

CITIZENS OF SPECTRUM, ASSEMBLE! Spectrum Management & the perennial political provocations of the electromagnetic field



This workshop was held via Zoom in September 2024, and drew a global cohort of radionauts, wave artists, and transmission enthusiasts to explore the realm of spectrum management: the overlapping forces of law, politics, economics & technology that shape the uses of the electromagnetic spectrum, and thereby the lives of the persons within it. A similar in-person workshop was held at the WGXC Catskill studio.

For 125+ years, the sheer immaterial strangeness of the radio spectrum has mounted challenge after challenge to the “commonsense” around which our world is ordered: property, territory, the greater good. For, at heart, what *is* spectrum? Is it an invisible continent? common utility? precious natural resource? transcendent ether? Each analogy naturalizes certain ideas about how spectrum can and ought to be used. But our language misleads us.

Together, workshop “articipants” formed a citizens’ assembly of sorts, deliberating these themes. We kept open a global view, considering not only the regulatory environment in the US, but also Indigenous legal challenges to spectrum auctions in Aotearoa New Zealand & Turtle Island, grassroots spectrum autonomy in Latin America, and the claims to spectrum by its more-than-human users. We were guided by a spirit of experimentalism in language and listening, to renovate our understanding of spectrum and recover its strangeness.

Now as ever, the spectrum is a proving ground for some of the most urgent political recalibrations of our time: the rights and powers of corporate bodies, the nature of the democratic nation-state, Indigenous sovereignty and decolonial governance, overlapping sovereignties within shared territorial environments. In deliberating together over the radio spectrum, may we also find a way to walk together on the earth.

A Spectrum Overture, feat. Gregory Whitehead & Celeste Oram live on WGXC: [LISTEN](#)

The following embedded audio clips are edited from responses submitted by workshop participants, before and during the workshop.

Question to the Assembly: What is one question you'd like to ask the electromagnetic spectrum (if it could answer)? [LISTEN](#)

workshop thesis

1. The radio spectrum is immaterial, invisible, intangible. Our understanding of spectrum, and its potential uses in human technology, is constantly evolving.
2. This slipperiness in defining or describing radio spectrum—or, put another way, this ontological instability—has continually challenged and confounded ‘common-sense’ understandings of terrestrial authority and order.
 - a. This language has always come from an unholy melage of terminology from religion, science, technology, and policy.
 - b. The language around radio matters, because if you're going to regulate something invisible, it needs to be made comprehensive to a general public - and in terms that justify the regulation of it.
 - c. These terms are not just metaphors, but loaded language that triggers concrete actions and concrete consequences.
3. Therefore, if ideas about material things (property rights / territory / natural resources) inform our ideas about the immaterial radio spectrum, how can our shifting understanding of spectrum re-invent ideas about material things (property rights / territory / natural resources)?
 - a. How do we account for both the commonalities AND incommensurabilities between radio occupation vs. terrestrial occupation?
 - b. How can we re-encounter the strangeness of spectrum?

Question to the Assembly: How would you describe the electromagnetic spectrum, in your own words? [LISTEN](#)

PART ONE: early radio regulation

We start the story more than 100 years ago, in the early days of radio telephony and broadcasting. What's striking about the language for radio in this era is how much it sizzles with

the thrill of expansionism: spectrum is “a new domain comparable to the discovery of a hitherto unknown continent”. The development of transmission technology is dominated by concerns about ‘interference’ and ‘national security’. In the United States, theoretical ideas about “the ether” conflict with the practical functioning of nascent broadcasting. Congress having legislated in 1925 that the “ether” and use thereof were the “inalienable possession of the people of the United States”, subsequent government attempts to regulate broadcasting in various ways are struck down by the courts. The number of broadcasters mushrooms, and the radioscope becomes “chaos”, a clamouring for “squatter’s rights”. In this episode, we consider the early technological conditions that continue to shape our ideas about radio; the enduring spectre of occult “ether” in ideas about spectrum; and the confluences & conflicts around language & law invoking notions of territory.

Question to the Assembly: Imagine you are tuning through the AM band in the early days of radio, when the radio spectrum is an “ethereal bedlam”, a “state of chaos”. What do you hear? How does your listening shape your ideas about what the radio spectrum is? what interference is? [LISTEN](#)

PART TWO: the nature of spectrum

The 1960s sees renewed environmental awareness in many parts of the world, and ideas about environmental conservation as top-down ‘resource management’ start to influence discourse around spectrum: namely, in a Kennedy-era executive order designating the radio spectrum as a “critical natural resource”. In this episode, we weigh the aptness of likening spectrum to a natural resource, including questions of electromagnetic-radiation pollution, the use of spectrum by more-than-human beings, and whether there really *is* a “spectrum”—a medium out there somewhere—outside of the particular operations of transmissions and receivers.

Question to the Assembly: Is electromagnetism part of nature, of your nature, of human nature? On the radio frequencies, are we the guests or the hosts? [LISTEN](#)

PART THREE: spectrum sovereignty and open spectrum

At the turn of the 21st century, spectrum has become “the most valuable piece of property worth owning”, “one of the nation-state’s last remaining vestiges of real power”. The global deregulation of spectrum through spectrum auctions is met with legal challenges by Indigenous claims to spectrum sovereignty. In Aotearoa New Zealand, rulings by the Waitangi Tribunal, advocating for a Māori claim to spectrum, set a global precedent by questioning the presumed authority of the nation-state to be sole arbiter and profiteer in such transactions. These Indigenous claims to spectrum fuse Indigenous and Western knowledge to renovate understandings of spectrum and how it shapes personhood and peoplehood — especially by drawing legal analogies between uses of radio spectrum and other spectrums: light, heat, solar energy. “The spectrum”, as a concept, is thus no longer merely an elegant scientific theory unifying physical properties; it is something with real legal and political stakes. In this chapter we tune into global and grassroots efforts to enable autonomous spectrum use and advocate for open spectrum access: [Rhizomatica](#), [RONJA](#), the [Open Spectrum](#) movement, to name only a few. We consider transmission innovations, like dynamic spectrum sharing and software-defined

radio, which offer technological solutions that make redundant many principles like interference or scarcity which historically have determined spectrum allocation.

Question to the Assembly: How is your own personhood shaped by your use of spectrum? [LISTEN](#)

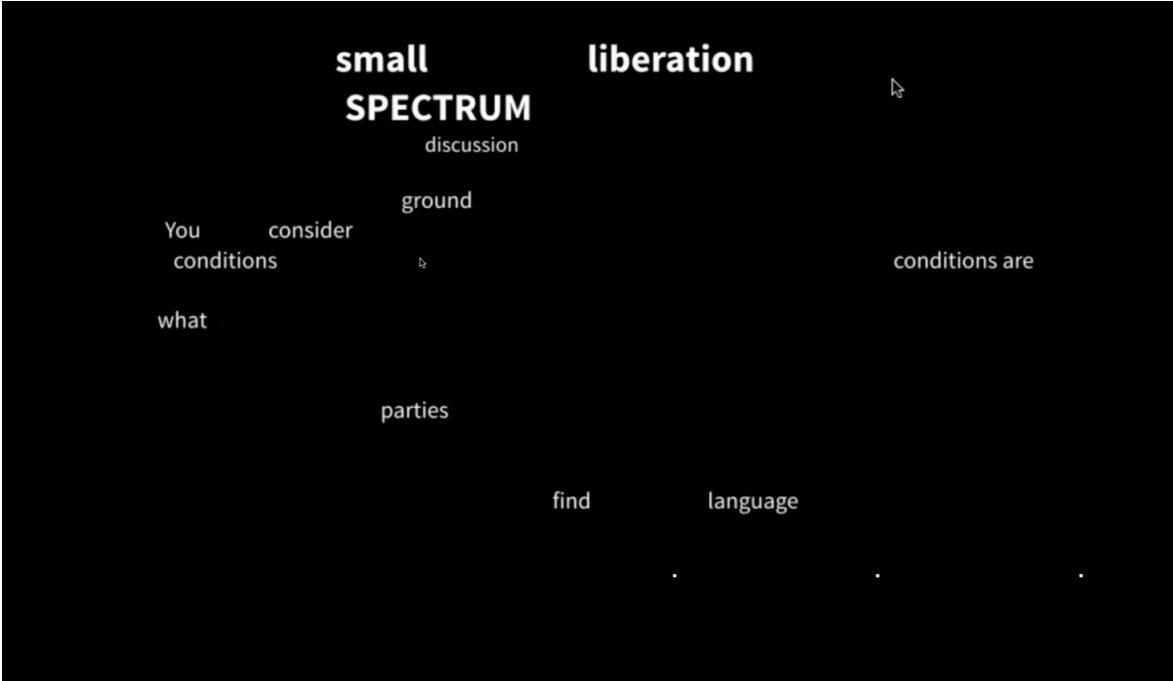
small group deliberation: SPECTRUM CITIZENSHIP

Draft a document that outlines the grounds which establish you, personally, as a Citizen of Spectrum. You might consider —

1. what conditions ‘naturalize’ you to spectrum citizenship? (i.e. by virtue of what conditions are you entitled to spectrum usage?)
2. what uses of spectrum do you want to claim as unalienable?
3. what obligations are you bound to uphold in order to enjoy those privileges?
4. what are the boundaries of the spectrum of which you are a citizen?
5. what other parties and agencies have a stake in spectrum, and how does your citizenship accommodate those other interests?

(maybe your group wants to find alternative language for some of these concepts e.g. ‘citizen’, ‘spectrum’, etc.)

A final epilogue from the Assembly: [LISTEN](#)



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from workshop participant Rob Ray
from workshop participant Keir GoGwilt (to be read right > left)

Bibliography of resources for further reading & listening resources about spectrum allocation

artistic explorations

- Sisters Akousmatica: Border Radio. [Read about it here](#), and [listen here](#) (three chapters, three separate audio files).
- [The Frequency Post](#). (2005) Kunstradio series curated by Andrew Garton.
- [‘Indian Spectrum for Sale’](#). (2023) Darrah Blackwater in collaboration with Solange Aguilar.

grassroots publications & organisations

- [Rhizomatica](#): non-profit supporting community-run autonomous cell networks.
- [RONJA](#): free-space, open-source optical communication system.
- [Red Hook Wifi](#): community wifi network in Red Hook, Brooklyn, NY
- Ron Sakolsky & Stephen Dunifer, eds (1998). [Seizing the Airwaves: A Free Radio Handbook](#).

industry & lobby documents

- [The Citizen’s Guide to the Airwaves](#) (New America Foundation). 2 July 2003. front and back of poster, plus explanatory report (PDF links at bottom of webpage).
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news media

- [Determi-Nation podcast](#), by Darrah Blackwater, especially the episodes [Spectrum Sovereignty Explained with Mariel Triggs](#) and [Māori Spectrum Rights with Antony Royal](#).
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- [Spectrum Unceded: How Indigenous people are Fighting for Digital Sovereignty in a Wireless World](#). Jen Culcullo, The Wire Report. 30 September 2022.
- [How native Hawaiians are taking internet access into their own hands](#). Valerie Vande Panne, Salon. 19 November 2015.
- [Assign unused wireless spectrum to Indigenous communities](#). James Hobart & Cindy Woodhouse, Policy Options (Institute for Research on Public Policy). 14 April 2022.
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- [What is Spectrum, and why should Māori care?](#) Andrew Robb, e-tangata. 29 Feb 2022.
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