Digital Arts Reader* would not have been realised without the support of AUT University, Otago Polytechnic and Creative New Zealand.



Electromagnetic Dreams: New Zealand Artists in Radio Space

Zita Joyce

Radio waves, the electromagnetic waves transmitted by human communications devices, flow constantly around and through us all, permeating our bodies and our environments with a constant stream of information. In their ubiquity, radio waves are described by French art collective Bureau d'Etudes as a new kind of natural object, one with which, after slightly more than one hundred years of use, humans have become intrinsically connected.¹ As a result, "In a world constituted by electromagnetic cosmology (and industry), understanding the electromagnetic wave field is the only way to understand ourselves and our surroundings."² When media theorist Mackenzie Wark observes that "Television passes through and permeates every pore of my body," he is referring to his absorption of the content of television, which renders his body "90 percent TV drama and pop songs and other trash that wafted in on the vector."³ In this, Wark incidentally acknowledges the permeation of his body by the waves that carry television information, to which could be added radio sounds, cell phone calls, and data transfer.

Radio and other electromagnetic waves are so intrinsic in contemporary communications that German new media artist and curator Armin Medosch describes them as the "invisible workhorses of electronic mass society" and the fundamental medium of media art.⁴ Radio waves are the medium of art that works with broadcast radio and television signals, of projects that use wireless networking and ubiquitous connectivity, of GPS-enabled locative media, and of cell phone-based interactivity. In using radio technologies artists are not simply exploiting their cultural meaning, instant connectivity and location-awareness. Rather, artists are engaging with the medium of radio waves in ways that reveal new aspects of our electromagnetic environment, and raise awareness of the role of these 'invisible workhorses' in our lives, as well as the social, political, technical and economic forces that shape our interaction with them. By engaging with these kinds of issues, Marshall McLuhan wrote, the artist is "indispensable in the shaping and analysis and understanding of the life of forms and structures created by electric technology."⁵

McLuhan viewed 'art' as a means of apprehending the world, a preparation for coping with new technologies.⁶ This is articulated by Canadian artist Robert Adrian X in terms of a now-old 'new' technology as he discusses a 1982 work, an international telecommunications networking project using slow-scan television and telefax machines, which he directed. Of the role of artists in relation to new technologies he writes:

We can at least try to discover ways to insert human content into the commercial/military world floating in this electronic space. And this is where artists are traditionally strong... in discovering new ways to use media and materials, in inventing new and contradictory meanings for existing organisations and systems, in subverting self-serving power structures in the interests of nearly

*everyone. Artists using electronic telecommunications are trying to find human meaning in an electronic space.*⁷

In the case of radio waves this "electronic space" is the physical space of the everyday, which makes the role of artists in finding new ways to use radio technologies, subverting the power structures that control them and inserting human meaning into radio waves, all the more significant.

The "electronic space" of radio is a permeable and permeating virtual space. This kind of space is created all around us by the multitude of broadcast and telecommunications transmissions, but also by radio objects that are not documented on databases, by multiple small-scale sources of radio waves. In the introduction to the essay collection *Radiotext(e)* Neil Strauss observes that 'radio' is much more than just the receiving boxes usually associated with the word, "Radio itself is something you can't see, or necessarily even hear; it's radio receivers that are visible and audible."⁸ Receivers are simply interventions within the broader progress of radio waves themselves: outside the receiving box, radio "knows no boundaries; its signal is as unavoidable as it is unstoppable."⁹ John Cage described radio in terms like this in a 1966 broadcast with fellow composer Morton Feldman, who complained about the ubiquity of sound from transistors. In response Cage argued:

*All that radio is... is making available to your ears what was already in the air and available to your ears but you couldn't hear it. In other words, all it is is making audible something which you're already in. You are bathed in radio waves.*¹⁰

This sense of radio evokes the permeation of the body suggested by Mackenzie Wark, and the electromagnetic wave-field described by the Bureau d'Etudes. Radio space is the pervasive quasi-natural presence of broadcast and communications transmissions, the electromagnetic pulses of astronomical objects, the signals of wireless networking, and what Anthony Dunne calls the "electromagnetic dreams" of electronic objects. These dreams describe the tendency of devices to "leak radiation into the space and objects around them, including our bodies."¹¹ Dunne observes that:

*All electronic objects are a form of radio. If our eyes could see (tune into) energy of a lower frequency these objects would not only appear different but their boundaries would extend much further into space, interpenetrating other objects considered discrete at the frequency of light.*¹²

This extension through radio frequencies reveals the extrasensory 'leakiness' and fluidity of visually inert objects, in which they take forms we can't interpret with our biological receivers. This sense of the invisible and inaudible radio world is explored by projects that intercept radio waves and translate them into sound, making audible the ubiquity of waves in the environment and reflecting on the broader implications of extended radio wave networks.

Boundary dissolution in radio space

radioquai's *Radioastronomy* project (begun in 2004) reveals the most pervasive and ubiquitous of environmental radio signals by audifying the electromagnetic emissions of the sun and distant extra-terrestrial objects, the radio-rays that bathe the planet. *Radioastronomy* connects the output of major

1. Bureau d'Etudes, "Electro-Magnetic Propaganda—The Statement of Industrial Dogma," in *Waves: Electromagnetic Waves as Material and Medium for Arts*, ed. Rasa Smite, et al. (Riga: RIXC Centre for New Media Culture, 2006), 44.
2. Bureau d'Etudes, "Electro-Magnetic Propaganda—The Statement of Industrial Dogma," 44.
3. Mackenzie Wark, *Virtual Geography: Living with Global Media Events* (Bloomington: Indiana University Press, 1994), 16.
4. Armin Medosch, "Waves—An Introduction," in *Waves: Electromagnetic Waves as Material and Medium for Arts*, 18.
5. Marshall McLuhan, *Understanding Media: The Extensions of Man* (New York: Mentor and Penguin, 1964), 70.
6. McLuhan, *Understanding Media: The Extensions of Man*, 71.

7. Robert Adrian X, "The World in 24 Hours," in *Ars Electronica: Facing the Future*, ed. Timothy Druckery with Ars Electronica (Cambridge, MA: MIT Press, 1999), 346.
8. Strauss, "Introduction," in *Radiotext(e)*, ed. Neil Strauss and Dave Mandl (New York: Semiotext(e), 1993), 9.
9. Strauss, "Introduction," 9.
10. Quoted in Joe Milutis, *Ether: The Nothing that Connects Everything* (Minneapolis: University of Minnesota Press, 2006), 98.
11. Anthony Dunne, *Hertzian Tales: Electronic Products, Aesthetic Experience and Critical Design* (London: Royal College of Art, 1999), 90.
12. Dunne, *Hertzian Tales: Electronic Products, Aesthetic Experience and Critical Design*, 89.

radio telescopes around the world via the Internet and uses a process of data audification to allow anyone to ‘listen’ to the sounds of the universe online. The *Solar Listening Station* iteration of the project foregrounds the sun’s electromagnetism and reveals the radio telescope to be simply a receiver tuned to the biggest radio station in the solar system. Ever since Dr Watson tuned into the first telephone cable, laid across the rooftops of Boston, in the 1870s, the sound of the sun has been treated as interference. Watson believed that the ethereal squeals and hisses along the line were the sound of explosions on the sun, but although they fascinated him, the search for a clear connection required the removal of an earth-wire, rendering the line immune to the solar signals.¹³ The discipline of radio astronomy was founded in the 1930s, after the realisation that the background hum in telephone systems was formed by traces of the radiation of the Big Bang. Solar electromagnetism is still a major source of so-called ‘interference’ in telecommunications systems, and rather than try to avoid this, the *Solar Listening Station* tunes directly into the sun, treating it as both source and content. The work makes available to our ears what is already in the air, and expands our perceptions of the sun beyond the frequencies of heat and light that we can see and feel, revealing the extent of its electromagnetic dreams.

Wifio (2006), a project by New Zealander Adam Hyde, with Aleksander Erkalovic and Lotte Meijer, exploits the openness of wireless networks to reveal the permeation of lived spaces by wireless transmissions and the insecurity of communications that take place within them. *Wifio* is a conceptual device, a radio receiver tuned into the 2.4 GHz band on which Wi-Fi signals are transmitted. The tuner receives all the signals exchanged between Wi-Fi devices within its range and reads aloud the text carried by the unencoded waves. By exploiting the unseen extensions of computers in Wi-Fi space, their ‘wireless dreams’, *Wifio* implicitly reveals the extensions of human consciousness through wireless networks. Users may imagine that emails and instant messages exist only as visible, textual objects, which simply disappear in the gap between computers, but *Wifio* reveals the presence of those words in the space beyond the wireless card and the router. The security implications of this are explicitly promoted by the faux marketing language used in the work’s exhibition material, which describes *Wifio* as a fun way for the family to hear what their neighbours are up to—“just turn on Wifio and find out what’s happening on the world wide web in your neighbourhood”, or “listen to what your neighbours are discussing using the new Voice Over IP telephones.”¹⁴ The language of *Wifio* frames it as family entertainment, but the project fundamentally emphasises the insecurity of Wi-Fi transmissions, and suggests that the flow of wireless communications within the 2.4 GHz range constitutes a form of externalised, extended consciousness.

From another angle, the musical practice of Adam Willetts engages with the electromagnetic dreams of objects across multiple wave frequencies, as he translates transmissions into dense layers of sound. Performing in the midst of walkie-talkies, telephone pick-up coils, wireless game controllers and an ‘electrosmog’ detector, he really does seem to be “bathed in radio waves”. The walkie-talkies create feedback loops of sound as the game controllers manipulate live sampling software on a laptop. Both create radio signals that are read by the ‘electrosmog’ detector, which receives and audifies all radio waves from 50MHz

1: RT16 antenna at Ventpils International Radio Astronomy Centre, Latvia, 2009, photographed for the *Radio Astronomy* project by *radioqualia*.
 2: RT12 antenna at Ventpils International Radio Astronomy Centre, Latvia, 2009, photo: RIXC.
 3: Zlita Joyce, with Igor Dreeki, Alan Kwok Lun Cheung and Steve Smith, *Ethernapping*, 2005 – 2006, A0 map detailing data from GIS and transmission data from the Radio Spectrum Management Group’s *Spectrum Online* database. The *Ethernapping* locates transmitters and the frequencies they transmit to illustrate the relationship between the physical and electromagnetic geographies of Auckland. In this map the only physical trace of Auckland is the blue outline of coast around the Waitemata Harbour and Rangitoto Island. Transmissions stretch across these boundaries, while a cluster of transmitters marks the density of communications in the inner city. The largest transmission circles emanate from the Sky Tower, a landmark, an entertainment complex, and the most powerful transmitter in the city.

13. Erik Davis, *Technognosis: Myth, Magic, Mysticism in the Age of Information* (New York: Harmony Books, 1998), 73.
 14. Adam Hyde, Aleksander Erkalovic and Lotte Meijer, “Wifio,” in *Waves: Electromagnetic Waves as Material and Medium for Arts*, 74.



fig. 1

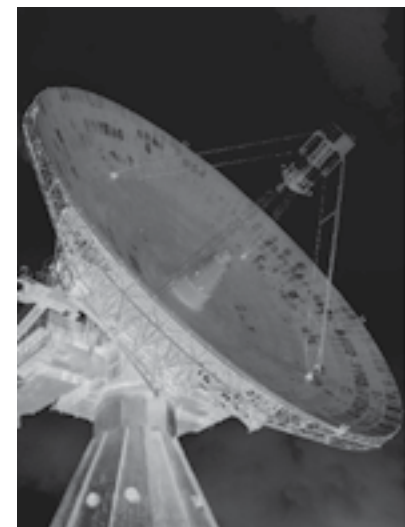


fig. 2

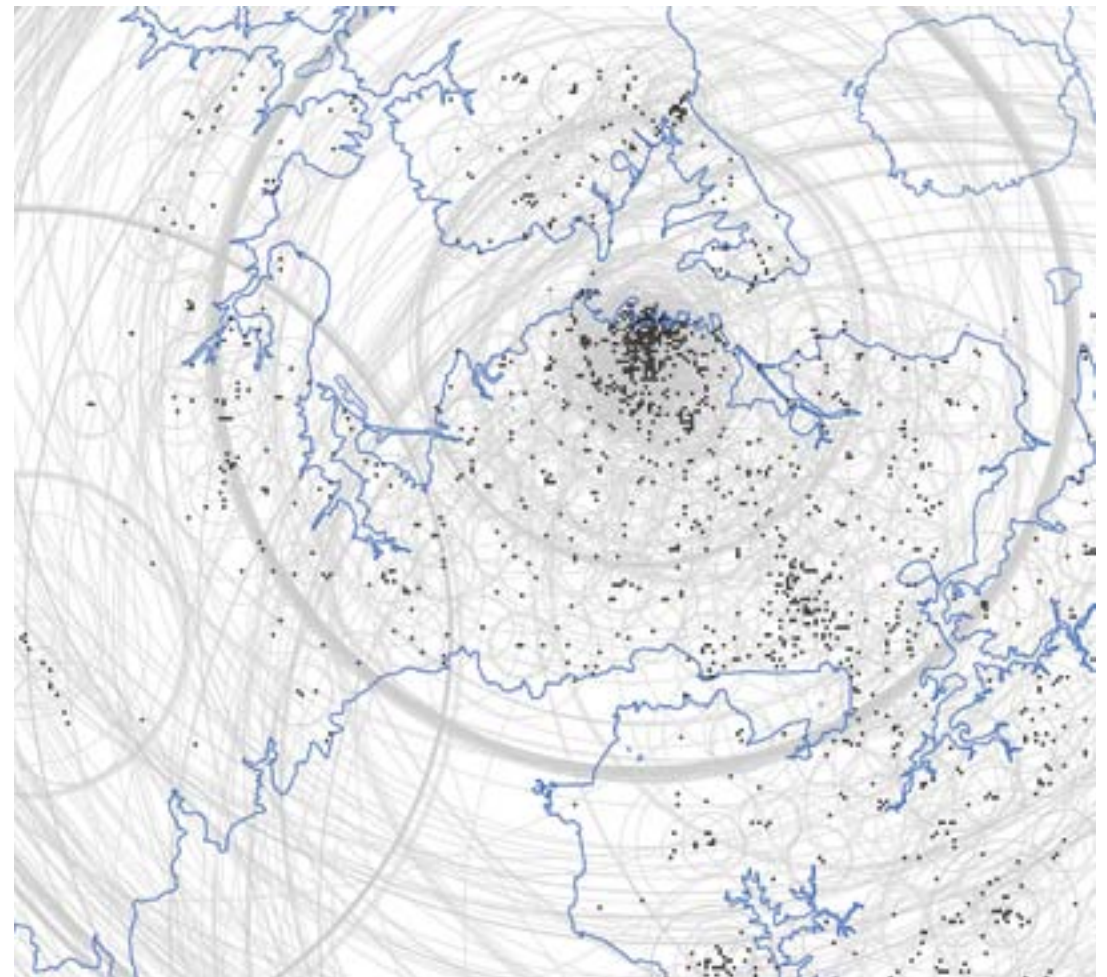


fig. 3

to 3GHz, locating the controller and walkie-talkie signals in a complex soup of intersecting broadcast, cell phone and communications signals. The telephone pick-up coils in turn dissolve the external shell of the computer, audifying the electromagnetic emissions of its internal electronics and making manifest the way it extends in space beyond its visible aluminium boundaries. In the middle of this array of devices, Willetts physically intersects the networks of radio waves he manipulates, extending his physical self, like his laptop, into multiple radio zones, layers of frequencies, an intermingling mass of radio waves. The devices create a variegated radio space, which at some frequencies barely extends beyond the electronics themselves, and at others reaches out into the audience or fills the room, or broadcasts beyond the performance venue on public communication channels. In this space the air seems viscous, filled with a tangible sense of the density of radio signals in which performer, instruments, and audience are immersed. The music appears to be crafted out of the air itself, sculpted into viscerally audible shapes. Like the *Solar Listening Station* Adam Willetts' practice foregrounds the noise that electronic music usually tries to eradicate, the 'interference' created by the instruments themselves. The signals his music draws on are not simply aesthetic devices however, they are iterations of political and economic networks, owned by commercial interests, and managed by the state. By pulling signals from the air and into his music Adam Willetts reveals not only the electromagnetic dreams of his laptop and radio tools, but those of the cell phone, broadcast, and communications networks that extend through his performance space.

Tracing property in radio space

The form and content of radio waves that are available 'in the ether' for artists to work with are influenced by forms of control that determine how radio signals may be used, transmitted, received, and interpreted. In New Zealand the transmission of radio signals has been managed by the state since the 1903 Wireless Telegraphy Act prohibited all unlicensed wireless communication—the first legislation in the world to do so. The licensing of radio transmissions, and the allocation of frequencies used for broadcasting and communications, was, like other areas of the economy, deregulated in 1989. This meant the government relinquished much of its control over who could use radio devices and for what purpose. Instead of the transmission licensing systems of the Post Office and Broadcasting Tribunal, the government established a market-based system for allocating radio frequencies by auction, creating a form of property right in the virtual space of the 'radio spectrum'. The radio spectrum describes the sequence of radio frequencies used for human communications. In New Zealand those frequencies are currently allocated by a combination of property rights and state-administered licensing, with a few designated as commons. Artists using radio waves in New Zealand are therefore not simply drawing on ethereal aesthetic tools, but are engaging with a form of electronic space that is inherently imbued with power relationships and financial interests.

The proprietisation of New Zealand's radio spectrum has been largely unexamined, and the extent and implications of the market in frequency property rights is for the most part only publicly apparent in the heavily commercialised nature of most New Zealand broadcasting. To raise awareness of the extent

and nature of ownership in the New Zealand radio spectrum, *Ethermapping* is a mapping project developed by Zita Joyce with Igor Drecki, Steve Smith and Alan Kwok Lun Cheung that attempts to draw connections between the radio transmissions within which we live and the ownership of property rights to those frequencies. The *Ethermapping* project is focused on a map that identifies the location of 1800 transmitters in the Auckland area and plots an approximation of the coverage of the 6000 radio frequencies transmitted from them. It is an expanded version of the 'node maps' used for freenetworking, on which people who keep their wireless routers 'open'—meaning that anyone can use them without payment or a password—can register the location and technical details of the wireless signal. In this way a node map traces a small proportion of the total transmissions at the 2.4 GHz frequency within a city. By documenting the 'closed', licensed, spectrum, *Ethermapping* seeks to reveal more powerful radio waves and their location in flows of finance and control, as well as the location of their transmission sources. Although many transmitters are physically large and visually imposing, their silence and passivity as objects can mean their role in translating between physical space and the flows of radio waves is overlooked. *Ethermapping* acknowledges the presence of transmitters in the landscape, and the way in which they reach beyond the visual boundaries of their physical construction into radio space. *Ethermapping* is an interactive digital map linked to a database of radio frequency licenses in New Zealand. The transmitters are represented as nodes, on which users can click to reveal a representation of the physical extent of the transmissions from that point. The map also shows ownership details of the frequencies transmitted from each point, along with technical parameters of the transmissions.

The information represented comes from a publicly available but complex database of radio frequency licenses maintained by the Radio Spectrum Management Group within the New Zealand Ministry of Economic Development. Without this level of access to the information the project would be impossible—similar data could not, for example, easily be compiled by walking around a city with a scanning device and measuring the extent of every radio signal. The database records all allocated frequencies in New Zealand, the owners of the licenses, the location of the transmitters, and the technical details of the transmissions. It ensures that information on the ownership of frequency licenses is accessible to potential bidders, as well as to the general public. However, this information is very technical and difficult to drill down into and interpret as a whole, so *Ethermapping* reframes it in a way intended to make it more accessible and meaningful for public users. As it is, the map currently treats the Auckland topography as an idealised flat expanse with consistent surface characteristics and atmosphere. The represented transmissions can only be a suggestive indication of the extent of Auckland's radio space. *Ethermapping* was developed to provide a context for the growing field of media art that uses radio waves, to represent the radio waves themselves, and to connect their artistic exploration with the economic, political, and technical forces that structure these technologies.

Not all of New Zealand radio spectrum is treated as property, however. Some frequencies are reserved for shared, unlicensed use that is not documented in the spectrum database. These include the 2.4 GHz bands used for wireless

networking, and also the 'guardband' frequencies which were opened up for unlicensed 'low power fm' (lpfm) broadcasting in 2003. Most low power stations in New Zealand are run along the model of 'normal' broadcasters. They have songs, voicebreaks, even advertising, but low power fm could be a space for more creative use of radio. The *Radio Kiosk* project initiated by Zita Joyce and Adam Willetts in the Kiosk public art space in Christchurch in June 2006 used a very low powered fm transmitter, which was built by Adam Hyde to a design by Japanese 'mini-fm' pioneer Tetsuo Kogawa, to create an art radio station out of content contributed by broadcasters and podcasters in New Zealand, Australia, and the Netherlands. *Radio Kiosk* was a commentary on the diminishing space for experimental and art programming on radio around the world and it carved out a little physical space of transmissions dedicated to creative radio. The transience, smallness and invisibility of the transmissions inevitably made this a somewhat futile gesture however, amplifying the difficulty of creating and maintaining space and recognition for art radio.

The delicacy of very low powered fm broadcasting is exemplified by the use of radio in the multifaceted *No Chinatown* project; a reflection on Auckland's lack of a recognisable Chinatown area initiated as part of the 2007 Auckland Triennial by Chinese collective The Long March with New Zealand artists Daniel Malone and Kah Bee Chow. The *Friendly Road Radio* broadcasts accompanied the project's architecture competition, held in the Gus Fisher Gallery, in which exhibition visitors were invited to create models of a potential Chinatown. These transmissions appropriated space in the overcrowded radio spectrum of downtown Auckland, using the publicly zoned low powered fm radio band to extend the space of the *No Chinatown* project, creating a kind of Chinatown of the airwaves, what Daniel Malone calls an 'allegorical model' of what a Chinatown might mean. The fragility of the low powered broadcast, the interference, unstable tuning and small scale of transmission mirrors the intangibility of cultural spaces in a city with multiple forms of Chinese cultural presence but no Chinatown.

Friendly Road Radio complemented the *No Chinatown* project's spatial and discursive concerns—the fragile cardboard models and the contingent and performative aspects of the project's planning and realisation. The contingency was emphasised by an unstable radio space that combined programmes from various local and international Chinese radio stations with historical New Zealand recordings and sound works such as *The Jamming Incident*, James Pinker's 2003 piece about the jamming of Uncle Scrim's radio show by the New Zealand government. 'Uncle Scrim' broadcast a programme on Auckland station 1ZB during the Great Depression, in which he offered support for the poor and downtrodden in the form of a 'radio church'. The 'Church of the Friendly Road' was revolutionary in offering space for ordinary New Zealanders to speak about the realities of their lives in the Depression in its vox-pop 'Man in the Street' sessions. Scrim's active support for Labour in the lead-up to the 1935 General Election was considered so threatening to the conservative government that a critical broadcast just days before the election was 'jammed' by the Post and Telegraph Department and the Friendly Road was drowned out by powerful interference. Long after Labour's resulting victory, and the end of Scrim's own career in the New Zealand Commercial Broadcasting Service, in 1959 Scrim served as an advisor for the

Chinese television service. Uncle Scrim serves here not just as a tangential link to Chinese state broadcasting, but as a reminder of the community-building possibilities of radio, its role as a site of public discourse, and the potentially precarious nature of access to the means of transmission.

The mainstream broadcasters form a predominantly Pakeha presence in the commercial, propertised areas of the New Zealand radio spectrum. Other cultural identities are marginalised into community stations and the low power fm bands. These radio spaces still maintain a potential tactical power however, mobilised through low power fm's small scale and temporal immediacy, the specificity of its geographical and community location. *Friendly Road Radio* asserts a Chinese presence in the public space of the low power fm bands, a makeshift Chinatown cobbled together from local historical discourses, and transplanted cultural reference points. Its transmission area was tiny, largely containing the project within Auckland's Gus Fisher Gallery, a grand brick edifice built in 1935 for state-owned commercial broadcaster 1YA in Shortland St. The low power broadcast returned the building to a micro version of its original purpose and tactically transplanted Scrim's broadcasts into the heart of the original state broadcasting establishment.

The art projects documented here use radio technologies that are frequently overlooked, taken for granted, or perceived in purely utilitarian terms. In these works however, radio is revealed to be a means of connecting into broader networks of social meaning, naturally occurring transmissions, and economic and political interests. New Zealand's radio space is heavily commercialised and imbued with a legacy of strict regulation. These artists are trying to find human meaning in radio space, to translate its content and networks into new and surprising forms using the radio signals that permeate the pores of our bodies, and describe our electromagnetic dreams. The invisible workhorses of electronic mass society are shaped by systems of allocation, administration and control, by the ideologies of economic and political power, and by the way in which users engage with them. In their representations of radio technologies and the connections they make possible, these artists make available what is already in the air in new and potentially challenging and revealing ways.